

SBML Model Report

Model name: “Smallbone2013 - E.coli metabolic model with modular rate law”



May 6, 2016

1 General Overview

This is a document in SBML Level 2 Version 4 format. This model was created by the following three authors: Nick Juty¹, Vijayalakshmi Chelliah² and Kieran Smallbone³ at November 22nd 2011 at no o' clock in the morning. and last time modified at November fifth 2013 at 10:10 a. m. Table 1 gives an overview of the quantities of all components of this model.

Table 1: Number of components in this model, which are described in the following sections.

Element	Quantity	Element	Quantity
compartment types	0	compartments	2
species types	0	species	786
events	0	constraints	0
reactions	399	function definitions	1
global parameters	0	unit definitions	7
rules	0	initial assignments	0

2 Unit Definitions

This is an overview of eleven unit definitions of which four are predefined by SBML and not mentioned in the model.

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2.1 Unit substance

Name mmol

Definition mmol

2.2 Unit mM

Name mM

Definition $\text{mmol} \cdot \text{l}^{-1}$

2.3 Unit mM_per_s

Name mM per s

Definition $\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$

2.4 Unit mM_squared

Name mM squared

Definition $\text{mmol}^2 \cdot \text{l}^{-2}$

2.5 Unit mM_fourth

Name mM fourth

Definition $\text{mmol}^4 \cdot \text{l}^{-4}$

2.6 Unit per_mM

Name per mM

Definition $\text{mmol}^{-1} \cdot \text{l}$

2.7 Unit per_mM_squared

Name per mM squared

Definition $\text{mmol}^{-2} \cdot \text{l}^2$

2.8 Unit volume

Notes Litre is the predefined SBML unit for volume.

Definition 1

2.9 Unit area

Notes Square metre is the predefined SBML unit for `area` since SBML Level 2 Version 1.

Definition m^2

2.10 Unit length

Notes Metre is the predefined SBML unit for `length` since SBML Level 2 Version 1.

Definition m

2.11 Unit time

Notes Second is the predefined SBML unit for `time`.

Definition s

3 Compartments

This model contains two compartments.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
cell	cell	0000290	3	1	litre	<input checked="" type="checkbox"/>	
extracellular	extracellular	0000290	3	1	litre	<input checked="" type="checkbox"/>	

3.1 Compartment cell

This is a three dimensional compartment with a constant size of one litre.

Name cell

SBO:0000290 physical compartment

3.2 Compartment extracellular

This is a three dimensional compartment with a constant size of one litre.

Name extracellular

SBO:0000290 physical compartment

4 Species

This model contains 786 species. The boundary condition of 384 of these species is set to true so that these species' amount cannot be changed by any reaction. Section 7 provides further details and the derived rates of change of each species.

Table 3: Properties of each species.

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	cell	mmol · l ⁻¹	☒	☒
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	cell	mmol · l ⁻¹	☒	☒
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	cell	mmol · l ⁻¹	☐	☒
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	cell	mmol · l ⁻¹	☐	☒
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	cell	mmol · l ⁻¹	☐	☒
s_0029	(R)-Glycerate	cell	mmol · l ⁻¹	☐	☒
s_0032	(R)-Pantoate	cell	mmol · l ⁻¹	☐	☒
s_0033	(R)-Pantothenate	cell	mmol · l ⁻¹	☐	☒
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	cell	mmol · l ⁻¹	☐	☒
s_0041	(S)-2-Aceto-2-hydroxybutanoate	cell	mmol · l ⁻¹	☐	☒
s_0042	(S)-2-Acetylacetate	cell	mmol · l ⁻¹	☐	☒
s_0043	(S)-3-Hydroxybutanoyl-CoA	cell	mmol · l ⁻¹	☐	☒
s_0044	(S)-3-Hydroxydecanoyl-CoA	cell	mmol · l ⁻¹	☐	☒
s_0045	(S)-3-Hydroxydodecanoyl-CoA	cell	mmol · l ⁻¹	☐	☒
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	cell	mmol · l ⁻¹	☐	☒
s_0047	(S)-3-Hydroxyhexanoyl-CoA	cell	mmol · l ⁻¹	☐	☒

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0049	(S)-3-Hydroxyoctanoyl-CoA	cell	mmol·l ⁻¹	□	□
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	cell	mmol·l ⁻¹	□	□
s_0051	(S)-3-Methyl-2-oxopentanoate	cell	mmol·l ⁻¹	□	□
s_0052	(S)-Dihydroorotate	cell	mmol·l ⁻¹	□	□
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol phosphate	3-cell	mmol·l ⁻¹	□	□
s_0075	1,2-dihexadecanoyl-sn-glycerol phosphate	3-cell	mmol·l ⁻¹	□	□
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	cell	mmol·l ⁻¹	□	□
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	cell	mmol·l ⁻¹	□	□
s_0098	1-(5-Phosphoribosyl)-AMP	cell	mmol·l ⁻¹	□	□
s_0099	1-(5-Phosphoribosyl)-ATP	cell	mmol·l ⁻¹	□	□
s_0116	1-deoxy-D-xylulose 5-phosphate	cell	mmol·l ⁻¹	□	□
s_0119	1-hexadec-9-enoyl-sn-glycerol phosphate	3-cell	mmol·l ⁻¹	□	□
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	cell	mmol·l ⁻¹	□	□
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl diphosphate	4-cell	mmol·l ⁻¹	□	□
s_0128	1-Pyrroline-5-carboxylate	cell	mmol·l ⁻¹	□	□
s_0133	10-Formyltetrahydrofolate	cell	mmol·l ⁻¹	□	□
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate	cell	mmol·l ⁻¹	□	□
s_0148	2,3,4,5-Tetrahydrodipicolinate	cell	mmol·l ⁻¹	□	□

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition	
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	cell	mmol · l ⁻¹	☒	☒	
s_0155	2,3-Dihydrodipicolinate	cell	mmol · l ⁻¹	☒	☒	
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	cell	mmol · l ⁻¹	☒	☒	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	cell	mmol · l ⁻¹	☒	☒	
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	cell	mmol · l ⁻¹	☒	☒	
s_0193	2-C-methyl-D-erythritol cyclodiphosphate	2,4-	cell	mmol · l ⁻¹	☒	☒
s_0194	2-C-methyl-D-erythritol 4-phosphate	cell	mmol · l ⁻¹	☒	☒	
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	cell	mmol · l ⁻¹	☒	☒	
s_0201	2-Dehydro-3-deoxy-D-gluconate phosphate	6-	cell	mmol · l ⁻¹	☒	☒
s_0203	2-Dehydropantoate	cell	mmol · l ⁻¹	☒	☒	
s_0214	2-Hydroxy-3-oxopropanoate	cell	mmol · l ⁻¹	☒	☒	
s_0217	2-Isopropylmaleate	cell	mmol · l ⁻¹	☒	☒	
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	cell	mmol · l ⁻¹	☒	☒	
s_0226	2-Octaprenyl-6-hydroxyphenol	cell	mmol · l ⁻¹	☒	☒	
s_0229	2-Octaprenylphenol	cell	mmol · l ⁻¹	☒	☒	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	cell	mmol · l ⁻¹	☒	☒	
s_0232	2-Oxobutanoate	cell	mmol · l ⁻¹	☒	☒	
s_0233	2-Oxoglutarate	cell	mmol · l ⁻¹	☒	☒	

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	cell	mmol · l ⁻¹	☒	☒
s_0252	3'-Phosphoadenylyl sulfate	cell	mmol · l ⁻¹	☒	☒
s_0255	3,4-dihydroxy-2-butanone 4-phosphate	cell	mmol · l ⁻¹	☒	☒
s_0262	3-(4-Hydroxyphenyl)pyruvate	cell	mmol · l ⁻¹	☒	☒
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	cell	mmol · l ⁻¹	☒	☒
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	cell	mmol · l ⁻¹	☒	☒
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	cell	mmol · l ⁻¹	☒	☒
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	cell	mmol · l ⁻¹	☒	☒
s_0269	3-Dehydroquinate	cell	mmol · l ⁻¹	☒	☒
s_0270	3-Dehydroshikimate	cell	mmol · l ⁻¹	☒	☒
s_0271	3-Deoxy-D-manno-2-octulosonate	cell	mmol · l ⁻¹	☒	☒
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	cell	mmol · l ⁻¹	☒	☒
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	cell	mmol · l ⁻¹	☒	☒
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	cell	mmol · l ⁻¹	☒	☒
s_0282	3-Methyl-2-oxobutanoate	cell	mmol · l ⁻¹	☒	☒
s_0283	3-Octaprenyl-4-hydroxybenzoate	cell	mmol · l ⁻¹	☒	☒
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	cell	mmol · l ⁻¹	☒	☒
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	cell	mmol · l ⁻¹	☒	☒
s_0293	3-Oxodecanoyl-CoA	cell	mmol · l ⁻¹	☒	☒

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0295	3-Oxododecanoyl-CoA	cell	mmol · l ⁻¹	□	□
s_0297	3-Oxohexadecanoyl-CoA	cell	mmol · l ⁻¹	□	□
s_0299	3-Oxohexanoyl-CoA	cell	mmol · l ⁻¹	□	□
s_0303	3-Oxoctanoyl-CoA	cell	mmol · l ⁻¹	□	□
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	cell	mmol · l ⁻¹	□	□
s_0305	3-Oxitetradecanoyl-CoA	cell	mmol · l ⁻¹	□	□
s_0306	3-Phospho-D-glycerate	cell	mmol · l ⁻¹	□	□
s_0307	3-Phospho-D-glyceroyl phosphate	cell	mmol · l ⁻¹	□	□
s_0308	3-Phosphohydroxypyruvate	cell	mmol · l ⁻¹	□	□
s_0310	4,5-dihydroxy-2,3-pentanedione	cell	mmol · l ⁻¹	□	□
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	cell	mmol · l ⁻¹	□	□
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	cell	mmol · l ⁻¹	□	□
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	cell	mmol · l ⁻¹	□	□
s_0316	4-amino-4-deoxychorismate	cell	mmol · l ⁻¹	□	□
s_0318	4-Aminobenzoate	cell	mmol · l ⁻¹	□	□
s_0325	4-Hydroxybenzoate	cell	mmol · l ⁻¹	□	□
s_0328	4-Methyl-2-oxopentanoate	cell	mmol · l ⁻¹	□	□
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	cell	mmol · l ⁻¹	□	□
s_0331	4-Phospho-D-erythronate	cell	mmol · l ⁻¹	□	□
s_0332	4-Phospho-L-aspartate	cell	mmol · l ⁻¹	□	□
s_0333	5'-Deoxyadenosine	cell	mmol · l ⁻¹	□	□
s_0334	5'-deoxyribose	cell	mmol · l ⁻¹	□	□
s_0335	5,10-Methenyltetrahydrofolate	cell	mmol · l ⁻¹	□	□
s_0336	5,10-Methylenetetrahydrofolate	cell	mmol · l ⁻¹	□	□
s_0337	5,6,7,8-Tetrahydrofolate	cell	mmol · l ⁻¹	□	□

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxamide	cell	mmol · l ⁻¹	☒	☒
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	cell	mmol · l ⁻¹	☒	☒
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	cell	mmol · l ⁻¹	☒	☒
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	cell	mmol · l ⁻¹	☒	☒
s_0345	5-Amino-4-oxopentanoate	cell	mmol · l ⁻¹	☒	☒
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	cell	mmol · l ⁻¹	☒	☒
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	cell	mmol · l ⁻¹	☒	☒
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	cell	mmol · l ⁻¹	☒	☒
s_0354	5-Methyltetrahydrofolate	cell	mmol · l ⁻¹	☒	☒
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	cell	mmol · l ⁻¹	☒	☒
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	cell	mmol · l ⁻¹	☒	☒
s_0361	5-Phospho-beta-D-ribosylamine	cell	mmol · l ⁻¹	☒	☒
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	cell	mmol · l ⁻¹	☒	☒
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	cell	mmol · l ⁻¹	☒	☒
s_0367	6-hydroxymethyl dihydropterin	cell	mmol · l ⁻¹	☒	☒
s_0368	6-hydroxymethyl-dihydropterinophosphate	py-cell	mmol · l ⁻¹	☒	☒

	Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0369		6-Phospho-D-gluconate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0370		6-phospho-D-glucono-1,5-lactone	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0371		7,8-Diaminononanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0372		7,8-Dihydrofolate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0376		8-Amino-7-oxononanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0377		[2Fe-1S] desulfurated iron-sulfur cluster	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0378		[2Fe-2S] iron-sulfur cluster	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0380		[4Fe-4S] iron-sulfur cluster	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0381		Acetaldehyde	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0384		Acetate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0391		Acetoacetyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0393		Acetyl phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0395		Acetyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0397		acyl carrier protein	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0405		Adenine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0408		Adenosine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0411		Adenosine 3',5'-bisphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0412		Adenosine 5'-phosphosulfate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0420		adenylated molybdopterin	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0421		ADP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0435		all-trans-Octaprenyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0445		alpha-D-Ribose 1-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0446		alpha-D-Ribose 5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0451		Ammonium	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0453		Ammonium	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0454		AMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0457		Anthranilate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0467	ATP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0470	beta-Alanine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0474	Bicarbonate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0476	Biotin	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0479	bis-molybdenum cofactor	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0480	bis-molybdopterin guanine dinucleotide	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0481	bis-molybdopterin mono-guanine dinucleotide	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0488	Butanoyl-CoA	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0497	Calcium	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0499	Calcium	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0502	Carbamoyl phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0510	CDP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0513	CDP-1,2-dihexadecanoylglycerol	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0520	Chloride	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0522	Chloride	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0526	chorismate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0530	cis-Aconitate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0536	Citrate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0539	CMP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0542	CMP-3-deoxy-D-manno-octulosonate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0543	CO2	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_0545	CO2	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

			Compartment	Derived Unit	Constant	Boundary Condition
	s_0546	Co2+	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0548	Co2+	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_0555	Coenzyme A	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0565	Coproporphyrinogen III	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0574	Crotonoyl-CoA	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0575	CTP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0579	Cu2+	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0581	Cu2+	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_0585	cyclic pyranopterin monophosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0599	D-4'-Phosphopantothenate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0600	D-Alanine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0603	D-Alanyl-D-alanine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0611	D-Arabinose 5-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0621	D-Erythrose 4-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0622	D-Fructose	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0627	D-Fructose 6-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0653	D-Glucosamine 1-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0654	D-Glucosamine 6-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0657	D-Glucose	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0659	D-Glucose	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_0663	D-Glucose 6-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0671	D-Glutamate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0675	D-Glycerate 2-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0704	D-Ribulose 5-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_0721	D-Xylulose 5-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition	
s_0726	dATP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0731	dCTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0732	Deamino-NAD+	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0737	Decanoyl-CoA (n-C10:0CoA)	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0738	dehydroglycine	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0754	Dephospho-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0755	Dethiobiotin	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0760	dGTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0765	Dihydronicopterin	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0766	Dihydronicopterin monophosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0767	Dihydropteroate	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0768	dihydrosirohydrochlorin	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0772	Dihydroxyacetone phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0779	Dimethylallyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0783	Diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0785	Dodecanoate (n-C12:0)	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0795	dTDP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0802	dTMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0805	dTTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0807	dUMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0810	dUTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□	
s_0812	Enoylglutaryl-[acyl-carrier methyl ester	protein]	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□
s_0813	Enoylpimeloyl-[acyl-carrier methyl ester	protein]	cell	$\text{mmol} \cdot \text{l}^{-1}$	□	□

	Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
	s_0826	Farnesyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0838	Fe2+	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0840	Fe2+	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_0841	Fe3+	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0843	Fe3+	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_0859	Flavin adenine dinucleotide oxidized	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0860	Flavin adenine dinucleotide reduced	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0861	Flavodoxin reduced	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0862	flavodoxin semi oxidized	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0863	FMN	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0867	Formate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0875	Fumarate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0896	GDP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0903	Geranyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0910	Glutaryl-[acyl-carrier protein] methyl ester	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0913	Glyceraldehyde 3-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0920	Glycerol 3-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0929	Glycine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0936	Glycolaldehyde	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0937	Glycolate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0941	Glyoxylate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0942	GMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0945	GTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0971	Hexadecanoate (n-C16:0)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0976	Hexadecenoate (n-C16:1)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0984	Hexanoyl-CoA (n-C6:0CoA)	cell	mmol · l ⁻¹	□	□
s_0991	Hydrogen peroxide	cell	mmol · l ⁻¹	□	□
s_0994	Hydrogen sulfide	cell	mmol · l ⁻¹	□	□
s_0998	Hydroxymethylbilane	cell	mmol · l ⁻¹	□	□
s_1005	Iminoaspartate	cell	mmol · l ⁻¹	□	□
s_1006	IMP	cell	mmol · l ⁻¹	□	□
s_1009	Indole	cell	mmol · l ⁻¹	□	□
s_1017	IscS sulfur acceptor protein	cell	mmol · l ⁻¹	□	□
s_1018	IscS with bound sulfur	cell	mmol · l ⁻¹	□	□
s_1019	IscU scaffold protein	cell	mmol · l ⁻¹	□	□
s_1020	IscU with bound [2Fe-2S] cluster	cell	mmol · l ⁻¹	□	□
s_1021	IscU with bound [4Fe-4S] cluster	cell	mmol · l ⁻¹	□	□
s_1022	IscU with two bound [2Fe-2S] clusters	cell	mmol · l ⁻¹	□	□
s_1027	Isocitrate	cell	mmol · l ⁻¹	□	□
s_1028	Isopentenyl diphosphate	cell	mmol · l ⁻¹	□	□
s_1033	KDO(2)-lipid IV(A)	cell	mmol · l ⁻¹	□	□
s_1038	KDO-lipid IV(A)	cell	mmol · l ⁻¹	□	□
s_1040	L-2-Amino-3-oxobutanoate	cell	mmol · l ⁻¹	□	□
s_1041	L-Alanine	cell	mmol · l ⁻¹	□	□
s_1061	L-Arginine	cell	mmol · l ⁻¹	□	□
s_1068	L-Asparagine	cell	mmol · l ⁻¹	□	□
s_1072	L-Aspartate	cell	mmol · l ⁻¹	□	□
s_1075	L-Aspartate 4-semialdehyde	cell	mmol · l ⁻¹	□	□
s_1081	L-Citrulline	cell	mmol · l ⁻¹	□	□
s_1082	L-Cystathionine	cell	mmol · l ⁻¹	□	□
s_1083	L-Cysteine	cell	mmol · l ⁻¹	□	□
s_1095	L-Glutamate	cell	mmol · l ⁻¹	□	□

	Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
	s_1098	L-Glutamate 1-semialdehyde	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1099	L-Glutamate 5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1100	L-Glutamate 5-semialdehyde	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1101	L-Glutamine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1105	L-Glutamyl-tRNA(Glu)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1106	L-Histidine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1109	L-Histidinol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1110	L-Histidinol phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1112	L-Homocysteine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1113	L-Homoserine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1119	L-Isoleucine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1127	L-Leucine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1131	L-Lysine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1138	L-Malate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1141	L-Methionine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1151	L-Phenylalanine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1155	L-Proline	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1170	L-Serine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1179	L-Threonine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1185	L-Tryptophan	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1189	L-Tyrosine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1193	L-Valine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1204	Lipid A Disaccharide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1211	LL-2,6-Diaminoheptanedioate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1212	magnesium	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1214	magnesium	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_1216	Malonyl-[acyl-carrier protein]	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1217	Malonyl-CoA	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1218	malonyl-CoA methyl ester	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1239	Menaquinol 8	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1240	Menaquinone 8	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1242	meso-2,6-Diaminoheptanedioate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1248	Methanol	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1250	Methanol	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1255	Mn2+	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1257	Mn2+	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1258	MoaD Protein with bound AMP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1259	MoaD Protein with carboxylate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1260	MoaD Protein with thiocarboxylate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1261	Molybdate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1263	Molybdate	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1264	molybdenum cofactor	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1265	molybdopterin	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1274	N(omega)-(L-Arginino)succinate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1277	N-((R)-4-Phosphopantethenoyl)-L-cysteine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1287	N-Acetyl-D-glucosamine 1-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1302	N-Acetyl-L-glutamate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1304	N-Acetyl-L-glutamyl 5-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1312	N-Carbamoyl-L-aspartate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>

	Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
	s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1321	N2-Acetyl-L-ornithine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1327	N6-(1,2-Dicarboxyethyl)-AMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1329	nickel	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1331	nickel	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_1333	Nicotinamide adenine dinucleotide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1334	Nicotinamide adenine dinucleotide - reduced	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1335	Nicotinamide adenine dinucleotide phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1340	Nicotinate D-ribonucleotide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1358	O-Acetyl-L-serine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1362	O-Phospho-4-hydroxy-L-threonine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1363	O-Phospho-L-homoserine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1364	O-Phospho-L-serine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1367	O-Succinyl-L-homoserine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1372	O2	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1374	O2	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_1390	Octanoyl-CoA (n-C8:0CoA)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1391	Ornithine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1394	Orotate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1397	Orotidine 5'-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1399	Oxaloacetate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1406	Oxidized thioredoxin	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1407	p-Cresol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1411	Palmitoyl-ACP (n-C16:0ACP)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1412	Palmitoyl-CoA (n-C16:0CoA)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1413	Pantetheine 4'-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1429	Phenylpyruvate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1430	Phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1432	Phosphate	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1484	Phosphoenolpyruvate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1491	Pimeloyl-[acyl-carrier protein]	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1493	Porphobilinogen	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1494	potassium	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1496	potassium	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1497	Prephenate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1508	Protoheme	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1511	Protoporphyrin	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

	Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
	s_1512	Protoporphyrinogen IX	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1522	Pyridoxal 5'-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1530	Pyridoxine 5'-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1531	Pyruvate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1537	Quinolinate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1544	Reduced thioredoxin	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1546	Riboflavin	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1551	S-Adenosyl-L-homocysteine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1552	S-Adenosyl-L-methionine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1558	S-Ribosyl-L-homocysteine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1561	Sedoheptulose 7-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1571	Shikimate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1574	Shikimate 5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1577	Siroheme	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1578	sirohydrochlorin	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1595	Succinate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1599	Succinyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1609	Sulfate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1611	Sulfate	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_1612	Sulfite	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1643	Thiamin monophosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1644	Thiamine diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1668	trans-Dec-2-enoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1670	trans-Dodec-2-enoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
	s_1672	trans-Hex-2-enoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1674	trans-Hexadec-2-enoyl-CoA	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1676	trans-Oct-2-enoyl-CoA	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1680	trans-Tetradec-2-enoyl-CoA	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1690	tRNA (Glu)	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-alal) (middle of chain)	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1725	two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1731	Ubiquinol-8	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1732	Ubiquinone-8	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1733	UDP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1745	UDP-N-acetyl-D-glucosamine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1750	UDP-N-acetylmuramate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1751	UDP-N-acetylmuramoyl-L-alanine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>

	Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
	s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1762	UMP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1765	Undecaprenyl diphosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1768	Undecaprenyl phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopimeloyl-D-ala-D-ala	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1791	Uroporphyrinogen III	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1792	UTP	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1799	Xanthosine 5'-phosphate	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1804	Zinc	cell	mmol · l ⁻¹	<input type="checkbox"/>	<input type="checkbox"/>
	s_1806	Zinc	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_1807	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_1835	5'-deoxyribose	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_2072	p-Cresol	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	s_2093	S-Adenosyl-4-methylthio-2-oxobutanoate	extracellular	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0001	thrA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0002	thrB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0003	thrC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0005	talB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0006	mog	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0008	ribF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0010	ispH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0012	dapB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0020	folA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0022	pdxA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0030	leuD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0031	leuC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0032	leuB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0033	leuA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0034	ilvI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0035	ilvH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0036	ftsI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0037	murE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0038	murF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0039	mraY	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0040	murD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0041	murG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0042	murC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0043	ddlB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0044	lpxC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0045	mutT	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0046	coaE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0048	nadC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0051	aceE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0052	aceF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0053	lpdA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0054	acnB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0060	can	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0061	panD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0062	panC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0063	panB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0064	folK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0065	mrcB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0071	hemL	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0074	mtnN	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0076	dapD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0077	pyrH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0078	dxr	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0079	uppS	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0080	cdsA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0081	lpxD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0082	fabZ	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0083	lpxA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0084	lpxB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0085	accA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0094	fadE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0099	proB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0100	proA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0103	argF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0110	yahI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0116	cynT	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0125	mhpF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0134	hemB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0135	ddlA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0137	proc	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0138	aroL	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0139	mak	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0144	ribD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0145	ribH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0146	thiL	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0149	dxs	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0150	ispA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0151	thiL	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0152	panE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0162	tesB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0167	adk	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0168	hemH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0175	gcl	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0177	glxR	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0183	arcC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0184	purK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0185	pure	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0186	lpxH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0188	fold	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0221	mrdA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0223	nadD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0225	hscC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0238	fldA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0246	gltA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0253	sucC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0254	sucD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0260	nadA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0263	aroG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0264	gpmA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0273	pgl	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0274	bioA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0275	bioB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0276	bioF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0277	bioc	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0278	bioD1	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0279	moaA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0280	moaC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0281	moaD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0282	moaE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0291	moeB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0292	moeA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0300	ybjG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0313	ltaE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0318	trxB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0323	pflA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0324	pflB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0326	serC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0327	aroA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0328	cmk	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0330	lpxK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0331	kdsB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0332	aspC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0342	pyrD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0368	pyrC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0372	fabH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0373	fabD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0374	fabG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0375	acpP	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0376	fabF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0377	pabC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0378	tmk	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0389	purB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0391	icd	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0395	dadX	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0403	prs	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0404	ispE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0405	hemA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0406	kdsA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0416	adhE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0425	trpA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0426	trpB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0427	trpC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0428	trpD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0429	trpE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0431	acnA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0432	ribA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0433	pgpB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0435	pyrF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0436	fabI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0439	puuA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0451	ydbK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0466	aldA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0514	folM	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0515	fumC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0516	fumA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0519	malY	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0531	ribE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0540	ydiB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0541	aroD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0544	aroH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0554	nadE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0559	astC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0561	gdhA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0567	gapA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0572	pabB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0577	purT	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0578	eda	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0579	edd	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0580	zwf	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0586	nudB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0605	hisG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0606	hisD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0607	hisC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0608	hisB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0609	hisH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0610	hisA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0611	hisF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0612	hisI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0641	thiD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0657	folE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0682	atoB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0691	nudI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0717	yfbQ	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0719	ackA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0720	pta	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0727	ubiX	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0728	purF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0729	folC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0730	accD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0731	pdxB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0732	fabB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0734	aroC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0735	fadJ	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0736	fadI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0742	yfdZ	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0743	glk	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0746	gltX	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0750	cysK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0757	cysM	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0765	hemF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
	e_0768	eutD	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0770	talA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0771	tktB	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0774	dapE	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0775	purC	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0776	dapA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0791	purM	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0793	ppk	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0795	guaA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0796	guaB	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0798	ispG	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0799	ndk	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0803	iscA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0804	nifU	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0805	iscS	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0813	glyA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0815	purL	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0818	pdxJ	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0819	nadB	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0821	grcA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0822	trxC	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0823	pssA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0825	pheA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0826	tyrA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0827	aroF	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0828	ppnK	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	e_0839	luxS	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0848	gutQ	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0866	ispF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0867	ispD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0868	cysC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0869	cysN	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0870	cysD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0871	cysH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0872	cysI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0873	cysJ	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0875	eno	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0876	pyrG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0893	argA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0894	thyA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0896	aas	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0897	lysA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0903	yqeA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0911	fldB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0918	serA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0919	rpiA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0925	pgk	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0926	epd	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0928	tktA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0931	metK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0941	glcD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0951	metC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0953	plsC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0960	ribB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0962	uppP	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0964	folB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0974	tdcE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0975	tdcD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0977	tdcB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0978	garK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0979	garR	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0986	argG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0987	glmM	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0988	folP	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0990	ispB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0991	murA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0993	kdsD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0994	kdsC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1004	mdh	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1005	accB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1006	accC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1010	aroE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1014	argD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1015	pabA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1019	cysG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1023	yhfW	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1026	rpe	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1027	aroB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1028	aroK	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1029	mrcA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1034	bioH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1045	asd	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1086	xylA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1105	cysE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1106	gpsA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1108	gpmI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1109	tdh	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1110	tbl	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1125	waaA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1126	coaD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1127	coaBC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1128	dut	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1129	pyrE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1130	gmk	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1136	ilvN	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1137	ilvB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1141	tnaA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1149	glmS	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1150	glmU	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1160	asnA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1167	ilvE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1168	ilvD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1169	ilvA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1170	ilvC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1172	trxA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1184	hemX	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1185	hemD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1186	hemC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1188	cyaY	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1189	dapF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1196	metE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1200	ubiD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1201	fre	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1202	fadA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1203	fadB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1205	hemG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1206	mobB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1207	mobA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1210	glnA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1226	tpiA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1227	fpr	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1232	metB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1233	metL	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1234	metF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1238	pflD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1239	pflC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1240	ppc	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1241	argE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1242	argC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1243	argB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1244	argH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1247	murI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1248	murB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1249	coaA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1250	thiH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1251	thiG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1252	thiF	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1253	thiE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1254	thiC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1256	hemE	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1257	purD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1258	purH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1259	metA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1262	metH	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1263	lysC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1264	pgi	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1271	ubiC	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1272	ubiA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1273	plsB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1275	alr	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1276	tyrB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1277	aphA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1291	rpiB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1298	fumB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1312	psd	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1313	rsgA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1315	purA	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1326	cysQ	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1334	nrdG	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1335	nrdD	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1339	pyrI	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1340	pyrB	cell	mmol · l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_1341	argI	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1355	sgcE	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1366	deoB	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1367	deoD	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1369	serB	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1373	gpmB	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1374	thiS	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1376	glcF	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_1377	glcE	cell	mmol·l ⁻¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

5 Function definition

This is an overview of one function definition.

5.1 Function definition `max`

Arguments `x, y`

Mathematical Expression

$$\frac{x + y + |x - y|}{2} \quad (1)$$

6 Reactions

This model contains 399 reactions. All reactions are listed in the following table and are subsequently described in detail. If a reaction is affected by a modifier, the identifier of this species is written above the reaction arrow.

Table 4: Overview of all reactions

Nº	Id	Name	Reaction Equation	SBO
1	r_0001	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran (spontaneous)	s_0004 $\xrightleftharpoons{\quad}$ s_0003	0000176
2	r_0008	1-(5-phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino)imidazole-4-carboxamide isomerase	s_0097 $\xrightleftharpoons{e_0610, s_0097, s_0341}$ s_0341	0000176
3	r_0009	1-deoxy-D-xylulose 5-phosphate synthase	s_0913+s_1531 $\xrightleftharpoons{e_0149, s_0913, s_1531, s_0543, s_0116}$	0000543 + s_0116
4	r_0011	1-deoxy-D-xylulose reductoisomerase	s_0116+s_1336 $\xrightleftharpoons{e_0078, s_0116, s_1336, s_0194, s_1335}$	00001764 + s_1335
5	r_0012	1-hexadec-7-enoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:1)	s_0119+s_0533 $\xrightleftharpoons{e_0953, s_0119, s_0533, s_0397, s_0073}$	0000397 + s_0073
6	r_0013	1-hexadecanoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:0)	s_0121+s_1411 $\xrightleftharpoons{e_0953, s_0121, s_1411, s_0397, s_0075}$	0000397 + s_0075
7	r_0014	1-hydroxy-2-methyl-2-(E)-butenyl diphosphate reductase (dmpp)	4- s_0123+s_1334 $\xrightleftharpoons{e_0010, s_0123, s_1334, s_0779, s_1333}$	0000769 + s_1333
8	r_0015	1-hydroxy-2-methyl-2-(E)-butenyl diphosphate reductase (ipdp)	4- s_0123+s_1334 $\xrightleftharpoons{e_0010, s_0123, s_1334, s_1028, s_1333}$	0001028 + s_1333

Nº	Id	Name		Reaction Equation	SBO
9	r_0038	2-aceto-2-hydroxybutanoate synthase		s_0232 + s_1531 $\xrightleftharpoons[e_{1137}, e_{0034}, e_{0035}, e_{1136}, s_{0232}, s_{1531}, s_{0041}, s_{0543}]{0000176}$ s_0543	
10	r_0053	2-C-methyl-D-erythritol cyclodiphosphate synthase	2,4-	s_0237 $\xrightleftharpoons[e_{0866}, s_{0237}, s_{0193}, s_{0539}]{0000176}$ s_0193 + s_0539	
11	r_0054	2-C-methyl-D-erythritol 4-phosphate cytidyltransferase		s_0194 + s_0575 $\xrightleftharpoons[e_{0867}, s_{0194}, s_{0575}, s_{0312}, s_{0783}]{0000376}$ s_0783	
12	r_0056	2-dehydro-3-deoxy-phosphogluconate dolase	al-	s_0201 $\xrightleftharpoons[e_{0578}, s_{0201}, s_{0913}, s_{1531}]{0000176}$ s_0913 + s_1531	
13	r_0063	2-dehydropantoate 2-reductase		s_0203 + s_1336 $\xrightleftharpoons[e_{0152}, e_{1170}, s_{0203}, s_{1336}, s_{1335}, s_{0032}]{0000176}$ s_1335 + s_0032	
14	r_0066	2-isopropylmalate hydratase		s_0266 $\xrightleftharpoons[e_{0031}, e_{0030}, s_{0266}, s_{0217}]{0000176}$ s_0217	0000176
15	r_0067	2-isopropylmalate synthase		s_0282 + s_0395 $\xrightleftharpoons[e_{0033}, s_{0282}, s_{0395}, s_{0266}, s_{0555}]{0000266}$ s_0555	0000266 +
16	r_0078	2-Oxo-4-methyl-3-carboxypentanoate decarboxylation		s_0267 $\xrightleftharpoons[s_{0328}, s_{0543}]{0000176}$ s_0328 + s_0543	0000176
17	r_0084	2C-methyl-D-erythritol 2,4 cyclodiphosphate dehydratase		s_0193 + 2 s_0861 $\xrightleftharpoons[e_{0238}, e_{0798}, e_{0911}, s_{0193}, s_{0861}, s_{0862}, s_{0123}]{0000176}$ 2 s_0862 + s_0123	
18	r_0085	3',5'-bisphosphate nucleotidase		s_0411 $\xrightleftharpoons[e_{1326}, s_{0411}, s_{0454}, s_{1430}]{0000176}$ s_0454 + s_1430	0000176
19	r_0092	3,4-Dihydroxy-2-butanone-4-phosphate synthase		s_0704 $\xrightleftharpoons[e_{0960}, s_{0704}, s_{0255}, s_{0867}]{0000176}$ s_0255 + s_0867	0000176
20	r_0096	3-cis-2-trans-enoyl-CoA isomerase		s_1674 $\xrightleftharpoons[e_{1203}, s_{1674}, s_{0979}]{0000176}$ s_0979	0000176

Nº	Id	Name	Reaction Equation	SBO
21	r_0098	3-dehydroquinate dehydratase, irreversible	s_0269 $\xrightleftharpoons[e_0541, s_0269, s_0270]{}$ s_0270	0000176
22	r_0099	3-dehydroquinate synthase	s_0195 $\xrightleftharpoons[s_1430]{e_1027, s_0195, s_0269, s_1430}$ s_0269 + s_1430	0000176
23	r_0100	3-deoxy-D-manno-octulosonic acid 8-phosphate synthase	s_0611 + s_1484 $\xrightleftharpoons[e_0406, s_0611, s_1484, s_0272, s_1430]{}$ 00002762 + s_1430	
24	r_0101	3-deoxy-D-arabino-heptulosonate 7-phosphate synthetase	s_0621 + s_1484 $\xrightleftharpoons[e_0544, e_0827, e_0263, s_0621, s_1484, s_0195, s_1430]{}$ 0000176 s_0195 + s_1430	
25	r_0102	3-deoxy-D-manno-octulosonic acid transferase	s_0542 + s_0147 $\xrightleftharpoons[e_1125, s_0542, s_0147, s_0539, s_1038]{}$ 00005769 + s_1038	
26	r_0103	3-deoxy-D-manno-octulosonic acid transferase	s_0542 + s_1038 $\xrightleftharpoons[e_1125, s_0542, s_1038, s_0539, s_1033]{}$ 00005769 + s_1033	
27	r_0105	3-deoxy-manno-octulosonate cytidylyltransferase	s_0575 + s_0271 $\xrightleftharpoons[e_0331, s_0575, s_0271, s_0542, s_0783]{}$ 00005762 + s_0783	
28	r_0106	3-deoxy-manno-octulosonate-8-phosphatase	s_0272 $\xrightleftharpoons[e_0994, s_0272, s_0271, s_1430]{}$ s_0271 + 0000176 s_1430	
29	r_0120	3-hydroxyacyl-CoA dehydratase (3-hydroxybutanoyl-CoA)	(3- s_0043 $\xrightleftharpoons[e_1203, e_0735, s_0043, s_0574]{}$ s_0574	0000176
30	r_0121	3-hydroxyacyl-CoA dehydratase (3-hydroxydecanoyl-CoA)	(3- s_0044 $\xrightleftharpoons[e_1203, e_0735, s_0044, s_1668]{}$ s_1668	0000176
31	r_0122	3-hydroxyacyl-CoA dehydratase (3-hydroxdodecanoyl-CoA)	(3- s_0045 $\xrightleftharpoons[e_1203, e_0735, s_0045, s_1670]{}$ s_1670	0000176
32	r_0123	3-hydroxyacyl-CoA dehydratase (3-hydroxyhexadecanoyl-CoA)	(3- s_0046 $\xrightleftharpoons[e_1203, e_0735, s_0046, s_1674]{}$ s_1674	0000176

Nº	Id	Name		Reaction Equation	SBO
33	r_0124	3-hydroxyacyl-CoA dehydratase hydroxyhexanoyl-CoA)	(3-	s_0047 $\xrightleftharpoons[e_1203, e_0735, s_0047]{s_1672}$ s_1672	0000176
34	r_0126	3-hydroxyacyl-CoA dehydratase hydroxyoctanoyl-CoA)	(3-	s_0049 $\xrightleftharpoons[e_1203, e_0735, s_0049, s_1676]{s_1676}$ s_1676	0000176
35	r_0127	3-hydroxyacyl-CoA dehydratase hydroxytetradecanoyl-CoA)	(3-	s_0050 $\xrightleftharpoons[e_1203, e_0735, s_0050, s_1680]{s_1680}$ s_1680	0000176
36	r_0128	3-hydroxyacyl-CoA dehydrogenase oxodecanoyl-CoA)	(3-	s_0293+s_1334 $\xrightleftharpoons[e_1203, e_0735, s_0293, s_1334, s_0044, s_1333]{0000176}$ s_0044 + s_1333	0000176
37	r_0129	3-hydroxyacyl-CoA dehydrogenase oxododecanoyl-CoA)	(3-	s_0295+s_1334 $\xrightleftharpoons[e_1203, e_0735, s_0295, s_1334, s_0045, s_1333]{0000176}$ s_0045 + s_1333	0000176
38	r_0130	3-hydroxyacyl-CoA dehydrogenase oxohexadecanoyl-CoA)	(3-	s_0297+s_1334 $\xrightleftharpoons[e_1203, e_0735, s_0297, s_1334, s_0046, s_1333]{0000176}$ s_0046 + s_1333	0000176
39	r_0131	3-hydroxyacyl-CoA dehydrogenase oxohexanoyl-CoA)	(3-	s_0299+s_1334 $\xrightleftharpoons[e_1203, e_0735, s_0299, s_1334, s_0047, s_1333]{0000176}$ s_0047 + s_1333	0000176
40	r_0133	3-hydroxyacyl-CoA dehydrogenase oxooctanoyl-CoA)	(3-	s_0303+s_1334 $\xrightleftharpoons[e_1203, e_0735, s_0303, s_1334, s_0049, s_1333]{0000176}$ s_0049 + s_1333	0000176
41	r_0134	3-hydroxyacyl-CoA dehydrogenase oxotetradecanoyl-CoA)	(3-	s_0305+s_1334 $\xrightleftharpoons[e_1203, e_0735, s_0305, s_1334, s_0050, s_1333]{0000176}$ s_0050 + s_1333	0000176
42	r_0135	3-hydroxyacyl-CoA dehydrogenase (acetoacetyl-CoA)		s_0391+s_1334 $\xrightleftharpoons[e_1203, e_0735, s_0391, s_1334, s_0043, s_1333]{0000176}$ s_0043 + s_1333	
43	r_0138	3-isopropylmalate dehydratase		s_0217 $\xrightleftharpoons[e_0031, e_0030, s_0217, s_0265]{s_0265}$ s_0265	0000176
44	r_0139	3-isopropylmalate dehydrogenase		s_0265+s_1333 $\xrightleftharpoons[e_0032, s_0265, s_1333, s_0267, s_1334]{0000267+}$ s_1334	0000267+

Nº	Id	Name	Reaction Equation	SBO
45	r_0143	3-methyl-2-oxobutanoate hydroxymethyl-transferase	s_0282 + s_0336 $\xrightleftharpoons[e_0063, s_0282, s_0336, s_0203, s_0337]{}$ s_0337	00000263 +
46	r_0145	3-Oxo-glutaryl-[ACP] methyl ester dehydratase	s_0276 $\xrightleftharpoons[e_0082, s_0276, s_0812]{}$ s_0812	0000176
47	r_0146	3-Oxo-glutaryl-[ACP] methyl ester reductase	s_1336 + s_0289 $\xrightleftharpoons[e_0374, s_1336, s_0289, s_0276, s_1335]{}$ s_1335	00002766 +
48	r_0147	3-Oxo-glutaryl-[ACP] methyl ester synthase	s_1216 + s_1218 $\xrightleftharpoons[e_0372, s_1216, s_1218, s_0543, s_0555, s_0289]{}$ s_0543 + s_0555 + s_0289	0000176
49	r_0148	3-Oxo-pimeloyl-[ACP] methyl ester dehydratase	s_0277 $\xrightleftharpoons[e_0082, s_0277, s_0813]{}$ s_0813	0000176
50	r_0149	3-Oxo-pimeloyl-[ACP] methyl ester reductase	s_1336 + s_0290 $\xrightleftharpoons[e_0374, s_1336, s_0290, s_0277, s_1335]{}$ s_1335	00002777 +
51	r_0150	3-Oxo-pimeloyl-[ACP] methyl ester synthase	s_0910 + s_1216 $\xrightleftharpoons[e_0732, s_0910, s_1216, s_0397, s_0543, s_0290]{}$ s_0397 + s_0543 + s_0290	0000176
52	r_0154	3-oxoacyl-[acyl-carrier-protein] reductase (n-C14:0)	s_0304 + s_1336 $\xrightleftharpoons[e_0374, s_0304, s_1336, s_0028, s_1335]{}$ s_1335	00000728 +
53	r_0166	3-oxoacyl-[acyl-carrier-protein] synthase (n-C14:0)	s_0789 + s_1216 $\xrightleftharpoons[e_0376, e_0732, s_0789, s_1216, s_0304, s_0397, s_0543]{}$ s_0304 + s_0397 + s_0543	0000176
54	r_0175	3-phosphoshikimate carboxyvinyltransferase	1- s_1484 + s_1574 $\xrightleftharpoons[e_0327, s_1484, s_1574, s_0359, s_1430]{}$ s_1430	00003769 +
55	r_0176	4,5-dihydroxy-2,3-pentanedione cyclization (spontaneous)	s_0310 $\xrightleftharpoons[s_0310, s_0004]{}$ s_0004	0000176

Nº	Id	Name	Reaction Equation	SBO
56	r_0178	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol kinase	s_0312 + s_0467 $\xrightleftharpoons[e_0404, s_0312, s_0467, s_0237, s_0421]{}$ 000002367 + s_0421	
57	r_0179	4-amino-2-methyl-5-phosphomethylpyrimidine synthetase	s_0342 + s_1333 $\xrightleftharpoons[e_1254, s_0342, s_1333, s_0313, s_0867, s_1334]{}$ 0000176 s_0313 + 2 s_0867 + s_1334	
58	r_0181	4-amino-4-deoxychorismate synthase	s_0526 + s_1101 $\xrightleftharpoons[e_1015, e_0572, s_0526, s_1101, s_0316, s_1095]{}$ 0000176 s_0316 + s_1095	
59	r_0182	4-aminobenzoate synthase	s_0316 $\xrightleftharpoons[e_0377, s_0316, s_0318, s_1531]{}$ s_0318 + 0000176 s_1531	
60	r_0186	5'-deoxyadenosine nucleosidase	s_0333 $\xrightleftharpoons[e_0074, s_0333, s_0334, s_0405]{}$ s_0334 + 0000176 s_0405	
61	r_0211	5,10-methylenetetrahydrofolate (NADH) reductase	s_0336 + s_1334 $\xrightleftharpoons[e_1234, s_0336, s_1334, s_0354, s_1333]{}$ 000003564 + s_1333	
62	r_0212	5-amino-6-(5-phosphoribosylamino)uracil reductase	s_0347 + s_1336 $\xrightleftharpoons[e_0144, s_0347, s_1336, s_0346, s_1335]{}$ 000003466 + s_1335	
63	r_0216	6-hydroxymethyl-dihydropterin pyrophosphokinase	s_0367 + s_0467 $\xrightleftharpoons[e_0064, s_0367, s_0467, s_0368, s_0454]{}$ 00000368 + s_0454	
64	r_0217	6-phosphogluconate dehydratase	s_0369 $\xrightleftharpoons[e_0579, s_0369, s_0201]{}$ s_0201 0000176	
65	r_0218	6-phosphogluconolactonase	s_0370 $\xrightleftharpoons[e_0273, s_0370, s_0369]{}$ s_0369 0000176	
66	r_0222	8-amino-7-oxononanoate synthase	s_1041 + s_1491 $\xrightleftharpoons[e_0276, s_1041, s_1491, s_0376, s_0397, s_0543]{}$ 0000176 s_0376 + s_0397 + s_0543	
67	r_0224	acetaldehyde dehydrogenase (acetylating)	s_0381 + s_0555 + 0000176 e_0125, e_0416, s_0381, s_0555, s_1333, s_0395, s_1334 $\xrightleftharpoons[s_1333]{}$ s_0395 + s_1334	

Nº	Id	Name	Reaction Equation	SBO
68	r_0225	acetate kinase	s_0384 + s_0467 $\xrightleftharpoons[e_0975, e_0719, e_0577, s_0384, s_0467, s_0393, s_0421]{0000176}$ s_0393 + s_0421	
69	r_0227	acetolactate synthase	2 s_1531 $\xrightleftharpoons[e_1137, e_0034, e_0035, e_1136, s_1531, s_0042, s_0543]{0000176}$ s_0042 + s_0543	
70	r_0230	acetyl-CoA C-acetyltransferase	2 s_0395 $\xrightleftharpoons[e_0682, e_1202, e_0736, s_0395, s_0391, s_0555]{0000176}$ s_0391 + s_0555	
71	r_0231	acetyl-CoA C-acyltransferase (butanoyl-CoA) (r)	s_0395 + s_0488 $\xrightleftharpoons[e_1202, e_0736, s_0395, s_0488, s_0299, s_0555]{0000176}$ s_0299 + s_0555	
72	r_0232	acetyl-CoA C-acyltransferase (decanoyl-CoA) (r)	s_0395 + s_0737 $\xrightleftharpoons[e_1202, e_0736, s_0395, s_0737, s_0295, s_0555]{0000176}$ s_0295 + s_0555	
73	r_0233	acetyl-CoA C-acyltransferase (dodecanoyl-CoA) (r)	s_0395 + s_0790 $\xrightleftharpoons[e_1202, e_0736, s_0395, s_0790, s_0305, s_0555]{0000176}$ s_0305 + s_0555	
74	r_0234	acetyl-CoA C-acyltransferase (hexanoyl-CoA) (r)	s_0395 + s_0984 $\xrightleftharpoons[e_1202, e_0736, s_0395, s_0984, s_0303, s_0555]{0000176}$ s_0303 + s_0555	
75	r_0235	acetyl-CoA C-acyltransferase (octanoyl-CoA) (r)	s_0395 + s_1390 $\xrightleftharpoons[e_1202, e_0736, s_0395, s_1390, s_0293, s_0555]{0000176}$ s_0293 + s_0555	
76	r_0236	acetyl-CoA C-acyltransferase (tetradecanoyl-CoA) (r)	s_0395 + s_1632 $\xrightleftharpoons[e_1202, e_0736, s_0395, s_1632, s_0297, s_0555]{0000176}$ s_0297 + s_0555	
77	r_0237	acetyl-CoA carboxylase	s_0395 + s_0467 + 0000176 s_0474 $\xrightleftharpoons[e_0085, e_1006, e_1005, e_0730, s_0395, s_0467, s_0474, s_0421, s_1217, s_1217 + s_1430]{0000176}$ s_0421	
78	r_0243	acetylglutamate kinase	s_1302 + s_0467 $\xrightleftharpoons[e_1243, s_1302, s_0467, s_1304, s_0421]{0000176}$ s_0421	

Nº	Id	Name	Reaction Equation	SBO
79	r_0244	acetylornithine deacetylase	s_1321 $\xrightleftharpoons[e_1241, s_1321, s_0384, s_1391]{}$ s_0384 + 0000176 s_1391	
80	r_0245	acetylornithine transaminase	s_1303 + s_1095 $\xrightleftharpoons[e_0559, e_1014, s_1303, s_1095, s_1321, s_0233]{}$ 0000176 s_1321 + s_0233	
81	r_0246	aconitase (half-reaction A, Citrate hydro-lyase)	s_0536 $\xrightleftharpoons[e_0431, e_0054, s_0536, s_0530]{}$ s_0530	0000176
82	r_0247	aconitase (half-reaction B, Isocitrate hydro-lyase)	s_0530 $\xrightleftharpoons[e_0431, e_0054, s_0530, s_1027]{}$ s_1027	0000176
83	r_0257	acyl-[acyl-carrier-protein] synthetase (n-C12:0)	s_0397 + s_0467 + 0000176 s_0785 $\xrightleftharpoons[e_0375, e_0896, s_0397, s_0467, s_0785, s_0454, s_0789, s_0783]{}$ s_0454 + s_0789 + s_0783	
84	r_0259	acyl-[acyl-carrier-protein] synthetase (n-C16:0)	s_0397 + s_0467 + 0000176 s_0971 $\xrightleftharpoons[e_0375, e_0896, s_0397, s_0467, s_0971, s_0454, s_1411, s_0783]{}$ s_0454 + s_1411 + s_0783	
85	r_0260	acyl-[acyl-carrier-protein] synthetase (n-C16:1)	s_0397 + s_0467 + 0000176 s_0976 $\xrightleftharpoons[e_0375, e_0896, s_0397, s_0467, s_0976, s_0454, s_0533, s_0783]{}$ s_0454 + s_0533 + s_0783	
86	r_0266	acyl-CoA dehydrogenase (butanoyl-CoA)	s_0574 + s_0860 $\xrightleftharpoons[e_0094, s_0574, s_0860, s_0488, s_0859]{}$ 000004788 + s_0859	
87	r_0267	acyl-CoA dehydrogenase (decanoyl-CoA)	s_1668 + s_0860 $\xrightleftharpoons[e_0094, s_1668, s_0860, s_0737, s_0859]{}$ 000007767 + s_0859	
88	r_0268	acyl-CoA dehydrogenase (dodecanoyl-CoA)	s_1670 + s_0860 $\xrightleftharpoons[e_0094, s_1670, s_0860, s_0790, s_0859]{}$ 000007700 + s_0859	

Nº	Id	Name	Reaction Equation	SBO
89	r_0269	acyl-CoA dehydrogenase (hexadecanoyl-CoA)	s_0860 + s_1674 $\xrightleftharpoons[e_0094, s_0860, s_1674, s_0859, s_1412]{}$ 00000859 + s_1412	
90	r_0270	acyl-CoA dehydrogenase (hexanoyl-CoA)	s_0860 + s_1672 $\xrightleftharpoons[e_0094, s_0860, s_1672, s_0859, s_0984]{}$ 00000859 + s_0984	
91	r_0272	acyl-CoA dehydrogenase (octanoyl-CoA)	s_0860 + s_1676 $\xrightleftharpoons[e_0094, s_0860, s_1676, s_0859, s_1390]{}$ 00000859 + s_1390	
92	r_0273	acyl-CoA dehydrogenase (tetradecanoyl-CoA)	s_0860 + s_1680 $\xrightleftharpoons[e_0094, s_0860, s_1680, s_0859, s_1632]{}$ 00000859 + s_1632	
93	r_0292	adenosine kinase	s_0408 + s_0467 $\xrightleftharpoons[e_0167, s_0408, s_0467, s_0421, s_0454]{}$ 000004761 + s_0454	
94	r_0297	adenosylmethionine-8-amino-7-oxononanoate transaminase	s_0376 + s_1552 $\xrightleftharpoons[e_0274, s_0376, s_1552, s_1550, s_0371]{}$ 00001550 + s_0371	
95	r_0301	adenylate kinase	s_0454 + s_0467 $\xrightleftharpoons[e_0167, s_0454, s_0467, s_0421]{}$ 2 s_04000176	
96	r_0302	adenylosuccinate lyase	s_0040 $\xrightleftharpoons[e_0389, s_0040, s_0343, s_0875]{}$ s_0343 + 0000176 s_0875	
97	r_0303	adenylosuccinate synthase	s_1072 $\xrightleftharpoons[e_1315, s_1072, s_0945, s_1006, s_1327, s_0896, s_1430]{}$ s_0945 + 0000176 s_1006 $\xrightleftharpoons[s_0896 + s_1430]{}$ s_1327 + s_1430	
98	r_0304	adenylosuccinate lyase	s_1327 $\xrightleftharpoons[e_0389, s_1327, s_0454, s_0875]{}$ s_0454 + 0000176 s_0875	
99	r_0305	adenylyl-sulfate kinase	s_0412 + s_0467 $\xrightleftharpoons[e_0868, s_0412, s_0467, s_0421, s_0252]{}$ 000004761 + s_0252	
100	r_0310	alanine racemase	s_1041 $\xrightleftharpoons[e_0395, e_1275, s_1041, s_0600]{}$ s_0600 0000176	

Nº	Id	Name	Reaction Equation	SBO
101	r_0348	anthranilate phosphoribosyltransferase	$s_{0457} + s_{0360} \xrightleftharpoons{e_{0428}, s_{0457}, s_{0360}, s_{0783}, s_{1278}} 00000783 + s_{1278}$	
102	r_0349	anthranilate synthase	$s_{0526} + s_{1101} \xrightleftharpoons{e_{0429}, e_{0428}, s_{0526}, s_{1101}, s_{0457}, s_{1095}, s_{1531}} 0000176 s_{0457} + s_{1095} + s_{1531}$	
103	r_0355	arabinose-5-phosphate isomerase	$s_{0704} \xrightleftharpoons{e_{0993}, e_{0848}, s_{0704}, s_{0611}} s_{0611}$	0000176
104	r_0360	argininosuccinate lyase	$s_{1274} \xrightleftharpoons{e_{1244}, s_{1274}, s_{1061}, s_{0875}} s_{1061} + s_{0875}$	0000176
105	r_0361	argininosuccinate synthase	$s_{1072} + s_{0467} \xrightleftharpoons{s_{1081}} s_{0454} + s_{1274} + s_{0783}$ $s_{1072} + s_{0467} \xrightleftharpoons{s_{0451}} s_{0454} + s_{1068} + s_{0783}$	0000176
106	r_0365	asparagine synthetase	$s_{1072} + s_{0467} \xrightleftharpoons{s_{0451}} s_{0454} + s_{1068} + s_{0783}$	0000176
107	r_0367	aspartate 1-decarboxylase	$s_{1072} + s_{0461} \xrightleftharpoons{s_{0543}} s_{0470} + s_{0543}$	0000176
108	r_0368	aspartate carbamoyltransferase	$s_{1072} + s_{0502} \xrightleftharpoons{e_{1340}, e_{1339}, s_{1072}, s_{0502}, s_{1312}, s_{1430}} 0000176 s_{1312} + s_{1430}$	
109	r_0369	aspartate kinase	$s_{1072} + s_{0467} \xrightleftharpoons{e_{1263}, e_{0001}, e_{1233}, s_{1072}, s_{0467}, s_{0332}, s_{0421}} 0000176 s_{0332} + s_{0421}$	
110	r_0370	aspartate transaminase	$s_{1095} + s_{1399} \xrightleftharpoons{e_{0332}, s_{1095}, s_{1399}, s_{0233}, s_{1072}} 00002763 + s_{1072}$	
111	r_0371	aspartate-semialdehyde dehydrogenase	$s_{0332} + s_{1336} \xrightleftharpoons{e_{1045}, s_{0332}, s_{1336}, s_{1075}, s_{1335}, s_{1430}} 0000176 s_{1075} + s_{1335} + s_{1430}$	

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112	r_0374	ATP phosphoribosyltransferase	s_0467 + s_0360 $\xrightleftharpoons[e_0605, s_0467, s_0360, s_0783, s_0099]{}$ 00000783 + s_0099	
113	r_0383	Biotin synthase	s_0378 + s_1552 e_0275, s_0378, s_1552, s_0755, s_0377, s_0476, s_0333, s_1141 s_0755 $\xrightleftharpoons[s_0377 + s_0476 + s_0333 + s_1141]{}$ s_0377 +	0000176
114	r_0384	bis-molybdenum cofactor synthase	s_1264 + s_0420 $\xrightleftharpoons[e_0292, s_1264, s_0420, s_0454, s_0479, s_0579]{}$ 0000176 s_0454 + s_0479 + s_0579	
115	r_0385	bis-molybdopterin guanine dinucleotide synthase	s_0481 + s_0945 $\xrightleftharpoons[e_1207, e_1206, s_0481, s_0945, s_0480, s_0783]{}$ 0000176 s_0480 + s_0783	
116	r_0386	bis-molybdopterin guanine dinucleotide synthase (single GDP)	s_0479 + s_0945 $\xrightleftharpoons[e_1207, e_1206, s_0479, s_0945, s_0481, s_0783]{}$ 0000176 s_0481 + s_0783	
117	r_0388	Carbamate kinase	s_0467 + s_0543 e_0903, e_0183, e_0110, s_0467, s_0543, s_0451, s_0421, s_0502 s_0451 $\xrightleftharpoons[e_0903, e_0183, e_0110, s_0467, s_0543, s_0451, s_0421, s_0502]{}$ s_0421 + s_0502	0000176
118	r_0418	CDP-diacylglycerol synthetase (n-C16:0)	s_0575 + s_0075 $\xrightleftharpoons[e_0080, s_0575, s_0075, s_0513, s_0783]{}$ 00000563 + s_0783	
119	r_0419	CDP-diacylglycerol synthetase (n-C16:1)	s_0575 + s_0073 $\xrightleftharpoons[e_0080, s_0575, s_0073, s_0512, s_0783]{}$ 00000562 + s_0783	
120	r_0423	chorismate mutase	s_0526 $\xrightleftharpoons[e_0825, e_0826, s_0526, s_1497]{}$ s_1497	0000176
121	r_0424	Chorismate pyruvate lyase	s_0526 $\xrightleftharpoons[e_1271, s_0526, s_0325, s_1531]{}$ s_0325 + s_1531	0000176
122	r_0425	chorismate synthase	s_0359 $\xrightleftharpoons[e_0734, s_0359, s_0526, s_1430]{}$ s_0526 + s_1430	0000176

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123	r_0428	citrate synthase	s_0395 + s_1399 $\xrightleftharpoons[e_0246, s_0395, s_1399, s_0536, s_0555]{}$ 000005766 + s_0555	
124	r_0436	coproporphyrinogen oxidase (O2 required)	s_0565 + s_1372 $\xrightleftharpoons[e_0765, s_0565, s_1372, s_0543, s_1512]{}$ 000010643 + s_1512	
125	r_0440	CTP synthase (glutamine)	s_0467 + s_1101 $\xrightleftharpoons[s_1792]{e_0876, s_0467, s_1101, s_1792, s_0421, s_0575, s_1095, s_1430}$ 0000176 s_0421 + s_0575 + s_1095 + s_1430	
126	r_0445	cyclic pyranopterin monophosphate synthase	s_0945 $\xrightleftharpoons[e_0279, e_0280, s_0945, s_0585, s_0783]{}$ 0000176 s_0585 + s_0783	
127	r_0450	cystathionine b-lyase	s_1082 $\xrightleftharpoons[e_0951, e_0519, s_1082, s_1112, s_0451, s_1531]{}$ 0000176 + s_0451 + s_1531	
128	r_0452	cysteine synthase	s_1358 + s_0994 $\xrightleftharpoons[e_0757, e_0750, s_1358, s_0994, s_0384, s_1083]{}$ 0000176 s_0384 + s_1083	
129	r_0457	cytidylate kinase (CMP)	s_0467 + s_0539 $\xrightleftharpoons[e_0328, s_0467, s_0539, s_0421, s_0510]{}$ 000004761 + s_0510	
130	r_0463	D-alanine-D-alanine ligase (reversible)	2 s_0600 + s_0467 $\xrightleftharpoons[e_0043, e_0135, s_0600, s_0467, s_0421, s_0603, s_1430]{}$ 00000176 s_0421 + s_0603 + s_1430	
131	r_0488	dephospho-CoA kinase	s_0467 + s_0754 $\xrightleftharpoons[e_0046, s_0467, s_0754, s_0421, s_0555]{}$ 000004761 + s_0555	
132	r_0489	dethiobiotin synthase	s_0467 + s_0543 $\xrightleftharpoons[s_0371]{e_0278, s_0467, s_0543, s_0371, s_0421, s_0755, s_1430}$ 0000176 s_0421 + s_0755 + s_1430	
133	r_0498	diaminohydroxyphosphoribosylaminopyrimidine deaminase (25drapp)	e_0144, s_0160, s_0347, s_0451 $\xrightleftharpoons[s_0451]{}$ s_0347 + 0000176	

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134	r_0499	diaminopimelate decarboxylase	s_1242 $\xrightleftharpoons[e_0897, s_1242, s_0543, s_{1131}]{}$ s_0543 + 0000176 s_{1131}	
135	r_0500	diaminopimelate epimerase	s_1211 $\xrightleftharpoons[e_1189, s_1211, s_{1242}]{}$ s_1242 0000176	
136	r_0501	dihydroorotic acid dehydrogenase (quinone8)	s_0052 + s_1732 $\xrightleftharpoons[e_0342, s_0052, s_{1732}, s_{1394}, s_{1731}]{}$ 00001764 + s_1731	
137	r_0502	dihydridopicolinate reductase (NADPH)	s_0155 + s_1336 $\xrightleftharpoons[e_0012, s_0155, s_{1336}, s_{1335}, s_0148]{}$ 00001765 + s_0148	
138	r_0503	dihydridopicolinate synthase	s_1075 + s_1531 $\xrightleftharpoons[e_0776, s_{1075}, s_{1531}, s_0155]{}$ s_0155 0000176	
139	r_0504	dihydrofolate reductase	s_0372 + s_1336 $\xrightleftharpoons[e_0514, e_0020, s_0372, s_{1336}, s_{1335}, s_0337]{}$ 0000176 s_1335 + s_0337	
140	r_0505	dihydrofolate synthase	s_0467 + s_1095 $\xrightleftharpoons[e_0729, s_0467, s_0767, s_{1095}, s_0421, s_0372, s_{1430}]{}$ s_0421 + s_0372 + s_1430 s_0467 + s_0767 + s_0421 + 0000176 s_0767 + s_0421 + s_0372 + s_1430 0000176	
141	r_0507	dihydronoopterin aldolase reversible	s_0765 $\xrightleftharpoons[e_0964, s_0765, s_0367, s_0936]{}$ s_0367 + 0000176 s_0765 + s_0367 + s_0936	
142	r_0510	Dihydronoopterin triphosphate pyrophosphatase	s_0191 $\xrightleftharpoons[e_0045, e_0586, s_0191, s_0766, s_0783]{}$ s_0766 0000176 s_0783	
143	r_0511	dihydroorotase	s_1312 $\xrightleftharpoons[e_0368, s_{1312}, s_0052]{}$ s_0052 0000176	
144	r_0512	dihydroorotic acid (menaquinone-8)	s_0052 + s_1240 $\xrightleftharpoons[e_0342, s_0052, s_{1240}, s_{1239}, s_{1394}]{}$ 00001769 + s_1394	
145	r_0515	dihydropteroate synthase	s_0318 + s_0368 $\xrightleftharpoons[e_0988, s_0318, s_0368, s_0767, s_0783]{}$ 00000767 + s_0783	

Nº	Id	Name	Reaction Equation	SBO
146	r_0517	dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylbutanoate)	s_0017 $\xrightleftharpoons[e_1168, s_0017, s_0282]{}$ s_0282	0000176
147	r_0518	Dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylpentanoate)	s_0018 $\xrightleftharpoons[e_1168, s_0018, s_0051]{}$ s_0051	0000176
148	r_0522	dimethylallyltransferase	s_0779 + s_1028 $\xrightleftharpoons[e_0150, s_0779, s_1028, s_0903, s_0783]{}$ 00000963 + s_0783	
149	r_0532	dTMP kinase	s_0467 + s_0802 $\xrightleftharpoons[e_0378, s_0467, s_0802, s_0421, s_0795]{}$ 000004761 + s_0795	
150	r_0533	dUTP diphosphatase	s_0810 $\xrightleftharpoons[e_1128, e_0691, s_0810, s_0807, s_0783]{}$ s_0807 0000176 s_0783	
151	r_0538	enolase	s_0675 $\xrightleftharpoons[e_0875, s_0675, s_1484]{}$ s_1484	0000176
152	r_0563	Enoylglutaryl-[ACP] methyl ester reductase	s_0812 + s_1336 $\xrightleftharpoons[e_0436, s_0812, s_1336, s_0910, s_1335]{}$ 00000960 + s_1335	
153	r_0564	Enoylpimeloyl-[ACP] methyl ester reductase	s_0813 + s_1336 $\xrightleftharpoons[e_0436, s_0813, s_1336, s_1335, s_1492]{}$ 00001365 + s_1492	
154	r_0573	Erythronate 4-phosphate (4per) dehydrogenase	s_0331 + s_1333 $\xrightleftharpoons[e_0731, s_0331, s_1333, s_1334, s_0231]{}$ 00001364 + s_0231	
155	r_0574	Erythrose 4-phosphate dehydrogenase	s_0621 + s_1333 $\xrightleftharpoons[e_0926, e_0567, s_0621, s_1333, s_0331, s_1334]{}$ 0000176 + s_0331 + s_1334	
156	r_0576	FAD reductase	s_0859 + s_1334 $\xrightleftharpoons[e_1201, s_0859, s_1334, s_0860, s_1333]{}$ 00000860 + s_1333	
157	r_0579	fatty-acid-CoA thioesterase (dodecanoate)	s_0790 $\xrightleftharpoons[e_0162, s_0790, s_0555, s_0785]{}$ s_0555 + s_0785	0000176

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158	r_0580	fatty-acid-CoA thioesterase (hexadecanoate)	s_1412 $\xrightleftharpoons[e_0162, s_1412, s_0555, s_0971]{s_0555}$ s_0555 + 0000176 s_0971	
159	r_0581	fatty-acid-CoA thioesterase (hexadecenoate)	s_0979 $\xrightleftharpoons[e_0162, s_0979, s_0555, s_0976]{s_0555}$ s_0555 + 0000176 s_0976	
160	r_0602	Ferrochelatase	s_0838 + s_1511 $\xrightleftharpoons[e_0168, s_0838, s_1511, s_1508]{s_1508}$ 0000176	
161	r_0611	FMN adenylyltransferase	s_0467 + s_0863 $\xrightleftharpoons[e_0008, s_0467, s_0863, s_0859, s_0783]{s_0783}$ 0000859 +	
162	r_0622	formate-tetrahydrofolate ligase	s_0467 + s_0867 $\xrightleftharpoons[s_0467, s_0867, s_0337, s_0133, s_0421, s_1430]{s_0337}$ 0000176 s_0337 $\xrightleftharpoons[s_0421 + s_1430]{s_0133 + s_0421 + s_1430}$	
163	r_0632	fumarase	s_0875 $\xrightleftharpoons[e_1298, e_0515, e_0516, s_0875, s_1138]{s_1138}$ 0000176	
164	r_0648	GAR transformylase-T	s_0467 + s_0867 $\xrightleftharpoons[e_0577, s_0467, s_0867, s_1318, s_0421, s_1322, s_1430]{s_1318}$ 0000176 s_1318 $\xrightleftharpoons[s_0421 + s_1322 + s_1430]{s_0421 + s_1322 + s_1430}$	
165	r_0655	geranyltransterase	s_0903 + s_1028 $\xrightleftharpoons[e_0150, s_0903, s_1028, s_0826, s_0783]{s_0783}$ 0000876 +	
166	r_0658	glucosamine-1-phosphate acetyltransferase	N- s_0395 + s_0653 $\xrightleftharpoons[e_1150, s_0395, s_0653, s_1287, s_0555]{s_0555}$ 00001287 +	
167	r_0660	glucose 6-phosphate dehydrogenase	s_0663 + s_1335 $\xrightleftharpoons[e_0580, s_0663, s_1335, s_0370, s_1336]{s_1336}$ 00003760 +	
168	r_0664	glucose-6-phosphate isomerase	s_0663 $\xrightleftharpoons[e_1264, s_0663, s_0627]{s_0627}$ 0000176	
169	r_0673	glutamate 5-kinase	s_0467 + s_1095 $\xrightleftharpoons[e_0099, s_0467, s_1095, s_0421, s_1099]{s_1099}$ 00004761 +	

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170	r_0675	glutamate dehydrogenase (NADP)	s_0233 + s_1336 + 0000176 e_0561, s_0233, s_1336, s_0451, s_1095, s_1335 s_1095 + s_1335	
171	r_0676	glutamate racemase	s_1095 e_1247, s_1095, s_0671 s_0671 0000176	
172	r_0678	glutamate-1-semialdehyde aminotransferase	s_1098 e_0071, s_1098, s_0345 s_0345 0000176	
173	r_0679	glutamate-5-semialdehyde dehydrogenase	s_1099 + s_1336 e_0100, s_1099, s_1336, s_1100, s_1335, s_1430 0000176 s_1100 + s_1335 + s_1430	
174	r_0682	glutamine phosphoribosyldiphosphate amidotransferase	s_1101 + s_0360 e_0728, s_1101, s_0360, s_1095, s_0783, s_0361 0000176 s_1095 + s_0783 + s_0361	
175	r_0683	glutamine synthetase	s_0467 + s_1095 + 0000176 e_1210, e_0439, s_0467, s_1095, s_0451, s_0421, s_1101, s_1430 s_0421 + s_1101 + s_1430	
176	r_0684	glutamine-fructose-6-phosphate transaminase	s_0627 + s_1101 e_1149, s_0627, s_1101, s_0654, s_1095 00006754 + s_1095	
177	r_0686	glutamyl-tRNA reductase	s_1105 + s_1336 e_0405, s_1105, s_1336, s_1098, s_1335, s_1690 0000176 s_1098 + s_1335 + s_1690	
178	r_0687	Glutamyl-tRNA synthetase	s_0467 + s_1095 + 0000176 e_0746, s_0467, s_1095, s_1690, s_0454, s_1105, s_0783 s_0454 + s_1105 + s_0783	
179	r_0695	glyceraldehyde-3-phosphate dehydrogenase	s_0913 + s_1333 + 0000176 e_0567, s_0913, s_1333, s_1430, s_0307, s_1334 s_0307 + s_1334	
180	r_0697	glycerate kinase	s_0467 + s_0029 e_0978, s_0467, s_0029, s_0675, s_0421 0000675 + s_0421	

Nº	Id	Name	Reaction Equation	SBO
181	r_0706	glycerol-3-phosphate acyltransferase (C16:0)	s_0920+s_1411 $\xrightleftharpoons[e_0375, e_1273, s_0920, s_1411, s_0121, s_0397]{0000176}$ s_0121+s_0397	
182	r_0707	glycerol-3-phosphate acyltransferase (C16:1)	s_0920+s_0533 $\xrightleftharpoons[e_0375, e_1273, s_0920, s_0533, s_0119, s_0397]{0000176}$ s_0119+s_0397	
183	r_0712	glycerol-3-phosphate (NADP) dehydrogenase	s_0772+s_1336 $\xrightleftharpoons[e_1106, s_0772, s_1336, s_0920, s_1335]{00000920+}$ s_1335	
184	r_0724	glycine C-acetyltransferase	s_1040+s_0555 $\xrightleftharpoons[e_1110, s_1040, s_0555, s_0395, s_0929]{00000365+}$ s_0929	
185	r_0726	glycine hydroxymethyltransferase, reversible	s_1170+s_0337 $\xrightleftharpoons[e_0813, s_1170, s_0337, s_0929, s_0336]{00000929+}$ s_0336	
186	r_0731	Glycolaldehyde dehydrogenase	s_0936+s_1333 $\xrightleftharpoons[e_0466, s_0936, s_1333, s_0937, s_1334]{00000937+}$ s_1334	
187	r_0734	Glycolate oxidase	s_0937+s_1732 $\xrightleftharpoons[e_1376, e_0941, e_1377, s_0937, s_1732, s_0941, s_1731]{0000176}$ s_0941+s_1731	
188	r_0735	Glycolate oxidase	s_0937+s_1240 $\xrightleftharpoons[e_1376, e_0941, e_1377, s_0937, s_1240, s_0941, s_1239]{0000176}$ s_0941+s_1239	
189	r_0739	glyoxalate carboligase	2 s_0941 $\xrightleftharpoons[e_0175, s_0941, s_0214, s_0543]{}$ s_0214 + 0000176 s_0543	
190	r_0741	GMP synthase	s_0467 + s_1101 + 0000176 $\xrightleftharpoons[s_1799]{e_0795, s_0467, s_1101, s_1799, s_0454, s_1095, s_0942, s_0783}$ s_0454 + s_1095 + s_0942 + s_0783	
191	r_0744	GTP cyclohydrolase I	s_0945 $\xrightleftharpoons[e_0657, s_0945, s_0191, s_0867]{}$ s_0191 + 0000176 s_0867	

Nº	Id	Name	Reaction Equation	SBO
192	r_0745	GTP cyclohydrolase II (25drapp)	s_0945 $\xrightleftharpoons[s_0867 + s_0783]{e_0432, s_0945, s_0160, s_0867, s_0783}$ s_0160000176	
193	r_0754	guanylate kinase (GMP:ATP)	s_0467 + s_0942 $\xrightleftharpoons[e_1130, s_0467, s_0942, s_0421, s_0896]{s_0467 + s_0942}$ 000004761 + s_0896	
194	r_0755	HCO3 equilibration reaction	s_0543 $\xrightleftharpoons[e_0060, e_0116, s_0543, s_0474]{e_0060, e_0116, s_0543, s_0474}$ s_0474 0000176	
195	r_0761	hexokinase (D-fructose:ATP)	s_0467 + s_0622 $\xrightleftharpoons[e_0139, s_0467, s_0622, s_0421, s_0627]{s_0467 + s_0622}$ 000004761 + s_0627	
196	r_0762	hexokinase (D-glucose:ATP)	s_0467 + s_0657 $\xrightleftharpoons[e_0743, s_0467, s_0657, s_0421, s_0663]{e_0743, s_0467, s_0657, s_0421, s_0663}$ 000004761 + s_0663	
197	r_0763	histidinol dehydrogenase	s_1109 + 2 s_1333 $\xrightleftharpoons[e_0606, s_1109, s_1333, s_1106, s_1334]{e_0606, s_1109, s_1333, s_1106, s_1334}$ 000017606 + 2 s_1334	
198	r_0764	histidinol-phosphatase	s_1110 $\xrightleftharpoons[e_0608, s_1110, s_1109, s_1430]{e_0608, s_1110, s_1109, s_1430}$ s_1109 + 0000176 s_1430	
199	r_0765	histidinol-phosphate transaminase	s_1095 + s_0263 $\xrightleftharpoons[e_0607, s_1095, s_0263, s_0233, s_1110]{e_0607, s_1095, s_0263, s_0233, s_1110}$ 000002763 + s_1110	
200	r_0769	homoserine dehydrogenase (NADPH)	s_1075 + s_1336 $\xrightleftharpoons[e_0001, e_1233, s_1075, s_1336, s_1113, s_1335]{e_0001, e_1233, s_1075, s_1336, s_1113, s_1335}$ s_1113 + s_1335	
201	r_0770	homoserine kinase	s_0467 + s_1113 $\xrightleftharpoons[e_0002, s_0467, s_1113, s_0421, s_1363]{s_0467 + s_1113}$ 000004761 + s_1363	
202	r_0771	homoserine O-succinyltransferase	s_1113 + s_1599 $\xrightleftharpoons[e_1259, s_1113, s_1599, s_0555, s_1367]{e_1259, s_1113, s_1599, s_0555, s_1367}$ 000005765 + s_1367	
203	r_0775	Hydroxybenzoate octaprenyltransferase	s_0325 + s_0435 $\xrightleftharpoons[e_1272, s_0325, s_0435, s_0283, s_0783]{s_0325 + s_0435}$ 000002763 + s_0783	

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204	r_0777	hydroxymethylbilane synthase	$4 \text{s_1493} \xrightleftharpoons[\text{4 s_0451}]{\text{e_1186, s_1493, s_0998, s_0451}} \text{s_0998} + 0000176$	
205	r_0784	Imidazole-glycerol-3-phosphate synthase	$\text{s_1101+s_0341} \xrightleftharpoons[\text{s_0620+s_1095}]{\text{e_0611, e_0609, s_1101, s_0341, s_0343, s_0620, s_1095}} 0000176 \xrightleftharpoons[\text{s_0343+s_0620+s_1095}]{}$	
206	r_0785	imidazoleglycerol-phosphate dehydratase	$\text{s_0620} \xrightleftharpoons[\text{s_0620, s_0263}]{\text{e_0608, s_0620, s_0263}} \text{s_0263} 0000176$	0000176
207	r_0786	IMP cyclohydrolase	$\text{s_0352} \xrightleftharpoons[\text{s_1006}]{\text{e_1258, s_0352, s_1006}} \text{s_1006} 0000176$	0000176
208	r_0787	IMP dehydrogenase	$\text{s_1006+s_1333} \xrightleftharpoons[\text{s_1799}]{\text{e_0796, s_1006, s_1333, s_1334, s_1799}} 0000176 \xrightleftharpoons[\text{s_1799}]{}$	0000176
209	r_0788	indole-3-glycerol-phosphate synthase	$\text{s_0096} \xrightleftharpoons[\text{s_0543}]{\text{e_0427, s_0096, s_0493, s_0543}} \text{s_0493} + 0000176$	0000176
210	r_0796	ISC [2Fe-2S] regeneration	$\text{s_0377} + \text{s_1018} 0000176 \\ \text{s_1019} \xrightleftharpoons[\text{s_1017+s_1020}]{\text{e_0805, e_0804, s_0377, s_1018, s_1019, s_1017, s_1020}} \text{s_1017+s_1020}$	0000176
211	r_0797	ISC [2Fe-2S] Synthesis	$\text{s_0860} + 2 \text{s_0838} + 2 \text{s_1018} + 0000176 \\ \text{s_1019} \xrightleftharpoons[\text{2 s_1017+s_1020}]{\text{e_0804, e_1188, e_0805, s_0860, s_0838, s_1018, s_1019, s_0859, s_1017, s_1020}} 2 \text{s_1017+s_1020}$	0000176
212	r_0798	ISC [2Fe-2S] Synthesis II	$\text{s_0860} + 2 \text{s_0838} + 2 \text{s_1018} + 0000176 \\ \text{s_1020} \xrightleftharpoons[\text{2 s_1017+s_1022}]{\text{e_0804, e_1188, e_0805, s_0860, s_0838, s_1018, s_1020, s_0859, s_1017, s_1022}} 2 \text{s_1017+s_1022}$	0000176
213	r_0799	ISC [2Fe-2S] Transfer	$\text{s_1020} \xrightleftharpoons[\text{s_1019}]{\text{e_0803, e_0804, s_1020, s_0378, s_1019}} 0000176 \xrightleftharpoons[\text{s_1019}]{\text{s_0378}}$	0000176
214	r_0800	ISC [4Fe-4S] Reduction	$\text{s_0860+s_1022} \xrightleftharpoons[\text{s_1021}]{\text{e_0804, s_0860, s_1022, s_0859, s_1021}} 0000859 + \text{s_1021}$	0000859

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215	r_0801	ISC [4Fe-4S] Transfer	s_1021 $\xrightleftharpoons[e_0803, e_0804, s_1021, s_0380, s_1019]{}$ s_0380 + 000176	
216	r_0802	ISC Cysteine desulfuration	s_1083 + s_1017 $\xrightleftharpoons[e_0805, s_1083, s_1017, s_1041, s_1018]{}$ 0001041 + s_1018	
217	r_0806	isocitrate dehydrogenase (NADP)	s_1027 + s_1335 $\xrightleftharpoons[e_0391, s_1027, s_1335, s_0233, s_0543, s_1336]{}$ 0000176 + s_0233 + s_0543 + s_1336	
218	r_0808	isoleucine transaminase	s_0051 + s_1095 $\xrightleftharpoons[e_1167, s_0051, s_1095, s_0233, s_1119]{}$ 00000263 + s_1119	
219	r_0811	ketol-acid reductoisomerase (2,3-dihydroxy-3-methylbutanoate)	s_0042 + s_1336 $\xrightleftharpoons[e_1170, s_0042, s_1336, s_0017, s_1335]{}$ 00000767 + s_1335	
220	r_0812	ketol-acid reductoisomerase (2-Acetolactate)	s_0041 + s_1336 $\xrightleftharpoons[e_1170, s_0041, s_1336, s_0018, s_1335]{}$ 00000768 + s_1335	
221	r_0815	L-alanine transaminase	s_1095 + s_1531 $\xrightleftharpoons[e_0742, e_0717, s_1095, s_1531, s_0233, s_1041]{}$ 0000176 + s_0233 + s_1041	
222	r_0829	L-aspartate oxidase	s_1072 + s_1372 $\xrightleftharpoons[e_0819, s_1072, s_1372, s_0991, s_1005]{}$ 00000961 + s_1005	
223	r_0835	L-glutamate 5-semialdehyde dehydratase (spontaneous)	s_1100 $\xrightleftharpoons[s_1100, s_0128]{}$ s_0128	0000176
224	r_0847	L-threonine deaminase	s_1179 $\xrightleftharpoons[e_1169, e_0977, s_1179, s_0232, s_0451]{}$ s_0232 + 000176	
225	r_0848	L-threonine dehydrogenase	s_1333 + s_1179 $\xrightleftharpoons[e_1109, s_1333, s_1179, s_1040, s_1334]{}$ 00001040 + s_1334	

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226	r_0854	leucine transaminase (irreversible)	s_0328 + s_1095 $\xrightleftharpoons[e_{1167}, e_{1276}, s_{0328}, s_{1095}, s_{0233}, s_{1127}]{}$ 0000176 s_0233 + s_1127	
227	r_0857	Lipid A disaccharide synthase	s_0149 + s_1734 $\xrightleftharpoons[e_{0084}, s_{0149}, s_{1734}, s_{1204}, s_{1733}]{}$ 00001264 + s_1733	
228	r_0925	malate dehydrogenase	s_1138 + s_1333 $\xrightleftharpoons[e_{1004}, s_{1138}, s_{1333}, s_{1334}, s_{1399}]{}$ 00001364 + s_1399	
229	r_0928	malate oxidase	s_0991 + s_1399 $\xrightleftharpoons[s_{0991}, s_{1399}, s_{1138}, s_{1372}]{}$ s_1138 0000176 s_1372	
230	r_0934	Malonyl-CoA methyltransferase	s_1552 + s_1217 $\xrightleftharpoons[e_{0277}, s_{1552}, s_{1217}, s_{1551}, s_{1218}]{}$ 00001561 + s_1218	
231	r_0935	Malonyl-CoA-ACP transacylase	s_0397 + s_1217 $\xrightleftharpoons[e_{0375}, e_{0373}, s_{0397}, s_{1217}, s_{0555}, s_{1216}]{}$ 0000176 s_0555 + s_1216	
232	r_0950	methenyltetrahydrofolate cyclohydrolase	s_0335 $\xrightleftharpoons[e_{0188}, s_{0335}, s_{0133}]{}$ s_0133 0000176	
233	r_0951	methionine adenosyltransferase	s_0467 + s_1141 $\xrightleftharpoons[e_{0931}, s_{0467}, s_{1141}, s_{1552}, s_{1430}, s_{0783}]{}$ 0000176 s_1552 + s_1430 + s_0783	
234	r_0954	methionine synthase	s_0354 + s_1112 $\xrightleftharpoons[e_{1196}, e_{1262}, s_{0354}, s_{1112}, s_{1141}, s_{0337}]{}$ 0000176 s_1141 + s_0337	
235	r_0957	methylenetetrahydrofolate dehydrogenase (NADP)	s_0336 + s_1335 $\xrightleftharpoons[e_{0188}, s_{0336}, s_{1335}, s_{0335}, s_{1336}]{}$ 00000365 + s_1336	
236	r_0963	MoaD sulfuration (nadh, assumed)	s_1018 + s_1258 $\xrightleftharpoons[e_{0281}, e_{0805}, s_{1018}, s_{1258}, s_{1334}, s_{0454}, s_{1017}, s_{1260}, s_{1333}]{}$ 0000176 s_1334 $\xrightleftharpoons[s_{1017} + s_{1260} + s_{1333}]{}$ s_04	

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237	r_0964	molybdenum cofactor synthase	s_1261 + s_0420 $\xrightleftharpoons[e_0292, s_1261, s_0420, s_0454, s_0579, s_1264]{0000176}$ s_0454 + s_0579 + s_1264	
238	r_0965	molybdopterin adenylyltransferase	s_0467 + s_1265 $\xrightleftharpoons[e_0006, s_0467, s_1265, s_0420, s_0783]{0000476}$ s_0783	
239	r_0968	molybdopterin synthase	s_0585 $\xrightleftharpoons[2\ s_1260]{e_0281, e_0282, s_0585, s_0579, s_1260, s_1259, s_1265} s_0579 + 0000176$ 2 s_1259 + s_1265	
240	r_0969	molybdopterin synthase sulfurylase	s_0467 + s_1259 $\xrightleftharpoons[e_0291, s_0467, s_1259, s_1258, s_0783]{00001258}$ s_0783	
241	r_0970	murein crosslinking transpeptidase 1A:(A2pm->D-ala) (periplasm)	s_1725 $\xrightleftharpoons[e_0036, e_1029, e_0221, e_0065, s_1725, s_0600, s_1719]{0000176}$ s_0600 + s_1719	
242	r_0996	N-acetyl-g-glutamyl-phosphate reductase	s_1304 + s_1336 $\xrightleftharpoons[e_1242, s_1304, s_1336, s_1303, s_1335, s_1430]{0000176}$ s_1303 + s_1335 + s_1430	
243	r_0999	N-acetylglutamate synthase	s_0395 + s_1095 $\xrightleftharpoons[e_0893, s_0395, s_1095, s_1302, s_0555]{00001362}$ s_0555	
244	r_1006	NAD kinase	s_0467 + s_1333 $\xrightleftharpoons[e_0828, s_0467, s_1333, s_0421, s_1335]{0000476}$ s_1335	
245	r_1008	NAD synthase (nh3)	s_0467 $\xrightleftharpoons[s_0451]{e_0554, s_0467, s_0732, s_0451, s_0454, s_1333, s_0783} s_0732 + 0000176$ s_0454 + s_1333 + s_0783	
246	r_1019	nicotinate-nucleotide adenylyltransferase	s_0467 + s_1340 $\xrightleftharpoons[e_0223, s_0467, s_1340, s_0732, s_0783]{00000762}$ s_0783	
247	r_1021	nicotinate-nucleotide diphosphorylase (carboxylating)	s_0360 + s_1537 $\xrightleftharpoons[e_0048, s_0360, s_1537, s_0543, s_1340, s_0783]{0000176}$ s_0543 + s_1340 + s_0783	

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248	r_1039	nucleoside-diphosphate kinase (ATP:CDP)	s_0467+s_0510 $\xrightleftharpoons[e_0799, e_0167, s_0467, s_0510, s_0421, s_0575]{s_0421 + s_0575}$	0000176
249	r_1043	nucleoside-diphosphate kinase (ATP:dTDP)	s_0467+s_0795 $\xrightleftharpoons[e_0799, e_0167, s_0467, s_0795, s_0421, s_0805]{s_0421 + s_0805}$	0000176
250	r_1045	nucleoside-diphosphate kinase (ATP:GDP)	s_0467+s_0896 $\xrightleftharpoons[e_0799, e_0167, s_0467, s_0896, s_0421, s_0945]{s_0421 + s_0945}$	0000176
251	r_1046	nucleoside-diphosphate kinase (ATP:UDP)	s_0467+s_1733 $\xrightleftharpoons[e_0799, e_0167, s_0467, s_1733, s_0421, s_1792]{s_0421 + s_1792}$	0000176
252	r_1047	nucleoside-triphosphatase (ATP)	s_0467 $\xrightleftharpoons[e_1313, e_0225, s_0467, s_0421, s_1430]{s_0421 + s_1430}$	0000176
253	r_1054	O-Phospho-4-hydroxy-L-threonine:2-oxoglutarate aminotransferase	s_1095+s_0231 $\xrightleftharpoons[e_0326, s_1095, s_0231, s_0233, s_1362]{s_1362 + s_1362}$	0000276
254	r_1057	O-succinylhomoserine lyase (L-cysteine)	s_1083+s_1367 $\xrightleftharpoons[e_1232, s_1083, s_1367, s_1082, s_1595]{s_1595 + s_1595}$	00001082
255	r_1063	Octaprenyl pyrophosphate synthase	s_0826+5 s_1028 $\xrightleftharpoons[s_0826 + 5 s_1028]{e_0990, s_0826, s_1028, s_0435, s_0783}$	000010435
256	r_1064	Octaprenyl-hydroxybenzoate decarboxylase	s_0283 $\xrightleftharpoons[e_0727, e_1200, s_0283, s_0229, s_0543]{s_0229 + s_0543}$	0000176
257	r_1065	ornithine carbamoyltransferase	s_0502+s_1391 $\xrightleftharpoons[e_1341, e_0103, s_0502, s_1391, s_1081, s_1430]{s_1081 + s_1430}$	0000176
258	r_1067	orotate phosphoribosyltransferase	s_1394+s_0360 $\xrightleftharpoons[e_1129, s_1394, s_0360, s_1397, s_0783]{s_0783 + s_0783}$	00001307

Nº	Id	Name	Reaction Equation	SBO
259	r_1068	orotidine-5'-phosphate decarboxylase	s_1397 $\xrightleftharpoons[e_0435, s_1397, s_0543, s_1762]{}$ s_0543 + 0000176 s_1762	
260	r_1074	pantetheine-phosphate adenylyltransferase	s_0467+s_1413 $\xrightleftharpoons[e_1126, s_0467, s_1413, s_0754, s_0783]{}$ 00001764 + s_0783	
261	r_1075	pantothenate kinase	s_0467+s_0033 $\xrightleftharpoons[e_1249, s_0467, s_0033, s_0599, s_0421]{}$ 00000509 + s_0421	
262	r_1076	pantothenate synthase	s_0470 + s_0467 $\xrightleftharpoons[s_0032]{e_0062, s_0470, s_0467, s_0032, s_0454, s_0033, s_0783}$ + 0000176 s_0032 $\xrightleftharpoons[s_0454+s_0033+s_0783]{}$ s_0454 + s_0033 + s_0783	
263	r_1081	phenylalanine transaminase	s_1095+s_1429 $\xrightleftharpoons[e_1167, e_1276, e_0332, s_1095, s_1429, s_0233, s_1151]{}$ 0000176 s_0233 + s_1151	
264	r_1123	Phosphatidylserine decarboxylase (n-C16:0)	s_1477 $\xrightleftharpoons[e_1312, s_1477, s_0543, s_1437]{}$ s_0543 + 0000176 s_1437	
265	r_1124	Phosphatidylserine decarboxylase (n-C16:1)	s_1476 $\xrightleftharpoons[e_1312, s_1476, s_0543, s_1435]{}$ s_0543 + 0000176 s_1435	
266	r_1130	Phosphatidylserine syntase (n-C16:0)	s_0513+s_1170 $\xrightleftharpoons[e_0823, s_0513, s_1170, s_0539, s_1477]{}$ 00000569 + s_1477	
267	r_1131	Phosphatidylserine syntase (n-C16:1)	s_0512+s_1170 $\xrightleftharpoons[e_0823, s_0512, s_1170, s_0539, s_1476]{}$ 00000569 + s_1476	
268	r_1134	phospho-L-serine phosphatase (periplasmic)	s_1364 $\xrightleftharpoons[e_1277, e_1369, s_1364, s_1430, s_1170]{}$ s_1430 0000176 s_1170	
269	r_1137	phospho-N-acetylmuramoyl-pentapeptide-transferase (meso-2,6-diaminopimelate)	s_1768+s_1755 $\xrightleftharpoons[e_0039, s_1768, s_1755, s_1777, s_1762]{}$ 00001767 + s_1762	

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270	r_1139	phosphoadenylyl-sulfate reductase (thioredoxin)	s_0252 + s_1544 $\xrightleftharpoons[e_0871, e_1172, e_0822, s_0252, s_1544, s_0411, s_1612, s_1406]{s_0000176}$ s_0	
271	r_1141	phosphoenolpyruvate carboxylase	s_0543 + s_1484 $\xrightleftharpoons[e_1240, s_0543, s_1484, s_1399, s_1430]{s_00001769 +}$ s_1430	
272	r_1150	phosphoglucosamine mutase	s_0654 $\xrightleftharpoons[e_0987, s_0654, s_0653]{s_0653}$ 0000176	
273	r_1151	phosphoglycerate dehydrogenase	s_0306 + s_1333 $\xrightleftharpoons[e_0918, s_0306, s_1333, s_0308, s_1334]{s_00003768 +}$ s_1334	
274	r_1152	phosphoglycerate kinase	s_0307 + s_0421 $\xrightleftharpoons[e_0925, s_0307, s_0421, s_0306, s_0467]{s_00003766 +}$ s_0467	
275	r_1153	phosphoglycerate mutase	s_0306 $\xrightleftharpoons[e_1108, e_1373, e_0264, s_0306, s_0675]{s_0675}$ 0000176	
276	r_1198	phosphomethylpyrimidine kinase	s_0313 + s_0467 $\xrightleftharpoons[e_0641, s_0313, s_0467, s_0218, s_0421]{s_00002768 +}$ s_0421	
277	r_1200	phosphopantothenate-cysteine ligase	s_0599 $\xrightleftharpoons[e_1127, s_0599, s_0575, s_1083, s_1277, s_0539, s_0783]{s_1083}$ s_0575 + 0000176 s_0539 + s_0783 $\xrightleftharpoons[s_1277 +]{s_0599, s_0575, s_1083, s_1277, s_0539, s_0783}$ s_1277 + s_0599	
278	r_1201	phosphopantothenoylcysteine decarboxylase	s_1277 $\xrightleftharpoons[e_1127, s_1277, s_0543, s_1413]{s_0543}$ + 0000176 s_1413 $\xrightleftharpoons[s_0543]{e_1127, s_1277, s_0543, s_1413}$ s_1277	
279	r_1202	phosphopentomutase	s_0446 $\xrightleftharpoons[e_1023, e_1366, s_0446, s_0445]{s_0445}$ 0000176	
280	r_1204	phosphoribosyl-AMP cyclohydrolase	s_0098 $\xrightleftharpoons[e_0612, s_0098, s_0097]{s_0097}$ 0000176	
281	r_1205	phosphoribosyl-ATP pyrophosphatase	s_0099 $\xrightleftharpoons[e_0612, s_0099, s_0783, s_0098]{s_0783}$ + 0000176 s_0098 $\xrightleftharpoons[s_0783]{e_0612, s_0099, s_0783, s_0098}$ s_0098	

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282	r_1206	phosphoribosylaminoimidazole carboxylase	s_0342 + s_0467 + 0000176 e_0184, s_0342, s_0467, s_0474, s_0362, s_0421, s_1430 s_0474 + s_0362 + s_0421 + s_1430	
283	r_1207	phosphoribosylaminoimidazole carboxylase (mutase rxn)	s_0362 ⇌ s_0344	0000176
284	r_1208	phosphoribosylaminoimidazole synthase	s_0467 + s_0162 ⇌ e_0791, s_0467, s_0162, s_0421, s_0342, s_1430 0000176 s_0342 + s_1430	
285	r_1209	phosphoribosylaminoimidazolecarboxamide formyltransferase	s_0133 + s_0343 ⇌ e_1258, s_0133, s_0343, s_0352, s_0337 0000352 + s_0337	
286	r_1210	phosphoribosylaminoimidazolesuccinocarboxamide synthase	s_0344 + s_1072 + 0000176 e_0775, s_0344, s_1072, s_0467, s_0040, s_0421, s_1430 s_0467 + s_0040 + s_0421 + s_1430	
287	r_1211	phosphoribosylanthranilate isomerase (irreversible)	s_1278 ⇌ e_0427, s_1278, s_0096 s_0096	0000176
288	r_1212	phosphoribosylformylglycinamide synthase	syn- s_0467 + s_1322 + 0000176 e_0815, s_0467, s_1322, s_1101, s_0421, s_0162, s_1095, s_1430 s_1101 + s_0421 + s_0162 + s_1095 + s_1430	
289	r_1214	phosphoribosylglycinamide synthase	s_0467 + s_0929 + 0000176 e_1257, s_0467, s_0929, s_0361, s_0421, s_1318, s_1430 s_0361 + s_0421 + s_1318 + s_1430	
290	r_1215	phosphoribosylpyrophosphate synthetase	s_0467 + s_0446 ⇌ e_0403, s_0467, s_0446, s_0454, s_0360 0000454 + s_0360	
291	r_1217	phosphoserine transaminase	s_0308 + s_1095 ⇌ e_0326, s_0308, s_1095, s_0233, s_1364 0000263 + s_1364	

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292	r_1218	phosphotransacetylase	$s_{.0393} + s_{.0555} \xrightleftharpoons[e_{.0768}, s_{.0720}, s_{.0393}, s_{.0555}, s_{.0395}, s_{.1430}]{0000176} s_{.0395} + s_{.1430}$	
293	r_1220	Pimeloyl-[ACP] methyl ester esterase	$s_{.1492} \xrightleftharpoons[e_{.1034}, s_{.1492}, s_{.1248}, s_{.1491}]{0000176} s_{.1248} + s_{.1491}$	
294	r_1222	polyphosphate kinase	$s_{.0421} + s_{.0783} \xrightleftharpoons[e_{.0793}, s_{.0421}, s_{.0783}, s_{.0467}, s_{.1430}]{0000467} s_{.1430}$	
295	r_1223	porphobilinogen synthase	$2 s_{.0345} \xrightleftharpoons[e_{.0134}, s_{.0345}, s_{.1493}]{0000176} s_{.1493}$	0000176
296	r_1224	prephenate dehydratase	$s_{.1497} \xrightleftharpoons[e_{.0825}, s_{.1497}, s_{.0543}, s_{.1429}]{0000468} s_{.0543} + s_{.1429}$	0000176
297	r_1225	prephenate dehydrogenase	$s_{.1333} + s_{.1497} \xrightleftharpoons[e_{.0826}, s_{.1333}, s_{.1497}, s_{.0262}, s_{.0543}, s_{.1334}]{0000176} s_{.0262} + s_{.0543} + s_{.1334}$	
298	r_1230	protoporphyrinogen oxidase (aerobic)	$1 \cdot 5 s_{.1372} + s_{.1512} \xrightleftharpoons[e_{.1205}, s_{.1372}, s_{.1512}, s_{.1511}]{0000176}$	0000176
299	r_1232	purine-nucleoside phosphorylase (Adenosine)	$s_{.0405} + s_{.0445} \xrightleftharpoons[e_{.1367}, s_{.0405}, s_{.0445}, s_{.0408}, s_{.1430}]{0000468} s_{.1430}$	0000468
300	r_1245	Pyridoxine 5'-phosphate synthase	$s_{.0116} + s_{.1333} \xrightleftharpoons[e_{.0818}, e_{.0022}, s_{.0116}, s_{.1333}, s_{.1362}, s_{.0543}, s_{.1334}, s_{.1530}, s_{.1430}]{0000176} s_{.1362} + s_{.1334} + s_{.1530} + s_{.1430}$	0000176
301	r_1250	pyrroline-5-carboxylate reductase	$s_{.0128} + s_{.1336} \xrightleftharpoons[e_{.0137}, s_{.0128}, s_{.1336}, s_{.1335}, s_{.1155}]{00001765} s_{.1155}$	00001765
302	r_1251	pyruvate dehydrogenase	$s_{.0555} + s_{.1333} \xrightleftharpoons[e_{.0052}, e_{.0051}, e_{.0053}, s_{.0555}, s_{.1333}, s_{.1531}, s_{.0395}, s_{.0543}, s_{.1334}]{0000176} s_{.0543} + s_{.1334}$	0000176

Nº	Id	Name	Reaction Equation	SBO
303	r_1252	pyruvate formate lyase	$s_{.0555} + s_{.1531} \xrightleftharpoons[e_{.0974}, e_{.1238}, e_{.1239}, e_{.0323}, e_{.0324}, e_{.0821}, s_{.0555}, s_{.1531}, s_{.0867}]{0000176}$	
304	r_1255	pyruvate synthase	$s_{.0555} + s_{.1531} \xrightleftharpoons[e_{.0451}, e_{.0238}, e_{.0911}, s_{.0555}, s_{.0862}, s_{.1531}, s_{.0395}, s_{.0543}, s_{.0861}]{0000176} 2s_{.0862} + s_{.0543} + 2s_{.0861}$	
305	r_1259	quinolinate synthase	$s_{.0772} + s_{.1005} \xrightleftharpoons[e_{.0260}, s_{.0772}, s_{.1005}, s_{.1430}, s_{.1537}]{0000176} 00001760 + s_{.1537}$	
306	r_1264	riboflavin kinase	$s_{.0467} + s_{.1546} \xrightleftharpoons[e_{.0008}, s_{.0467}, s_{.1546}, s_{.0421}, s_{.0863}]{00004761} 00004761 + s_{.0863}$	
307	r_1265	riboflavin synthase	$s_{.0311} + s_{.0255} \xrightleftharpoons[e_{.0531}, s_{.0311}, s_{.0255}, s_{.0364}, s_{.1430}]{00003764} 00003764 + s_{.1430}$	
308	r_1266	riboflavin synthase	$2s_{.0364} \xrightleftharpoons[e_{.0145}, s_{.0364}, s_{.0311}, s_{.1546}]{0000176} s_{.0311} + 0000176 s_{.1546}$	
309	r_1276	ribonucleoside-triphosphate reductase (ATP) (flavodoxin)	$s_{.0467} + 2s_{.0861} \xrightleftharpoons[e_{.1335}, e_{.1227}, e_{.1334}, e_{.0238}, e_{.0911}, s_{.0467}, s_{.0861}, s_{.0726}, s_{.0862}]{0000176}$	
310	r_1277	ribonucleoside-triphosphate reductase (CTP) (flavodoxin)	$s_{.0575} + 2s_{.0861} \xrightleftharpoons[e_{.1335}, e_{.1227}, e_{.1334}, e_{.0238}, e_{.0911}, s_{.0575}, s_{.0861}, s_{.0731}, s_{.0862}]{0000176}$	
311	r_1278	ribonucleoside-triphosphate reductase (GTP) (flavodoxin)	$2s_{.0861} + s_{.0945} \xrightleftharpoons[e_{.1335}, e_{.1227}, e_{.1334}, e_{.0238}, e_{.0911}, s_{.0861}, s_{.0945}, s_{.0760}, s_{.0862}]{0000176}$	
312	r_1279	ribonucleoside-triphosphate reductase (UTP) (flavodoxin)	$2s_{.0861} + s_{.1792} \xrightleftharpoons[e_{.1335}, e_{.1227}, e_{.1334}, e_{.0238}, e_{.0911}, s_{.0861}, s_{.1792}, s_{.0810}, s_{.0862}]{0000176}$	
313	r_1284	ribose-5-phosphate isomerase	$s_{.0704} \xrightleftharpoons[e_{.0919}, e_{.1291}, s_{.0704}, s_{.0446}]{0000176} s_{.0446}$	0000176
314	r_1285	ribulose 5-phosphate 3-epimerase	$s_{.0721} \xrightleftharpoons[e_{.1355}, e_{.1026}, s_{.0721}, s_{.0704}]{0000176} s_{.0704}$	0000176

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315	r_1288	S-adenosylhomocysteine nucleosidase	s_1551 $\xrightleftharpoons[e_0074, s_1551, s_0405, s_1558]{}$ s_0405 + s_1558	0000176
316	r_1291	S-ribosylhomocysteine cleavage enzyme	s_1558 $\xrightleftharpoons[e_0839, s_1558, s_0310, s_1112]{}$ s_0310 + s_1112	0000176
317	r_1301	serine O-acetyltransferase	s_0395 + s_1170 $\xrightleftharpoons[e_1105, s_0395, s_1170, s_1358, s_0555]{}$ 0000176 + s_0555	
318	r_1304	shikimate dehydrogenase	s_0270 + s_1336 $\xrightleftharpoons[e_1010, e_0540, s_0270, s_1336, s_1335, s_1571]{}$ 0000176 + s_1335 + s_1571	
319	r_1305	shikimate kinase	s_0467 + s_1571 $\xrightleftharpoons[e_1028, e_0138, s_0467, s_1571, s_0421, s_1574]{}$ 0000176 + s_0421 + s_1574	
320	r_1306	sirohydrochlorin dehydrogenase (NAD)	s_0768 + s_1333 $\xrightleftharpoons[e_1019, s_0768, s_1333, s_1334, s_1578]{}$ 0000176 + s_1578	
321	r_1307	sirohydrochlorin ferrochelatase	s_0838 + s_1578 $\xrightleftharpoons[e_1019, s_0838, s_1578, s_1577]{}$ 0000176	
322	r_1315	succinyl-CoA synthetase (ADP-forming)	s_0467 + s_0555 $\xrightleftharpoons[e_0253, e_0254, s_0467, s_0555, s_1595, s_0421, s_1430, s_1599]{}$ 0000176 + s_0421 + s_1430 + s_1599	
323	r_1316	succinyl-diaminopimelate desuccinylase	s_1316 $\xrightleftharpoons[e_0774, s_1316, s_1211, s_1595]{}$ s_1211 + s_1595	0000176
324	r_1318	succinyl-diaminopimelate transaminase	s_1095 + s_1315 $\xrightleftharpoons[e_1014, s_1095, s_1315, s_0233, s_1316]{}$ 0000276 + s_1316	
325	r_1329	Sulfate adenyltransferase	s_0467 + s_0945 $\xrightleftharpoons[e_0869, e_0870, s_0467, s_0945, s_1609, s_0412, s_0896, s_1430, s_0783]{}$ 0000176 + s_04896 + s_1430 + s_0783	

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326	r_1330	sulfite reductase (NADPH2)	$3\text{s_1336} + \text{s_1612} \xrightleftharpoons[\text{0000176}]{\text{e_0872, e_0873, s_1336, s_1612, s_0994, s_1335}} \text{s_0994} + 3\text{s_1335}$	
327	r_1335	tartronate semialdehyde reductase	$\text{s_0214} + \text{s_1334} \xrightleftharpoons[\text{0000176}]{\text{e_0979, e_0177, s_0214, s_1334, s_0029, s_1333}} \text{s_0029} + \text{s_1333}$	
328	r_1337	Tetraacyldisaccharide 4'kinase	$\text{s_0467} + \text{s_1204} \xrightleftharpoons[\text{00004761}]{\text{e_0330, s_0467, s_1204, s_0421, s_0147}} \text{s_0147}$	
329	r_1338	tetrahydrodipicolinate succinylase	$\text{s_1599} + \text{s_0148} \xrightleftharpoons[\text{00005765}]{\text{e_0076, s_1599, s_0148, s_0555, s_1315}} \text{s_1315}$	
330	r_1344	thiamine-phosphate diphosphorylase	$\text{s_0218} + \text{s_0330} \xrightleftharpoons[\text{00007763}]{\text{e_1253, s_0218, s_0330, s_0783, s_1643}} \text{s_1643}$	
331	r_1345	thiamine-phosphate kinase	$\text{s_0467} + \text{s_1643} \xrightleftharpoons[\text{00004761}]{\text{e_0146, s_0467, s_1643, s_0421, s_1644}} \text{s_1644}$	
332	r_1346	thiazole phosphate synthesis	$\text{s_0467} + \text{s_0738} + \text{s_0116} + \text{s_1018} + \text{s_1336} \xrightleftharpoons[\text{0000176}]{\text{e_1374, e_1250, e_0805, e_0151, e_1252, s_0467, s_0738, s_0116, s_1018, s_1136}} \text{s_0454} + \text{s_0543} + \text{s_1017} + \text{s_1335} + \text{s_0783}$	
333	r_1347	thioredoxin reductase (NADPH)	$\text{s_1336} + \text{s_1406} \xrightleftharpoons[\text{0000176}]{\text{e_1172, e_0822, e_0318, s_1336, s_1406, s_1335, s_1544}} \text{s_1335} + \text{s_1544}$	
334	r_1348	Threonine aldolase	$\text{s_1179} \xrightleftharpoons[\text{s_0929}]{\text{e_0313, e_0813, s_1179, s_0381, s_0929}} \text{s_0381} \xrightleftharpoons[\text{0000176}]{\text{s_0929}}$	
335	r_1349	threonine synthase	$\text{s_1363} \xrightleftharpoons[\text{s_1179}]{\text{e_0003, s_1363, s_1430, s_1179}} \text{s_1430} + \text{0000176}$	
336	r_1353	thymidylate synthase	$\text{s_0807} + \text{s_0336} \xrightleftharpoons[\text{00003762}]{\text{e_0894, s_0807, s_0336, s_0372, s_0802}} \text{s_0802}$	

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337	r_1356	transaldolase	$s_{0621} + s_{0627} \xrightleftharpoons[e_{0770}, e_{0005}, s_{0621}, s_{0627}, s_{0913}, s_{1561}]{s_{0913} + s_{1561}}$	0000176
338	r_1357	transketolase	$s_{0913} + s_{1561} \xrightleftharpoons[e_{0771}, e_{0928}, s_{0913}, s_{1561}, s_{0446}, s_{0721}]{s_{0446} + s_{0721}}$	0000176
339	r_1358	transketolase	$s_{0627} + s_{0913} \xrightleftharpoons[e_{0771}, e_{0928}, s_{0627}, s_{0913}, s_{0621}, s_{0721}]{s_{0621} + s_{0721}}$	0000176
340	r_1363	triose-phosphate isomerase	$s_{0913} \xrightleftharpoons[e_{1226}, s_{0913}, s_{0772}]{s_{0772}}$	0000176
341	r_1367	tryptophan synthase (indoleglycerol phosphate)	$s_{0493} \xrightleftharpoons[e_{0425}, e_{0426}, s_{0493}, s_{0913}, s_{1009}]{s_{0913} + s_{1009}}$	0000176
342	r_1368	Tryptophanase (L-tryptophan)	$s_{1009} \xrightleftharpoons[e_{1141}, s_{1009}, s_{0451}, s_{1531}, s_{1185}]{s_{1185}} + s_{0451}$	0000176
343	r_1375	tyrosine lyase	$s_{1552} \xrightleftharpoons[e_{1251}, s_{1552}, s_{1336}, s_{1189}, s_{1407}, s_{0333}, s_{0738}, s_{1141}, s_{1335}]{s_{14}} + s_{1336}$	0000176
344	r_1376	tyrosine transaminase	$s_{0262} + s_{1095} \xrightleftharpoons[e_{1276}, e_{0332}, s_{0262}, s_{1095}, s_{0233}, s_{1189}]{s_{0233} + s_{1189}}$	0000176
345	r_1378	UDP-3-O-(3-hydroxymyristoyl)glucosamine acyltransferase	$s_{0028} + s_{1735} \xrightleftharpoons[e_{0081}, s_{0028}, s_{1735}, s_{0397}, s_{1734}]{s_{1734}}$	00003767
346	r_1379	UDP-3-O-acetylglucosamine deacetylase	$s_{1736} \xrightleftharpoons[e_{0044}, s_{1736}, s_{0384}, s_{1735}]{s_{0384} + s_{1735}}$	0000176
347	r_1388	UDP-N-acetylenolpyruvoylg glucosamine reductase	$s_{1336} + s_{1742} \xrightleftharpoons[e_{1248}, s_{1336}, s_{1742}, s_{1335}, s_{1750}]{s_{1750}}$	00001765

Nº	Id	Name		Reaction Equation	SBO
348	r_1389	UDP-N-acetylglucosamine carboxyvinyltransferase	1-	s_1484 + s_1745 $\xrightleftharpoons[e_0991, s_1484, s_1745, s_1430, s_1742]{}$ s_1742	000014760+
349	r_1391	UDP-N-acetylglucosamine acyltransferase		s_0028 + s_1745 $\xrightleftharpoons[e_0375, e_0083, s_0028, s_1745, s_0397, s_1736]{}$ s_0397 + s_1736	0000176
350	r_1392	UDP-N-acetylglucosamine diphosphorylase		s_1287 + s_1792 $\xrightleftharpoons[e_1150, s_1287, s_1792, s_0783, s_1745]{}$ s_1745	00000783+
351	r_1393	UDP-N-acetylglucosamine- N-acetylmuramyl- (pentapeptide)pyrophosphoryl-undecaprenol N-acetylglucosamine transferase		s_1745 + s_1777 $\xrightleftharpoons[e_0041, s_1745, s_1777, s_1776, s_1733]{}$ s_1733	000017766+
352	r_1397	UDP-N-acetylmuramoyl-L-alanine thetase	syn-	s_1041 + s_0467 $\xrightleftharpoons[s_1750]{e_0042, s_1041, s_0467, s_1750, s_0421, s_1430, s_1751}$ s_0421 + s_1430 + s_1751	0000176
353	r_1399	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate synthetase		s_0467 + s_0671 $\xrightleftharpoons[s_1751]{e_0040, s_0467, s_0671, s_1751, s_0421, s_1430, s_1754}$ s_0421 + s_1430 + s_1754	0000176
354	r_1400	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimelate thetase	syn-	s_1242 + s_0467 $\xrightleftharpoons[s_1754]{e_0037, s_1242, s_0467, s_1754, s_0421, s_1430, s_1752}$ s_0421 + s_1430 + s_1752	0000176
355	r_1401	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine synthetase		s_0603 + s_0467 $\xrightleftharpoons[s_1752]{e_0038, s_0603, s_0467, s_1752, s_0421, s_1430, s_1755}$ s_0421 + s_1430 + s_1755	0000176
356	r_1402	UDP-sugar hydrolase		s_1734 $\xrightleftharpoons[e_0186, s_1734, s_0149, s_1762]{s_0149}$ + s_1762	0000176

Nº	Id	Name	Reaction Equation	SBO
357	r_1409	UMP kinase	$s_{0467} + s_{1762} \xrightleftharpoons[e_{0328}, e_{0077}, s_{0467}, s_{1762}, s_{0421}, s_{1733}]{0000176} s_{0421} + s_{1733}$	
358	r_1410	Undecaprenyl diphosphate synthase	$s_{0826} + 8 s_{1028} \xrightleftharpoons[e_{0079}, s_{0826}, s_{1028}, s_{0783}, s_{1765}]{0000176} s_{0783} + s_{1765}$	
359	r_1413	undecaprenyl-diphosphatase	$s_{1765} \xrightleftharpoons[e_{0962}, e_{0433}, e_{0300}, s_{1765}, s_{1430}, s_{1768}]{0000176} s_{1768}$	
360	r_1421	uroporphyrinogen decarboxylase (uroporphyrinogen III)	$s_{1791} \xrightleftharpoons[e_{1256}, s_{1791}, s_{0543}, s_{0565}]{4} s_{0543} + 0000176 s_{0565}$	
361	r_1422	uroporphyrinogen methyltransferase	$2 s_{1552} + s_{1791} \xrightleftharpoons[e_{1184}, e_{1019}, s_{1552}, s_{1791}, s_{1551}, s_{0768}]{0000176} 2 s_{1551} + s_{0768}$	
362	r_1423	uroporphyrinogen-III synthase	$s_{0998} \xrightleftharpoons[e_{1185}, s_{0998}, s_{1791}]{s_{1791}} 0000176$	
363	r_1425	valine transaminase	$s_{0282} + s_{1095} \xrightleftharpoons[e_{1167}, s_{0282}, s_{1095}, s_{0233}, s_{1193}]{0000276} s_{1193}$	
364	r_1432	xylose isomerase	$s_{0657} \xrightleftharpoons[e_{1086}, s_{0657}, s_{0622}]{s_{0622}} 0000176$	
365	r_1511	ammonia transport via diffusion (extracellular to periplasm)	$s_{0453} \xrightleftharpoons[s_{0453}, s_{0451}]{s_{0451}} 0000185$	
366	r_1521	ATP synthase (four protons for one ATP) (periplasm)	$s_{0421} + s_{1430} \xrightleftharpoons[s_{0421}, s_{1430}, s_{0467}]{s_{0467}} 0000176$	
367	r_1536	calcium (Ca+2) transport via diffusion (extracellular to periplasm)	$s_{0499} \xrightleftharpoons[s_{0499}, s_{0497}]{s_{0497}} 0000185$	
368	r_1543	chloride (Cl-1) transport via diffusion (extracellular to periplasm)	$s_{0522} \xrightleftharpoons[s_{0522}, s_{0520}]{s_{0520}} 0000185$	

Nº	Id	Name	Reaction Equation	SBO
369	r_1551	CO2 transport via diffusion (extracellular to periplasm)	s_0543 $\xrightarrow{s_0543}$ s_0545	0000185
370	r_1557	cobalt (Co+2) transport via diffusion (extracellular to periplasm)	s_0548 $\xrightleftharpoons{s_0548, s_0546}$ s_0546	0000185
371	r_1565	copper (Cu+2) transport via diffusion (extracellular to periplasm)	s_0581 $\xrightleftharpoons{s_0581, s_0579}$ s_0579	0000185
372	r_1581	cytochrome oxidase bd (menaquinol-8: 2 protons) (periplasm)	s_1239 + 0 · 5 s_1372 $\xrightleftharpoons{s_1239, s_1372, s_1240}$ s_1240	0000176
373	r_1582	cytochrome oxidase bd (ubiquinol-8: 2 protons) (periplasm)	0 · 5 s_1372 + s_1731 $\xrightleftharpoons{s_1372, s_1731, s_1732}$ s_1732	0000176
374	r_1621	D-glucose transport via diffusion (extracellular to periplasm) irreversible	s_0659 $\xrightleftharpoons{s_0659, s_0657}$ s_0657	0000185
375	r_1622	D-glucose transport via PEP:Pyr PTS (periplasm)	s_1484 + s_0657 $\xrightleftharpoons{s_1484, s_0657, s_0663, s_1531}$ s_0660000176 s_1531	0000176
376	r_1714	Fructose transport via PEP:Pyr PTS (f6p generating) (periplasm)	s_1484 + s_0622 $\xrightleftharpoons{s_1484, s_0622, s_0627, s_1531}$ s_0620000176 s_1531	0000176
377	r_1792	iron (II) transport via diffusion (extracellular to periplasm)	s_0840 $\xrightleftharpoons{s_0840, s_0838}$ s_0838	0000185
378	r_1793	iron (III) transport via diffusion (extracellular to periplasm)	s_0843 $\xrightleftharpoons{s_0843, s_0841}$ s_0841	0000185
379	r_1906	magnesium (Mg+2) transport via diffusion (extracellular to periplasm)	s_1214 $\xrightleftharpoons{s_1214, s_1212}$ s_1212	0000185

Nº	Id	Name	Reaction Equation	SBO
380	r_1923	Manganese (Mn+2) transport via diffusion (extracellular to periplasm)	s_1257 $\xrightleftharpoons{s_{_1255}}$ s_1255	0000185
381	r_1939	Methanol transport via diffusion (extracellular to periplasm)	s_1248 $\xrightarrow{s_{_1248}}$ s_1250	0000185
382	r_1943	molybdate transport via diffusion (extracellular to periplasm)	s_1263 $\xrightleftharpoons{s_{_1261}}$ s_1261	0000185
383	r_1944	murein polymerizing transglycosylase	2 s_1776 $\xrightleftharpoons{s_{_1765}, s_{_1725}}$ 2 s_1765 + s_1725	0000176
384	r_1962	NAD(P) transhydrogenase (periplasm)	s_1334 + s_1335 $\xrightleftharpoons{s_{_1334}, s_{_1335}, s_{_1333}, s_{_1336}}$ s_1330	0000176
385	r_1968	nickel transport via diffusion (extracellular to periplasm)	s_1331 $\xrightleftharpoons{s_{_1329}}$ s_1329	0000185
386	r_2002	oxygen transport via diffusion (extracellular to periplasm)	s_1374 $\xrightleftharpoons{s_{_1374}, s_{_1372}}$ s_1372	0000185
387	r_2011	phosphate transport via diffusion (extracellular to periplasm)	s_1432 $\xrightleftharpoons{s_{_1430}}$ s_1430	0000185
388	r_2047	potassium transport via diffusion (extracellular to periplasm)	s_1496 $\xrightleftharpoons{s_{_1494}}$ s_1494	0000185
389	r_2108	sulfate transport via diffusion (extracellular to periplasm)	s_1611 $\xrightleftharpoons{s_{_1609}}$ s_1609	0000185
390	r_2167	zinc (Zn+2) transport via diffusion (extracellular to periplasm)	s_1806 $\xrightleftharpoons{s_{_1804}}$ s_1804	0000185

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391	r_2195	2-Octaprenylphenol hydroxylase (anaerobic)	s_0229 + s_0229, s_0467, s_1333, s_0226, s_0421, s_1334, s_1430 → 2 s_0467 + s_0226 + 2 s_0421 + s_1334 + 2 s_1430	0000176
392	r_2310	Dihydronoopterin monophosphate dephosphorylase	s_0766 ⇌ s_0766, s_0765, s_1430 → s_0765 + s_1430	0000176
393	r_2519	pyridoxine 5'-phosphate oxidase (anaerobic)	s_1333 + s_1530 ⇌ s_1333, s_1530, s_1334, s_1522 → s_1334, s_1522	0000176
394	r_2521	pyrimidine phosphatase	s_0346 ⇌ s_0346, s_0311, s_1430 → s_0311 + s_1430	0000176
395	r_2533	Sink needed to allow (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran to leave system	s_0003 → s_1807	0000185
396	r_2534	Sink needed to allow 5'-deoxyribose to leave system	s_0334 → s_0334 → s_1835	0000185
397	r_2537	Sink needed to allow p-Cresol to leave system	s_1407 → s_1407 → s_2072	0000185
398	r_2538	Sink needed to allow S-Adenosyl-4-methylthio-2-oxobutanoate to leave system	s_1550 → s_1550 → s_2093	0000185

Nº	Id	Name	Reaction Equation				SBO
399	r_2584	growth	$2.23 \cdot 10^{-4} s_{_0133}$	+	$2.6 \cdot 10^{-5} s_{_0378}$	+	0000176
			$2.23 \cdot 10^{-4} s_{_0226}$	+	$2.6 \cdot 10^{-4} s_{_0380}$	+	
			$0 \cdot 5137 s_{_1041}$	+	$2.23 \cdot 10^{-4} s_{_1552}$	+	
			$0 \cdot 2958 s_{_1061}$	+	$0 \cdot 2411 s_{_1068}$	+	
			$0 \cdot 2411 s_{_1072}$	+	$54 \cdot 12 s_{_0467}$	+	
			$1.22 \cdot 10^{-4} s_{_0480}$	+	$2 \cdot 10^{-6} s_{_0476}$	+	
			$0 \cdot 005205 s_{_0497}$	+	$0 \cdot 005205 s_{_0520}$	+	
			$5.76 \cdot 10^{-4} s_{_0555}$	+	$2.5 \cdot 10^{-5} s_{_0546}$	+	
			$0 \cdot 1335 s_{_0575}$	+	$7.09 \cdot 10^{-4} s_{_0579}$	+	
			$0 \cdot 09158 s_{_1083}$	+	$0 \cdot 02617 s_{_0726}$	+	
			$0 \cdot 02702 s_{_0731}$	+	$0 \cdot 02702 s_{_0760}$	+	
			$0 \cdot 02617 s_{_0805}$	+	$2.23 \cdot 10^{-4} s_{_0859}$	+	
			$0 \cdot 006715 s_{_0838}$	+	$0 \cdot 007808 s_{_0841}$	+	
			$0 \cdot 2632 s_{_1101}$	+	$0 \cdot 2632 s_{_1095}$	+	
			$0 \cdot 6126 s_{_0929}$	+	$0 \cdot 2151 s_{_0945}$	+	
			$0 \cdot 09474 s_{_1106}$	+	$0 \cdot 2905 s_{_1119}$	+	
			$0 \cdot 1952 s_{_1494}$	+	$0 \cdot 4505 s_{_1127}$	+	
			$0 \cdot 3432 s_{_1131}$	+	$0 \cdot 1537 s_{_1141}$	+	
			$0 \cdot 008675 s_{_1212}$	+	$2.23 \cdot 10^{-4} s_{_0336}$	+	
			$6.91 \cdot 10^{-4} s_{_1255}$	+	$7 \cdot 10^{-6} s_{_1261}$	+	
			$0 \cdot 001831 s_{_1333}$	+	$4.47 \cdot 10^{-4} s_{_1335}$	+	
			$0 \cdot 01301 s_{_0451}$	+	$3.23 \cdot 10^{-4} s_{_1329}$	+	
			$0 \cdot 06382 s_{_1437}$	+	$0 \cdot 07521 s_{_1435}$	+	
			$0 \cdot 1853 s_{_1151}$	+	$2.23 \cdot 10^{-4} s_{_1508}$	+	
			$0 \cdot 2211 s_{_1155}$	+	$2.23 \cdot 10^{-4} s_{_1522}$	+	
			$2.23 \cdot 10^{-4} s_{_1546}$	+	$0 \cdot 2158 s_{_1170}$	+	
			$2.23 \cdot 10^{-4} s_{_1577}$	+	$0 \cdot 004338 s_{_1609}$	+	
			$2.23 \cdot 10^{-4} s_{_0337}$	+	$2.23 \cdot 10^{-4} s_{_1644}$	+	
			$0 \cdot 2537 s_{_1179}$	+	$0 \cdot 05684 s_{_1185}$	+	
			$0 \cdot 1379 s_{_1189}$	+	$5.5 \cdot 10^{-5} s_{_1765}$	+	
			$0 \cdot 1441 s_{_1792}$	+	$0 \cdot 4232 s_{_1193}$	+	
			$3.41 \cdot 10^{-4} s_{_1804}$	+	$0 \cdot 01946 s_{_1033}$	+	
			$0 \cdot 01389 s_{_1719}$	<u>s_{_0133}, s_{_0378}, s_{_0226}, s_{_0380}, s_{_1041}, s_{_1552}, s_{_1061}, s_{_1068}, s_{_1}</u>			
					$53 \cdot 95 s_{_1430} + 0 \cdot 7739 s_{_0783}$		

Nº	Id	Name	Reaction Equation	SBO
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6.1 Reaction r_0001

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran synthesis (spontaneous)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 5: Properties of each reactant.

Id	Name	SBO
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	

Modifiers

Table 6: Properties of each modifier.

Id	Name	SBO
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Product

Table 7: Properties of each product.

Id	Name	SBO
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Kinetic Law

Derived unit contains undeclared units

$$v_1 = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot \left([s_{\text{0004}}] - \frac{[s_{\text{0003}}]}{K_{\text{eq}}} \right)}{K_{\text{m0004}}}}{1 + \frac{[s_{\text{0004}}]}{K_{\text{m0004}}} + 1 + \frac{[s_{\text{0003}}]}{K_{\text{m0003}}} - 1} \quad (3)$$

Table 8: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.72332981485438 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0004		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0003		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

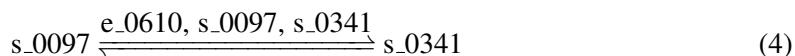
6.2 Reaction r_0008

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 1-(5-phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 9: Properties of each reactant.

Id	Name	SBO
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	

Modifiers

Table 10: Properties of each modifier.

Id	Name	
e_0610	hisA	
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxamide	

Product

Table 11: Properties of each product.

Id	Name
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxylic acid

Kinetic Law

Derived unit contains undeclared units

$$v_2 = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{0097}] - \frac{[s_{0341}]}{K_{\text{eq}}} \right)}{1 + \frac{[s_{0097}]}{K_{m0097}} + 1 + \frac{[s_{0341}]}{K_{m0341}} - 1} \quad (5)$$

Table 12: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.079	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0097		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0341		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

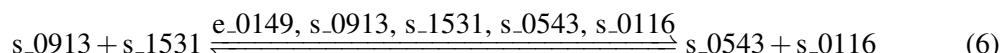
6.3 Reaction r_0009

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-deoxy-D-xylulose 5-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 13: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	

Modifiers

Table 14: Properties of each modifier.

Id	Name	SBO
e_0149	dxs	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	
s_0543	CO2	
s_0116	1-deoxy-D-xylulose 5-phosphate	

Products

Table 15: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_0116	1-deoxy-D-xylulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_3 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0913}] \cdot [s_{1531}] - \frac{[s_{0543}] \cdot [s_{0116}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{0913}]}{K_{m0913}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{0116}]}{K_{m0116}} \right) - 1} \quad (7)$$

Table 16: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.92694941408386 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0913}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1531}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0116}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

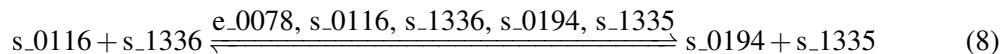
6.4 Reaction r_0011

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-deoxy-D-xylulose reductoisomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 17: Properties of each reactant.

Id	Name	SBO
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 18: Properties of each modifier.

Id	Name	SBO
e_0078	dxr	0000460
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 19: Properties of each product.

Id	Name	SBO
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_4 = \frac{\frac{vol(cell) \cdot Vmax \cdot \left([s_{0116}] \cdot [s_{1336}] - \frac{[s_{0194}] \cdot [s_{1335}]}{K_{eq}} \right)}{Km0116 \cdot Km1336}}{\left(1 + \frac{[s_{0116}]}{Km0116} \right) \cdot \left(1 + \frac{[s_{1336}]}{Km1336} \right) + \left(1 + \frac{[s_{0194}]}{Km0194} \right) \cdot \left(1 + \frac{[s_{1335}]}{Km1335} \right) - 1} \quad (9)$$

Table 20: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0116		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0194		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

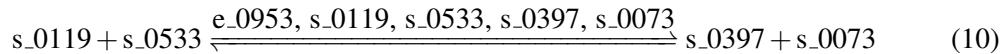
6.5 Reaction r_0012

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hexadec-7-enoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 21: Properties of each reactant.

Id	Name	SBO
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	

Modifiers

Table 22: Properties of each modifier.

Id	Name	SBO
e_0953	plsC	0000460

Id	Name	SBO
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0397	acyl carrier protein	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	

Products

Table 23: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_5 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0119] \cdot [s_0533] - \frac{[s_0397] \cdot [s_0073]}{K_{eq}} \right)}{Km0119 \cdot Km0533} \quad (11)$$

$$\left(1 + \frac{[s_0119]}{Km0119} \right) \cdot \left(1 + \frac{[s_0533]}{Km0533} \right) + \left(1 + \frac{[s_0397]}{Km0397} \right) \cdot \left(1 + \frac{[s_0073]}{Km0073} \right) - 1$$

Table 24: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.146	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0119		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0533		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0397		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0073		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

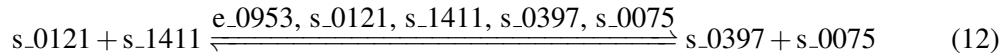
6.6 Reaction r_0013

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hexadecanoyl-sn-glycerol 3-phosphate O-acyltransferase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 25: Properties of each reactant.

Id	Name	SBO
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	

Modifiers

Table 26: Properties of each modifier.

Id	Name	SBO
e_0953	plsC	0000460
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0397	acyl carrier protein	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	

Products

Table 27: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_6 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0121}] \cdot [s_{1411}] - \frac{[s_{0397}] \cdot [s_{0075}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{0121}]}{K_{m0121}} \right) \cdot \left(1 + \frac{[s_{1411}]}{K_{m1411}} \right) + \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{0075}]}{K_{m0075}} \right) - 1} \quad (13)$$

Table 28: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.124	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0121		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1411		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0397		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0075		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

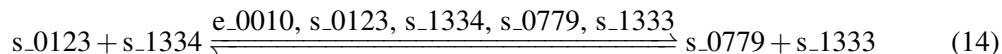
6.7 Reaction r_0014

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate reductase (dmpp)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 29: Properties of each reactant.

Id	Name	SBO
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 30: Properties of each modifier.

Id	Name	SBO
e_0010	ispH	0000460
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0779	Dimethylallyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 31: Properties of each product.

Id	Name	SBO
s_0779	Dimethylallyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_7 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0123}] \cdot [s_{1334}] - \frac{[s_{0779}] \cdot [s_{1333}]}{K_{eq}} \right)}{K_{m0123} \cdot K_{m1334}} \quad (15)$$

$$\left(1 + \frac{[s_{0123}]}{K_{m0123}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) + \left(1 + \frac{[s_{0779}]}{K_{m0779}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) - 1$$

Table 32: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.85076520790662 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$5.39107129106927 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0123}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1334}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0779}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1333}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

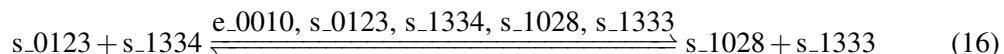
6.8 Reaction r_0015

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate reductase (ipdp)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 33: Properties of each reactant.

Id	Name	SBO
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 34: Properties of each modifier.

Id	Name	SBO
e_0010	ispH	0000460
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1028	Isopentenyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 35: Properties of each product.

Id	Name	SBO
s_1028	Isopentenyl diphosphate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_8 = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot ([s_0123] \cdot [s_1334] - \frac{[s_1028] \cdot [s_1333]}{K_{eq}})}{K_{m0123} \cdot K_{m1334}}}{\left(1 + \frac{[s_0123]}{K_{m0123}}\right) \cdot \left(1 + \frac{[s_1334]}{K_{m1334}}\right) + \left(1 + \frac{[s_1028]}{K_{m1028}}\right) \cdot \left(1 + \frac{[s_1333]}{K_{m1333}}\right) - 1} \quad (17)$$

Table 36: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.92408825885483 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0123}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1334		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1028		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

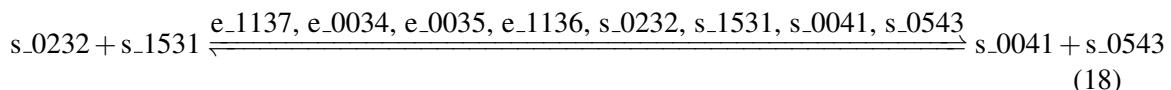
6.9 Reaction r_0038

This is a reversible reaction of two reactants forming two products influenced by eight modifiers.

Name 2-aceto-2-hydroxybutanoate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 37: Properties of each reactant.

Id	Name	SBO
s_0232	2-Oxobutanoate	
s_1531	Pyruvate	

Modifiers

Table 38: Properties of each modifier.

Id	Name	SBO
e_1137	ilvB	0000460
e_0034	ilvI	0000460
e_0035	ilvH	0000460
e_1136	ilvN	0000460
s_0232	2-Oxobutanoate	
s_1531	Pyruvate	
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_0543	CO2	

Products

Table 39: Properties of each product.

Id	Name	SBO
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_9 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0232] \cdot [s_1531] - \frac{[s_0041] \cdot [s_0543]}{K_{eq}} \right)}{K_{m0232} \cdot K_{m1531}} \quad (19)$$

$$\left(1 + \frac{[s_0232]}{K_{m0232}} \right) \cdot \left(1 + \frac{[s_1531]}{K_{m1531}} \right) + \left(1 + \frac{[s_0041]}{K_{m0041}} \right) \cdot \left(1 + \frac{[s_0543]}{K_{m0543}} \right) - 1$$

Table 40: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.563	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0232		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1531		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0041		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

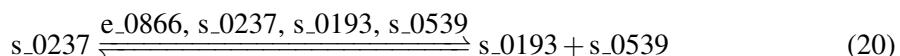
6.10 Reaction r_0053

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 2-C-methyl-D-erythritol 2,4-cyclodiphosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 41: Properties of each reactant.

Id	Name	SBO
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	

Modifiers

Table 42: Properties of each modifier.

Id	Name	SBO
e_0866	ispF	0000460
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0539	CMP	

Products

Table 43: Properties of each product.

Id	Name	SBO
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0539	CMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{10} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0237] - \frac{[s_0193] \cdot [s_0539]}{K_{eq}} \right)}{1 + \frac{[s_0237]}{K_{m0237}} + \left(1 + \frac{[s_0193]}{K_{m0193}} \right) \cdot \left(1 + \frac{[s_0539]}{K_{m0539}} \right) - 1} \quad (21)$$

Table 44: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0237}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0193}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0539}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

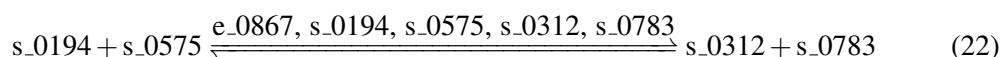
6.11 Reaction r_0054

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 2-C-methyl-D-erythritol 4-phosphate cytidylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 45: Properties of each reactant.

Id	Name	SBO
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_0575	CTP	

Modifiers

Table 46: Properties of each modifier.

Id	Name	SBO
e_0867	ispD	0000460
s_0194	2-C-methyl-D-erythritol 4-phosphate	
s_0575	CTP	
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0783	Diphosphate	

Products

Table 47: Properties of each product.

Id	Name	SBO
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{11} = \frac{\frac{vol(cell) \cdot Vmax \cdot \left([s_0194] \cdot [s_0575] - \frac{[s_0312] \cdot [s_0783]}{K_{eq}} \right)}{Km0194 \cdot Km0575}}{\left(1 + \frac{[s_0194]}{Km0194} \right) \cdot \left(1 + \frac{[s_0575]}{Km0575} \right) + \left(1 + \frac{[s_0312]}{Km0312} \right) \cdot \left(1 + \frac{[s_0783]}{Km0783} \right) - 1} \quad (23)$$

Table 48: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0194		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0575		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0312		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

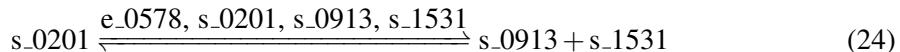
6.12 Reaction r_0056

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 2-dehydro-3-deoxy-phosphogluconate aldolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 49: Properties of each reactant.

Id	Name	SBO
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Modifiers

Table 50: Properties of each modifier.

Id	Name	SBO
e_0578	eda	0000460
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	

Products

Table 51: Properties of each product.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{12} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0201}] - \frac{[s_{0913}] \cdot [s_{1531}]}{K_{eq}} \right)}{1 + \frac{[s_{0201}]}{K_{m0201}} + \left(1 + \frac{[s_{0913}]}{K_{m0913}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) - 1} \quad (25)$$

Table 52: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	8.799	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0201		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0913		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

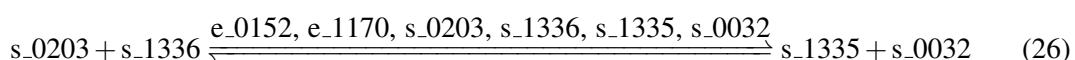
6.13 Reaction r_0063

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 2-dehydropantoate 2-reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 53: Properties of each reactant.

Id	Name	SBO
s_0203	2-Dehydropantoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 54: Properties of each modifier.

Id	Name	SBO
e_0152	panE	0000460
e_1170	ilvC	0000460
s_0203	2-Dehydropantoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0032	(R)-Pantoate	

Products

Table 55: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0032	(R)-Pantoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{13} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0203] \cdot [s_1336] - \frac{[s_1335] \cdot [s_0032]}{K_{eq}} \right)}{K_{m0203} \cdot K_{m1336}} \quad (27)$$

$$\left(1 + \frac{[s_0203]}{K_{m0203}} \right) \cdot \left(1 + \frac{[s_1336]}{K_{m1336}} \right) + \left(1 + \frac{[s_1335]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_0032]}{K_{m0032}} \right) - 1$$

Table 56: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			7.97856388884133 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.001	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0203		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0032		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

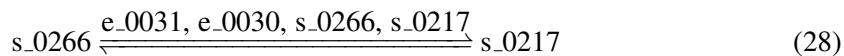
6.14 Reaction r_0066

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 2-isopropylmalate hydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 57: Properties of each reactant.

Id	Name	SBO
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	

Modifiers

Table 58: Properties of each modifier.

Id	Name	SBO
e_0031	leuC	0000460
e_0030	leuD	0000460
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	
s_0217	2-Isopropylmaleate	

Product

Table 59: Properties of each product.

Id	Name	SBO
s_0217	2-Isopropylmaleate	

Kinetic Law

Derived unit contains undeclared units

$$v_{14} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0266}] - \frac{[s_{0217}]}{K_{eq}} \right)}{K_{m0266}} \quad (29)$$

$$\frac{1 + \frac{[s_{0266}]}{K_{m0266}} + 1 + \frac{[s_{0217}]}{K_{m0217}} - 1}{1}$$

Table 60: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.374	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0266		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0217		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

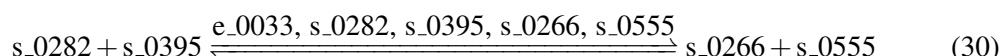
6.15 Reaction r_0067

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 2-isopropylmalate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 61: Properties of each reactant.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	
s_0395	Acetyl-CoA	

Modifiers

Table 62: Properties of each modifier.

Id	Name	SBO
e_0033	leuA	0000460
s_0282	3-Methyl-2-oxobutanoate	
s_0395	Acetyl-CoA	
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	
s_0555	Coenzyme A	

Products

Table 63: Properties of each product.

Id	Name	SBO
s_0266	3-Carboxy-3-hydroxy-4-methylpentanoate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{15} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0282}] \cdot [s_{0395}] - \frac{[s_{0266}] \cdot [s_{0555}]}{K_{eq}} \right)}{K_{m0282} \cdot K_{m0395}} \quad (31)$$

$$\left(1 + \frac{[s_{0282}]}{K_{m0282}} \right) \cdot \left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) + \left(1 + \frac{[s_{0266}]}{K_{m0266}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1$$

Table 64: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.874	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0282		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0266		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

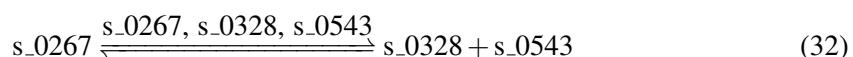
6.16 Reaction r_0078

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name 2-Oxo-4-methyl-3-carboxypentanoate decarboxylation

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 65: Properties of each reactant.

Id	Name	SBO
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	

Modifiers

Table 66: Properties of each modifier.

Id	Name	SBO
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	
s_0328	4-Methyl-2-oxopentanoate	
s_0543	CO2	

Products

Table 67: Properties of each product.

Id	Name	SBO
s_0328	4-Methyl-2-oxopentanoate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{16} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0267}] - \frac{[s_{0328}] \cdot [s_{0543}]}{K_{eq}} \right)}{K_{m0267}}}{1 + \frac{[s_{0267}]}{K_{m0267}} + \left(1 + \frac{[s_{0328}]}{K_{m0328}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) - 1} \quad (33)$$

Table 68: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.624	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0267		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0328		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

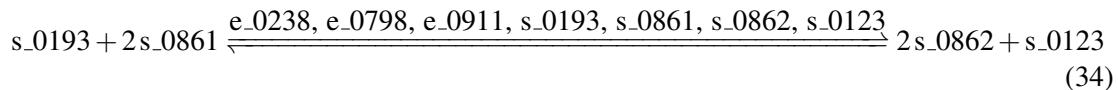
6.17 Reaction r_0084

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name 2C-methyl-D-erythritol 2,4 cyclodiphosphate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 69: Properties of each reactant.

Id	Name	SBO
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0861	Flavodoxin reduced	

Modifiers

Table 70: Properties of each modifier.

Id	Name	SBO
e_0238	fldA	0000460

Id	Name	SBO
e_0798	ispG	0000460
e_0911	fldB	0000460
s_0193	2-C-methyl-D-erythritol 2,4-cyclodiphosphate	
s_0861	Flavodoxin reduced	
s_0862	flavodoxin semi oxidized	
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	

Products

Table 71: Properties of each product.

Id	Name	SBO
s_0862	flavodoxin semi oxidized	
s_0123	1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{17} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0193}] \cdot [s_{0861}]^2 - \frac{[s_{0862}]^2 \cdot [s_{0123}]}{K_{eq}} \right)}{(1 + \frac{[s_{0193}]}{K_{m0193}}) \cdot \left(1 + \frac{[s_{0861}]}{K_{m0861}} \right)^2 + \left(1 + \frac{[s_{0862}]}{K_{m0862}} \right)^2 \cdot \left(1 + \frac{[s_{0123}]}{K_{m0123}} \right) - 1} \quad (35)$$

Table 72: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.30916477964549 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.010	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0193}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0861}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0862}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0123}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

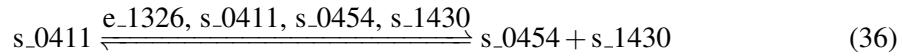
6.18 Reaction r_0085

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3',5'-bisphosphate nucleotidase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 73: Properties of each reactant.

Id	Name	SBO
s_{_0411}	Adenosine 3',5'-bisphosphate	

Modifiers

Table 74: Properties of each modifier.

Id	Name	SBO
e_{_1326}	cysQ	0000460
s_{_0411}	Adenosine 3',5'-bisphosphate	
s_{_0454}	AMP	
s_{_1430}	Phosphate	

Products

Table 75: Properties of each product.

Id	Name	SBO
s_{_0454}	AMP	
s_{_1430}	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{18} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{_0411}] - \frac{[s_{_0454}] \cdot [s_{_1430}]}{K_{\text{eq}}} \right)}{1 + \frac{[s_{_0411}]}{K_{m0411}} + \left(1 + \frac{[s_{_0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{_1430}]}{K_{m1430}} \right) - 1} \quad (37)$$

Table 76: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.343	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0411		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

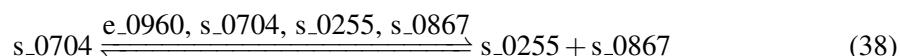
6.19 Reaction r_0092

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3,4-Dihydroxy-2-butanone-4-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 77: Properties of each reactant.

Id	Name	SBO
s_{-0704}	D-Ribulose 5-phosphate	

Modifiers

Table 78: Properties of each modifier.

Id	Name	SBO
e_{-0960}	ribB	0000460
s_{-0704}	D-Ribulose 5-phosphate	
s_{-0255}	3,4-dihydroxy-2-butanone 4-phosphate	
s_{-0867}	Formate	

Products

Table 79: Properties of each product.

Id	Name	SBO
s_0255	3,4-dihydroxy-2-butanone 4-phosphate	
s_0867	Formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{19} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0704}] - \frac{[s_{0255}] \cdot [s_{0867}]}{K_{eq}} \right)}{Km_{0704}} \quad (39)$$

$$1 + \frac{[s_{0704}]}{Km_{0704}} + \left(1 + \frac{[s_{0255}]}{Km_{0255}} \right) \cdot \left(1 + \frac{[s_{0867}]}{Km_{0867}} \right) - 1$$

Table 80: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.23556926891731 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km ₀₇₀₄		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km ₀₂₅₅		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km ₀₈₆₇		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

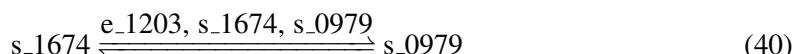
6.20 Reaction r_0096

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-cis-2-trans-enoyl-CoA isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 81: Properties of each reactant.

Id	Name	SBO
s_1674	trans-Hexadec-2-enoyl-CoA	

Id	Name	SBO
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Modifiers

Table 82: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
s_1674	trans-Hexadec-2-enoyl-CoA	
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	

Product

Table 83: Properties of each product.

Id	Name	SBO
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{20} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{1674}] - \frac{[s_{0979}]}{K_{eq}})}{K_{m1674}}}{1 + \frac{[s_{1674}]}{K_{m1674}} + 1 + \frac{[s_{0979}]}{K_{m0979}} - 1} \quad (41)$$

Table 84: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.125	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1674}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0979}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

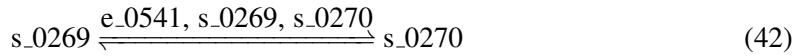
6.21 Reaction r_0098

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-dehydroquinate dehydratase, irreversible

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 85: Properties of each reactant.

Id	Name	SBO
s_0269	3-Dehydroquinate	

Modifiers

Table 86: Properties of each modifier.

Id	Name	SBO
e_0541	aroD	0000460
s_0269	3-Dehydroquinate	
s_0270	3-Dehydroshikimate	

Product

Table 87: Properties of each product.

Id	Name	SBO
s_0270	3-Dehydroshikimate	

Kinetic Law

Derived unit contains undeclared units

$$v_{21} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{_0269}] - \frac{[s_{_0270}]}{K_{\text{eq}}} \right)}{1 + \frac{[s_{_0269}]}{K_{m0269}} + 1 + \frac{[s_{_0270}]}{K_{m0270}} - 1} \quad (43)$$

Table 88: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.317	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0269		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0270		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

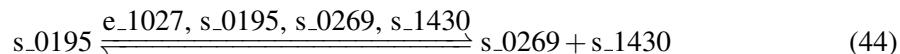
6.22 Reaction r_0099

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3-dehydroquinate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 89: Properties of each reactant.

Id	Name	SBO
s_{-0195}	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	

Modifiers

Table 90: Properties of each modifier.

Id	Name	SBO
e_{-1027}	aroB	0000460
s_{-0195}	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	
s_{-0269}	3-Dehydroquinate	
s_{-1430}	Phosphate	

Products

Table 91: Properties of each product.

Id	Name	SBO
s_0269	3-Dehydroquinate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{22} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0195}] - \frac{[s_{0269}] \cdot [s_{1430}]}{K_{eq}} \right)}{Km_{0195}} \quad (45)$$

$$1 + \frac{[s_{0195}]}{Km_{0195}} + \left(1 + \frac{[s_{0269}]}{Km_{0269}} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km_{1430}} \right) - 1$$

Table 92: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.528	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0195		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0269		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

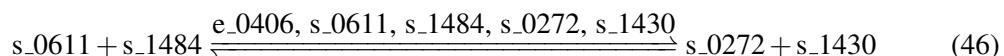
6.23 Reaction r_0100

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy -D-manno-octulosonic -acid 8-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 93: Properties of each reactant.

Id	Name	SBO
s_0611	D-Arabinose 5-phosphate	

Id	Name	SBO
s_1484	Phosphoenolpyruvate	

Modifiers

Table 94: Properties of each modifier.

Id	Name	SBO
e_0406	kdsA	0000460
s_0611	D-Arabinose 5-phosphate	
s_1484	Phosphoenolpyruvate	
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	
s_1430	Phosphate	

Products

Table 95: Properties of each product.

Id	Name	SBO
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{23} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0611}] \cdot [s_{1484}] - \frac{[s_{0272}] \cdot [s_{1430}]}{K_{eq}} \right)}{(1 + \frac{[s_{0611}]}{Km0611}) \cdot (1 + \frac{[s_{1484}]}{Km1484}) + (1 + \frac{[s_{0272}]}{Km0272}) \cdot (1 + \frac{[s_{1430}]}{Km1430}) - 1} \quad (47)$$

Table 96: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.075	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0611		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1484		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0272		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

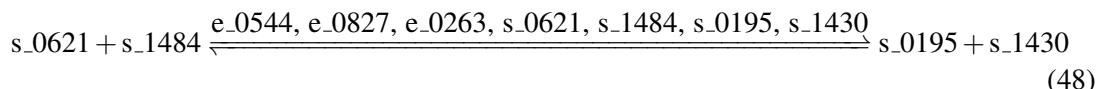
6.24 Reaction r_0101

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name 3-deoxy-D-arabino-heptulosonate 7-phosphate synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 97: Properties of each reactant.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_1484	Phosphoenolpyruvate	

Modifiers

Table 98: Properties of each modifier.

Id	Name	SBO
e_0544	aroH	0000460
e_0827	aroF	0000460
e_0263	aroG	0000460
s_0621	D-Erythrose 4-phosphate	
s_1484	Phosphoenolpyruvate	
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	
s_1430	Phosphate	

Products

Table 99: Properties of each product.

Id	Name	SBO
s_0195	2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{24} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0621}] \cdot [s_{1484}] - \frac{[s_{0195}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0621} \cdot K_{m1484}} \quad (49)$$

$$\frac{\left(1 + \frac{[s_{0621}]}{K_{m0621}} \right) \cdot \left(1 + \frac{[s_{1484}]}{K_{m1484}} \right) + \left(1 + \frac{[s_{0195}]}{K_{m0195}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{\left(1 + \frac{[s_{0621}]}{K_{m0621}} \right) \cdot \left(1 + \frac{[s_{1484}]}{K_{m1484}} \right) + \left(1 + \frac{[s_{0195}]}{K_{m0195}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1} - 1$$

Table 100: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.739	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0621}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1484}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0195}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

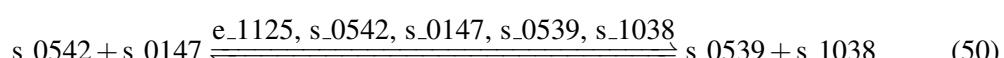
6.25 Reaction r_0102

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy-D-manno-octulosonic acid transferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 101: Properties of each reactant.

Id	Name
s_0542	CMP-3-deoxy-D-manno-octulosonate
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

Modifiers

Table 102: Properties of each modifier.

Id	Name
e_1125	waaA
s_0542	CMP-3-deoxy-D-manno-octulosonate
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate
s_0539	CMP
s_1038	KDO-lipid IV(A)

Products

Table 103: Properties of each product.

Id	Name	SBO
s_0539	CMP	
s_1038	KDO-lipid IV(A)	

Kinetic Law

Derived unit contains undeclared units

$$v_{25} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0542}] \cdot [s_{0147}] - \frac{[s_{0539}] \cdot [s_{1038}]}{K_{eq}} \right)}{(1 + \frac{[s_{0542}]}{K_{m0542}}) \cdot (1 + \frac{[s_{0147}]}{K_{m0147}}) + (1 + \frac{[s_{0539}]}{K_{m0539}}) \cdot (1 + \frac{[s_{1038}]}{K_{m1038}}) - 1} \quad (51)$$

Table 104: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.038	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0542		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0147		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0539		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1038		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

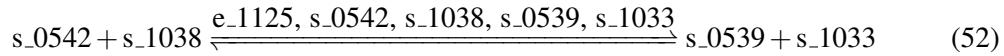
6.26 Reaction r_0103

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy-D-manno-octulosonic acid transferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 105: Properties of each reactant.

Id	Name	SBO
s_{_0542}	CMP-3-deoxy-D-manno-octulosonate	
s_{_1038}	KDO-lipid IV(A)	

Modifiers

Table 106: Properties of each modifier.

Id	Name	SBO
e_{_1125}	waaA	0000460
s_{_0542}	CMP-3-deoxy-D-manno-octulosonate	
s_{_1038}	KDO-lipid IV(A)	
s_{_0539}	CMP	
s_{_1033}	KDO(2)-lipid IV(A)	

Products

Table 107: Properties of each product.

Id	Name	SBO
s_{_0539}	CMP	
s_{_1033}	KDO(2)-lipid IV(A)	

Kinetic Law

Derived unit contains undeclared units

$$v_{26} = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot \left([s_{_0542}] \cdot [s_{_1038}] - \frac{[s_{_0539}] \cdot [s_{_1033}]}{K_{\text{eq}}} \right)}{K_{\text{m0542}} \cdot K_{\text{m1038}}}}{\left(1 + \frac{[s_{_0542}]}{K_{\text{m0542}}} \right) \cdot \left(1 + \frac{[s_{_1038}]}{K_{\text{m1038}}} \right) + \left(1 + \frac{[s_{_0539}]}{K_{\text{m0539}}} \right) \cdot \left(1 + \frac{[s_{_1033}]}{K_{\text{m1033}}} \right) - 1} \quad (53)$$

Table 108: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.038	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0542		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1038		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0539		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1033		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

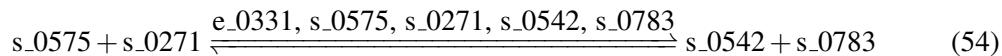
6.27 Reaction r_0105

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-deoxy-manno-octulosonate cytidylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 109: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	
s_0271	3-Deoxy-D-manno-2-octulosonate	

Modifiers

Table 110: Properties of each modifier.

Id	Name	SBO
e_0331	kdsB	0000460
s_0575	CTP	
s_0271	3-Deoxy-D-manno-2-octulosonate	
s_0542	CMP-3-deoxy-D-manno-octulosonate	
s_0783	Diphosphate	

Products

Table 111: Properties of each product.

Id	Name	SBO
s_0542	CMP-3-deoxy-D-manno-octulosonate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{27} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0575] \cdot [s_0271] - \frac{[s_0542] \cdot [s_0783]}{K_{eq}} \right)}{Km0575 \cdot Km0271} \quad (55)$$

$$\frac{\left(1 + \frac{[s_0575]}{Km0575} \right) \cdot \left(1 + \frac{[s_0271]}{Km0271} \right) + \left(1 + \frac{[s_0542]}{Km0542} \right) \cdot \left(1 + \frac{[s_0783]}{Km0783} \right) - 1}{\left(1 + \frac{[s_0575]}{Km0575} \right) \cdot \left(1 + \frac{[s_0271]}{Km0271} \right) + \left(1 + \frac{[s_0542]}{Km0542} \right) \cdot \left(1 + \frac{[s_0783]}{Km0783} \right) - 1}$$

Table 112: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.075	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0575		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0271		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0542		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

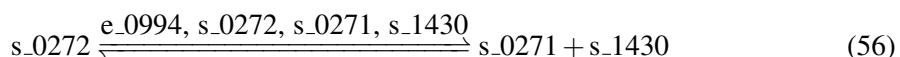
6.28 Reaction r_0106

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 3-deoxy-manno-octulosonate-8-phosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 113: Properties of each reactant.

Id	Name	SBO
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	

Modifiers

Table 114: Properties of each modifier.

Id	Name	SBO
e_0994	kdsC	0000460
s_0272	3-Deoxy-D-manno-octulosonate 8-phosphate	
s_0271	3-Deoxy-D-manno-2-octulosonate	
s_1430	Phosphate	

Products

Table 115: Properties of each product.

Id	Name	SBO
s_0271	3-Deoxy-D-manno-2-octulosonate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{28} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0272] - \frac{[s_0271] \cdot [s_1430]}{K_{eq}} \right)}{1 + \frac{[s_0272]}{Km0272} + \left(1 + \frac{[s_0271]}{Km0271} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1} \quad (57)$$

Table 116: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.054	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0272		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0271		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

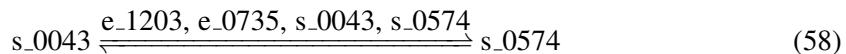
6.29 Reaction r_0120

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxybutanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 117: Properties of each reactant.

Id	Name	SBO
s_0043	(S)-3-Hydroxybutanoyl-CoA	

Modifiers

Table 118: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0043	(S)-3-Hydroxybutanoyl-CoA	
s_0574	Crotonoyl-CoA	

Product

Table 119: Properties of each product.

Id	Name	SBO
s_0574	Crotonoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{29} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{0043}] - \frac{[s_{0574}]}{K_{eq}})}{K_{m0043}}}{1 + \frac{[s_{0043}]}{K_{m0043}} + 1 + \frac{[s_{0574}]}{K_{m0574}} - 1} \quad (59)$$

Table 120: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.296	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0043		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0574		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

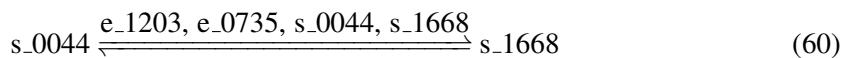
6.30 Reaction r_0121

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxydecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 121: Properties of each reactant.

Id	Name	SBO
s_0044	(S)-3-Hydroxydecanoyl-CoA	

Modifiers

Table 122: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0044	(S)-3-Hydroxydecanoyl-CoA	
s_1668	trans-Dec-2-enoyl-CoA	

Product

Table 123: Properties of each product.

Id	Name	SBO
s_1668	trans-Dec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{30} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0044] - \frac{[s_1668]}{K_{eq}} \right)}{1 + \frac{[s_0044]}{K_{m0044}} + 1 + \frac{[s_1668]}{K_{m1668}} - 1} \quad (61)$$

Table 124: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.296	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0044		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1668		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

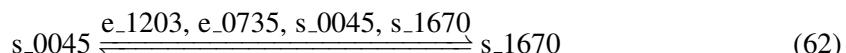
6.31 Reaction r_0122

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxydodecanoyle-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 125: Properties of each reactant.

Id	Name	SBO
s_0045	(S)-3-Hydroxydodecanoyle-CoA	

Modifiers

Table 126: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0045	(S)-3-Hydroxydodecanoyl-CoA	
s_1670	trans-Dodec-2-enoyl-CoA	

Product

Table 127: Properties of each product.

Id	Name	SBO
s_1670	trans-Dodec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{31} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0045] - \frac{[s_1670]}{K_{eq}} \right)}{Km0045}}{1 + \frac{[s_0045]}{Km0045} + 1 + \frac{[s_1670]}{Km1670} - 1} \quad (63)$$

Table 128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.296	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0045		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1670		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

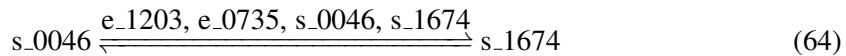
6.32 Reaction r_0123

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxyhexadecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 129: Properties of each reactant.

Id	Name	SBO
s_{_0046}	(S)-3-Hydroxyhexadecanoyl-CoA	

Modifiers

Table 130: Properties of each modifier.

Id	Name	SBO
e_{_1203}	fadB	0000460
e_{_0735}	fadJ	0000460
s_{_0046}	(S)-3-Hydroxyhexadecanoyl-CoA	
s_{_1674}	trans-Hexadec-2-enoyl-CoA	

Product

Table 131: Properties of each product.

Id	Name	SBO
s_{_1674}	trans-Hexadec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{32} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{_0046}] - \frac{[s_{_1674}]}{K_{eq}} \right)}{K_{m0046}}}{1 + \frac{[s_{_0046}]}{K_{m0046}} + 1 + \frac{[s_{_1674}]}{K_{m1674}} - 1} \quad (65)$$

Table 132: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.231	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0046		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1674		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

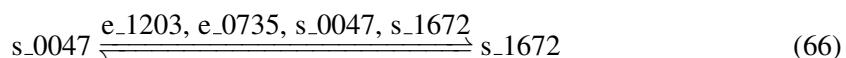
6.33 Reaction r_0124

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxyhexanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 133: Properties of each reactant.

Id	Name	SBO
s_0047	(S)-3-Hydroxyhexanoyl-CoA	

Modifiers

Table 134: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0047	(S)-3-Hydroxyhexanoyl-CoA	
s_1672	trans-Hex-2-enoyl-CoA	

Product

Table 135: Properties of each product.

Id	Name	SBO
s_1672	trans-Hex-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{33} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0047] - \frac{[s_1672]}{K_{eq}} \right)}{1 + \frac{[s_0047]}{K_{m0047}} + 1 + \frac{[s_1672]}{K_{m1672}} - 1} \quad (67)$$

Table 136: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.296	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0047		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1672		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

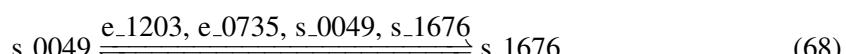
6.34 Reaction r_0126

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxyoctanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 137: Properties of each reactant.

Id	Name	SBO
s_0049	(S)-3-Hydroxyoctanoyl-CoA	

Modifiers

Table 138: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460

Id	Name	SBO
e_0735	fadJ	0000460
s_0049	(S)-3-Hydroxyoctanoyl-CoA	
s_1676	trans-Oct-2-enoyl-CoA	

Product

Table 139: Properties of each product.

Id	Name	SBO
s_1676	trans-Oct-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{34} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0049] - \frac{[s_1676]}{K_{eq}} \right)}{1 + \frac{[s_0049]}{Km0049} + 1 + \frac{[s_1676]}{Km1676} - 1} \quad (69)$$

Table 140: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.296	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0049		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1676		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

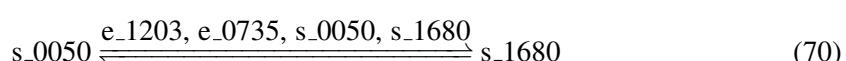
6.35 Reaction r_0127

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-hydroxyacyl-CoA dehydratase (3-hydroxytetradecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 141: Properties of each reactant.

Id	Name	SBO
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	

Modifiers

Table 142: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	
s_1680	trans-Tetradec-2-enoyl-CoA	

Product

Table 143: Properties of each product.

Id	Name	SBO
s_1680	trans-Tetradec-2-enoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{35} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0050}] - \frac{[s_{1680}]}{K_{eq}} \right)}{1 + \frac{[s_{0050}]}{Km0050} + 1 + \frac{[s_{1680}]}{Km1680} - 1} \quad (71)$$

Table 144: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.231	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0050		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1680		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

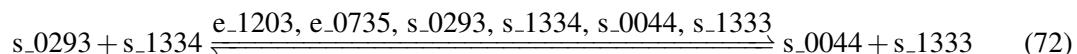
6.36 Reaction r_0128

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxodecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 145: Properties of each reactant.

Id	Name	SBO
s_0293	3-Oxodecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 146: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0293	3-Oxodecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0044	(S)-3-Hydroxydecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 147: Properties of each product.

Id	Name	SBO
s_0044	(S)-3-Hydroxydecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{36} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0293}] \cdot [s_{1334}] - \frac{[s_{0044}] \cdot [s_{1333}]}{K_{eq}} \right)}{K_{m0293} \cdot K_{m1334}} \quad (73)$$

$$\frac{\left(1 + \frac{[s_{0293}]}{K_{m0293}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) + \left(1 + \frac{[s_{0044}]}{K_{m0044}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) - 1}{\left(1 + \frac{[s_{0293}]}{K_{m0293}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) + \left(1 + \frac{[s_{0044}]}{K_{m0044}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) - 1} - 1$$

Table 148: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0293}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1334}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0044}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1333}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

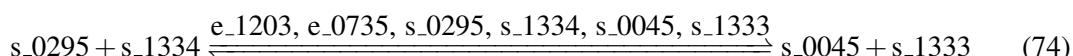
6.37 Reaction r_0129

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxododecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 149: Properties of each reactant.

Id	Name	SBO
s_0295	3-Oxododecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 150: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0295	3-Oxododecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0045	(S)-3-Hydroxydodecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 151: Properties of each product.

Id	Name	SBO
s_0045	(S)-3-Hydroxydodecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{37} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0295] \cdot [s_1334] - \frac{[s_0045] \cdot [s_1333]}{K_{eq}} \right)}{Km0295 \cdot Km1334} \quad (75)$$

$$\frac{\left(1 + \frac{[s_0295]}{Km0295} \right) \cdot \left(1 + \frac{[s_1334]}{Km1334} \right) + \left(1 + \frac{[s_0045]}{Km0045} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) - 1}{\left(1 + \frac{[s_0295]}{Km0295} \right) \cdot \left(1 + \frac{[s_1334]}{Km1334} \right) + \left(1 + \frac{[s_0045]}{Km0045} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) - 1} \quad (75)$$

Table 152: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0295		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0045		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

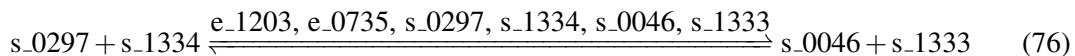
6.38 Reaction r_0130

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxohexadecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 153: Properties of each reactant.

Id	Name	SBO
s_0297	3-Oxohexadecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 154: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0297	3-Oxohexadecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 155: Properties of each product.

Id	Name	SBO
s_0046	(S)-3-Hydroxyhexadecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{38} = \frac{\frac{vol(cell) \cdot Vmax \cdot \left([s_0297] \cdot [s_1334] - \frac{[s_0046] \cdot [s_1333]}{K_{eq}} \right)}{Km0297 \cdot Km1334}}{\left(1 + \frac{[s_0297]}{Km0297} \right) \cdot \left(1 + \frac{[s_1334]}{Km1334} \right) + \left(1 + \frac{[s_0046]}{Km0046} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) - 1} \quad (77)$$

Table 156: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.539	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0297		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0046		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

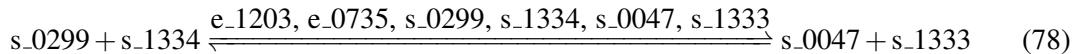
6.39 Reaction r_0131

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxohexanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 157: Properties of each reactant.

Id	Name	SBO
s_0299	3-Oxohexanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 158: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460

Id	Name	SBO
e_0735	fadJ	0000460
s_0299	3-Oxohexanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0047	(S)-3-Hydroxyhexanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 159: Properties of each product.

Id	Name	SBO
s_0047	(S)-3-Hydroxyhexanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{39} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0299}] \cdot [s_{1334}] - \frac{[s_{0047}] \cdot [s_{1333}]}{K_{eq}} \right)}{(1 + \frac{[s_{0299}]}{Km0299}) \cdot (1 + \frac{[s_{1334}]}{Km1334}) + (1 + \frac{[s_{0047}]}{Km0047}) \cdot (1 + \frac{[s_{1333}]}{Km1333}) - 1} \quad (79)$$

Table 160: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.690	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0299		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0047		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

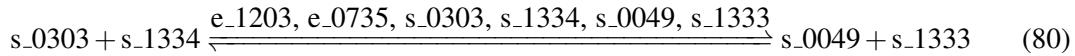
6.40 Reaction r_0133

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxooctanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 161: Properties of each reactant.

Id	Name	SBO
s_{_0303}	3-Oxoctanoyl-CoA	
s_{_1334}	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 162: Properties of each modifier.

Id	Name	SBO
e_{_1203}	fadB	0000460
e_{_0735}	fadJ	0000460
s_{_0303}	3-Oxoctanoyl-CoA	
s_{_1334}	Nicotinamide adenine dinucleotide - reduced	
s_{_0049}	(S)-3-Hydroxyoctanoyl-CoA	
s_{_1333}	Nicotinamide adenine dinucleotide	

Products

Table 163: Properties of each product.

Id	Name	SBO
s_{_0049}	(S)-3-Hydroxyoctanoyl-CoA	
s_{_1333}	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{40} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{_0303}] \cdot [s_{_1334}] - \frac{[s_{_0049}] \cdot [s_{_1333}]}{K_{\text{eq}}} \right)}{(1 + \frac{[s_{_0303}]}{K_{m0303}}) \cdot (1 + \frac{[s_{_1334}]}{K_{m1334}}) + (1 + \frac{[s_{_0049}]}{K_{m0049}}) \cdot (1 + \frac{[s_{_1333}]}{K_{m1333}}) - 1} \quad (81)$$

Table 164: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0303		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0049		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

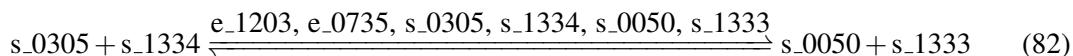
6.41 Reaction r_0134

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (3-oxotetradecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 165: Properties of each reactant.

Id	Name	SBO
s_0305	3-Oxotetradecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 166: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0305	3-Oxotetradecanoyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 167: Properties of each product.

Id	Name	SBO
s_0050	(S)-3-Hydroxytetradecanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{41} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0305] \cdot [s_1334] - \frac{[s_0050] \cdot [s_1333]}{K_{eq}} \right)}{Km0305 \cdot Km1334} \quad (83)$$

$$\frac{\left(1 + \frac{[s_0305]}{Km0305} \right) \cdot \left(1 + \frac{[s_1334]}{Km1334} \right) + \left(1 + \frac{[s_0050]}{Km0050} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) - 1}{\left(1 + \frac{[s_0305]}{Km0305} \right) \cdot \left(1 + \frac{[s_1334]}{Km1334} \right) + \left(1 + \frac{[s_0050]}{Km0050} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) - 1}$$

Table 168: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.539	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0305		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0050		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

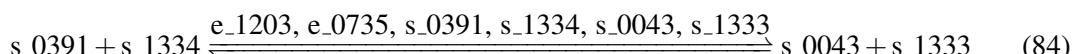
6.42 Reaction r_0135

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 3-hydroxyacyl-CoA dehydrogenase (acetoacetyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 169: Properties of each reactant.

Id	Name	SBO
s_0391	Acetoacetyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 170: Properties of each modifier.

Id	Name	SBO
e_1203	fadB	0000460
e_0735	fadJ	0000460
s_0391	Acetoacetyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0043	(S)-3-Hydroxybutanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 171: Properties of each product.

Id	Name	SBO
s_0043	(S)-3-Hydroxybutanoyl-CoA	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{42} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0391] \cdot [s_1334] - \frac{[s_0043] \cdot [s_1333]}{K_{eq}} \right)}{(1 + \frac{[s_0391]}{Km0391}) \cdot (1 + \frac{[s_1334]}{Km1334}) + (1 + \frac{[s_0043]}{Km0043}) \cdot (1 + \frac{[s_1333]}{Km1333}) - 1} \quad (85)$$

Table 172: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0391		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0043		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

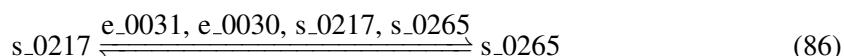
6.43 Reaction r_0138

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name 3-isopropylmalate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 173: Properties of each reactant.

Id	Name	SBO
s_0217	2-Isopropylmaleate	

Modifiers

Table 174: Properties of each modifier.

Id	Name	SBO
e_0031	leuC	0000460
e_0030	leuD	0000460
s_0217	2-Isopropylmaleate	
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	

Product

Table 175: Properties of each product.

Id	Name	SBO
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{43} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0217}] - \frac{[s_{0265}]}{K_{eq}} \right)}{1 + \frac{[s_{0217}]}{K_{m0217}} + 1 + \frac{[s_{0265}]}{K_{m0265}} - 1} \quad (87)$$

Table 176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.374	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0217		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0265		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

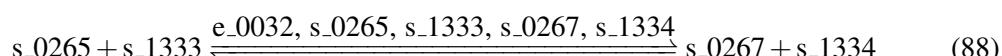
6.44 Reaction r_0139

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-isopropylmalate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 177: Properties of each reactant.

Id	Name	SBO
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 178: Properties of each modifier.

Id	Name	SBO
e_0032	leuB	0000460
s_0265	3-Carboxy-2-hydroxy-4-methylpentanoate	
s_1333	Nicotinamide adenine dinucleotide	
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 179: Properties of each product.

Id	Name	SBO
s_0267	3-Carboxy-4-methyl-2-oxopentanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{44} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0265}] \cdot [s_{1333}] - \frac{[s_{0267}] \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m0265} \cdot K_{m1333}} \quad (89)$$

$$\frac{\left(1 + \frac{[s_{0265}]}{K_{m0265}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{0267}]}{K_{m0267}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}{}$$

Table 180: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.874	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0265		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0267		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

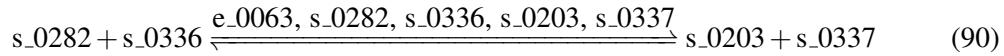
6.45 Reaction r_0143

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-methyl-2-oxobutanoate hydroxymethyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 181: Properties of each reactant.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	
s_0336	5,10-Methylenetetrahydrofolate	

Modifiers

Table 182: Properties of each modifier.

Id	Name	SBO
e_0063	panB	0000460
s_0282	3-Methyl-2-oxobutanoate	
s_0336	5,10-Methylenetetrahydrofolate	
s_0203	2-Dehydropantoate	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 183: Properties of each product.

Id	Name	SBO
s_0203	2-Dehydropantoate	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{45} = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot ([s_{0282}] \cdot [s_{0336}] - \frac{[s_{0203}] \cdot [s_{0337}]}{K_{eq}})}{K_{m0282} \cdot K_{m0336}}}{\left(1 + \frac{[s_{0282}]}{K_{m0282}}\right) \cdot \left(1 + \frac{[s_{0336}]}{K_{m0336}}\right) + \left(1 + \frac{[s_{0203}]}{K_{m0203}}\right) \cdot \left(1 + \frac{[s_{0337}]}{K_{m0337}}\right) - 1} \quad (91)$$

Table 184: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388884133 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0282		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0203		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0337		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

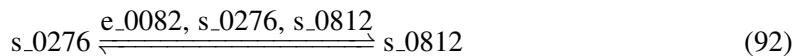
6.46 Reaction r_0145

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-Oxo-glutaryl-[ACP] methyl ester dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 185: Properties of each reactant.

Id	Name	SBO
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	

Modifiers

Table 186: Properties of each modifier.

Id	Name	SBO
e_0082	fabZ	0000460
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	

Product

Table 187: Properties of each product.

Id	Name	SBO
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{46} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0276}] - \frac{[s_{0812}]}{K_{eq}} \right)}{K_{m0276}} \quad (93)$$

$$1 + \frac{[s_{0276}]}{K_{m0276}} + 1 + \frac{[s_{0812}]}{K_{m0812}} - 1$$

Table 188: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			2.77033467884759 · 10 ⁻⁷	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	1.66220080730855 · 10 ⁻⁶	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0276}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0812}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

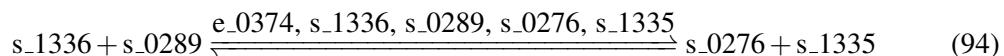
6.47 Reaction r_0146

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-Oxo-glutaryl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 189: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	

Modifiers

Table 190: Properties of each modifier.

Id	Name	SBO
e_0374	fabG	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 191: Properties of each product.

Id	Name	SBO
s_0276	3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{47} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1336}] \cdot [s_{0289}] - \frac{[s_{0276}] \cdot [s_{1335}]}{K_{eq}} \right)}{K_{m1336} \cdot K_{m0289}} \quad (95)$$

$$v_{47} = \frac{\left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{0289}]}{K_{m0289}} \right) + \left(1 + \frac{[s_{0276}]}{K_{m0276}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1}{\left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{0289}]}{K_{m0289}} \right) + \left(1 + \frac{[s_{0276}]}{K_{m0276}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1} \quad (95)$$

Table 192: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.87846855038663 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1336}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0289}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0276}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1335}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

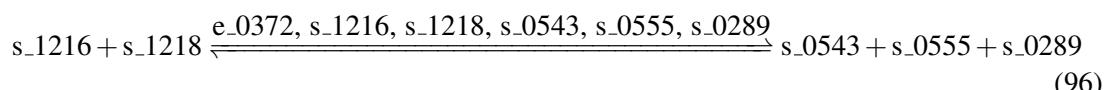
6.48 Reaction r_0147

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 3-Oxo-glutaryl-[ACP] methyl ester synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 193: Properties of each reactant.

Id	Name	SBO
s_1216	Malonyl-[acyl-carrier protein]	
s_1218	malonyl-CoA methyl ester	

Modifiers

Table 194: Properties of each modifier.

Id	Name	SBO
e_0372	fabH	0000460
s_1216	Malonyl-[acyl-carrier protein]	
s_1218	malonyl-CoA methyl ester	
s_0543	CO2	
s_0555	Coenzyme A	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	

Products

Table 195: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_0555	Coenzyme A	
s_0289	3-Oxo-glutaryl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{48} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1216}] \cdot [s_{1218}] - \frac{[s_{0543}] \cdot [s_{0555}] \cdot [s_{0289}]}{K_{eq}} \right)}{K_{m1216} \cdot K_{m1218}} \\ \frac{\left(1 + \frac{[s_{1216}]}{K_{m1216}} \right) \cdot \left(1 + \frac{[s_{1218}]}{K_{m1218}} \right) + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{0289}]}{K_{m0289}} \right) - 1}{(97)}$$

Table 196: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$6.0947362934647 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1216}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1218}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0555}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0289}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.49 Reaction r_0148

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 3-Oxo-pimeloyl-[ACP] methyl ester dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 197: Properties of each reactant.

Id	Name	SBO
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	

Modifiers

Table 198: Properties of each modifier.

Id	Name	SBO
e_0082	fabZ	0000460
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	

Product

Table 199: Properties of each product.

Id	Name	SBO
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{49} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0277] - \frac{[s_0813]}{K_{eq}} \right)}{Km0277}}{1 + \frac{[s_0277]}{Km0277} + 1 + \frac{[s_0813]}{Km0813} - 1} \quad (99)$$

Table 200: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$1.66220080730855 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0277		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0813		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

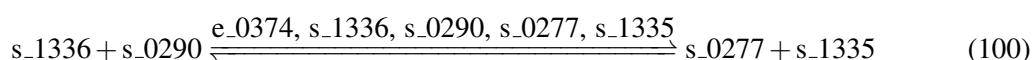
6.50 Reaction r_0149

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-Oxo-pimeloyl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 201: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	

Modifiers

Table 202: Properties of each modifier.

Id	Name	SBO
e_0374	fabG	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 203: Properties of each product.

Id	Name	SBO
s_0277	3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{50} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1336}] \cdot [s_{0290}] - \frac{[s_{0277}] \cdot [s_{1335}]}{K_{eq}} \right)}{K_{m1336} \cdot K_{m0290}} \quad (101)$$

$$\frac{\left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{0290}]}{K_{m0290}} \right) + \left(1 + \frac{[s_{0277}]}{K_{m0277}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1}{\left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{0290}]}{K_{m0290}} \right) + \left(1 + \frac{[s_{0277}]}{K_{m0277}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1}$$

Table 204: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.87846855038663 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0290		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0277		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

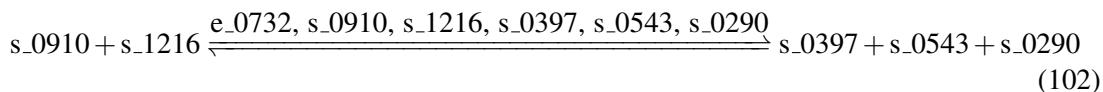
6.51 Reaction r_0150

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 3-Oxo-pimeloyl-[ACP] methyl ester synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 205: Properties of each reactant.

Id	Name	SBO
s_{_0910}	Glutaryl-[acyl-carrier protein] methyl ester	
s_{_1216}	Malonyl-[acyl-carrier protein]	

Modifiers

Table 206: Properties of each modifier.

Id	Name	SBO
e_{_0732}	fabB	0000460
s_{_0910}	Glutaryl-[acyl-carrier protein] methyl ester	
s_{_1216}	Malonyl-[acyl-carrier protein]	
s_{_0397}	acyl carrier protein	
s_{_0543}	CO2	
s_{_0290}	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	

Products

Table 207: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0543	CO2	
s_0290	3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{51} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0910}] \cdot [s_{1216}] - \frac{[s_{0397}] \cdot [s_{0543}] \cdot [s_{0290}]}{K_{eq}} \right)}{K_{m0910} \cdot K_{m1216}} \\ \frac{\left(1 + \frac{[s_{0910}]}{K_{m0910}} \right) \cdot \left(1 + \frac{[s_{1216}]}{K_{m1216}} \right) + \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{0290}]}{K_{m0290}} \right) - 1}{(103)}$$

Table 208: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			2.77033467884759 · 10 ⁻⁷	dimensionless	✓
V _{max}		0000324	6.0947362934647 · 10 ⁻⁶	mmol · l ⁻¹ · s ⁻¹	✓
K _{eq}		0000281	0.200	mmol · l ⁻¹	✓
K _{m0910}		0000322	0.100	mmol · l ⁻¹	✓
K _{m1216}		0000322	0.100	mmol · l ⁻¹	✓
K _{m0397}		0000323	0.100	mmol · l ⁻¹	✓
K _{m0543}		0000323	0.100	mmol · l ⁻¹	✓
K _{m0290}		0000323	0.100	mmol · l ⁻¹	✓

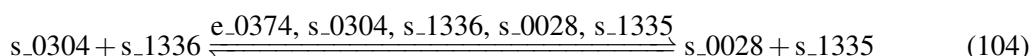
6.52 Reaction r_0154

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-oxoacyl-[acyl-carrier-protein] reductase (n-C14:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 209: Properties of each reactant.

Id	Name	SBO
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 210: Properties of each modifier.

Id	Name	SBO
e_0374	fabG	0000460
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 211: Properties of each product.

Id	Name	SBO
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{52} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0304] \cdot [s_1336] - \frac{[s_0028] \cdot [s_1335]}{K_{eq}} \right)}{Km0304 \cdot Km1336}}{\left(1 + \frac{[s_0304]}{Km0304} \right) \cdot \left(1 + \frac{[s_1336]}{Km1336} \right) + \left(1 + \frac{[s_0028]}{Km0028} \right) \cdot \left(1 + \frac{[s_1335]}{Km1335} \right) - 1} \quad (105)$$

Table 212: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.151	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0304		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0028		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

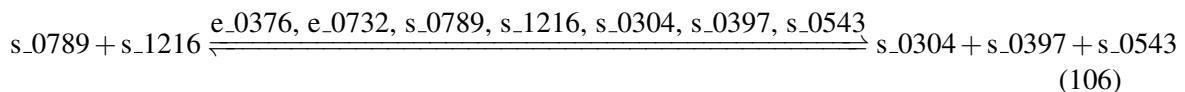
6.53 Reaction r_0166

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name 3-oxoacyl-[acyl-carrier-protein] synthase (n-C14:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 213: Properties of each reactant.

Id	Name	SBO
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_1216	Malonyl-[acyl-carrier protein]	

Modifiers

Table 214: Properties of each modifier.

Id	Name	SBO
e_0376	fabF	0000460
e_0732	fabB	0000460
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_1216	Malonyl-[acyl-carrier protein]	
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_0397	acyl carrier protein	
s_0543	CO2	

Products

Table 215: Properties of each product.

Id	Name	SBO
s_0304	3-Oxotetradecanoyl-[acyl-carrier protein]	
s_0397	acyl carrier protein	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{53} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0789}] \cdot [s_{1216}] - \frac{[s_{0304}] \cdot [s_{0397}] \cdot [s_{0543}]}{K_{eq}} \right)}{K_{m0789} \cdot K_{m1216}} \\ \left(1 + \frac{[s_{0789}]}{K_{m0789}} \right) \cdot \left(1 + \frac{[s_{1216}]}{K_{m1216}} \right) + \left(1 + \frac{[s_{0304}]}{K_{m0304}} \right) \cdot \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) - 1 \quad (107)$$

Table 216: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.237	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0789		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1216		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0304		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0397		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

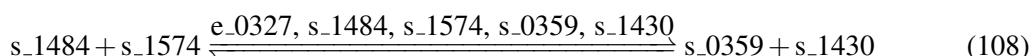
6.54 Reaction r_0175

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 3-phosphoshikimate 1-carboxyvinyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 217: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_1574	Shikimate 5-phosphate	

Modifiers

Table 218: Properties of each modifier.

Id	Name	SBO
e_0327	aroA	0000460
s_1484	Phosphoenolpyruvate	
s_1574	Shikimate 5-phosphate	
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	
s_1430	Phosphate	

Products

Table 219: Properties of each product.

Id	Name	SBO
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{54} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1484}] \cdot [s_{1574}] - \frac{[s_{0359}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m1484} \cdot K_{m1574}} \quad (109)$$

$$\frac{\left(1 + \frac{[s_{1484}]}{K_{m1484}} \right) \cdot \left(1 + \frac{[s_{1574}]}{K_{m1574}} \right) + \left(1 + \frac{[s_{0359}]}{K_{m0359}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{}$$

Table 220: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.739	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1484}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1574		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0359		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

6.55 Reaction r_0176

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name 4,5-dihydroxy-2,3-pentanedione cyclization (spontaneous)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 221: Properties of each reactant.

Id	Name	SBO
s_0310	4,5-dihydroxy-2,3-pentanedione	

Modifiers

Table 222: Properties of each modifier.

Id	Name	SBO
s_0310	4,5-dihydroxy-2,3-pentanedione	
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	

Product

Table 223: Properties of each product.

Id	Name	SBO
s_0004	(2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one	

Kinetic Law

Derived unit contains undeclared units

$$v_{55} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0310] - \frac{[s_0004]}{K_{eq}} \right)}{K_{m0310}}}{1 + \frac{[s_0310]}{K_{m0310}} + 1 + \frac{[s_0004]}{K_{m0004}} - 1} \quad (111)$$

Table 224: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.72332981485438 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0310}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0004}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

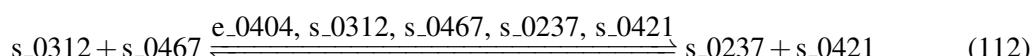
6.56 Reaction r_0178

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 225: Properties of each reactant.

Id	Name	SBO
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0467	ATP	

Modifiers

Table 226: Properties of each modifier.

Id	Name	SBO
e_0404	ispE	0000460
s_0312	4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0467	ATP	
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0421	ADP	

Products

Table 227: Properties of each product.

Id	Name	SBO
s_0237	2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{56} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0312}] \cdot [s_{0467}] - \frac{[s_{0237}] \cdot [s_{0421}]}{K_{eq}} \right)}{(1 + \frac{[s_{0312}]}{K_{m0312}}) \cdot (1 + \frac{[s_{0467}]}{K_{m0467}}) + (1 + \frac{[s_{0237}]}{K_{m0237}}) \cdot (1 + \frac{[s_{0421}]}{K_{m0421}}) - 1} \quad (113)$$

Table 228: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			3.30916477964549 · 10 ⁻⁴	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.005	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0312}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0237}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

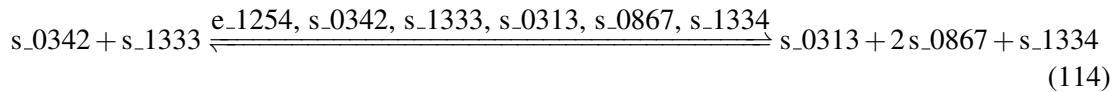
6.57 Reaction r_0179

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 4-amino-2-methyl-5-phosphomethylpyrimidine synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 229: Properties of each reactant.

Id	Name	SBO
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 230: Properties of each modifier.

Id	Name	SBO
e_1254	thiC	0000460
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1333	Nicotinamide adenine dinucleotide	
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0867	Formate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 231: Properties of each product.

Id	Name	SBO
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0867	Formate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{57} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0342}] \cdot [s_{1333}] - \frac{[s_{0313}] \cdot [s_{0867}]^2 \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m0342} \cdot K_{m1333}} \\ \left(1 + \frac{[s_{0342}]}{K_{m0342}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{0313}]}{K_{m0313}} \right) \cdot \left(1 + \frac{[s_{0867}]}{K_{m0867}} \right)^2 \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1 \quad (115)$$

Table 232: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	<input checked="" type="checkbox"/>
K _{m0342}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1333}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0313}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0867}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1334}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

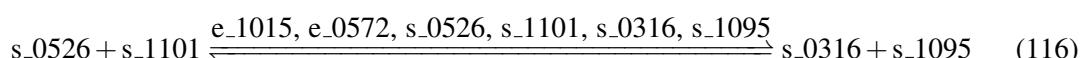
6.58 Reaction r_0181

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name 4-amino-4-deoxychorismate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 233: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	
s_1101	L-Glutamine	

Modifiers

Table 234: Properties of each modifier.

Id	Name	SBO
e_1015	pabA	0000460
e_0572	pabB	0000460
s_0526	chorismate	
s_1101	L-Glutamine	
s_0316	4-amino-4-deoxychorismate	
s_1095	L-Glutamate	

Products

Table 235: Properties of each product.

Id	Name	SBO
s_0316	4-amino-4-deoxychorismate	
s_1095	L-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{58} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0526}] \cdot [s_{1101}] - \frac{[s_{0316}] \cdot [s_{1095}]}{K_{eq}} \right)}{K_{m0526} \cdot K_{m1101}} \quad (117)$$

$$\frac{\left(1 + \frac{[s_{0526}]}{K_{m0526}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) + \left(1 + \frac{[s_{0316}]}{K_{m0316}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) - 1}{}$$

Table 236: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0526}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1101}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0316}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1095}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

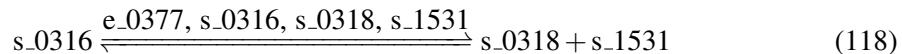
6.59 Reaction r_0182

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 4-aminobenzoate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 237: Properties of each reactant.

Id	Name	SBO
s_0316	4-amino-4-deoxychorismate	

Modifiers

Table 238: Properties of each modifier.

Id	Name	SBO
e_0377	pabC	0000460
s_0316	4-amino-4-deoxychorismate	
s_0318	4-Aminobenzoate	
s_1531	Pyruvate	

Products

Table 239: Properties of each product.

Id	Name	SBO
s_0318	4-Aminobenzoate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{59} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{\text{0316}}] - \frac{[s_{\text{0318}}][s_{\text{1531}}]}{K_{\text{eq}}} \right)}{K_{\text{m0316}}}}{1 + \frac{[s_{\text{0316}}]}{K_{\text{m0316}}} + \left(1 + \frac{[s_{\text{0318}}]}{K_{\text{m0318}}} \right) \cdot \left(1 + \frac{[s_{\text{1531}}]}{K_{\text{m1531}}} \right) - 1} \quad (119)$$

Table 240: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0316		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0318		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

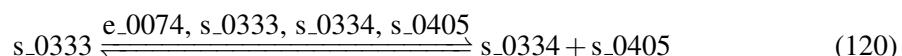
6.60 Reaction r_0186

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name 5'-deoxyadenosine nucleosidase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 241: Properties of each reactant.

Id	Name	SBO
s_0333	5'-Deoxyadenosine	

Modifiers

Table 242: Properties of each modifier.

Id	Name	SBO
e_0074	mtnN	0000460
s_0333	5'-Deoxyadenosine	
s_0334	5'-deoxyribose	
s_0405	Adenine	

Products

Table 243: Properties of each product.

Id	Name	SBO
s_0334	5'-deoxyribose	
s_0405	Adenine	

Kinetic Law

Derived unit contains undeclared units

$$v_{60} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0333}] - \frac{[s_{0334}] \cdot [s_{0405}]}{K_{eq}} \right)}{Km_{0333}} \quad (121)$$

$$1 + \frac{[s_{0333}]}{Km_{0333}} + \left(1 + \frac{[s_{0334}]}{Km_{0334}} \right) \cdot \left(1 + \frac{[s_{0405}]}{Km_{0405}} \right) - 1$$

Table 244: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.11662651885034 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.11662651885034 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km ₀₃₃₃		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km ₀₃₃₄		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km ₀₄₀₅		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

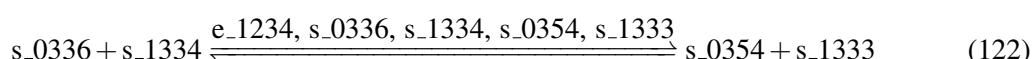
6.61 Reaction r_0211

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 5,10-methylenetetrahydrofolate reductase (NADH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 245: Properties of each reactant.

Id	Name	SBO
s_0336	5,10-Methylenetetrahydrofolate	

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 246: Properties of each modifier.

Id	Name	SBO
e_1234	metF	0000460
s_0336	5,10-Methylenetetrahydrofolate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0354	5-Methyltetrahydrofolate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 247: Properties of each product.

Id	Name	SBO
s_0354	5-Methyltetrahydrofolate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{61} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0336}] \cdot [s_{1334}] - \frac{[s_{0354}] \cdot [s_{1333}]}{K_{eq}} \right)}{(1 + \frac{[s_{0336}]}{Km0336}) \cdot (1 + \frac{[s_{1334}]}{Km1334}) + (1 + \frac{[s_{0354}]}{Km0354}) \cdot (1 + \frac{[s_{1333}]}{Km1333}) - 1} \quad (123)$$

Table 248: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.299	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0354		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

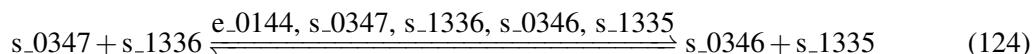
6.62 Reaction r_0212

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 5-amino-6-(5'-phosphoribosylamino)uracil reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 249: Properties of each reactant.

Id	Name	SBO
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 250: Properties of each modifier.

Id	Name	SBO
e_0144	ribD	0000460
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 251: Properties of each product.

Id	Name	SBO
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{62} = \frac{\frac{vol(cell) \cdot Vmax \cdot \left([s_0347] \cdot [s_1336] - \frac{[s_0346] \cdot [s_1335]}{K_{eq}} \right)}{Km0347 \cdot Km1336}}{\left(1 + \frac{[s_0347]}{Km0347} \right) \cdot \left(1 + \frac{[s_1336]}{Km1336} \right) + \left(1 + \frac{[s_0346]}{Km0346} \right) \cdot \left(1 + \frac{[s_1335]}{Km1335} \right) - 1} \quad (125)$$

Table 252: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$8.64898488242119 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0347		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0346		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

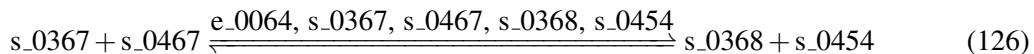
6.63 Reaction r_0216

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name 6-hydroxymethyl-dihydropterin pyrophosphokinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 253: Properties of each reactant.

Id	Name	SBO
s_0367	6-hydroxymethyl dihydropterin	
s_0467	ATP	

Modifiers

Table 254: Properties of each modifier.

Id	Name	SBO
e_0064	folK	0000460

Id	Name	SBO
s_0367	6-hydroxymethyl dihydropterin	
s_0467	ATP	
s_0368	6-hydroxymethyl-dihydropterin pyrophosphate	
s_0454	AMP	

Products

Table 255: Properties of each product.

Id	Name	SBO
s_0368	6-hydroxymethyl-dihydropterin pyrophosphate	
s_0454	AMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{63} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0367] \cdot [s_0467] - \frac{[s_0368] \cdot [s_0454]}{K_{eq}} \right)}{K_{m0367} \cdot K_{m0467}} \quad (127)$$

$$\left(1 + \frac{[s_0367]}{K_{m0367}} \right) \cdot \left(1 + \frac{[s_0467]}{K_{m0467}} \right) + \left(1 + \frac{[s_0368]}{K_{m0368}} \right) \cdot \left(1 + \frac{[s_0454]}{K_{m0454}} \right) - 1$$

Table 256: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0367}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0368}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0454}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

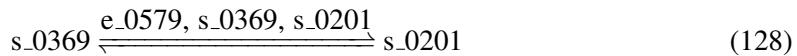
6.64 Reaction r_0217

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 6-phosphogluconate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 257: Properties of each reactant.

Id	Name	SBO
s_0369	6-Phospho-D-gluconate	

Modifiers

Table 258: Properties of each modifier.

Id	Name	SBO
e_0579	edd	0000460
s_0369	6-Phospho-D-gluconate	
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Product

Table 259: Properties of each product.

Id	Name	SBO
s_0201	2-Dehydro-3-deoxy-D-gluconate 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{64} = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot \left([s_{\text{0369}}] - \frac{[s_{\text{0201}}]}{K_{\text{eq}}} \right)}{K_{\text{m0369}}}}{1 + \frac{[s_{\text{0369}}]}{K_{\text{m0369}}} + 1 + \frac{[s_{\text{0201}}]}{K_{\text{m0201}}}} \quad (129)$$

Table 260: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	5.279	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0369		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0201		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

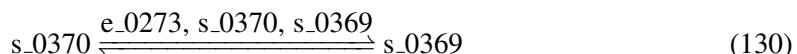
6.65 Reaction r_0218

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name 6-phosphogluconolactonase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 261: Properties of each reactant.

Id	Name	SBO
s_0370	6-phospho-D-glucono-1,5-lactone	

Modifiers

Table 262: Properties of each modifier.

Id	Name	SBO
e_0273	pgl	0000460
s_0370	6-phospho-D-glucono-1,5-lactone	
s_0369	6-Phospho-D-gluconate	

Product

Table 263: Properties of each product.

Id	Name	SBO
s_0369	6-Phospho-D-gluconate	

Kinetic Law

Derived unit contains undeclared units

$$v_{65} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0370] - \frac{[s_0369]}{K_{eq}} \right)}{K_{m0370}}}{1 + \frac{[s_0370]}{K_{m0370}} + 1 + \frac{[s_0369]}{K_{m0369}} - 1} \quad (131)$$

Table 264: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	5.279	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0370		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0369		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

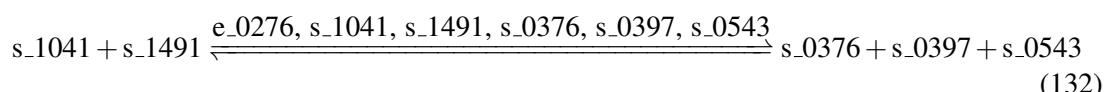
6.66 Reaction r_0222

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name 8-amino-7-oxononanoate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 265: Properties of each reactant.

Id	Name	SBO
s_1041	L-Alanine	
s_1491	Pimeloyl-[acyl-carrier protein]	

Modifiers

Table 266: Properties of each modifier.

Id	Name	SBO
e_0276	bioF	0000460
s_1041	L-Alanine	
s_1491	Pimeloyl-[acyl-carrier protein]	
s_0376	8-Amino-7-oxononanoate	
s_0397	acyl carrier protein	
s_0543	CO2	

Products

Table 267: Properties of each product.

Id	Name	SBO
s_0376	8-Amino-7-oxononanoate	
s_0397	acyl carrier protein	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{66} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1041}] \cdot [s_{1491}] - \frac{[s_{0376}] \cdot [s_{0397}] \cdot [s_{0543}]}{K_{eq}} \right)}{K_{m1041} \cdot K_{m1491}} \\ \left(1 + \frac{[s_{1041}]}{K_{m1041}} \right) \cdot \left(1 + \frac{[s_{1491}]}{K_{m1491}} \right) + \left(1 + \frac{[s_{0376}]}{K_{m0376}} \right) \cdot \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) - 1 \quad (133)$$

Table 268: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$6.0947362934647 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1041}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1491}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0376}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0397}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

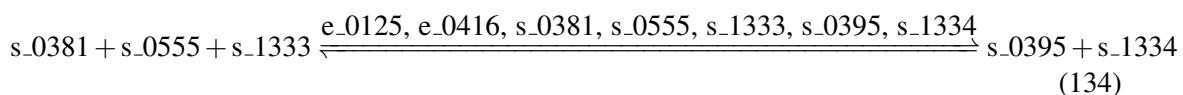
6.67 Reaction r_0224

This is a reversible reaction of three reactants forming two products influenced by seven modifiers.

Name acetaldehyde dehydrogenase (acetylating)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 269: Properties of each reactant.

Id	Name	SBO
s_0381	Acetaldehyde	
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 270: Properties of each modifier.

Id	Name	SBO
e_0125	mhpF	0000460
e_0416	adhE	0000460
s_0381	Acetaldehyde	
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	
s_0395	Acetyl-CoA	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 271: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{67} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0381}] \cdot [s_{0555}] \cdot [s_{1333}] - \frac{[s_{0395}] \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m0381} \cdot K_{m0555} \cdot K_{m1333}} \\ \frac{\left(1 + \frac{[s_{0381}]}{K_{m0381}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}{(135)}$$

Table 272: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.911	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
Km0381		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0395		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

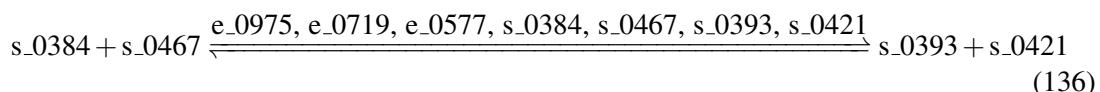
6.68 Reaction r_0225

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name acetate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 273: Properties of each reactant.

Id	Name	SBO
s_0384	Acetate	
s_0467	ATP	

Modifiers

Table 274: Properties of each modifier.

Id	Name	SBO
e_0975	tdcD	0000460
e_0719	ackA	0000460
e_0577	purT	0000460
s_0384	Acetate	
s_0467	ATP	
s_0393	Acetyl phosphate	
s_0421	ADP	

Products

Table 275: Properties of each product.

Id	Name	SBO
s_0393	Acetyl phosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{68} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0384] \cdot [s_0467] - \frac{[s_0393] \cdot [s_0421]}{K_{eq}} \right)}{Km0384 \cdot Km0467} \quad (137)$$

$$\frac{\left(1 + \frac{[s_0384]}{Km0384} \right) \cdot \left(1 + \frac{[s_0467]}{Km0467} \right) + \left(1 + \frac{[s_0393]}{Km0393} \right) \cdot \left(1 + \frac{[s_0421]}{Km0421} \right) - 1}{\left(1 + \frac{[s_0384]}{Km0384} \right) \cdot \left(1 + \frac{[s_0467]}{Km0467} \right) + \left(1 + \frac{[s_0393]}{Km0393} \right) \cdot \left(1 + \frac{[s_0421]}{Km0421} \right) - 1}$$

Table 276: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.081	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.130	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0384		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0393		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

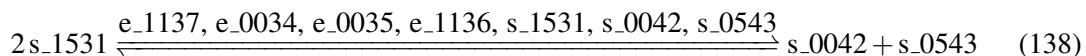
6.69 Reaction r_0227

This is a reversible reaction of one reactant forming two products influenced by seven modifiers.

Name acetolactate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 277: Properties of each reactant.

Id	Name	SBO
s_1531	Pyruvate	

Modifiers

Table 278: Properties of each modifier.

Id	Name	SBO
e_1137	ilvB	0000460
e_0034	ilvI	0000460
e_0035	ilvH	0000460
e_1136	ilvN	0000460
s_1531	Pyruvate	
s_0042	(S)-2-Acetylacetone	
s_0543	CO2	

Products

Table 279: Properties of each product.

Id	Name	SBO
s_0042	(S)-2-Acetolactate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{69} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1531}]^2 - \frac{[s_{0042}] \cdot [s_{0543}]}{K_{eq}} \right)}{K_{m1531}^2} \quad (139)$$

$$\frac{1}{\left(1 + \frac{[s_{1531}]}{K_{m1531}} \right)^2 + \left(1 + \frac{[s_{0042}]}{K_{m0042}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) - 1}$$

Table 280: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.695	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0042		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

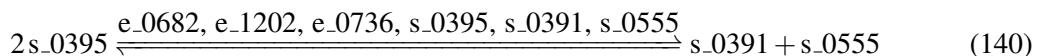
6.70 Reaction r_0230

This is a reversible reaction of one reactant forming two products influenced by six modifiers.

Name acetyl-CoA C-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 281: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	

Modifiers

Table 282: Properties of each modifier.

Id	Name	SBO
e_0682	atoB	0000460
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0391	Acetoacetyl-CoA	
s_0555	Coenzyme A	

Products

Table 283: Properties of each product.

Id	Name	SBO
s_0391	Acetoacetyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{70} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0395]^2 - \frac{[s_0391] \cdot [s_0555]}{K_{eq}} \right)}{Km0395^2} \quad (141)$$

$$\frac{\left(1 + \frac{[s_0395]}{Km0395} \right)^2 + \left(1 + \frac{[s_0391]}{Km0395} \right) \cdot \left(1 + \frac{[s_0555]}{Km0555} \right) - 1}{\left(1 + \frac{[s_0395]}{Km0395} \right)^2 + \left(1 + \frac{[s_0391]}{Km0395} \right) \cdot \left(1 + \frac{[s_0555]}{Km0555} \right) - 1}$$

Table 284: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0391		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

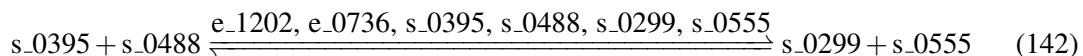
6.71 Reaction r_0231

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (butanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 285: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0488	Butanoyl-CoA	

Modifiers

Table 286: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0488	Butanoyl-CoA	
s_0299	3-Oxohexanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 287: Properties of each product.

Id	Name	SBO
s_0299	3-Oxohexanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{71} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0395}] \cdot [s_{0488}] - \frac{[s_{0299}] \cdot [s_{0555}]}{K_{eq}} \right)}{K_{m0395} \cdot K_{m0488}} \quad (143)$$

$$\frac{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0488}]}{K_{m0488}} \right) + \left(1 + \frac{[s_{0299}]}{K_{m0299}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0488}]}{K_{m0488}} \right) + \left(1 + \frac{[s_{0299}]}{K_{m0299}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}$$

Table 288: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0488		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0299		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

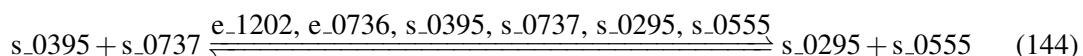
6.72 Reaction r_0232

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (decanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 289: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0737	Decanoyl-CoA (n-C10:0CoA)	

Modifiers

Table 290: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0737	Decanoyl-CoA (n-C10:0CoA)	
s_0295	3-Oxododecanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 291: Properties of each product.

Id	Name	SBO
s_0295	3-Oxododecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{72} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0395] \cdot [s_0737] - \frac{[s_0295] \cdot [s_0555]}{K_{eq}} \right)}{(1 + \frac{[s_0395]}{Km0395}) \cdot (1 + \frac{[s_0737]}{Km0737}) + (1 + \frac{[s_0295]}{Km0295}) \cdot (1 + \frac{[s_0555]}{Km0555}) - 1} \quad (145)$$

Table 292: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.690	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0395		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0737		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0295		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

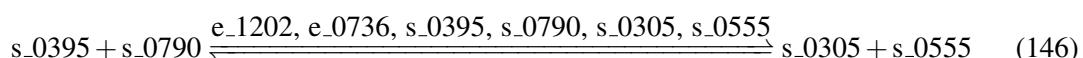
6.73 Reaction r_0233

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (dodecanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 293: Properties of each reactant.

Id	Name	SBO
s_{-0395}	Acetyl-CoA	
s_{-0790}	Dodecanoyl-CoA (n-C12:0CoA)	

Modifiers

Table 294: Properties of each modifier.

Id	Name	SBO
e_{-1202}	fadA	0000460
e_{-0736}	fadI	0000460
s_{-0395}	Acetyl-CoA	
s_{-0790}	Dodecanoyl-CoA (n-C12:0CoA)	
s_{-0305}	3-Oxotetradecanoyl-CoA	
s_{-0555}	Coenzyme A	

Products

Table 295: Properties of each product.

Id	Name	SBO
s_0305	3-Oxotetradecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{73} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0395}] \cdot [s_{0790}] - \frac{[s_{0305}] \cdot [s_{0555}]}{K_{eq}} \right)}{K_{m0395} \cdot K_{m0790}} \quad (147)$$

$$\frac{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0790}]}{K_{m0790}} \right) + \left(1 + \frac{[s_{0305}]}{K_{m0305}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0790}]}{K_{m0790}} \right) + \left(1 + \frac{[s_{0305}]}{K_{m0305}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}$$

Table 296: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.539	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0790		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0305		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

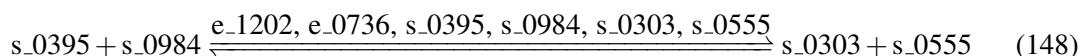
6.74 Reaction r_0234

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (hexanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 297: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	

Modifiers

Table 298: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	
s_0303	3-Oxoctanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 299: Properties of each product.

Id	Name	SBO
s_0303	3-Oxoctanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{74} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0395] \cdot [s_0984] - \frac{[s_0303] \cdot [s_0555]}{K_{eq}} \right)}{K_{m0395} \cdot K_{m0984}} \quad (149)$$

$$\left(1 + \frac{[s_0395]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_0984]}{K_{m0984}} \right) + \left(1 + \frac{[s_0303]}{K_{m0303}} \right) \cdot \left(1 + \frac{[s_0555]}{K_{m0555}} \right) - 1$$

Table 300: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0984		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0303		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

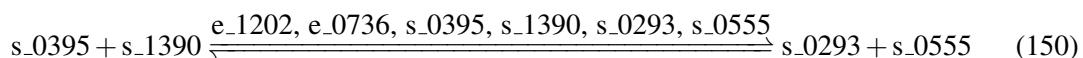
6.75 Reaction r_0235

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (octanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 301: Properties of each reactant.

Id	Name	SBO
s_{_0395}	Acetyl-CoA	
s_{_1390}	Octanoyl-CoA (n-C8:0CoA)	

Modifiers

Table 302: Properties of each modifier.

Id	Name	SBO
e_{_1202}	fadA	0000460
e_{_0736}	fadI	0000460
s_{_0395}	Acetyl-CoA	
s_{_1390}	Octanoyl-CoA (n-C8:0CoA)	
s_{_0293}	3-Oxodecanoyl-CoA	
s_{_0555}	Coenzyme A	

Products

Table 303: Properties of each product.

Id	Name	SBO
s_0293	3-Oxodecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{75} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0395}] \cdot [s_{1390}] - \frac{[s_{0293}] \cdot [s_{0555}]}{K_{eq}} \right)}{K_{m0395} \cdot K_{m1390}} \quad (151)$$

$$\frac{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{1390}]}{K_{m1390}} \right) + \left(1 + \frac{[s_{0293}]}{K_{m0293}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{1390}]}{K_{m1390}} \right) + \left(1 + \frac{[s_{0293}]}{K_{m0293}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}$$

Table 304: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1390		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0293		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

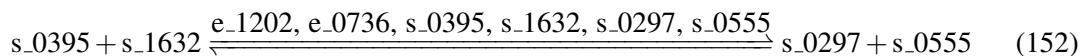
6.76 Reaction r_0236

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetyl-CoA C-acyltransferase (tetradecanoyl-CoA) (r)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 305: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	

Modifiers

Table 306: Properties of each modifier.

Id	Name	SBO
e_1202	fadA	0000460
e_0736	fadI	0000460
s_0395	Acetyl-CoA	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	
s_0297	3-Oxohexadecanoyl-CoA	
s_0555	Coenzyme A	

Products

Table 307: Properties of each product.

Id	Name	SBO
s_0297	3-Oxohexadecanoyl-CoA	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{76} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0395] \cdot [s_1632] - \frac{[s_0297] \cdot [s_0555]}{K_{eq}} \right)}{(1 + \frac{[s_0395]}{Km0395}) \cdot (1 + \frac{[s_1632]}{Km1632}) + (1 + \frac{[s_0297]}{Km0297}) \cdot (1 + \frac{[s_0555]}{Km0555}) - 1} \quad (153)$$

Table 308: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.539	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0395		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1632		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0297		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

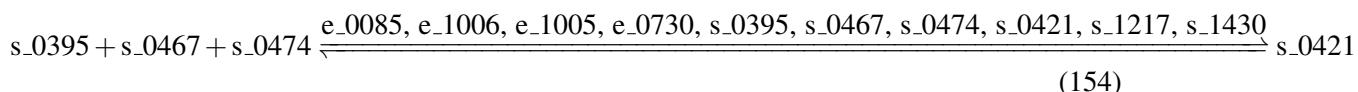
6.77 Reaction r_0237

This is a reversible reaction of three reactants forming three products influenced by ten modifiers.

Name acetyl-CoA carboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 309: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0467	ATP	
s_0474	Bicarbonate	

Modifiers

Table 310: Properties of each modifier.

Id	Name	SBO
e_0085	accA	0000460
e_1006	accC	0000460
e_1005	accB	0000460
e_0730	accD	0000460
s_0395	Acetyl-CoA	
s_0467	ATP	
s_0474	Bicarbonate	
s_0421	ADP	
s_1217	Malonyl-CoA	

Id	Name	SBO
s_1430	Phosphate	

Products

Table 311: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1217	Malonyl-CoA	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{77} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{0395}] \cdot [s_{0467}] \cdot [s_{0474}] - \frac{[s_{0421}] \cdot [s_{1217}] \cdot [s_{1430}]}{K_{eq}} \right)}{(1 + \frac{[s_{0395}]}{Km0395}) \cdot (1 + \frac{[s_{0467}]}{Km0467}) \cdot (1 + \frac{[s_{0474}]}{Km0474}) + (1 + \frac{[s_{0421}]}{Km0421}) \cdot (1 + \frac{[s_{1217}]}{Km1217}) \cdot (1 + \frac{[s_{1430}]}{Km1430}) - 1} \quad (155)$$

Table 312: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.323	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0474		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1217		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

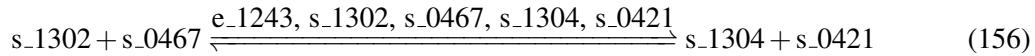
6.78 Reaction r_0243

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acetylglutamate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 313: Properties of each reactant.

Id	Name	SBO
s_1302	N-Acetyl-L-glutamate	
s_0467	ATP	

Modifiers

Table 314: Properties of each modifier.

Id	Name	SBO
e_1243	argB	0000460
s_1302	N-Acetyl-L-glutamate	
s_0467	ATP	
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_0421	ADP	

Products

Table 315: Properties of each product.

Id	Name	SBO
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{78} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1302}] \cdot [s_{0467}] - \frac{[s_{1304}] \cdot [s_{0421}]}{K_{eq}} \right)}{(1 + \frac{[s_{1302}]}{Km1302}) \cdot (1 + \frac{[s_{0467}]}{Km0467}) + (1 + \frac{[s_{1304}]}{Km1304}) \cdot (1 + \frac{[s_{0421}]}{Km0421}) - 1} \quad (157)$$

Table 316: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.574	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1302		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1304		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

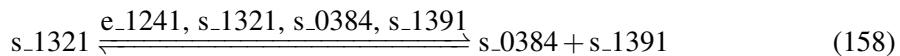
6.79 Reaction r_0244

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name acetyloornithine deacetylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 317: Properties of each reactant.

Id	Name	SBO
s_1321	N2-Acetyl-L-ornithine	

Modifiers

Table 318: Properties of each modifier.

Id	Name	SBO
e_1241	argE	0000460
s_1321	N2-Acetyl-L-ornithine	
s_0384	Acetate	
s_1391	Ornithine	

Products

Table 319: Properties of each product.

Id	Name	SBO
s_0384	Acetate	
s_1391	Ornithine	

Kinetic Law

Derived unit contains undeclared units

$$v_{79} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1321}] - \frac{[s_{0384}] \cdot [s_{1391}]}{K_{eq}} \right)}{Km_{1321}} \quad (159)$$

$$1 + \frac{[s_{1321}]}{Km_{1321}} + \left(1 + \frac{[s_{0384}]}{Km_{0384}} \right) \cdot \left(1 + \frac{[s_{1391}]}{Km_{1391}} \right) - 1$$

Table 320: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.410	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1321		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0384		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1391		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

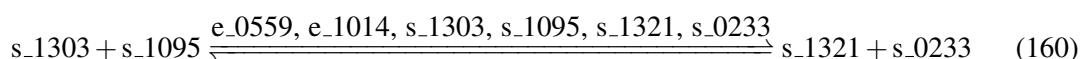
6.80 Reaction r_0245

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name acetylornithine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 321: Properties of each reactant.

Id	Name	SBO
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	

Id	Name	SBO
s_1095	L-Glutamate	

Modifiers

Table 322: Properties of each modifier.

Id	Name	SBO
e_0559	astC	0000460
e_1014	argD	0000460
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	
s_1095	L-Glutamate	
s_1321	N2-Acetyl-L-ornithine	
s_0233	2-Oxoglutarate	

Products

Table 323: Properties of each product.

Id	Name	SBO
s_1321	N2-Acetyl-L-ornithine	
s_0233	2-Oxoglutarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{80} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1303}] \cdot [s_{1095}] - \frac{[s_{1321}] \cdot [s_{0233}]}{K_{eq}} \right)}{K_{m1303} \cdot K_{m1095}} \quad (161)$$

$$\frac{\left(1 + \frac{[s_{1303}]}{K_{m1303}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{1321}]}{K_{m1321}} \right) \cdot \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) - 1}{}$$

Table 324: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.574	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1303		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1321		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

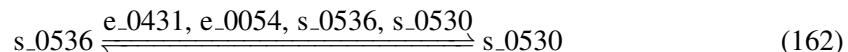
6.81 Reaction r_0246

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name aconitase (half-reaction A, Citrate hydro-lyase)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 325: Properties of each reactant.

Id	Name	SBO
s_{_0536}	Citrate	

Modifiers

Table 326: Properties of each modifier.

Id	Name	SBO
e_{_0431}	acnA	0000460
e_{_0054}	acnB	0000460
s_{_0536}	Citrate	
s_{_0530}	cis-Aconitate	

Product

Table 327: Properties of each product.

Id	Name	SBO
s_{_0530}	cis-Aconitate	

Kinetic Law

Derived unit contains undeclared units

$$v_{81} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{_0536}] - \frac{[s_{_0530}]}{K_{\text{eq}}} \right)}{K_{m0536}}}{1 + \frac{[s_{_0536}]}{K_{m0536}} + 1 + \frac{[s_{_0530}]}{K_{m0530}} - 1} \quad (163)$$

Table 328: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.894	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0536		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0530		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

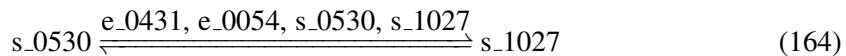
6.82 Reaction r_0247

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name aconitase (half-reaction B, Isocitrate hydro-lyase)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 329: Properties of each reactant.

Id	Name	SBO
s_{-0530}	cis-Aconitate	

Modifiers

Table 330: Properties of each modifier.

Id	Name	SBO
e_{-0431}	acnA	0000460
e_{-0054}	acnB	0000460
s_{-0530}	cis-Aconitate	
s_{-1027}	Isocitrate	

Product

Table 331: Properties of each product.

Id	Name	SBO
s_1027	Isocitrate	

Kinetic Law

Derived unit contains undeclared units

$$v_{82} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0530] - \frac{[s_1027]}{K_{eq}} \right)}{K_{m0530}} \quad (165)$$

$$1 + \frac{[s_0530]}{K_{m0530}} + 1 + \frac{[s_1027]}{K_{m1027}} - 1$$

Table 332: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.894	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0530		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1027		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

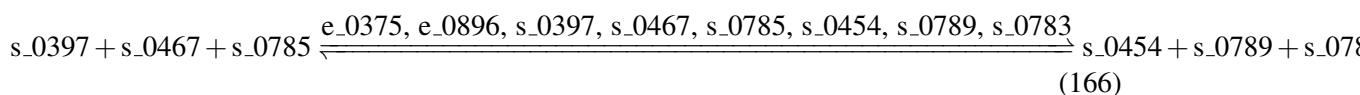
6.83 Reaction r_0257

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name acyl-[acyl-carrier-protein] synthetase (n-C12:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 333: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	

Id	Name	SBO
s_0467	ATP	
s_0785	Dodecanoate (n-C12:0)	

Modifiers

Table 334: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0896	aas	0000460
s_0397	acyl carrier protein	
s_0467	ATP	
s_0785	Dodecanoate (n-C12:0)	
s_0454	AMP	
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_0783	Diphosphate	

Products

Table 335: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0789	Dodecanoyl-ACP (n-C12:0ACP)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

v_{83}

(167)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0397] \cdot [s_0467] \cdot [s_0785] - \frac{[s_0454] \cdot [s_0789] \cdot [s_0783]}{K_{eq}} \right)}{\left(1 + \frac{[s_0397]}{Km0397} \right) \cdot \left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0785]}{Km0785} \right) + \left(1 + \frac{[s_0454]}{Km0454} \right) \cdot \left(1 + \frac{[s_0789]}{Km0789} \right) \cdot \left(1 + \frac{[s_0783]}{Km0783} \right) - 1}$$

Table 336: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.323	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0397		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0785		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0789		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

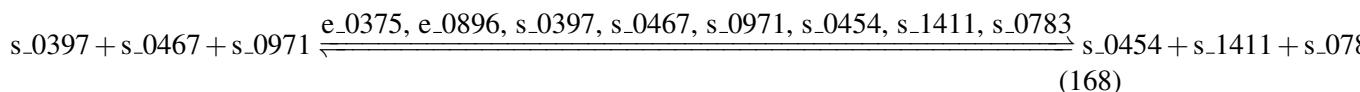
6.84 Reaction r_0259

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name acyl-[acyl-carrier-protein] synthetase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 337: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0467	ATP	
s_0971	Hexadecanoate (n-C16:0)	

Modifiers

Table 338: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0896	aas	0000460
s_0397	acyl carrier protein	
s_0467	ATP	

Id	Name	SBO
s_0971	Hexadecanoate (n-C16:0)	
s_0454	AMP	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0783	Diphosphate	

Products

Table 339: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{84} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0397}] \cdot [s_{0467}] \cdot [s_{0971}] - \frac{[s_{0454}] \cdot [s_{1411}] \cdot [s_{0783}]}{K_{eq}} \right)}{(1 + \frac{[s_{0397}]}{Km0397}) \cdot (1 + \frac{[s_{0467}]}{Km0467}) \cdot (1 + \frac{[s_{0971}]}{Km0971}) + (1 + \frac{[s_{0454}]}{Km0454}) \cdot (1 + \frac{[s_{1411}]}{Km1411}) \cdot (1 + \frac{[s_{0783}]}{Km0783}) - 1} \quad (169)$$

Table 340: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.018	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.530	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0397		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0971		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1411		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

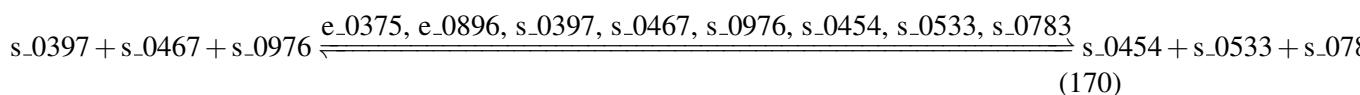
6.85 Reaction r_0260

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name acyl-[acyl-carrier-protein] synthetase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 341: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	
s_0467	ATP	
s_0976	Hexadecenoate (n-C16:1)	

Modifiers

Table 342: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0896	aas	0000460
s_0397	acyl carrier protein	
s_0467	ATP	
s_0976	Hexadecenoate (n-C16:1)	
s_0454	AMP	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0783	Diphosphate	

Products

Table 343: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{85} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0397}] \cdot [s_{0467}] \cdot [s_{0976}] - \frac{[s_{0454}] \cdot [s_{0533}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0397} \cdot K_{m0467} \cdot K_{m0976}} \\ = \frac{\left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0976}]}{K_{m0976}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{0533}]}{K_{m0533}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0976}]}{K_{m0976}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{0533}]}{K_{m0533}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1} \quad (171)$$

Table 344: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.625	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0397		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0976		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0533		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

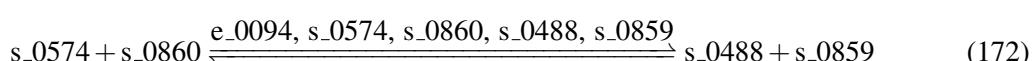
6.86 Reaction r_0266

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (butanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 345: Properties of each reactant.

Id	Name	SBO
s_0574	Crotonoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	

Modifiers

Table 346: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0574	Crotonoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	
s_0488	Butanoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	

Products

Table 347: Properties of each product.

Id	Name	SBO
s_0488	Butanoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{86} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0574] \cdot [s_0860] - \frac{[s_0488] \cdot [s_0859]}{K_{eq}} \right)}{K_{m0574} \cdot K_{m0860}} \quad (173)$$

$$\frac{\left(1 + \frac{[s_0574]}{K_{m0574}} \right) \cdot \left(1 + \frac{[s_0860]}{K_{m0860}} \right) + \left(1 + \frac{[s_0488]}{K_{m0488}} \right) \cdot \left(1 + \frac{[s_0859]}{K_{m0859}} \right) - 1}{}$$

Table 348: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0574		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0860		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0488		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

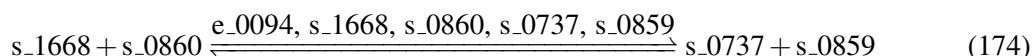
6.87 Reaction r_0267

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (decanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 349: Properties of each reactant.

Id	Name	SBO
s_{_1668}	trans-Dec-2-enoyl-CoA	
s_{_0860}	Flavin adenine dinucleotide reduced	

Modifiers

Table 350: Properties of each modifier.

Id	Name	SBO
e_{_0094}	fadE	0000460
s_{_1668}	trans-Dec-2-enoyl-CoA	
s_{_0860}	Flavin adenine dinucleotide reduced	
s_{_0737}	Decanoyl-CoA (n-C10:0CoA)	
s_{_0859}	Flavin adenine dinucleotide oxidized	

Products

Table 351: Properties of each product.

Id	Name	SBO
s_0737	Decanoyl-CoA (n-C10:0CoA)	
s_0859	Flavin adenine dinucleotide oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{87} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1668}] \cdot [s_{0860}] - \frac{[s_{0737}] \cdot [s_{0859}]}{K_{eq}} \right)}{K_{m1668} \cdot K_{m0860}} \quad (175)$$

$$\frac{\left(1 + \frac{[s_{1668}]}{K_{m1668}} \right) \cdot \left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) + \left(1 + \frac{[s_{0737}]}{K_{m0737}} \right) \cdot \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) - 1}{\left(1 + \frac{[s_{1668}]}{K_{m1668}} \right) \cdot \left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) + \left(1 + \frac{[s_{0737}]}{K_{m0737}} \right) \cdot \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) - 1}$$

Table 352: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1668		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0860		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0737		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

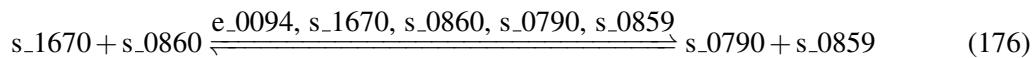
6.88 Reaction r_0268

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (dodecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 353: Properties of each reactant.

Id	Name	SBO
s_1670	trans-Dodec-2-enoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	

Modifiers

Table 354: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_1670	trans-Dodec-2-enoyl-CoA	
s_0860	Flavin adenine dinucleotide reduced	
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	
s_0859	Flavin adenine dinucleotide oxidized	

Products

Table 355: Properties of each product.

Id	Name	SBO
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	
s_0859	Flavin adenine dinucleotide oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{88} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1670}] \cdot [s_{0860}] - \frac{[s_{0790}] \cdot [s_{0859}]}{K_{eq}} \right)}{K_{m1670} \cdot K_{m0860}} \quad (177)$$

$$\frac{\left(1 + \frac{[s_{1670}]}{K_{m1670}} \right) \cdot \left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) + \left(1 + \frac{[s_{0790}]}{K_{m0790}} \right) \cdot \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) - 1}{}$$

Table 356: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.690	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1670}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0860		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0790		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

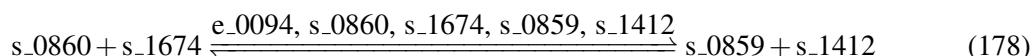
6.89 Reaction r_0269

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (hexadecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 357: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1674	trans-Hexadec-2-enoyl-CoA	

Modifiers

Table 358: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1674	trans-Hexadec-2-enoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	
s_1412	Palmitoyl-CoA (n-C16:0CoA)	

Products

Table 359: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1412	Palmitoyl-CoA (n-C16:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{89} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0860}] \cdot [s_{1674}] - \frac{[s_{0859}] \cdot [s_{1412}]}{K_{eq}} \right)}{K_{m0860} \cdot K_{m1674}} \quad (179)$$

$$\frac{\left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{1674}]}{K_{m1674}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{1412}]}{K_{m1412}} \right) - 1}{\left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{1674}]}{K_{m1674}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{1412}]}{K_{m1412}} \right) - 1}$$

Table 360: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.018	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.248	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0860		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1674		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1412		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

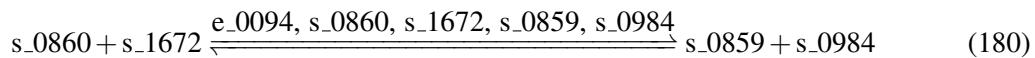
6.90 Reaction r_0270

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (hexanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 361: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1672	trans-Hex-2-enoyl-CoA	

Modifiers

Table 362: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1672	trans-Hex-2-enoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	

Products

Table 363: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_0984	Hexanoyl-CoA (n-C6:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{90} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0860}] \cdot [s_{1672}] - \frac{[s_{0859}] \cdot [s_{0984}]}{K_{eq}} \right)}{K_{m0860} \cdot K_{m1672}} \quad (181)$$

$$\frac{\left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{1672}]}{K_{m1672}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{0984}]}{K_{m0984}} \right) - 1}{}$$

Table 364: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1672		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0984		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

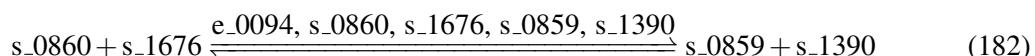
6.91 Reaction r_0272

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (octanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 365: Properties of each reactant.

Id	Name	SBO
s_{_0860}	Flavin adenine dinucleotide reduced	
s_{_1676}	trans-Oct-2-enoyl-CoA	

Modifiers

Table 366: Properties of each modifier.

Id	Name	SBO
e_{_0094}	fadE	0000460
s_{_0860}	Flavin adenine dinucleotide reduced	
s_{_1676}	trans-Oct-2-enoyl-CoA	
s_{_0859}	Flavin adenine dinucleotide oxidized	
s_{_1390}	Octanoyl-CoA (n-C8:0CoA)	

Products

Table 367: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1390	Octanoyl-CoA (n-C8:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{91} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0860}] \cdot [s_{1676}] - \frac{[s_{0859}] \cdot [s_{1390}]}{K_{eq}} \right)}{K_{m0860} \cdot K_{m1676}} \quad (183)$$

$$\frac{\left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{1676}]}{K_{m1676}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{1390}]}{K_{m1390}} \right) - 1}{\left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{1676}]}{K_{m1676}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{1390}]}{K_{m1390}} \right) - 1}$$

Table 368: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.690	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1676		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1390		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

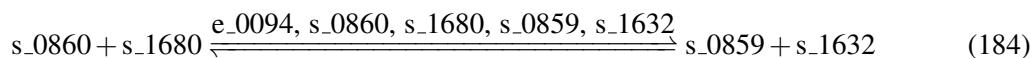
6.92 Reaction r_0273

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name acyl-CoA dehydrogenase (tetradecanoyl-CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 369: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1680	trans-Tetradec-2-enoyl-CoA	

Modifiers

Table 370: Properties of each modifier.

Id	Name	SBO
e_0094	fadE	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_1680	trans-Tetradec-2-enoyl-CoA	
s_0859	Flavin adenine dinucleotide oxidized	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	

Products

Table 371: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1632	Tetradecanoyl-CoA (n-C14:0CoA)	

Kinetic Law

Derived unit contains undeclared units

$$v_{92} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0860}] \cdot [s_{1680}] - \frac{[s_{0859}] \cdot [s_{1632}]}{K_{eq}} \right)}{K_{m0860} \cdot K_{m1680}} \quad (185)$$

$$\frac{\left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{1680}]}{K_{m1680}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{1632}]}{K_{m1632}} \right) - 1}{}$$

Table 372: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.039	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.539	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0860}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1680		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1632		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

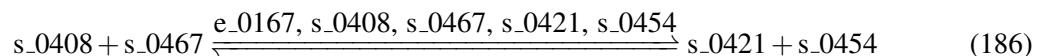
6.93 Reaction r_0292

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name adenosine kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 373: Properties of each reactant.

Id	Name	SBO
s_0408	Adenosine	
s_0467	ATP	

Modifiers

Table 374: Properties of each modifier.

Id	Name	SBO
e_0167	adk	0000460
s_0408	Adenosine	
s_0467	ATP	
s_0421	ADP	
s_0454	AMP	

Products

Table 375: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0454	AMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{93} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0408}] \cdot [s_{0467}] - \frac{[s_{0421}] \cdot [s_{0454}]}{K_{eq}} \right)}{K_{m0408} \cdot K_{m0467}} \quad (187)$$

$$\frac{\left(1 + \frac{[s_{0408}]}{K_{m0408}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) - 1}{\left(1 + \frac{[s_{0408}]}{K_{m0408}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) - 1}$$

Table 376: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.32217621027432 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0408}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0454}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

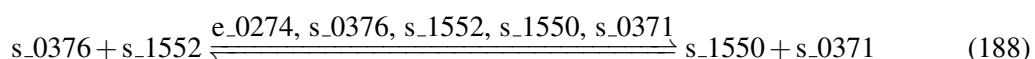
6.94 Reaction r_0297

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name adenosylmethionine-8-amino-7-oxononanoate transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 377: Properties of each reactant.

Id	Name	SBO
s_0376	8-Amino-7-oxononanoate	
s_1552	S-Adenosyl-L-methionine	

Modifiers

Table 378: Properties of each modifier.

Id	Name	SBO
e_0274	bioA	0000460
s_0376	8-Amino-7-oxononanoate	
s_1552	S-Adenosyl-L-methionine	
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	
s_0371	7,8-Diaminononanoate	

Products

Table 379: Properties of each product.

Id	Name	SBO
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	
s_0371	7,8-Diaminononanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{94} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0376] \cdot [s_1552] - \frac{[s_1550] \cdot [s_0371]}{K_{eq}} \right)}{(1 + \frac{[s_0376]}{Km0376}) \cdot (1 + \frac{[s_1552]}{Km1552}) + (1 + \frac{[s_1550]}{Km1550}) \cdot (1 + \frac{[s_0371]}{Km0371}) - 1} \quad (189)$$

Table 380: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.87846855038663 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0376		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1552		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1550		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0371		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

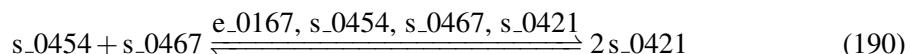
6.95 Reaction r_0301

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name adenylate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 381: Properties of each reactant.

Id	Name	SBO
s_0454	AMP	
s_0467	ATP	

Modifiers

Table 382: Properties of each modifier.

Id	Name	SBO
e_0167	adk	0000460
s_0454	AMP	
s_0467	ATP	
s_0421	ADP	

Product

Table 383: Properties of each product.

Id	Name	SBO
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{95} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{-0454}] \cdot [s_{-0467}] - \frac{[s_{-0421}]^2}{K_{eq}} \right)}{K_{m0454} \cdot K_{m0467}} \quad (191)$$

$$\frac{1}{\left(1 + \frac{[s_{-0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{-0467}]}{K_{m0467}} \right) + \left(1 + \frac{[s_{-0421}]}{K_{m0421}} \right)^2 - 1}$$

Table 384: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.362	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	5.072	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0454		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

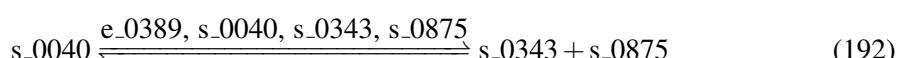
6.96 Reaction r_0302

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name adenylosuccinate lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 385: Properties of each reactant.

Id	Name	SBO
s_{-0040}	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	

Modifiers

Table 386: Properties of each modifier.

Id	Name	SBO
e_0389	purB	0000460
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0875	Fumarate	

Products

Table 387: Properties of each product.

Id	Name	SBO
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0875	Fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{96} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0040] - \frac{[s_0343] \cdot [s_0875]}{K_{eq}} \right)}{Km0040} \quad (193)$$

$$1 + \frac{[s_0040]}{Km0040} + \left(1 + \frac{[s_0343]}{Km0343} \right) \cdot \left(1 + \frac{[s_0875]}{Km0875} \right) - 1$$

Table 388: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.614	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0040		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0343		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0875		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

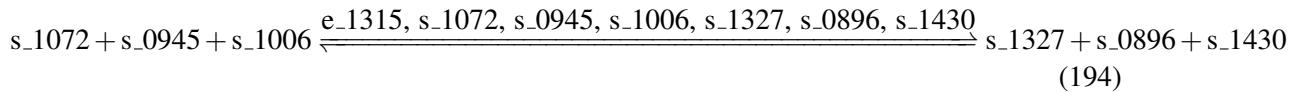
6.97 Reaction r_0303

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name adenylosuccinate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 389: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0945	GTP	
s_1006	IMP	

Modifiers

Table 390: Properties of each modifier.

Id	Name	SBO
e_1315	purA	0000460
s_1072	L-Aspartate	
s_0945	GTP	
s_1006	IMP	
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	
s_0896	GDP	
s_1430	Phosphate	

Products

Table 391: Properties of each product.

Id	Name	SBO
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	
s_0896	GDP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{97} \quad (195)$$

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{1072}] \cdot [s_{0945}] \cdot [s_{1006}] - \frac{[s_{1327}] \cdot [s_{0896}] \cdot [s_{1430}]}{K_{\text{eq}}} \right)}{K_{m1072} \cdot K_{m0945} \cdot K_{m1006}}$$

$$= \frac{\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{0945}]}{K_{m0945}} \right) \cdot \left(1 + \frac{[s_{1006}]}{K_{m1006}} \right) + \left(1 + \frac{[s_{1327}]}{K_{m1327}} \right) \cdot \left(1 + \frac{[s_{0896}]}{K_{m0896}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{0945}]}{K_{m0945}} \right) \cdot \left(1 + \frac{[s_{1006}]}{K_{m1006}} \right) + \left(1 + \frac{[s_{1327}]}{K_{m1327}} \right) \cdot \left(1 + \frac{[s_{0896}]}{K_{m0896}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}$$

Table 392: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.223	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0945		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1006		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1327		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0896		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

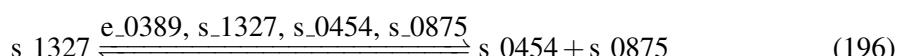
6.98 Reaction r_0304

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name adenylsuccinate lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 393: Properties of each reactant.

Id	Name	SBO
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	

Modifiers

Table 394: Properties of each modifier.

Id	Name	SBO
e_0389	purB	0000460
s_1327	N6-(1,2-Dicarboxyethyl)-AMP	
s_0454	AMP	
s_0875	Fumarate	

Products

Table 395: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0875	Fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{98} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1327}] - \frac{[s_{0454}] \cdot [s_{0875}]}{K_{eq}} \right)}{1 + \frac{[s_{1327}]}{Km_{1327}} + \left(1 + \frac{[s_{0454}]}{Km_{0454}} \right) \cdot \left(1 + \frac{[s_{0875}]}{Km_{0875}} \right) - 1} \quad (197)$$

Table 396: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.408	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1327		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0875		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

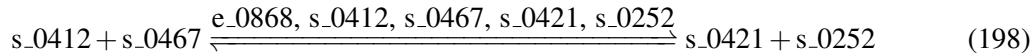
6.99 Reaction r_0305

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name adenylyl-sulfate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 397: Properties of each reactant.

Id	Name	SBO
s_0412	Adenosine 5'-phosphosulfate	
s_0467	ATP	

Modifiers

Table 398: Properties of each modifier.

Id	Name	SBO
e_0868	cysC	0000460
s_0412	Adenosine 5'-phosphosulfate	
s_0467	ATP	
s_0421	ADP	
s_0252	3'-Phosphoadenylyl sulfate	

Products

Table 399: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0252	3'-Phosphoadenylyl sulfate	

Kinetic Law

Derived unit contains undeclared units

$$v_{99} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0412}] \cdot [s_{0467}] - \frac{[s_{0421}] \cdot [s_{0252}]}{K_{eq}} \right)}{K_{m0412} \cdot K_{m0467}} \quad (199)$$

$$\frac{\left(1 + \frac{[s_{0412}]}{K_{m0412}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0252}]}{K_{m0252}} \right) - 1}{}$$

Table 400: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.481	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0412		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0252		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

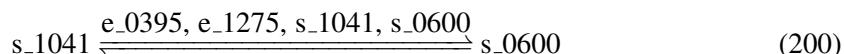
6.100 Reaction r_0310

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name alanine racemase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 401: Properties of each reactant.

Id	Name	SBO
s_1041	L-Alanine	

Modifiers

Table 402: Properties of each modifier.

Id	Name	SBO
e_0395	dadX	0000460
e_1275	alr	0000460
s_1041	L-Alanine	
s_0600	D-Alanine	

Product

Table 403: Properties of each product.

Id	Name	SBO
s_0600	D-Alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{100} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1041}] - \frac{[s_{0600}]}{K_{eq}} \right)}{1 + \frac{[s_{1041}]}{K_{m1041}} + 1 + \frac{[s_{0600}]}{K_{m0600}} - 1} \quad (201)$$

Table 404: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.006	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.035	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1041		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0600		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

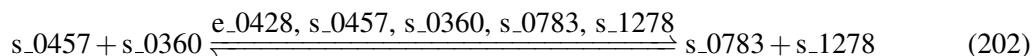
6.101 Reaction r_0348

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name anthranilate phosphoribosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 405: Properties of each reactant.

Id	Name	SBO
s_0457	Anthranilate	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 406: Properties of each modifier.

Id	Name	SBO
e_0428	trpD	0000460
s_0457	Anthranoate	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_0783	Diphosphate	
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	

Products

Table 407: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	

Kinetic Law

Derived unit contains undeclared units

$$v_{101} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0457] \cdot [s_0360] - \frac{[s_0783] \cdot [s_1278]}{K_{eq}} \right)}{(1 + \frac{[s_0457]}{Km0457}) \cdot (1 + \frac{[s_0360]}{Km0360}) + (1 + \frac{[s_0783]}{Km0783}) \cdot (1 + \frac{[s_1278]}{Km1278}) - 1} \quad (203)$$

Table 408: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.110	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0457		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0360		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1278		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

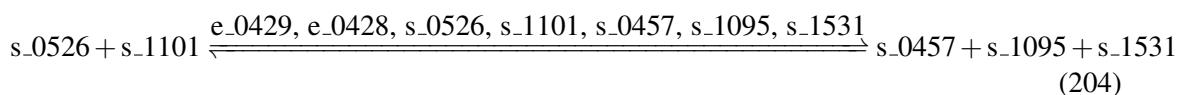
6.102 Reaction r_0349

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name anthranilate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 409: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	
s_1101	L-Glutamine	

Modifiers

Table 410: Properties of each modifier.

Id	Name	SBO
e_0429	trpE	0000460
e_0428	trpD	0000460
s_0526	chorismate	
s_1101	L-Glutamine	
s_0457	Anthranilate	
s_1095	L-Glutamate	
s_1531	Pyruvate	

Products

Table 411: Properties of each product.

Id	Name	SBO
s_0457	Anthranilate	
s_1095	L-Glutamate	

Id	Name	SBO
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{102} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0526}] \cdot [s_{1101}] - \frac{[s_{0457}] \cdot [s_{1095}] \cdot [s_{1531}]}{K_{eq}} \right)}{K_{m0526} \cdot K_{m1101}} \\ \frac{1 + \frac{[s_{0526}]}{K_{m0526}}}{\left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{0457}]}{K_{m0457}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) - 1} \quad (205)$$

Table 412: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.173	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0526		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0457		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1095		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1531		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

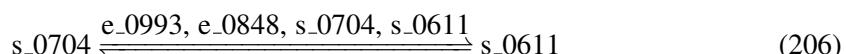
6.103 Reaction r_0355

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name arabinose-5-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 413: Properties of each reactant.

Id	Name	SBO
s_0704	D-Ribulose 5-phosphate	

Modifiers

Table 414: Properties of each modifier.

Id	Name	SBO
e_0993	kdsD	0000460
e_0848	gutQ	0000460
s_0704	D-Ribulose 5-phosphate	
s_0611	D-Arabinose 5-phosphate	

Product

Table 415: Properties of each product.

Id	Name	SBO
s_0611	D-Arabinose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{103} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0704] - \frac{[s_0611]}{K_{eq}} \right)}{Km0704} \quad (207)$$

$$1 + \frac{[s_0704]}{Km0704} + 1 + \frac{[s_0611]}{Km0611} - 1$$

Table 416: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.032	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0704		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0611		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

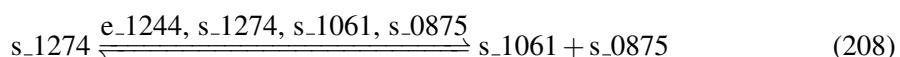
6.104 Reaction r_0360

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name argininosuccinate lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 417: Properties of each reactant.

Id	Name	SBO
s_1274	N(omega)-(L-Arginino)succinate	

Modifiers

Table 418: Properties of each modifier.

Id	Name	SBO
e_1244	argH	0000460
s_1274	N(omega)-(L-Arginino)succinate	
s_1061	L-Arginine	
s_0875	Fumarate	

Products

Table 419: Properties of each product.

Id	Name	SBO
s_1061	L-Arginine	
s_0875	Fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{104} = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot \left([s_{1274}] - \frac{[s_{1061}] \cdot [s_{0875}]}{K_{eq}} \right)}{K_{m1274}}}{1 + \frac{[s_{1274}]}{K_{m1274}} + \left(1 + \frac{[s_{1061}]}{K_{m1061}} \right) \cdot \left(1 + \frac{[s_{0875}]}{K_{m0875}} \right) - 1} \quad (209)$$

Table 420: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.410	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1274		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1061		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0875		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

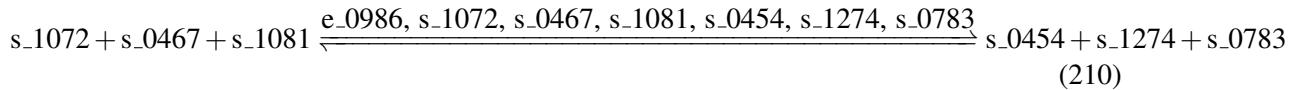
6.105 Reaction r_0361

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name argininosuccinate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 421: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0467	ATP	
s_1081	L-Citrulline	

Modifiers

Table 422: Properties of each modifier.

Id	Name	SBO
e_0986	argG	0000460
s_1072	L-Aspartate	
s_0467	ATP	
s_1081	L-Citrulline	
s_0454	AMP	
s_1274	N(omega)-(L-Arginino)succinate	
s_0783	Diphosphate	

Products

Table 423: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1274	N(omega)-(L-Arginino)succinate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{105} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1072}] \cdot [s_{0467}] \cdot [s_{1081}] - \frac{[s_{0454}] \cdot [s_{1274}] \cdot [s_{0783}]}{K_{eq}} \right)}{(1 + \frac{[s_{1072}]}{K_{m1072}}) \cdot (1 + \frac{[s_{0467}]}{K_{m0467}}) \cdot (1 + \frac{[s_{1081}]}{K_{m1081}}) + (1 + \frac{[s_{0454}]}{K_{m0454}}) \cdot (1 + \frac{[s_{1274}]}{K_{m1274}}) \cdot (1 + \frac{[s_{0783}]}{K_{m0783}}) - 1} \quad (211)$$

Table 424: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.229	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1081		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1274		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

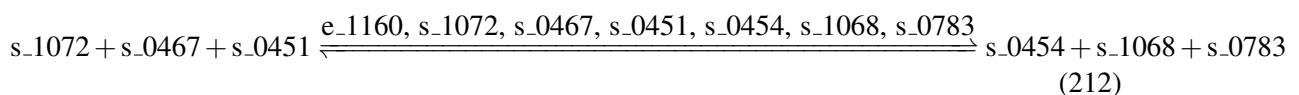
6.106 Reaction r_0365

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name asparagine synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 425: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0467	ATP	
s_0451	Ammonium	

Modifiers

Table 426: Properties of each modifier.

Id	Name	SBO
e_1160	asnA	0000460
s_1072	L-Aspartate	
s_0467	ATP	
s_0451	Ammonium	
s_0454	AMP	
s_1068	L-Asparagine	
s_0783	Diphosphate	

Products

Table 427: Properties of each product.

Id	Name	SBO
s_0454	AMP	

Id	Name	SBO
s_1068	L-Asparagine	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{106} = \frac{\text{vol}(cell) \cdot V_{\text{max}} \cdot \left([s_{1072}] \cdot [s_{0467}] \cdot [s_{0451}] - \frac{[s_{0454}] \cdot [s_{1068}] \cdot [s_{0783}]}{K_{\text{eq}}} \right)}{K_{m1072} \cdot K_{m0467} \cdot K_{m0451}} \\ = \frac{\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{1068}]}{K_{m1068}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{1068}]}{K_{m1068}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1} \quad (213)$$

Table 428: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.033	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0451		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1068		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

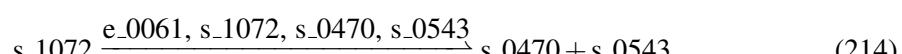
6.107 Reaction r_0367

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name aspartate 1-decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 429: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	

Modifiers

Table 430: Properties of each modifier.

Id	Name	SBO
e_0061	panD	0000460
s_1072	L-Aspartate	
s_0470	beta-Alanine	
s_0543	CO2	

Products

Table 431: Properties of each product.

Id	Name	SBO
s_0470	beta-Alanine	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{107} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1072}] - \frac{[s_{0470}] \cdot [s_{0543}]}{K_{eq}} \right)}{1 + \frac{[s_{1072}]}{K_{m1072}} + \left(1 + \frac{[s_{0470}]}{K_{m0470}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) - 1} \quad (215)$$

Table 432: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			7.97856388811725 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	7.97856388811725 · 10 ⁻⁴	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1072}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0470}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

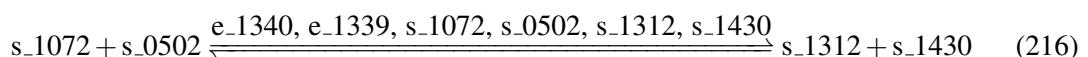
6.108 Reaction r_0368

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name aspartate carbamoyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 433: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0502	Carbamoyl phosphate	

Modifiers

Table 434: Properties of each modifier.

Id	Name	SBO
e_1340	pyrB	0000460
e_1339	pyrI	0000460
s_1072	L-Aspartate	
s_0502	Carbamoyl phosphate	
s_1312	N-Carbamoyl-L-aspartate	
s_1430	Phosphate	

Products

Table 435: Properties of each product.

Id	Name	SBO
s_1312	N-Carbamoyl-L-aspartate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{108} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1072}] \cdot [s_{0502}] - \frac{[s_{1312}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m1072} \cdot K_{m0502}} \quad (217)$$

$$\frac{\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{0502}]}{K_{m0502}} \right) + \left(1 + \frac{[s_{1312}]}{K_{m1312}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{0502}]}{K_{m0502}} \right) + \left(1 + \frac{[s_{1312}]}{K_{m1312}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1} - 1$$

Table 436: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.641	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1072		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0502		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1312		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

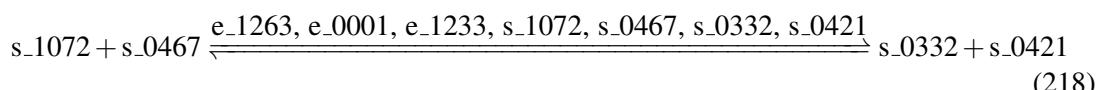
6.109 Reaction r_0369

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name aspartate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 437: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_0467	ATP	

Modifiers

Table 438: Properties of each modifier.

Id	Name	SBO
e_1263	lysC	0000460
e_0001	thrA	0000460
e_1233	metL	0000460
s_1072	L-Aspartate	
s_0467	ATP	
s_0332	4-Phospho-L-aspartate	
s_0421	ADP	

Products

Table 439: Properties of each product.

Id	Name	SBO
s_0332	4-Phospho-L-aspartate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{109} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1072}] \cdot [s_{0467}] - \frac{[s_{0332}] \cdot [s_{0421}]}{K_{eq}} \right)}{K_{m1072} \cdot K_{m0467}} \quad (219)$$

$$\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) + \left(1 + \frac{[s_{0332}]}{K_{m0332}} \right) \cdot \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) - 1$$

Table 440: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.231	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	3.233	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0332		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

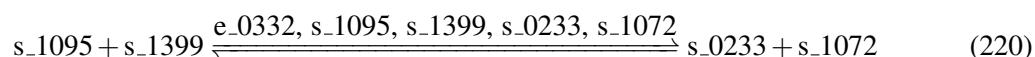
6.110 Reaction r_0370

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name aspartate transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 441: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1399	Oxaloacetate	

Modifiers

Table 442: Properties of each modifier.

Id	Name	SBO
e_0332	aspC	0000460
s_1095	L-Glutamate	
s_1399	Oxaloacetate	
s_0233	2-Oxoglutarate	
s_1072	L-Aspartate	

Products

Table 443: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1072	L-Aspartate	

Kinetic Law

Derived unit contains undeclared units

$$v_{110} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1095}] \cdot [s_{1399}] - \frac{[s_{0233}] \cdot [s_{1072}]}{K_{eq}} \right)}{K_{m1095} \cdot K_{m1399}} \quad (221)$$

$$\frac{\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1399}]}{K_{m1399}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) - 1}{}$$

Table 444: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.487	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	6.819	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1399		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1072		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

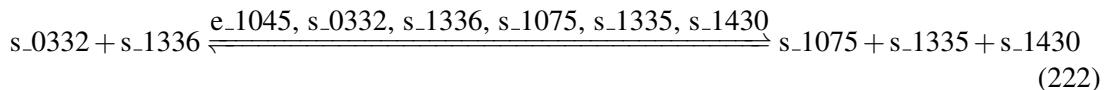
6.111 Reaction r_0371

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name aspartate-semialdehyde dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 445: Properties of each reactant.

Id	Name	SBO
s_0332	4-Phospho-L-aspartate	
s_1336	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 446: Properties of each modifier.

Id	Name	SBO
e_1045	asd	0000460
s_0332	4-Phospho-L-aspartate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1075	L-Aspartate 4-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Products

Table 447: Properties of each product.

Id	Name	SBO
s_1075	L-Aspartate 4-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{111} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0332] \cdot [s_1336] - \frac{[s_1075] \cdot [s_1335] \cdot [s_1430]}{K_{eq}} \right)}{K_{m0332} \cdot K_{m1336}} \\ \frac{\left(1 + \frac{[s_0332]}{K_{m0332}} \right) \cdot \left(1 + \frac{[s_1336]}{K_{m1336}} \right) + \left(1 + \frac{[s_1075]}{K_{m1075}} \right) \cdot \left(1 + \frac{[s_1335]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_1430]}{K_{m1430}} \right) - 1}{(223)}$$

Table 448: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.231	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	5.081	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0332		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1075		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

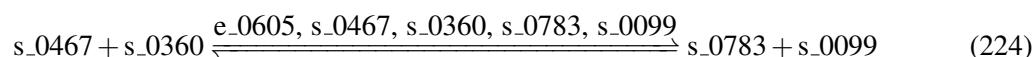
6.112 Reaction r_0374

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ATP phosphoribosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 449: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 450: Properties of each modifier.

Id	Name	SBO
e_0605	hisG	0000460
s_0467	ATP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_0783	Diphosphate	
s_0099	1-(5-Phosphoribosyl)-ATP	

Products

Table 451: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_0099	1-(5-Phosphoribosyl)-ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{112} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0360] - \frac{[s_0783] \cdot [s_0099]}{K_{eq}} \right)}{Km0467 \cdot Km0360}}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0360]}{Km0360} \right) + \left(1 + \frac{[s_0783]}{Km0783} \right) \cdot \left(1 + \frac{[s_0099]}{Km0099} \right) - 1} \quad (225)$$

Table 452: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.184	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0360		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0099		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

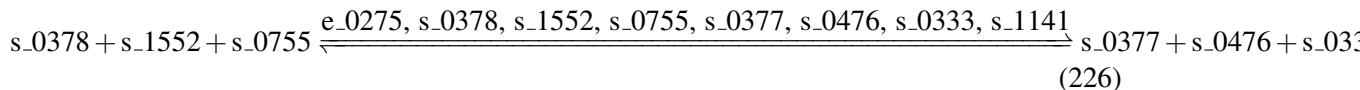
6.113 Reaction r_0383

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name Biotin synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 453: Properties of each reactant.

Id	Name	SBO
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1552	S-Adenosyl-L-methionine	
s_0755	Dethiobiotin	

Modifiers

Table 454: Properties of each modifier.

Id	Name	SBO
e_0275	bioB	0000460
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1552	S-Adenosyl-L-methionine	
s_0755	Dethiobiotin	
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	
s_0476	Biotin	
s_0333	5'-Deoxyadenosine	
s_1141	L-Methionine	

Products

Table 455: Properties of each product.

Id	Name	SBO
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	
s_0476	Biotin	
s_0333	5'-Deoxyadenosine	
s_1141	L-Methionine	

Kinetic Law

Derived unit contains undeclared units

$$v_{113} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0378] \cdot [s_1552] \cdot [s_0755] - \frac{[s_0377] \cdot [s_0476] \cdot [s_0333] \cdot [s_1141]}{K_{eq}} \right)}{Km0378 \cdot Km1552 \cdot Km0755} \quad (227)$$

$$= \frac{\left(1 + \frac{[s_0378]}{Km0378} \right) \cdot \left(1 + \frac{[s_1552]}{Km1552} \right) \cdot \left(1 + \frac{[s_0755]}{Km0755} \right) + \left(1 + \frac{[s_0377]}{Km0377} \right) \cdot \left(1 + \frac{[s_0476]}{Km0476} \right) \cdot \left(1 + \frac{[s_0333]}{Km0333} \right) \cdot \left(1 + \frac{[s_1141]}{Km1141} \right) - \left([s_0378] \cdot [s_1552] \cdot [s_0755] - \frac{[s_0377] \cdot [s_0476] \cdot [s_0333] \cdot [s_1141]}{K_{eq}} \right)}{\left(1 + \frac{[s_0378]}{Km0378} \right) \cdot \left(1 + \frac{[s_1552]}{Km1552} \right) \cdot \left(1 + \frac{[s_0755]}{Km0755} \right) + \left(1 + \frac{[s_0377]}{Km0377} \right) \cdot \left(1 + \frac{[s_0476]}{Km0476} \right) \cdot \left(1 + \frac{[s_0333]}{Km0333} \right) \cdot \left(1 + \frac{[s_1141]}{Km1141} \right)} - \left([s_0378] \cdot [s_1552] \cdot [s_0755] - \frac{[s_0377] \cdot [s_0476] \cdot [s_0333] \cdot [s_1141]}{K_{eq}} \right)$$

Table 456: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$1.27435395226989 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0378		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1552		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0755		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0377		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0476		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0333		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1141		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

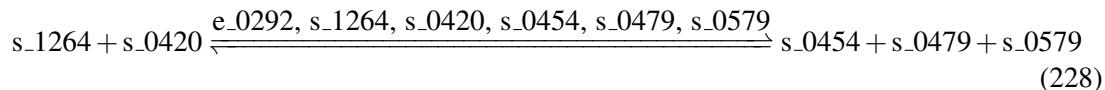
6.114 Reaction r_0384

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name bis-molybdenum cofactor synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 457: Properties of each reactant.

Id	Name	SBO
s_1264	molybdenum cofactor	
s_0420	adenylated molybdopterin	

Modifiers

Table 458: Properties of each modifier.

Id	Name	SBO
e_0292	moeA	0000460
s_1264	molybdenum cofactor	
s_0420	adenylated molybdopterin	
s_0454	AMP	
s_0479	bis-molybdenum cofactor	
s_0579	Cu2+	

Products

Table 459: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0479	bis-molybdenum cofactor	
s_0579	Cu2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{114} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1264}] \cdot [s_{0420}] - \frac{[s_{0454}] \cdot [s_{0479}] \cdot [s_{0579}]}{K_{eq}} \right)}{K_{m1264} \cdot K_{m0420}} \\ \frac{\left(1 + \frac{[s_{1264}]}{K_{m1264}} \right) \cdot \left(1 + \frac{[s_{0420}]}{K_{m0420}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{0479}]}{K_{m0479}} \right) \cdot \left(1 + \frac{[s_{0579}]}{K_{m0579}} \right) - 1}{(229)}$$

Table 460: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.71778914548703 \cdot 10^{-4}$	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1264}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0420}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0454}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0479}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0579}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

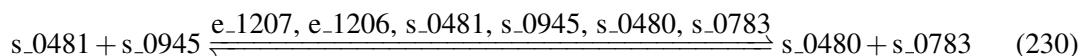
6.115 Reaction r_0385

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name bis-molybdopterin guanine dinucleotide synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 461: Properties of each reactant.

Id	Name	SBO
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0945	GTP	

Modifiers

Table 462: Properties of each modifier.

Id	Name	SBO
e_1207	mobA	0000460
e_1206	mobB	0000460
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0945	GTP	
s_0480	bis-molybdopterin guanine dinucleotide	
s_0783	Diphosphate	

Products

Table 463: Properties of each product.

Id	Name	SBO
s_0480	bis-molybdopterin guanine dinucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{115} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0481] \cdot [s_0945] - \frac{[s_0480] \cdot [s_0783]}{K_{eq}} \right)}{K_m0481 \cdot K_m0945} \quad (231)$$

$$\left(1 + \frac{[s_0481]}{K_m0481} \right) \cdot \left(1 + \frac{[s_0945]}{K_m0945} \right) + \left(1 + \frac{[s_0480]}{K_m0480} \right) \cdot \left(1 + \frac{[s_0783]}{K_m0783} \right) - 1$$

Table 464: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$2.36586581985538 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0481		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0945		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0480		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

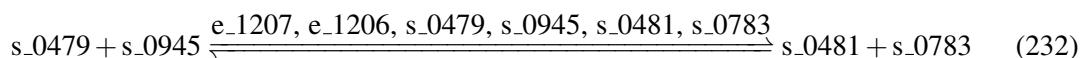
6.116 Reaction r_0386

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name bis-molybdopterin guanine dinucleotide synthase (single GDP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 465: Properties of each reactant.

Id	Name	SBO
s_0479	bis-molybdenum cofactor	
s_0945	GTP	

Modifiers

Table 466: Properties of each modifier.

Id	Name	SBO
e_1207	mobA	0000460
e_1206	mobB	0000460
s_0479	bis-molybdenum cofactor	
s_0945	GTP	
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0783	Diphosphate	

Products

Table 467: Properties of each product.

Id	Name	SBO
s_0481	bis-molybdopterin mono-guanine dinucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{116} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0479}] \cdot [s_{0945}] - \frac{[s_{0481}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0479} \cdot K_{m0945}} \quad (233)$$

$$\frac{\left(1 + \frac{[s_{0479}]}{K_{m0479}} \right) \cdot \left(1 + \frac{[s_{0945}]}{K_{m0945}} \right) + \left(1 + \frac{[s_{0481}]}{K_{m0481}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{0479}]}{K_{m0479}} \right) \cdot \left(1 + \frac{[s_{0945}]}{K_{m0945}} \right) + \left(1 + \frac{[s_{0481}]}{K_{m0481}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}$$

Table 468: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$2.36586581985538 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0479}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0945}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0481}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

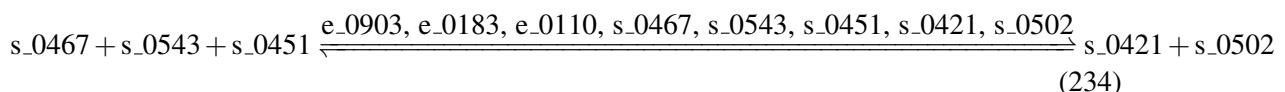
6.117 Reaction r_0388

This is a reversible reaction of three reactants forming two products influenced by eight modifiers.

Name Carbamate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 469: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0543	CO2	
s_0451	Ammonium	

Modifiers

Table 470: Properties of each modifier.

Id	Name	SBO
e_0903	yqeA	0000460
e_0183	arcC	0000460
e_0110	yahI	0000460
s_0467	ATP	
s_0543	CO2	
s_0451	Ammonium	
s_0421	ADP	
s_0502	Carbamoyl phosphate	

Products

Table 471: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0502	Carbamoyl phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{117} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0543] \cdot [s_0451] - \frac{[s_0421] \cdot [s_0502]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0543} \cdot K_{m0451}} \\ \left(1 + \frac{[s_0467]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_0543]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_0451]}{K_{m0451}} \right) + \left(1 + \frac{[s_0421]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_0502]}{K_{m0502}} \right) - 1 \quad (235)$$

Table 472: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.087	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.909	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0451		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0502		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

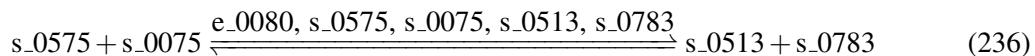
6.118 Reaction r_0418

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name CDP-diacylglycerol synthetase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 473: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	

Modifiers

Table 474: Properties of each modifier.

Id	Name	SBO
e_0080	cdsA	0000460
s_0575	CTP	
s_0075	1,2-dihexadecanoyl-sn-glycerol 3-phosphate	
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_0783	Diphosphate	

Products

Table 475: Properties of each product.

Id	Name	SBO
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{118} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0575}] \cdot [s_{0075}] - \frac{[s_{0513}] \cdot [s_{0783}]}{K_{eq}} \right)}{Km0575 \cdot Km0075} \quad (237)$$

$$\frac{\left(1 + \frac{[s_{0575}]}{Km0575} \right) \cdot \left(1 + \frac{[s_{0075}]}{Km0075} \right) + \left(1 + \frac{[s_{0513}]}{Km0513} \right) \cdot \left(1 + \frac{[s_{0783}]}{Km0783} \right) - 1}{\left(1 + \frac{[s_{0575}]}{Km0575} \right) \cdot \left(1 + \frac{[s_{0075}]}{Km0075} \right) + \left(1 + \frac{[s_{0513}]}{Km0513} \right) \cdot \left(1 + \frac{[s_{0783}]}{Km0783} \right) - 1}$$

Table 476: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.124	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0575		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0075		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0513		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

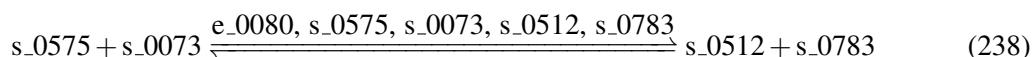
6.119 Reaction r_0419

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name CDP-diacylglycerol synthetase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 477: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	

Modifiers

Table 478: Properties of each modifier.

Id	Name	SBO
e_0080	cdsA	0000460
s_0575	CTP	
s_0073	1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	
s_0783	Diphosphate	

Products

Table 479: Properties of each product.

Id	Name	SBO
s_0512	CDP-1,2-dihexadec-9-enoylglycerol	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{119} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0575] \cdot [s_0073] - \frac{[s_0512] \cdot [s_0783]}{K_{eq}} \right)}{Km0575 \cdot Km0073} \quad (239)$$

$$\left(1 + \frac{[s_0575]}{Km0575} \right) \cdot \left(1 + \frac{[s_0073]}{Km0073} \right) + \left(1 + \frac{[s_0512]}{Km0512} \right) \cdot \left(1 + \frac{[s_0783]}{Km0783} \right) - 1$$

Table 480: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.146	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0575		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0073		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0512		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

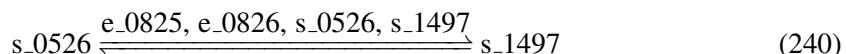
6.120 Reaction r_0423

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name chorismate mutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 481: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	

Modifiers

Table 482: Properties of each modifier.

Id	Name	SBO
e_0825	pheA	0000460
e_0826	tyrA	0000460
s_0526	chorismate	
s_1497	Prephenate	

Product

Table 483: Properties of each product.

Id	Name	SBO
s_1497	Prephenate	

Kinetic Law

Derived unit contains undeclared units

$$v_{120} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0526] - \frac{[s_1497]}{K_{eq}} \right)}{1 + \frac{[s_0526]}{K_{m0526}} + 1 + \frac{[s_1497]}{K_{m1497}} - 1} \quad (241)$$

Table 484: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.045	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.269	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0526		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1497		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

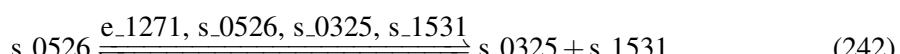
6.121 Reaction r_0424

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Chorismate pyruvate lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 485: Properties of each reactant.

Id	Name	SBO
s_0526	chorismate	

Modifiers

Table 486: Properties of each modifier.

Id	Name	SBO
e_1271	ubiC	0000460

Id	Name	SBO
s_0526	chorismate	
s_0325	4-Hydroxybenzoate	
s_1531	Pyruvate	

Products

Table 487: Properties of each product.

Id	Name	SBO
s_0325	4-Hydroxybenzoate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{121} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0526}] - \frac{[s_{0325}] \cdot [s_{1531}]}{K_{eq}} \right)}{1 + \frac{[s_{0526}]}{K_{m0526}} + \left(1 + \frac{[s_{0325}]}{K_{m0325}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) - 1} \quad (243)$$

Table 488: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.08892317229363 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0526		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0325		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

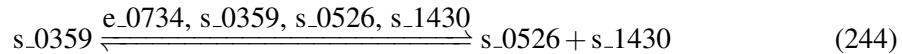
6.122 Reaction r_0425

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name chorismate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 489: Properties of each reactant.

Id	Name	SBO
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	

Modifiers

Table 490: Properties of each modifier.

Id	Name	SBO
e_0734	aroC	0000460
s_0359	5-O-(1-Carboxyvinyl)-3-phosphoshikimate	
s_0526	chorismate	
s_1430	Phosphate	

Products

Table 491: Properties of each product.

Id	Name	SBO
s_0526	chorismate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{122} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0359}] - \frac{[s_{0526}] \cdot [s_{1430}]}{K_{eq}} \right)}{1 + \frac{[s_{0359}]}{Km_{0359}} + \left(1 + \frac{[s_{0526}]}{Km_{0526}} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km_{1430}} \right) - 1} \quad (245)$$

Table 492: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.528	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0359		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0526		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

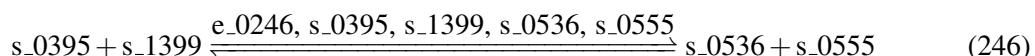
6.123 Reaction r_0428

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name citrate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 493: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1399	Oxaloacetate	

Modifiers

Table 494: Properties of each modifier.

Id	Name	SBO
e_0246	gltA	0000460
s_0395	Acetyl-CoA	
s_1399	Oxaloacetate	
s_0536	Citrate	
s_0555	Coenzyme A	

Products

Table 495: Properties of each product.

Id	Name	SBO
s_0536	Citrate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{123} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0395}] \cdot [s_{1399}] - \frac{[s_{0536}] \cdot [s_{0555}]}{K_{eq}} \right)}{Km0395 \cdot Km1399} \quad (247)$$

$$\frac{\left(1 + \frac{[s_{0395}]}{Km0395} \right) \cdot \left(1 + \frac{[s_{1399}]}{Km1399} \right) + \left(1 + \frac{[s_{0536}]}{Km0536} \right) \cdot \left(1 + \frac{[s_{0555}]}{Km0555} \right) - 1}{\left(1 + \frac{[s_{0395}]}{Km0395} \right) \cdot \left(1 + \frac{[s_{1399}]}{Km1399} \right) + \left(1 + \frac{[s_{0536}]}{Km0536} \right) \cdot \left(1 + \frac{[s_{0555}]}{Km0555} \right) - 1}$$

Table 496: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	2.085	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1399		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0536		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

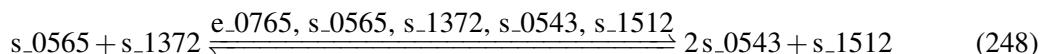
6.124 Reaction r_0436

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name coproporphyrinogen oxidase (O2 required)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 497: Properties of each reactant.

Id	Name	SBO
s_0565	Coproporphyrinogen III	
s_1372	O2	

Modifiers

Table 498: Properties of each modifier.

Id	Name	SBO
e_0765	hemF	0000460
s_0565	Coproporphyrinogen III	
s_1372	O2	
s_0543	CO2	
s_1512	Protoporphyrinogen IX	

Products

Table 499: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1512	Protoporphyrinogen IX	

Kinetic Law

Derived unit contains undeclared units

$$v_{124} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0565}] \cdot [s_{1372}] - \frac{[s_{0543}]^2 \cdot [s_{1512}]}{K_{eq}} \right)}{(1 + \frac{[s_{0565}]}{Km0565}) \cdot (1 + \frac{[s_{1372}]}{Km1372}) + \left(1 + \frac{[s_{0543}]}{Km0543}\right)^2 \cdot \left(1 + \frac{[s_{1512}]}{Km1512}\right) - 1} \quad (249)$$

Table 500: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317225085 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$6.79563097895187 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0565		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1372		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1512		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

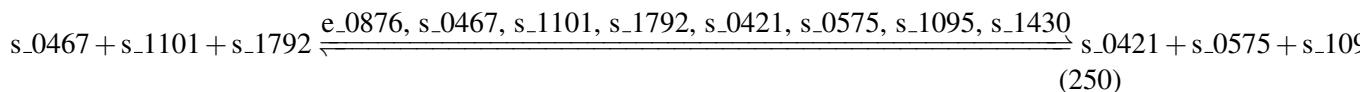
6.125 Reaction r_0440

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name CTP synthase (glutamine)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 501: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1101	L-Glutamine	
s_1792	UTP	

Modifiers

Table 502: Properties of each modifier.

Id	Name	SBO
e_0876	pyrG	0000460
s_0467	ATP	
s_1101	L-Glutamine	
s_1792	UTP	
s_0421	ADP	
s_0575	CTP	
s_1095	L-Glutamate	
s_1430	Phosphate	

Products

Table 503: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0575	CTP	
s_1095	L-Glutamate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{125} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{0467}] \cdot [s_{1101}] \cdot [s_{1792}] - \frac{[s_{0421}] \cdot [s_{0575}] \cdot [s_{1095}] \cdot [s_{1430}]}{K_{eq}} \right)}{Km0467 \cdot Km1101 \cdot Km1792} \quad (251)$$

$$= \frac{\left(1 + \frac{[s_{0467}]}{Km0467} \right) \cdot \left(1 + \frac{[s_{1101}]}{Km1101} \right) \cdot \left(1 + \frac{[s_{1792}]}{Km1792} \right) + \left(1 + \frac{[s_{0421}]}{Km0421} \right) \cdot \left(1 + \frac{[s_{0575}]}{Km0575} \right) \cdot \left(1 + \frac{[s_{1095}]}{Km1095} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km1430} \right) -}{\left(1 + \frac{[s_{0467}]}{Km0467} \right) \cdot \left(1 + \frac{[s_{1101}]}{Km1101} \right) \cdot \left(1 + \frac{[s_{1792}]}{Km1792} \right) + \left(1 + \frac{[s_{0421}]}{Km0421} \right) \cdot \left(1 + \frac{[s_{0575}]}{Km0575} \right) \cdot \left(1 + \frac{[s_{1095}]}{Km1095} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km1430} \right) -}$$

Table 504: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.022	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.023	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1792		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0575		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1095		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

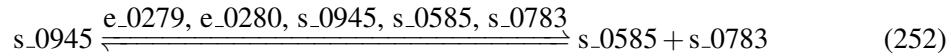
6.126 Reaction r_0445

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name cyclic pyranopterin monophosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 505: Properties of each reactant.

Id	Name	SBO
s_{_0945}	GTP	

Modifiers

Table 506: Properties of each modifier.

Id	Name	SBO
e_{_0279}	moaA	0000460
e_{_0280}	moaC	0000460
s_{_0945}	GTP	
s_{_0585}	cyclic pyranopterin monophosphate	
s_{_0783}	Diphosphate	

Products

Table 507: Properties of each product.

Id	Name	SBO
s_{_0585}	cyclic pyranopterin monophosphate	
s_{_0783}	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{126} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{_0945}] - \frac{[s_{_0585}] \cdot [s_{_0783}]}{K_{eq}} \right)}{1 + \frac{[s_{_0945}]}{K_{m0945}} + \left(1 + \frac{[s_{_0585}]}{K_{m0585}} \right) \cdot \left(1 + \frac{[s_{_0783}]}{K_{m0783}} \right) - 1} \quad (253)$$

Table 508: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.37980831407913 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.37980831407913 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0945		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0585		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

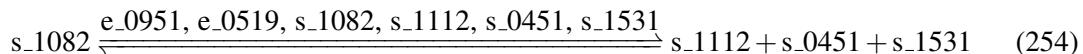
6.127 Reaction r_0450

This is a reversible reaction of one reactant forming three products influenced by six modifiers.

Name cystathionine b-lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 509: Properties of each reactant.

Id	Name	SBO
s_1082	L-Cystathionine	

Modifiers

Table 510: Properties of each modifier.

Id	Name	SBO
e_0951	metC	0000460
e_0519	malY	0000460
s_1082	L-Cystathionine	
s_1112	L-Homocysteine	
s_0451	Ammonium	
s_1531	Pyruvate	

Products

Table 511: Properties of each product.

Id	Name	SBO
s_1112	L-Homocysteine	
s_0451	Ammonium	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{127} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1082}] - \frac{[s_{1112}] \cdot [s_{0451}] \cdot [s_{1531}]}{K_{eq}} \right)}{1 + \frac{[s_{1082}]}{K_{m1082}} + \left(1 + \frac{[s_{1112}]}{K_{m1112}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) - 1} \quad (255)$$

Table 512: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.384	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.020	mmol ² · l ⁻²	<input checked="" type="checkbox"/>
K _{m1082}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1112}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0451}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1531}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

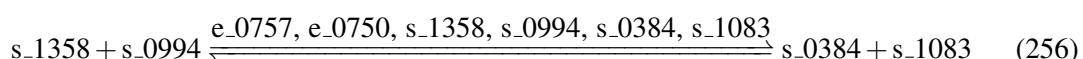
6.128 Reaction r_0452

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name cysteine synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 513: Properties of each reactant.

Id	Name	SBO
s_1358	O-Acetyl-L-serine	
s_0994	Hydrogen sulfide	

Modifiers

Table 514: Properties of each modifier.

Id	Name	SBO
e_0757	cysM	0000460
e_0750	cysK	0000460
s_1358	O-Acetyl-L-serine	
s_0994	Hydrogen sulfide	
s_0384	Acetate	
s_1083	L-Cysteine	

Products

Table 515: Properties of each product.

Id	Name	SBO
s_0384	Acetate	
s_1083	L-Cysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{128} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1358}] \cdot [s_{0994}] - \frac{[s_{0384}] \cdot [s_{1083}]}{K_{eq}} \right)}{(1 + \frac{[s_{1358}]}{K_m1358}) \cdot (1 + \frac{[s_{0994}]}{K_m0994}) + (1 + \frac{[s_{0384}]}{K_m0384}) \cdot (1 + \frac{[s_{1083}]}{K_m1083}) - 1} \quad (257)$$

Table 516: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.481	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1358		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0994		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0384		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1083		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

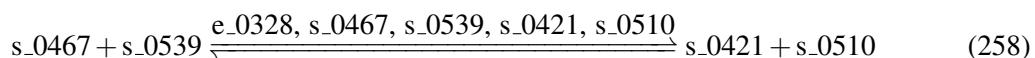
6.129 Reaction r_0457

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name cytidylate kinase (CMP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 517: Properties of each reactant.

Id	Name	SBO
s_{_0467}	ATP	
s_{_0539}	CMP	

Modifiers

Table 518: Properties of each modifier.

Id	Name	SBO
e_{_0328}	cmk	0000460
s_{_0467}	ATP	
s_{_0539}	CMP	
s_{_0421}	ADP	
s_{_0510}	CDP	

Products

Table 519: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0510	CDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{129} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0539}] - \frac{[s_{0421}] \cdot [s_{0510}]}{K_{eq}} \right)}{Km_{0467} \cdot Km_{0539}} \quad (259)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{Km_{0467}} \right) \cdot \left(1 + \frac{[s_{0539}]}{Km_{0539}} \right) + \left(1 + \frac{[s_{0421}]}{Km_{0421}} \right) \cdot \left(1 + \frac{[s_{0510}]}{Km_{0510}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{Km_{0467}} \right) \cdot \left(1 + \frac{[s_{0539}]}{Km_{0539}} \right) + \left(1 + \frac{[s_{0421}]}{Km_{0421}} \right) \cdot \left(1 + \frac{[s_{0510}]}{Km_{0510}} \right) - 1} - 1$$

Table 520: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.025	dimensionless	<input checked="" type="checkbox"/>
Vmax			0000324	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq			0000281	2.000	<input checked="" type="checkbox"/>
Km0467			0000322	0.100	<input checked="" type="checkbox"/>
Km0539			0000322	0.100	<input checked="" type="checkbox"/>
Km0421			0000323	0.100	<input checked="" type="checkbox"/>
Km0510			0000323	0.100	<input checked="" type="checkbox"/>

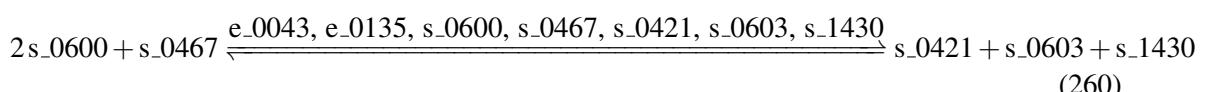
6.130 Reaction r_0463

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name D-alanine-D-alanine ligase (reversible)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 521: Properties of each reactant.

Id	Name	SBO
s_0600	D-Alanine	
s_0467	ATP	

Modifiers

Table 522: Properties of each modifier.

Id	Name	SBO
e_0043	ddlB	0000460
e_0135	ddlA	0000460
s_0600	D-Alanine	
s_0467	ATP	
s_0421	ADP	
s_0603	D-Alanyl-D-alanine	
s_1430	Phosphate	

Products

Table 523: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0603	D-Alanyl-D-alanine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{130} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0600}]^2 \cdot [s_{0467}] - \frac{[s_{0421}] \cdot [s_{0603}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0600}^2 \cdot K_{m0467}} \\ \frac{\left(1 + \frac{[s_{0600}]}{K_{m0600}} \right)^2 \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0603}]}{K_{m0603}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{(261)}$$

Table 524: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.115	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0600		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0603		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

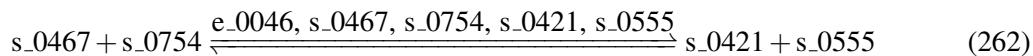
6.131 Reaction r_0488

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dephospho-CoA kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 525: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0754	Dephospho-CoA	

Modifiers

Table 526: Properties of each modifier.

Id	Name	SBO
e_0046	coaE	0000460
s_0467	ATP	
s_0754	Dephospho-CoA	
s_0421	ADP	
s_0555	Coenzyme A	

Products

Table 527: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{131} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0754}] - \frac{[s_{0421}] \cdot [s_{0555}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0754}} \quad (263)$$

$$\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0754}]}{K_{m0754}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1$$

Table 528: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0754}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0555}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

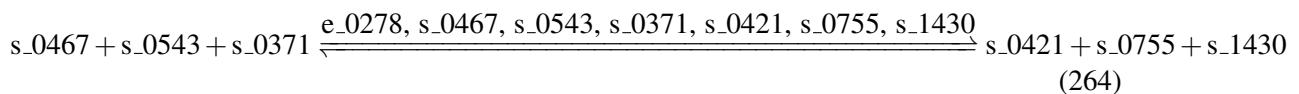
6.132 Reaction r_0489

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name dethiobiotin synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 529: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0543	CO2	
s_0371	7,8-Diaminononanoate	

Modifiers

Table 530: Properties of each modifier.

Id	Name	SBO
e_0278	bioD1	0000460
s_0467	ATP	
s_0543	CO2	
s_0371	7,8-Diaminononanoate	
s_0421	ADP	
s_0755	Dethiobiotin	
s_1430	Phosphate	

Products

Table 531: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0755	Dethiobiotin	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{132} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0543] \cdot [s_0371] - \frac{[s_0421] \cdot [s_0755] \cdot [s_1430]}{K_{eq}} \right)}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0543]}{Km0543} \right) \cdot \left(1 + \frac{[s_0371]}{Km0371} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_0755]}{Km0755} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right)} - 1 \quad (265)$$

Table 532: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$8.31100403654277 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0371		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0755		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

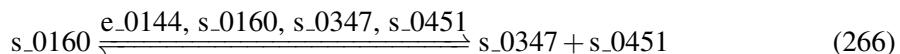
6.133 Reaction r_0498

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name diaminohydroxyphosphoribosylaminopryrimidine deaminase (25drapp)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 533: Properties of each reactant.

Id	Name	SBO
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	

Modifiers

Table 534: Properties of each modifier.

Id	Name	SBO
e_0144	ribD	0000460
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_0451	Ammonium	

Products

Table 535: Properties of each product.

Id	Name	SBO
s_0347	5-Amino-6-(5'-phosphoribosylamino)uracil	
s_0451	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{133} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0160}] - \frac{[s_{0347}] \cdot [s_{0451}]}{K_{eq}} \right)}{K_{m0160}} \quad (267)$$

$$1 + \frac{[s_{0160}]}{K_{m0160}} + \left(1 + \frac{[s_{0347}]}{K_{m0347}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right) - 1$$

Table 536: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$6.17784634458656 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0160}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0347}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0451}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

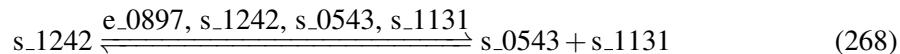
6.134 Reaction r_0499

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name diaminopimelate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 537: Properties of each reactant.

Id	Name	SBO
s_1242	meso-2,6-Diaminoheptanedioate	

Modifiers

Table 538: Properties of each modifier.

Id	Name	SBO
e_0897	lysA	0000460
s_1242	meso-2,6-Diaminoheptanedioate	
s_0543	CO2	
s_1131	L-Lysine	

Products

Table 539: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1131	L-Lysine	

Kinetic Law

Derived unit contains undeclared units

$$v_{134} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1242}] - \frac{[s_{0543}] \cdot [s_{1131}]}{K_{eq}} \right)}{1 + \frac{[s_{1242}]}{K_{m1242}} + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1131}]}{K_{m1131}} \right) - 1} \quad (269)$$

Table 540: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.048	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.475	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1242}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1131}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

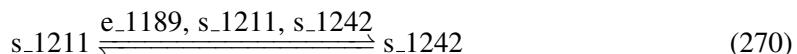
6.135 Reaction r_0500

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name diaminopimelate epimerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 541: Properties of each reactant.

Id	Name	SBO
s_1211	LL-2,6-Diaminoheptanedioate	

Modifiers

Table 542: Properties of each modifier.

Id	Name	SBO
e_1189	dapF	0000460
s_1211	LL-2,6-Diaminoheptanedioate	
s_1242	meso-2,6-Diaminoheptanedioate	

Product

Table 543: Properties of each product.

Id	Name	SBO
s_1242	meso-2,6-Diaminoheptanedioate	

Kinetic Law

Derived unit contains undeclared units

$$v_{135} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1211}] - \frac{[s_{1242}]}{K_{eq}} \right)}{1 + \frac{[s_{1211}]}{K_{m1211}} + 1 + \frac{[s_{1242}]}{K_{m1242}} - 1} \quad (271)$$

Table 544: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.308	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1211		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1242		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

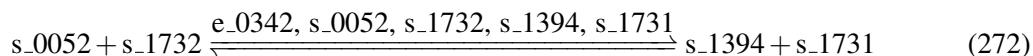
6.136 Reaction r_0501

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydorotic acid dehydrogenase (quinone8)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 545: Properties of each reactant.

Id	Name	SBO
s_0052	(S)-Dihydroorotate	
s_1732	Ubiquinone-8	

Modifiers

Table 546: Properties of each modifier.

Id	Name	SBO
e_0342	pyrD	0000460
s_0052	(S)-Dihydroorotate	
s_1732	Ubiquinone-8	
s_1394	Orotate	
s_1731	Ubiquinol-8	

Products

Table 547: Properties of each product.

Id	Name	SBO
s_1394	Orotate	
s_1731	Ubiquinol-8	

Kinetic Law

Derived unit contains undeclared units

$$v_{136} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0052}] \cdot [s_{1732}] - \frac{[s_{1394}] \cdot [s_{1731}]}{K_{eq}} \right)}{K_{m0052} \cdot K_{m1732}} \quad (273)$$

$$\frac{\left(1 + \frac{[s_{0052}]}{K_{m0052}} \right) \cdot \left(1 + \frac{[s_{1732}]}{K_{m1732}} \right) + \left(1 + \frac{[s_{1394}]}{K_{m1394}} \right) \cdot \left(1 + \frac{[s_{1731}]}{K_{m1731}} \right) - 1}{\left(1 + \frac{[s_{0052}]}{K_{m0052}} \right) \cdot \left(1 + \frac{[s_{1732}]}{K_{m1732}} \right) + \left(1 + \frac{[s_{1394}]}{K_{m1394}} \right) \cdot \left(1 + \frac{[s_{1731}]}{K_{m1731}} \right) - 1}$$

Table 548: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.321	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0052		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1732		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1394		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1731		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

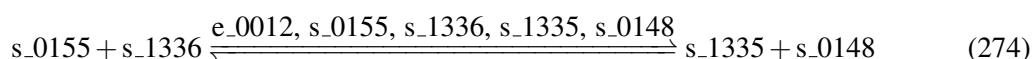
6.137 Reaction r_0502

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydridopicolinate reductase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 549: Properties of each reactant.

Id	Name	SBO
s_0155	2,3-Dihydrodipicolinate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 550: Properties of each modifier.

Id	Name	SBO
e_0012	dapB	0000460
s_0155	2,3-Dihydrodipicolinate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0148	2,3,4,5-Tetrahydrodipicolinate	

Products

Table 551: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0148	2,3,4,5-Tetrahydrodipicolinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{137} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0155}] \cdot [s_{1336}] - \frac{[s_{1335}] \cdot [s_{0148}]}{K_{eq}} \right)}{K_{m0155} \cdot K_{m1336}} \quad (275)$$

$$\frac{\left(1 + \frac{[s_{0155}]}{K_{m0155}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{0148}]}{K_{m0148}} \right) - 1}{}$$

Table 552: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.719	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0155		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0148		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

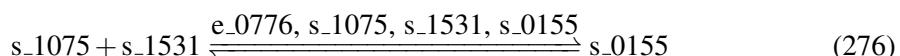
6.138 Reaction r_0503

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name dihydridopicolinate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 553: Properties of each reactant.

Id	Name	SBO
s_1075	L-Aspartate 4-semialdehyde	
s_1531	Pyruvate	

Modifiers

Table 554: Properties of each modifier.

Id	Name	SBO
e_0776	dapA	0000460
s_1075	L-Aspartate 4-semialdehyde	
s_1531	Pyruvate	
s_0155	2,3-Dihydridopicolinate	

Product

Table 555: Properties of each product.

Id	Name	SBO
s_0155	2,3-Dihydridopicolinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{138} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1075}] \cdot [s_{1531}] - \frac{[s_{0155}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{1075}]}{K_{m1075}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) + 1 + \frac{[s_{0155}]}{K_{m0155}} - 1} \quad (277)$$

Table 556: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.514	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	20.000	mmol ⁻¹ · l	<input checked="" type="checkbox"/>
Km1075		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1531		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0155		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

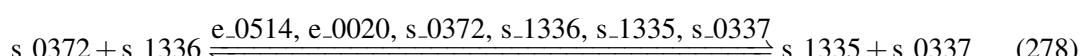
6.139 Reaction r_0504

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name dihydrofolate reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 557: Properties of each reactant.

Id	Name	SBO
s_0372	7,8-Dihydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 558: Properties of each modifier.

Id	Name	SBO
e_0514	folM	0000460
e_0020	folA	0000460
s_0372	7,8-Dihydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 559: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{139} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0372}] \cdot [s_{1336}] - \frac{[s_{1335}] \cdot [s_{0337}]}{K_{eq}} \right)}{K_{m0372} \cdot K_{m1336}} \quad (279)$$

$$\frac{\left(1 + \frac{[s_{0372}]}{K_{m0372}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{0337}]}{K_{m0337}} \right) - 1}{}$$

Table 560: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.052	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0372		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0337		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

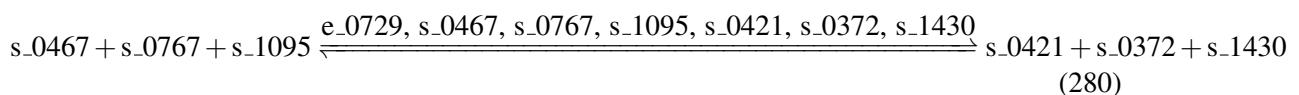
6.140 Reaction r_0505

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name dihydrofolate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 561: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0767	Dihydropteroate	
s_1095	L-Glutamate	

Modifiers

Table 562: Properties of each modifier.

Id	Name	SBO
e_0729	folC	0000460
s_0467	ATP	
s_0767	Dihydropteroate	
s_1095	L-Glutamate	
s_0421	ADP	
s_0372	7,8-Dihydrofolate	
s_1430	Phosphate	

Products

Table 563: Properties of each product.

Id	Name	SBO
s_0421	ADP	

Id	Name	SBO
s_0372	7,8-Dihydrofolate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{140} = \frac{\text{vol}(cell) \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0767}] \cdot [s_{1095}] - \frac{[s_{0421}] \cdot [s_{0372}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0767} \cdot K_{m1095}} \\ = \frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0767}]}{K_{m0767}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0372}]}{K_{m0372}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0767}]}{K_{m0767}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0372}]}{K_{m0372}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1} \quad (281)$$

Table 564: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0767}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1095}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0372}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

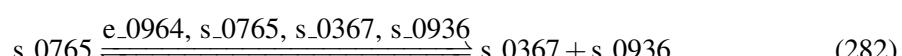
6.141 Reaction r_0507

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name dihydronopterin aldolase reversible

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 565: Properties of each reactant.

Id	Name	SBO
s_0765	Dihydronopterin	

Modifiers

Table 566: Properties of each modifier.

Id	Name	SBO
e_0964	folB	0000460
s_0765	Dihydronopterin	
s_0367	6-hydroxymethyl dihydropterin	
s_0936	Glycolaldehyde	

Products

Table 567: Properties of each product.

Id	Name	SBO
s_0367	6-hydroxymethyl dihydropterin	
s_0936	Glycolaldehyde	

Kinetic Law

Derived unit contains undeclared units

$$v_{141} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0765] - \frac{[s_0367] \cdot [s_0936]}{K_{eq}} \right)}{1 + \frac{[s_0765]}{K_{m0765}} + \left(1 + \frac{[s_0367]}{K_{m0367}} \right) \cdot \left(1 + \frac{[s_0936]}{K_{m0936}} \right) - 1} \quad (283)$$

Table 568: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$9.26676951688061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0765}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0367}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0936}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

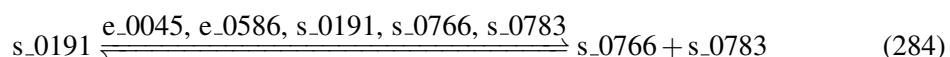
6.142 Reaction r_0510

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name Dihydronopterin triphosphate pyrophosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 569: Properties of each reactant.

Id	Name	SBO
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	

Modifiers

Table 570: Properties of each modifier.

Id	Name	SBO
e_0045	mutT	0000460
e_0586	nudB	0000460
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	
s_0766	Dihydronopterin monophosphate	
s_0783	Diphosphate	

Products

Table 571: Properties of each product.

Id	Name	SBO
s_0766	Dihydronopterin monophosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{142} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0191}] - \frac{[s_{0766}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0191}}}{1 + \frac{[s_{0191}]}{K_{m0191}} + \left(1 + \frac{[s_{0766}]}{K_{m0766}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1} \quad (285)$$

Table 572: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0191		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0766		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

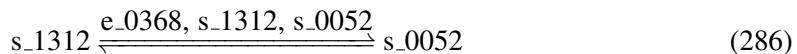
6.143 Reaction r_0511

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name dihydroorotase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 573: Properties of each reactant.

Id	Name	SBO
s_1312	N-Carbamoyl-L-aspartate	

Modifiers

Table 574: Properties of each modifier.

Id	Name	SBO
e_0368	pyrC	0000460
s_1312	N-Carbamoyl-L-aspartate	
s_0052	(S)-Dihydroorotate	

Product

Table 575: Properties of each product.

Id	Name	SBO
s_0052	(S)-Dihydroorotate	

Kinetic Law

Derived unit contains undeclared units

$$v_{143} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1312}] - \frac{[s_{0052}]}{K_{eq}} \right)}{1 + \frac{[s_{1312}]}{K_{m1312}} + 1 + \frac{[s_{0052}]}{K_{m0052}} - 1} \quad (287)$$

Table 576: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.275	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1312}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0052}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

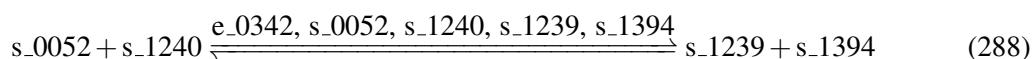
6.144 Reaction r_0512

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydroorotic acid (menaquinone-8)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 577: Properties of each reactant.

Id	Name	SBO
s_0052	(S)-Dihydroorotate	

Id	Name	SBO
s_1240	Menaquinone 8	

Modifiers

Table 578: Properties of each modifier.

Id	Name	SBO
e_0342	pyrD	0000460
s_0052	(S)-Dihydroorotate	
s_1240	Menaquinone 8	
s_1239	Menaquinol 8	
s_1394	Orotate	

Products

Table 579: Properties of each product.

Id	Name	SBO
s_1239	Menaquinol 8	
s_1394	Orotate	

Kinetic Law

Derived unit contains undeclared units

$$v_{144} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0052}] \cdot [s_{1240}] - \frac{[s_{1239}] \cdot [s_{1394}]}{K_{eq}} \right)}{K_{m0052} \cdot K_{m1240}} \quad (289)$$

$$\frac{\left(1 + \frac{[s_{0052}]}{K_{m0052}} \right) \cdot \left(1 + \frac{[s_{1240}]}{K_{m1240}} \right) + \left(1 + \frac{[s_{1239}]}{K_{m1239}} \right) \cdot \left(1 + \frac{[s_{1394}]}{K_{m1394}} \right) - 1}{}$$

Table 580: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.321	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0052		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1240		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1239		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1394		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

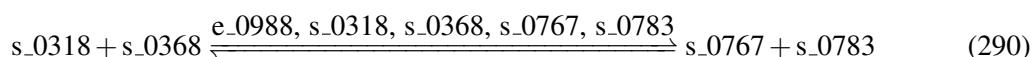
6.145 Reaction r_0515

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dihydropteroate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 581: Properties of each reactant.

Id	Name	SBO
s_0318	4-Aminobenzoate	
s_0368	6-hydroxymethyl-dihydropteroin pyrophosphate	

Modifiers

Table 582: Properties of each modifier.

Id	Name	SBO
e_0988	folP	0000460
s_0318	4-Aminobenzoate	
s_0368	6-hydroxymethyl-dihydropteroin pyrophosphate	
s_0767	Dihydropteroate	
s_0783	Diphosphate	

Products

Table 583: Properties of each product.

Id	Name	SBO
s_0767	Dihydropteroate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{145} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0318}] \cdot [s_{0368}] - \frac{[s_{0767}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0318} \cdot K_{m0368}} \quad (291)$$

$$\frac{\left(1 + \frac{[s_{0318}]}{K_{m0318}} \right) \cdot \left(1 + \frac{[s_{0368}]}{K_{m0368}} \right) + \left(1 + \frac{[s_{0767}]}{K_{m0767}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{0318}]}{K_{m0318}} \right) \cdot \left(1 + \frac{[s_{0368}]}{K_{m0368}} \right) + \left(1 + \frac{[s_{0767}]}{K_{m0767}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}$$

Table 584: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0318		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0368		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0767		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

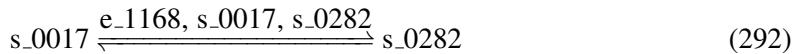
6.146 Reaction r_0517

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylbutanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 585: Properties of each reactant.

Id	Name	SBO
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	

Modifiers

Table 586: Properties of each modifier.

Id	Name	SBO
e_1168	ilvD	0000460
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	

Product

Table 587: Properties of each product.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{146} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0017}] - \frac{[s_{0282}]}{K_{eq}} \right)}{1 + \frac{[s_{0017}]}{K_{m0017}} + 1 + \frac{[s_{0282}]}{K_{m0282}} - 1} \quad (293)$$

Table 588: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.727	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0017}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0282}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

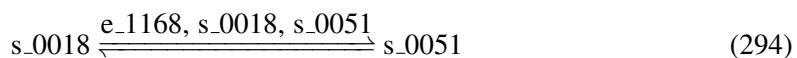
6.147 Reaction r_0518

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name Dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylpentanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 589: Properties of each reactant.

Id	Name	SBO
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	

Modifiers

Table 590: Properties of each modifier.

Id	Name	SBO
e_1168	ilvD	0000460
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	
s_0051	(S)-3-Methyl-2-oxopentanoate	

Product

Table 591: Properties of each product.

Id	Name	SBO
s_0051	(S)-3-Methyl-2-oxopentanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{147} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0018] - \frac{[s_0051]}{K_{eq}} \right)}{1 + \frac{[s_0018]}{Km0018} + 1 + \frac{[s_0051]}{Km0051} - 1} \quad (295)$$

Table 592: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.241	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0018		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0051		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

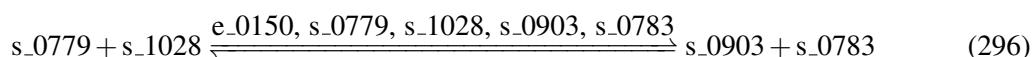
6.148 Reaction r_0522

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dimethylallyltranstransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 593: Properties of each reactant.

Id	Name	SBO
s_0779	Dimethylallyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 594: Properties of each modifier.

Id	Name	SBO
e_0150	ispA	0000460
s_0779	Dimethylallyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0903	Geranyl diphosphate	
s_0783	Diphosphate	

Products

Table 595: Properties of each product.

Id	Name	SBO
s_0903	Geranyl diphosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{148} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0779}] \cdot [s_{1028}] - \frac{[s_{0903}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0779} \cdot K_{m1028}} \quad (297)$$

$$\frac{\left(1 + \frac{[s_{0779}]}{K_{m0779}} \right) \cdot \left(1 + \frac{[s_{1028}]}{K_{m1028}} \right) + \left(1 + \frac{[s_{0903}]}{K_{m0903}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{0779}]}{K_{m0779}} \right) \cdot \left(1 + \frac{[s_{1028}]}{K_{m1028}} \right) + \left(1 + \frac{[s_{0903}]}{K_{m0903}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}$$

Table 596: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.85076521030325 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$5.39107129442455 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0779		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1028		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0903		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

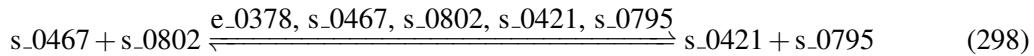
6.149 Reaction r_0532

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name dTMP kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 597: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0802	dTMP	

Modifiers

Table 598: Properties of each modifier.

Id	Name	SBO
e_0378	tmk	0000460

Id	Name	SBO
s_0467	ATP	
s_0802	dTMP	
s_0421	ADP	
s_0795	dTDP	

Products

Table 599: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0795	dTDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{149} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0802}] - \frac{[s_{0421}] \cdot [s_{0795}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0802}} \quad (299)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0802}]}{K_{m0802}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0795}]}{K_{m0795}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0802}]}{K_{m0802}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0795}]}{K_{m0795}} \right) - 1} - 1$$

Table 600: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.051	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0802}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0795}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

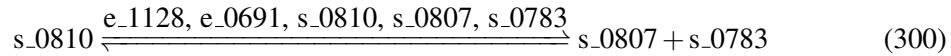
6.150 Reaction r_0533

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name dUTP diphosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 601: Properties of each reactant.

Id	Name	SBO
s_{_0810}	dUTP	

Modifiers

Table 602: Properties of each modifier.

Id	Name	SBO
e_{_1128}	dut	0000460
e_{_0691}	nudI	0000460
s_{_0810}	dUTP	
s_{_0807}	dUMP	
s_{_0783}	Diphosphate	

Products

Table 603: Properties of each product.

Id	Name	SBO
s_{_0807}	dUMP	
s_{_0783}	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{150} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{_0810}] - \frac{[s_{_0807}] \cdot [s_{_0783}]}{K_{eq}} \right)}{1 + \frac{[s_{_0810}]}{K_{m0810}} + \left(1 + \frac{[s_{_0807}]}{K_{m0807}} \right) \cdot \left(1 + \frac{[s_{_0783}]}{K_{m0783}} \right) - 1} \quad (301)$$

Table 604: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.036	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0810		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0807		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

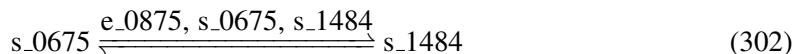
6.151 Reaction r_0538

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name enolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 605: Properties of each reactant.

Id	Name	SBO
s_{-0675}	D-Glycerate 2-phosphate	

Modifiers

Table 606: Properties of each modifier.

Id	Name	SBO
e_{-0875}	eno	0000460
s_{-0675}	D-Glycerate 2-phosphate	
s_{-1484}	Phosphoenolpyruvate	

Product

Table 607: Properties of each product.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{151} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0675}] - \frac{[s_{1484}]}{K_{eq}} \right)}{1 + \frac{[s_{0675}]}{K_{m0675}} + 1 + \frac{[s_{1484}]}{K_{m1484}} - 1} \quad (303)$$

Table 608: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.641	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	3.846	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0675		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1484		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

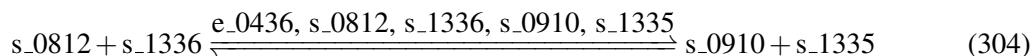
6.152 Reaction r_0563

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Enoylglutaryl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 609: Properties of each reactant.

Id	Name	SBO
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 610: Properties of each modifier.

Id	Name	SBO
e_0436	fabI	0000460
s_0812	Enoylglutaryl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0910	Glutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 611: Properties of each product.

Id	Name	SBO
s_0910	Glutaryl-[acyl-carrier protein] methyl ester	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{152} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0812}] \cdot [s_{1336}] - \frac{[s_{0910}] \cdot [s_{1335}]}{K_{eq}} \right)}{(1 + \frac{[s_{0812}]}{Km0812}) \cdot (1 + \frac{[s_{1336}]}{Km1336}) + (1 + \frac{[s_{0910}]}{Km0910}) \cdot (1 + \frac{[s_{1335}]}{Km1335}) - 1} \quad (305)$$

Table 612: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			2.77033467884759 · 10 ⁻⁷	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	3.87846855038663 · 10 ⁻⁶	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0812		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0910		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.153 Reaction r_0564

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Enoylpimeloyl-[ACP] methyl ester reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 613: Properties of each reactant.

Id	Name	SBO
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 614: Properties of each modifier.

Id	Name	SBO
e_0436	fabI	0000460
s_0813	Enoylpimeloyl-[acyl-carrier protein] methyl ester	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	

Products

Table 615: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{153} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0813}] \cdot [s_{1336}] - \frac{[s_{1335}] \cdot [s_{1492}]}{K_{eq}} \right)}{K_{m0813} \cdot K_{m1336}} \quad (307)$$

$$\frac{\left(1 + \frac{[s_{0813}]}{K_{m0813}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{1492}]}{K_{m1492}} \right) - 1}{\left(1 + \frac{[s_{0813}]}{K_{m0813}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{1492}]}{K_{m1492}} \right) - 1}$$

Table 616: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.87846855038663 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0813		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1492		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

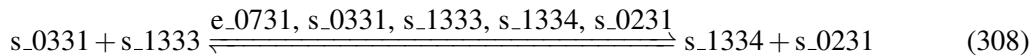
6.154 Reaction r_0573

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Erythonate 4-phosphate (4per) dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 617: Properties of each reactant.

Id	Name	SBO
s_0331	4-Phospho-D-erythonate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 618: Properties of each modifier.

Id	Name	SBO
e_0731	pdxB	0000460

Id	Name	SBO
s_0331	4-Phospho-D-erythronate	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	

Products

Table 619: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{154} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0331}] \cdot [s_{1333}] - \frac{[s_{1334}] \cdot [s_{0231}]}{K_{eq}} \right)}{K_{m0331} \cdot K_{m1333}} \quad (309)$$

$$\frac{\left(1 + \frac{[s_{0331}]}{K_{m0331}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{0231}]}{K_{m0231}} \right) - 1}{\left(1 + \frac{[s_{0331}]}{K_{m0331}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{0231}]}{K_{m0231}} \right) - 1}$$

Table 620: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$4.32449244111493 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0331}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1333}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1334}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0231}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

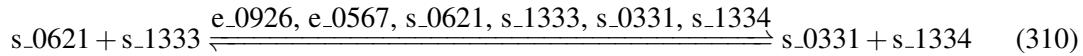
6.155 Reaction r_0574

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name Erythrose 4-phosphate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 621: Properties of each reactant.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 622: Properties of each modifier.

Id	Name	SBO
e_0926	epd	0000460
e_0567	gapA	0000460
s_0621	D-Erythrose 4-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_0331	4-Phospho-D-erythronate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 623: Properties of each product.

Id	Name	SBO
s_0331	4-Phospho-D-erythronate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{155} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0621}] \cdot [s_{1333}] - \frac{[s_{0331}] \cdot [s_{1334}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{0621}]}{Km_{0621}} \right) \cdot \left(1 + \frac{[s_{1333}]}{Km_{1333}} \right) + \left(1 + \frac{[s_{0331}]}{Km_{0331}} \right) \cdot \left(1 + \frac{[s_{1334}]}{Km_{1334}} \right) - 1} \quad (311)$$

Table 624: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.32449244111493 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0621		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0331		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

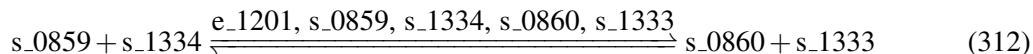
6.156 Reaction r_0576

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name FAD reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 625: Properties of each reactant.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 626: Properties of each modifier.

Id	Name	SBO
e_1201	fre	0000460
s_0859	Flavin adenine dinucleotide oxidized	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0860	Flavin adenine dinucleotide reduced	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 627: Properties of each product.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{156} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0859}] \cdot [s_{1334}] - \frac{[s_{0860}] \cdot [s_{1333}]}{K_{eq}} \right)}{Km0859 \cdot Km1334} \quad (313)$$

$$\left(1 + \frac{[s_{0859}]}{Km0859} \right) \cdot \left(1 + \frac{[s_{1334}]}{Km1334} \right) + \left(1 + \frac{[s_{0860}]}{Km0860} \right) \cdot \left(1 + \frac{[s_{1333}]}{Km1333} \right) - 1$$

Table 628: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.303	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	4.239	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0859		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0860		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

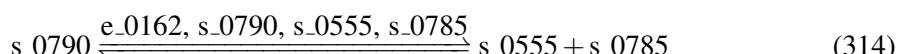
6.157 Reaction r_0579

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name fatty-acid-CoA thioesterase (dodecanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 629: Properties of each reactant.

Id	Name	SBO
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	

Modifiers

Table 630: Properties of each modifier.

Id	Name	SBO
e_0162	tesB	0000460
s_0790	Dodecanoyl-CoA (n-C12:0CoA)	
s_0555	Coenzyme A	
s_0785	Dodecanoate (n-C12:0)	

Products

Table 631: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_0785	Dodecanoate (n-C12:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{157} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0790] - \frac{[s_0555] \cdot [s_0785]}{K_{eq}} \right)}{1 + \frac{[s_0790]}{Km0790} + \left(1 + \frac{[s_0555]}{Km0555} \right) \cdot \left(1 + \frac{[s_0785]}{Km0785} \right) - 1} \quad (315)$$

Table 632: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.108	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0790		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0785		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

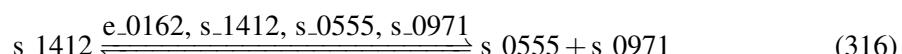
6.158 Reaction r_0580

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name fatty-acid-CoA thioesterase (hexadecanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 633: Properties of each reactant.

Id	Name	SBO
s_1412	Palmitoyl-CoA (n-C16:0CoA)	

Modifiers

Table 634: Properties of each modifier.

Id	Name	SBO
e_0162	tesB	0000460
s_1412	Palmitoyl-CoA (n-C16:0CoA)	
s_0555	Coenzyme A	
s_0971	Hexadecanoate (n-C16:0)	

Products

Table 635: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_0971	Hexadecanoate (n-C16:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{158} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1412}] - \frac{[s_{0555}] \cdot [s_{0971}]}{K_{eq}} \right)}{K_{m1412}}}{1 + \frac{[s_{1412}]}{K_{m1412}} + \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{0971}]}{K_{m0971}} \right) - 1} \quad (317)$$

Table 636: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.018	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.177	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1412		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0971		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

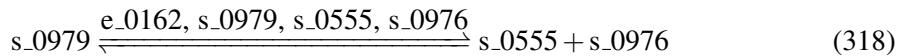
6.159 Reaction r_0581

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name fatty-acid-CoA thioesterase (hexadecenoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 637: Properties of each reactant.

Id	Name	SBO
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	

Modifiers

Table 638: Properties of each modifier.

Id	Name	SBO
e_0162	tesB	0000460
s_0979	Hexadecenoyl-CoA (n-C16:1CoA)	
s_0555	Coenzyme A	

Id	Name	SBO
s_0976	Hexadecenoate (n-C16:1)	

Products

Table 639: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_0976	Hexadecenoate (n-C16:1)	

Kinetic Law

Derived unit contains undeclared units

$$v_{159} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0979}] - \frac{[s_{0555}] \cdot [s_{0976}]}{K_{eq}} \right)}{1 + \frac{[s_{0979}]}{K_{m0979}} + \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{0976}]}{K_{m0976}} \right) - 1} \quad (319)$$

Table 640: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.208	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0979}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0555}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0976}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

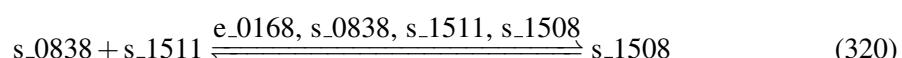
6.160 Reaction r_0602

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name Ferrochelatase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 641: Properties of each reactant.

Id	Name	SBO
s_0838	Fe2+	
s_1511	Protoporphyrin	

Modifiers

Table 642: Properties of each modifier.

Id	Name	SBO
e_0168	hemH	0000460
s_0838	Fe2+	
s_1511	Protoporphyrin	
s_1508	Protoheme	

Product

Table 643: Properties of each product.

Id	Name	SBO
s_1508	Protoheme	

Kinetic Law

Derived unit contains undeclared units

$$v_{160} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_0838] \cdot [s_1511] - \frac{[s_1508]}{K_{\text{eq}}} \right)}{(1 + \frac{[s_0838]}{Km0838}) \cdot (1 + \frac{[s_1511]}{Km1511}) + 1 + \frac{[s_1508]}{Km1508} - 1} \quad (321)$$

Table 644: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317225085 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.08892317225085 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
Km0838		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1511		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1508		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

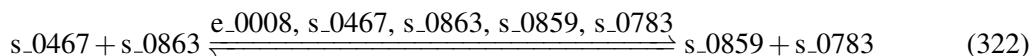
6.161 Reaction r_0611

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name FMN adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 645: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0863	FMN	

Modifiers

Table 646: Properties of each modifier.

Id	Name	SBO
e_0008	ribF	0000460
s_0467	ATP	
s_0863	FMN	
s_0859	Flavin adenine dinucleotide oxidized	
s_0783	Diphosphate	

Products

Table 647: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	

Id	Name	SBO
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{161} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0863}] - \frac{[s_{0859}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0863}} \quad (323)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0863}]}{K_{m0863}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{}$$

Table 648: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229329 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.32449244121061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0863		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

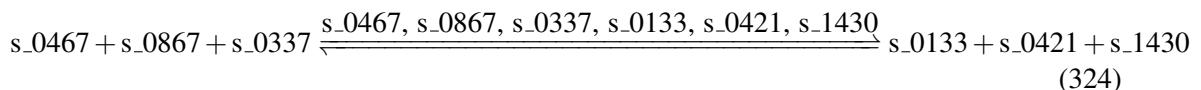
6.162 Reaction r_0622

This is a reversible reaction of three reactants forming three products influenced by six modifiers.

Name formate-tetrahydrofolate ligase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 649: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	

Id	Name	SBO
s_0867	Formate	
s_0337	5,6,7,8-Tetrahydrofolate	

Modifiers

Table 650: Properties of each modifier.

Id	Name	SBO
s_0467	ATP	
s_0867	Formate	
s_0337	5,6,7,8-Tetrahydrofolate	
s_0133	10-Formyltetrahydrofolate	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 651: Properties of each product.

Id	Name	SBO
s_0133	10-Formyltetrahydrofolate	
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{162} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0867] \cdot [s_0337] - \frac{[s_0133] \cdot [s_0421] \cdot [s_1430]}{K_{eq}} \right)}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0867]}{Km0867} \right) \cdot \left(1 + \frac{[s_0337]}{Km0337} \right) + \left(1 + \frac{[s_0133]}{Km0133} \right) \cdot \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1} \quad (325)$$

Table 652: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.036	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.087	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0867		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0337		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0133		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

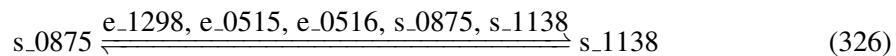
6.163 Reaction r_0632

This is a reversible reaction of one reactant forming one product influenced by five modifiers.

Name fumarase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 653: Properties of each reactant.

Id	Name	SBO
s_0875	Fumarate	

Modifiers

Table 654: Properties of each modifier.

Id	Name	SBO
e_1298	fumB	0000460
e_0515	fumC	0000460
e_0516	fumA	0000460
s_0875	Fumarate	
s_1138	L-Malate	

Product

Table 655: Properties of each product.

Id	Name	SBO
s_1138	L-Malate	

Kinetic Law

Derived unit contains undeclared units

$$v_{163} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0875}] - \frac{[s_{1138}]}{K_{eq}} \right)}{1 + \frac{[s_{0875}]}{K_{m0875}} + 1 + \frac{[s_{1138}]}{K_{m1138}} - 1} \quad (327)$$

Table 656: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.143	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.859	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0875		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1138		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

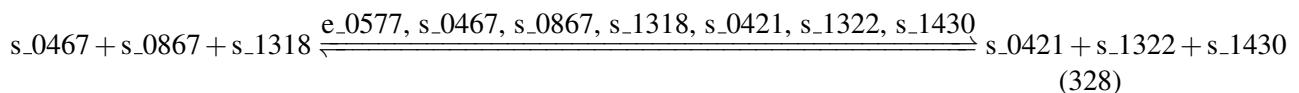
6.164 Reaction r_0648

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name GAR transformylase-T

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 657: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	

Id	Name	SBO
s_0867	Formate	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	

Modifiers

Table 658: Properties of each modifier.

Id	Name	SBO
e_0577	purT	0000460
s_0467	ATP	
s_0867	Formate	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	
s_0421	ADP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Products

Table 659: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{164} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0867] \cdot [s_1318] - \frac{[s_0421] \cdot [s_1322] \cdot [s_1430]}{K_{eq}} \right)}{Km0467 \cdot Km0867 \cdot Km1318} \\ = \frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0867]}{Km0867} \right) \cdot \left(1 + \frac{[s_1318]}{Km1318} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_1322]}{Km1322} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0867]}{Km0867} \right) \cdot \left(1 + \frac{[s_1318]}{Km1318} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_1322]}{Km1322} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1} \quad (329)$$

Table 660: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.843	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0867		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1318		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1322		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

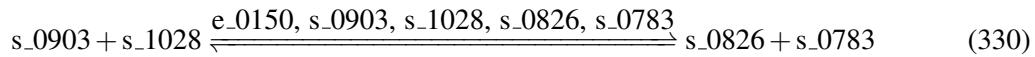
6.165 Reaction r_0655

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name geranyltranstransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 661: Properties of each reactant.

Id	Name	SBO
s_0903	Geranyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 662: Properties of each modifier.

Id	Name	SBO
e_0150	ispA	0000460
s_0903	Geranyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0826	Farnesyl diphosphate	
s_0783	Diphosphate	

Products

Table 663: Properties of each product.

Id	Name	SBO
s_0826	Farnesyl diphosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{165} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0903}] \cdot [s_{1028}] - \frac{[s_{0826}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0903} \cdot K_{m1028}} \quad (331)$$

$$= \frac{\left(1 + \frac{[s_{0903}]}{K_{m0903}} \right) \cdot \left(1 + \frac{[s_{1028}]}{K_{m1028}} \right) + \left(1 + \frac{[s_{0826}]}{K_{m0826}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{0903}]}{K_{m0903}} \right) \cdot \left(1 + \frac{[s_{1028}]}{K_{m1028}} \right) + \left(1 + \frac{[s_{0826}]}{K_{m0826}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}$$

Table 664: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.85076521030325 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$5.39107129442455 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0903}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1028}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0826}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

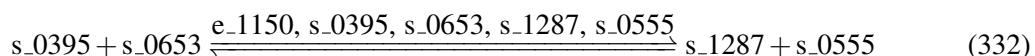
6.166 Reaction r_0658

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glucosamine-1-phosphate N-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 665: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0653	D-Glucosamine 1-phosphate	

Modifiers

Table 666: Properties of each modifier.

Id	Name	SBO
e_1150	glmU	0000460
s_0395	Acetyl-CoA	
s_0653	D-Glucosamine 1-phosphate	
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_0555	Coenzyme A	

Products

Table 667: Properties of each product.

Id	Name	SBO
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{166} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0395] \cdot [s_0653] - \frac{[s_1287] \cdot [s_0555]}{K_{eq}} \right)}{\left(1 + \frac{[s_0395]}{Km0395} \right) \cdot \left(1 + \frac{[s_0653]}{Km0653} \right) + \left(1 + \frac{[s_1287]}{Km1287} \right) \cdot \left(1 + \frac{[s_0555]}{Km0555} \right) - 1} \quad (333)$$

Table 668: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.183	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0653		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1287		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

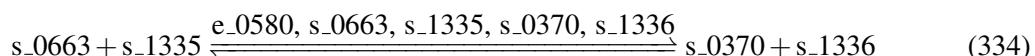
6.167 Reaction r_0660

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glucose 6-phosphate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 669: Properties of each reactant.

Id	Name	SBO
s_0663	D-Glucose 6-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 670: Properties of each modifier.

Id	Name	SBO
e_0580	zwf	0000460
s_0663	D-Glucose 6-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0370	6-phospho-D-glucono-1,5-lactone	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 671: Properties of each product.

Id	Name	SBO
s_0370	6-phospho-D-glucono-1,5-lactone	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{167} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0663}] \cdot [s_{1335}] - \frac{[s_{0370}] \cdot [s_{1336}]}{K_{eq}} \right)}{K_{m0663} \cdot K_{m1335}} \quad (335)$$

$$= \frac{\left(1 + \frac{[s_{0663}]}{K_{m0663}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) + \left(1 + \frac{[s_{0370}]}{K_{m0370}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) - 1}{\left(1 + \frac{[s_{0663}]}{K_{m0663}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) + \left(1 + \frac{[s_{0370}]}{K_{m0370}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) - 1}$$

Table 672: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.880	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	12.318	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0663}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1335}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0370}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1336}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

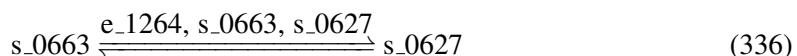
6.168 Reaction r_0664

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name glucose-6-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 673: Properties of each reactant.

Id	Name	SBO
s_0663	D-Glucose 6-phosphate	

Modifiers

Table 674: Properties of each modifier.

Id	Name	SBO
e_1264	pgi	0000460
s_0663	D-Glucose 6-phosphate	
s_0627	D-Fructose 6-phosphate	

Product

Table 675: Properties of each product.

Id	Name	SBO
s_0627	D-Fructose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{168} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0663}] - \frac{[s_{0627}]}{K_{eq}} \right)}{1 + \frac{[s_{0663}]}{Km0663} + 1 + \frac{[s_{0627}]}{Km0627} - 1} \quad (337)$$

Table 676: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.055	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.327	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0663		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0627		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

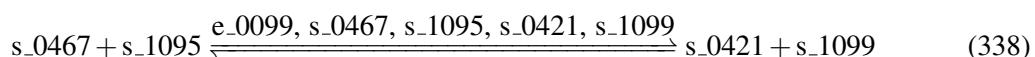
6.169 Reaction r_0673

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glutamate 5-kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 677: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1095	L-Glutamate	

Modifiers

Table 678: Properties of each modifier.

Id	Name	SBO
e_0099	proB	0000460
s_0467	ATP	
s_1095	L-Glutamate	
s_0421	ADP	
s_1099	L-Glutamate 5-phosphate	

Products

Table 679: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1099	L-Glutamate 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{169} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1095}] - \frac{[s_{0421}] \cdot [s_{1099}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m1095}} \quad (339)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1099}]}{K_{m1099}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1099}]}{K_{m1099}} \right) - 1}$$

Table 680: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.429	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1099		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

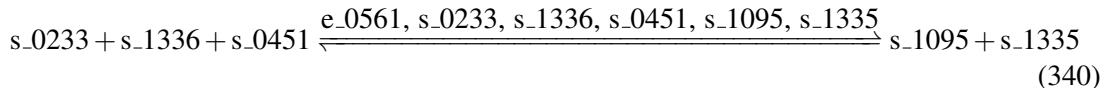
6.170 Reaction r_0675

This is a reversible reaction of three reactants forming two products influenced by six modifiers.

Name glutamate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 681: Properties of each reactant.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0451	Ammonium	

Modifiers

Table 682: Properties of each modifier.

Id	Name	SBO
e_0561	gdhA	0000460
s_0233	2-Oxoglutarate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0451	Ammonium	
s_1095	L-Glutamate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 683: Properties of each product.

Id	Name	SBO
s_1095	L-Glutamate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{170} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0233}] \cdot [s_{1336}] \cdot [s_{0451}] - \frac{[s_{1095}] \cdot [s_{1335}]}{K_{eq}} \right)}{K_{m0233} \cdot K_{m1336} \cdot K_{m0451}} \\ \frac{\left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right) + \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1}{(341)}$$

Table 684: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.175	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	25.851	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	20.000	mmol ⁻¹ · l	<input checked="" type="checkbox"/>
K _{m0233}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1336}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0451}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1095}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1335}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

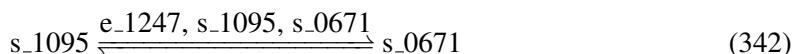
6.171 Reaction r_0676

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name glutamate racemase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 685: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	

Modifiers

Table 686: Properties of each modifier.

Id	Name	SBO
e_1247	murI	0000460
s_1095	L-Glutamate	
s_0671	D-Glutamate	

Product

Table 687: Properties of each product.

Id	Name	SBO
s_0671	D-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{171} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1095}] - \frac{[s_{0671}]}{K_{eq}} \right)}{1 + \frac{[s_{1095}]}{K_{m1095}} + 1 + \frac{[s_{0671}]}{K_{m0671}} - 1} \quad (343)$$

Table 688: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.023	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0671		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

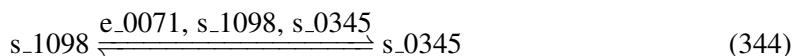
6.172 Reaction r_0678

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name glutamate-1-semialdehyde aminotransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 689: Properties of each reactant.

Id	Name	SBO
s_{-1098}	L-Glutamate 1-semialdehyde	

Modifiers

Table 690: Properties of each modifier.

Id	Name	SBO
e_{-0071}	hemL	0000460
s_{-1098}	L-Glutamate 1-semialdehyde	
s_{-0345}	5-Amino-4-oxopentanoate	

Product

Table 691: Properties of each product.

Id	Name	SBO
s_0345	5-Amino-4-oxopentanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{172} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1098}] - \frac{[s_{0345}]}{K_{eq}} \right)}{1 + \frac{[s_{1098}]}{K_{m1098}} + 1 + \frac{[s_{0345}]}{K_{m0345}} - 1} \quad (345)$$

Table 692: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.94227707563336 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1098}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0345}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

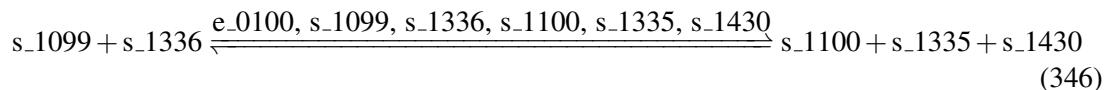
6.173 Reaction r_0679

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name glutamate-5-semialdehyde dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 693: Properties of each reactant.

Id	Name	SBO
s_1099	L-Glutamate 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 694: Properties of each modifier.

Id	Name	SBO
e_0100	proA	0000460
s_1099	L-Glutamate 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1100	L-Glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Products

Table 695: Properties of each product.

Id	Name	SBO
s_1100	L-Glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{173} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1099}] \cdot [s_{1336}] - \frac{[s_{1100}] \cdot [s_{1335}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m1099} \cdot K_{m1336}} \\ \frac{\left(1 + \frac{[s_{1099}]}{K_{m1099}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1100}]}{K_{m1100}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{(347)}$$

Table 696: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.674	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1099		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1100		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

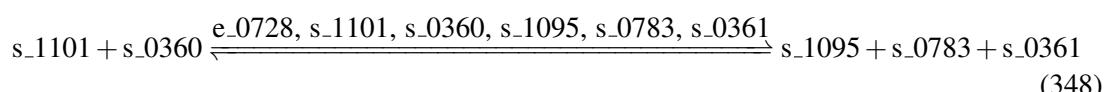
6.174 Reaction r_0682

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name glutamine phosphoribosylidiphosphate amidotransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 697: Properties of each reactant.

Id	Name	SBO
s_{_1101}	L-Glutamine	
s_{_0360}	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 698: Properties of each modifier.

Id	Name	SBO
e_{_0728}	purF	0000460
s_{_1101}	L-Glutamine	
s_{_0360}	5-Phospho-alpha-D-ribose 1-diphosphate	
s_{_1095}	L-Glutamate	
s_{_0783}	Diphosphate	
s_{_0361}	5-Phospho-beta-D-ribosylamine	

Products

Table 699: Properties of each product.

Id	Name	SBO
s_{_1095}	L-Glutamate	
s_{_0783}	Diphosphate	
s_{_0361}	5-Phospho-beta-D-ribosylamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{174} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1101}] \cdot [s_{0360}] - \frac{[s_{1095}] \cdot [s_{0783}] \cdot [s_{0361}]}{K_{eq}} \right)}{K_{m1101} \cdot K_{m0360}} \\ \frac{\left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{0360}]}{K_{m0360}} \right) + \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) \cdot \left(1 + \frac{[s_{0361}]}{K_{m0361}} \right) - 1}{(349)}$$

Table 700: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.351	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0360		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1095		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0361		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

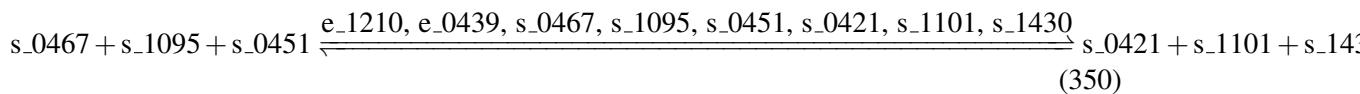
6.175 Reaction r_0683

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name glutamine synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 701: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1095	L-Glutamate	

Id	Name	SBO
s_0451	Ammonium	

Modifiers

Table 702: Properties of each modifier.

Id	Name	SBO
e_1210	glnA	0000460
e_0439	puuA	0000460
s_0467	ATP	
s_1095	L-Glutamate	
s_0451	Ammonium	
s_0421	ADP	
s_1101	L-Glutamine	
s_1430	Phosphate	

Products

Table 703: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1101	L-Glutamine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{175} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_1095] \cdot [s_0451] - \frac{[s_0421] \cdot [s_1101] \cdot [s_1430]}{K_{eq}} \right)}{Km0467 \cdot Km1095 \cdot Km0451} \\ = \frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_1095]}{Km1095} \right) \cdot \left(1 + \frac{[s_0451]}{Km0451} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_1101]}{Km1101} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_1095]}{Km1095} \right) \cdot \left(1 + \frac{[s_0451]}{Km0451} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_1101]}{Km1101} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1} \quad (351)$$

Table 704: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.249	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	7.484	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0451		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1101		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

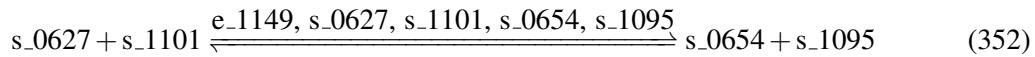
6.176 Reaction r_0684

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glutamine-fructose-6-phosphate transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 705: Properties of each reactant.

Id	Name	SBO
s_{_0627}	D-Fructose 6-phosphate	
s_{_1101}	L-Glutamine	

Modifiers

Table 706: Properties of each modifier.

Id	Name	SBO
e_{_1149}	glmS	0000460
s_{_0627}	D-Fructose 6-phosphate	
s_{_1101}	L-Glutamine	
s_{_0654}	D-Glucosamine 6-phosphate	
s_{_1095}	L-Glutamate	

Products

Table 707: Properties of each product.

Id	Name	SBO
s_0654	D-Glucosamine 6-phosphate	
s_1095	L-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{176} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0627}] \cdot [s_{1101}] - \frac{[s_{0654}] \cdot [s_{1095}]}{K_{eq}} \right)}{K_{m0627} \cdot K_{m1101}} \quad (353)$$

$$\frac{\left(1 + \frac{[s_{0627}]}{K_{m0627}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) + \left(1 + \frac{[s_{0654}]}{K_{m0654}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) - 1}{\left(1 + \frac{[s_{0627}]}{K_{m0627}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) + \left(1 + \frac{[s_{0654}]}{K_{m0654}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) - 1} - 1$$

Table 708: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.183	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0627		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0654		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1095		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

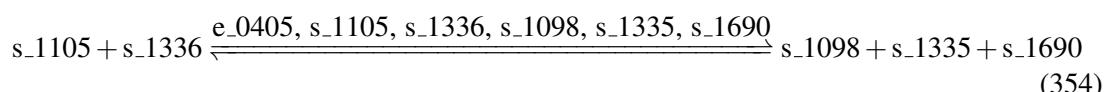
6.177 Reaction r_0686

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name glutamyl-tRNA reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 709: Properties of each reactant.

Id	Name	SBO
s_1105	L-Glutamyl-tRNA(Glu)	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 710: Properties of each modifier.

Id	Name	SBO
e_0405	hemA	0000460
s_1105	L-Glutamyl-tRNA(Glu)	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1098	L-Glutamate 1-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1690	tRNA (Glu)	

Products

Table 711: Properties of each product.

Id	Name	SBO
s_1098	L-Glutamate 1-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1690	tRNA (Glu)	

Kinetic Law

Derived unit contains undeclared units

$$v_{177} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1105}] \cdot [s_{1336}] - \frac{[s_{1098}] \cdot [s_{1335}] \cdot [s_{1690}]}{K_{eq}} \right)}{K_m1105 \cdot K_m1336} \\ \left(1 + \frac{[s_{1105}]}{K_m1105} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_m1336} \right) + \left(1 + \frac{[s_{1098}]}{K_m1098} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_m1335} \right) \cdot \left(1 + \frac{[s_{1690}]}{K_m1690} \right) - 1 \quad (355)$$

Table 712: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.94227707563336 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.011	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1105		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1098		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1690		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

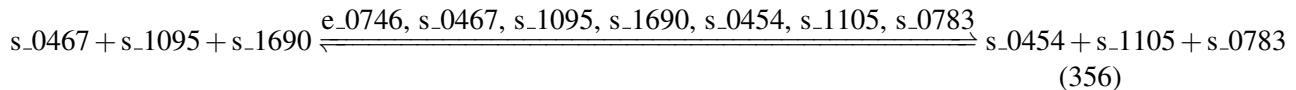
6.178 Reaction r_0687

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name Glutamyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 713: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1095	L-Glutamate	
s_1690	tRNA (Glu)	

Modifiers

Table 714: Properties of each modifier.

Id	Name	SBO
e_0746	gltX	0000460
s_0467	ATP	
s_1095	L-Glutamate	
s_1690	tRNA (Glu)	
s_0454	AMP	

Id	Name	SBO
s_1105	L-Glutamyl-tRNA(Glu)	
s_0783	Diphosphate	

Products

Table 715: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1105	L-Glutamyl-tRNA(Glu)	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{178} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{0467}] \cdot [s_{1095}] \cdot [s_{1690}] - \frac{[s_{0454}] \cdot [s_{1105}] \cdot [s_{0783}]}{K_{eq}} \right)}{(1 + \frac{[s_{0467}]}{Km0467}) \cdot (1 + \frac{[s_{1095}]}{Km1095}) \cdot (1 + \frac{[s_{1690}]}{Km1690}) + (1 + \frac{[s_{0454}]}{Km0454}) \cdot (1 + \frac{[s_{1105}]}{Km1105}) \cdot (1 + \frac{[s_{0783}]}{Km0783}) - 1} \quad (357)$$

Table 716: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			4.94227707563336 · 10 ⁻⁴	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.015	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1690		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1105		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

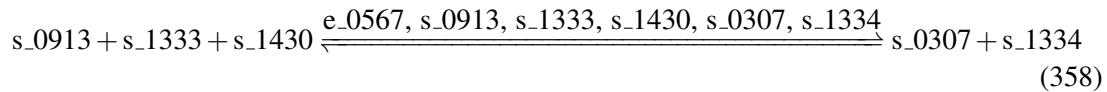
6.179 Reaction r_0695

This is a reversible reaction of three reactants forming two products influenced by six modifiers.

Name glyceraldehyde-3-phosphate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 717: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_1430	Phosphate	

Modifiers

Table 718: Properties of each modifier.

Id	Name	SBO
e_0567	gapA	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_1430	Phosphate	
s_0307	3-Phospho-D-glyceroyl phosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 719: Properties of each product.

Id	Name	SBO
s_0307	3-Phospho-D-glyceroyl phosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{179} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0913}] \cdot [s_{1333}] \cdot [s_{1430}] - \frac{[s_{0307}] \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m0913} \cdot K_{m1333} \cdot K_{m1430}} \\ \frac{\left(1 + \frac{[s_{0913}]}{K_{m0913}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) + \left(1 + \frac{[s_{0307}]}{K_{m0307}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}{(359)}$$

Table 720: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.788	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	17.332	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	20.000	mmol ⁻¹ ·l	<input checked="" type="checkbox"/>
Km0913		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0307		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

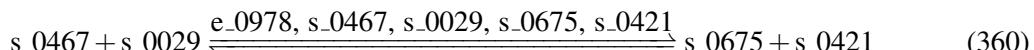
6.180 Reaction r_0697

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycerate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 721: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0029	(R)-Glycerate	

Modifiers

Table 722: Properties of each modifier.

Id	Name	SBO
e_0978	garK	0000460
s_0467	ATP	
s_0029	(R)-Glycerate	
s_0675	D-Glycerate 2-phosphate	
s_0421	ADP	

Products

Table 723: Properties of each product.

Id	Name	SBO
s_0675	D-Glycerate 2-phosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{180} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0029] - \frac{[s_0675] \cdot [s_0421]}{K_{eq}} \right)}{Km0467 \cdot Km0029} \quad (361)$$

$$\frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0029]}{Km0029} \right) + \left(1 + \frac{[s_0675]}{Km0675} \right) \cdot \left(1 + \frac{[s_0421]}{Km0421} \right) - 1}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0029]}{Km0029} \right) + \left(1 + \frac{[s_0675]}{Km0675} \right) \cdot \left(1 + \frac{[s_0421]}{Km0421} \right) - 1} - 1$$

Table 724: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338475844011 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$6.48673866181615 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0029		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0675		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

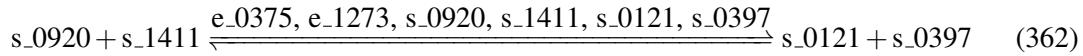
6.181 Reaction r_0706

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name glycerol-3-phosphate acyltransferase (C16:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 725: Properties of each reactant.

Id	Name	SBO
s_0920	Glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	

Modifiers

Table 726: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_1273	plsB	0000460
s_0920	Glycerol 3-phosphate	
s_1411	Palmitoyl-ACP (n-C16:0ACP)	
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Products

Table 727: Properties of each product.

Id	Name	SBO
s_0121	1-hexadecanoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{181} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0920}] \cdot [s_{1411}] - \frac{[s_{0121}] \cdot [s_{0397}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{0920}]}{K_{m0920}} \right) \cdot \left(1 + \frac{[s_{1411}]}{K_{m1411}} \right) + \left(1 + \frac{[s_{0121}]}{K_{m0121}} \right) \cdot \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) - 1} \quad (363)$$

Table 728: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.124	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0920		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1411		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0121		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0397		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

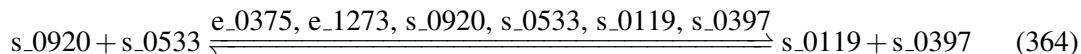
6.182 Reaction r_0707

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name glycerol-3-phosphate acyltransferase (C16:1)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 729: Properties of each reactant.

Id	Name	SBO
s_0920	Glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	

Modifiers

Table 730: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_1273	plsB	0000460
s_0920	Glycerol 3-phosphate	
s_0533	cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)	
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Products

Table 731: Properties of each product.

Id	Name	SBO
s_0119	1-hexadec-9-enoyl-sn-glycerol 3-phosphate	
s_0397	acyl carrier protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{182} = \frac{\text{vol(cell)} \cdot V_{\text{max}} \cdot \left([s_{0920}] \cdot [s_{0533}] - \frac{[s_{0119}] \cdot [s_{0397}]}{K_{\text{eq}}} \right)}{K_{m0920} \cdot K_{m0533}} \quad (365)$$

$$\left(1 + \frac{[s_{0920}]}{K_{m0920}} \right) \cdot \left(1 + \frac{[s_{0533}]}{K_{m0533}} \right) + \left(1 + \frac{[s_{0119}]}{K_{m0119}} \right) \cdot \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) - 1$$

Table 732: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.146	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0920		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0533		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0119		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0397		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

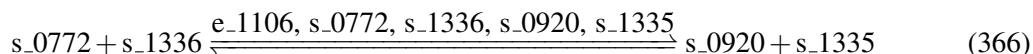
6.183 Reaction r_0712

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycerol-3-phosphate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 733: Properties of each reactant.

Id	Name	SBO
s_0772	Dihydroxyacetone phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 734: Properties of each modifier.

Id	Name	SBO
e_1106	gpsA	0000460
s_0772	Dihydroxyacetone phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0920	Glycerol 3-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 735: Properties of each product.

Id	Name	SBO
s_0920	Glycerol 3-phosphate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{183} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0772}] \cdot [s_{1336}] - \frac{[s_{0920}] \cdot [s_{1335}]}{K_{eq}} \right)}{K_{m0772} \cdot K_{m1336}} \quad (367)$$

$$\frac{\left(1 + \frac{[s_{0772}]}{K_{m0772}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{0920}]}{K_{m0920}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1}{}$$

Table 736: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.019	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.270	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0772		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0920		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

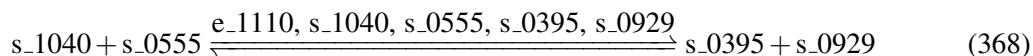
6.184 Reaction r_0724

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycine C-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 737: Properties of each reactant.

Id	Name	SBO
s_{_1040}	L-2-Amino-3-oxobutanoate	
s_{_0555}	Coenzyme A	

Modifiers

Table 738: Properties of each modifier.

Id	Name	SBO
e_{_1110}	tbl	0000460
s_{_1040}	L-2-Amino-3-oxobutanoate	
s_{_0555}	Coenzyme A	
s_{_0395}	Acetyl-CoA	
s_{_0929}	Glycine	

Products

Table 739: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0929	Glycine	

Kinetic Law

Derived unit contains undeclared units

$$v_{184} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1040}] \cdot [s_{0555}] - \frac{[s_{0395}] \cdot [s_{0929}]}{K_{eq}} \right)}{K_{m1040} \cdot K_{m0555}} \quad (369)$$

$$\frac{\left(1 + \frac{[s_{1040}]}{K_{m1040}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) + \left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0929}]}{K_{m0929}} \right) - 1}{\left(1 + \frac{[s_{1040}]}{K_{m1040}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) + \left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0929}]}{K_{m0929}} \right) - 1}$$

Table 740: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.580	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1040		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0395		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0929		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

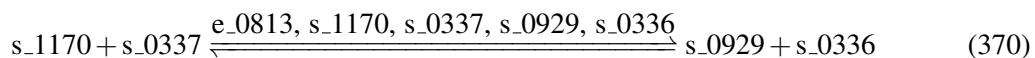
6.185 Reaction r_0726

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name glycine hydroxymethyltransferase, reversible

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 741: Properties of each reactant.

Id	Name	SBO
s_1170	L-Serine	
s_0337	5,6,7,8-Tetrahydrofolate	

Modifiers

Table 742: Properties of each modifier.

Id	Name	SBO
e_0813	glyA	0000460
s_1170	L-Serine	
s_0337	5,6,7,8-Tetrahydrofolate	
s_0929	Glycine	
s_0336	5,10-Methylenetetrahydrofolate	

Products

Table 743: Properties of each product.

Id	Name	SBO
s_0929	Glycine	
s_0336	5,10-Methylenetetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{185} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1170}] \cdot [s_{0337}] - \frac{[s_{0929}] \cdot [s_{0336}]}{K_{eq}} \right)}{K_{m1170} \cdot K_{m0337}} \quad (371)$$

$$\frac{\left(1 + \frac{[s_{1170}]}{K_{m1170}} \right) \cdot \left(1 + \frac{[s_{0337}]}{K_{m0337}} \right) + \left(1 + \frac{[s_{0929}]}{K_{m0929}} \right) \cdot \left(1 + \frac{[s_{0336}]}{K_{m0336}} \right) - 1}{}$$

Table 744: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.063	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.888	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1170		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0337		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0929		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0336		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

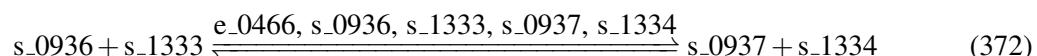
6.186 Reaction r_0731

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Glycolaldehyde dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 745: Properties of each reactant.

Id	Name	SBO
s_0936	Glycolaldehyde	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 746: Properties of each modifier.

Id	Name	SBO
e_0466	aldA	0000460
s_0936	Glycolaldehyde	
s_1333	Nicotinamide adenine dinucleotide	
s_0937	Glycolate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 747: Properties of each product.

Id	Name	SBO
s_0937	Glycolate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{186} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0936}] \cdot [s_{1333}] - \frac{[s_{0937}] \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m0936} \cdot K_{m1333}} \quad (373)$$

$$= \frac{\left(1 + \frac{[s_{0936}]}{K_{m0936}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{0937}]}{K_{m0937}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}{\left(1 + \frac{[s_{0936}]}{K_{m0936}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{0937}]}{K_{m0937}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}$$

Table 748: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			9.26676951688061 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0936}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1333}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0937}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1334}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

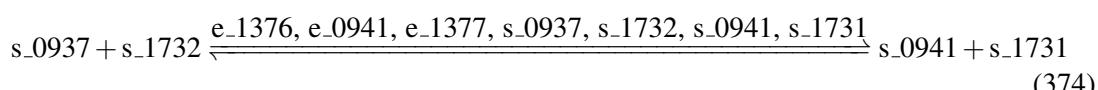
6.187 Reaction r_0734

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name Glycolate oxidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 749: Properties of each reactant.

Id	Name	SBO
s_0937	Glycolate	
s_1732	Ubiquinone-8	

Modifiers

Table 750: Properties of each modifier.

Id	Name	SBO
e_1376	glcF	0000460
e_0941	glcD	0000460
e_1377	glcE	0000460
s_0937	Glycolate	
s_1732	Ubiquinone-8	
s_0941	Glyoxylate	
s_1731	Ubiquinol-8	

Products

Table 751: Properties of each product.

Id	Name	SBO
s_0941	Glyoxylate	
s_1731	Ubiquinol-8	

Kinetic Law

Derived unit contains undeclared units

$$v_{187} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0937] \cdot [s_1732] - \frac{[s_0941] \cdot [s_1731]}{K_{eq}} \right)}{Km0937 \cdot Km1732} \quad (375)$$

$$v_{187} = \frac{\left(1 + \frac{[s_0937]}{Km0937} \right) \cdot \left(1 + \frac{[s_1732]}{Km1732} \right) + \left(1 + \frac{[s_0941]}{Km0941} \right) \cdot \left(1 + \frac{[s_1731]}{Km1731} \right) - 1}{\left(1 + \frac{[s_0937]}{Km0937} \right) \cdot \left(1 + \frac{[s_1732]}{Km1732} \right) + \left(1 + \frac{[s_0941]}{Km0941} \right) \cdot \left(1 + \frac{[s_1731]}{Km1731} \right) - 1} \quad (375)$$

Table 752: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338477495988 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$6.48673868494383 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0937		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1732		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0941		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1731		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

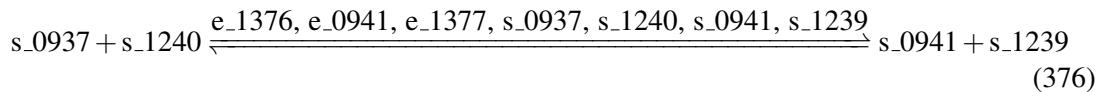
6.188 Reaction r_0735

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name Glycolate oxidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 753: Properties of each reactant.

Id	Name	SBO
s_0937	Glycolate	
s_1240	Menaquinone 8	

Modifiers

Table 754: Properties of each modifier.

Id	Name	SBO
e_1376	glcF	0000460
e_0941	glcD	0000460
e_1377	glcE	0000460
s_0937	Glycolate	
s_1240	Menaquinone 8	
s_0941	Glyoxylate	
s_1239	Menaquinol 8	

Products

Table 755: Properties of each product.

Id	Name	SBO
s_0941	Glyoxylate	
s_1239	Menaquinol 8	

Kinetic Law

Derived unit contains undeclared units

$$v_{188} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0937}] \cdot [s_{1240}] - \frac{[s_{0941}] \cdot [s_{1239}]}{K_{eq}} \right)}{K_m0937 \cdot K_m1240} \quad (377)$$

$$\frac{\left(1 + \frac{[s_{0937}]}{K_m0937} \right) \cdot \left(1 + \frac{[s_{1240}]}{K_m1240} \right) + \left(1 + \frac{[s_{0941}]}{K_m0941} \right) \cdot \left(1 + \frac{[s_{1239}]}{K_m1239} \right) - 1}{\left(1 + \frac{[s_{0937}]}{K_m0937} \right) \cdot \left(1 + \frac{[s_{1240}]}{K_m1240} \right) + \left(1 + \frac{[s_{0941}]}{K_m0941} \right) \cdot \left(1 + \frac{[s_{1239}]}{K_m1239} \right) - 1}$$

Table 756: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338474145563 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$6.48673863803788 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0937}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1240}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0941}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1239}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

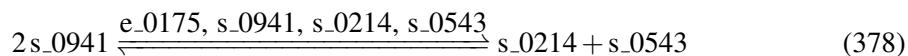
6.189 Reaction r_0739

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name glyoxalate carboligase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 757: Properties of each reactant.

Id	Name	SBO
s_0941	Glyoxylate	

Modifiers

Table 758: Properties of each modifier.

Id	Name	SBO
e_0175	gcl	0000460
s_0941	Glyoxylate	
s_0214	2-Hydroxy-3-oxopropanoate	
s_0543	CO2	

Products

Table 759: Properties of each product.

Id	Name	SBO
s_0214	2-Hydroxy-3-oxopropanoate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{189} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0941]^2 - \frac{[s_0214] \cdot [s_0543]}{K_{eq}} \right)}{\left(1 + \frac{[s_0941]}{Km0941} \right)^2 + \left(1 + \frac{[s_0214]}{Km0214} \right) \cdot \left(1 + \frac{[s_0543]}{Km0543} \right) - 1} \quad (379)$$

Table 760: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338475820775 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$6.48673866149085 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0941		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0214		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

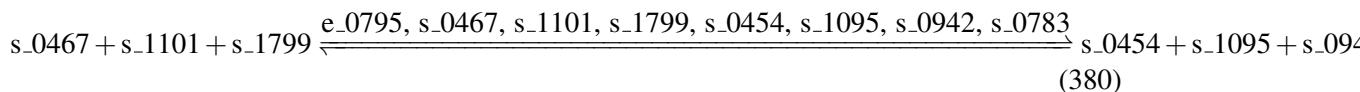
6.190 Reaction r_0741

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name GMP synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 761: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1101	L-Glutamine	
s_1799	Xanthosine 5'-phosphate	

Modifiers

Table 762: Properties of each modifier.

Id	Name	SBO
e_0795	guaA	0000460
s_0467	ATP	
s_1101	L-Glutamine	
s_1799	Xanthosine 5'-phosphate	
s_0454	AMP	
s_1095	L-Glutamate	
s_0942	GMP	
s_0783	Diphosphate	

Products

Table 763: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1095	L-Glutamate	
s_0942	GMP	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

v_{190}

(381)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1101}] \cdot [s_{1799}] - \frac{[s_{0454}] \cdot [s_{1095}] \cdot [s_{0942}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m1101} \cdot K_{m1799}} \\ = \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{1799}]}{K_{m1799}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{0942}]}{K_{m0942}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) -$$

Table 764: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	1.553	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1101}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1799}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0454}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1095}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0942}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

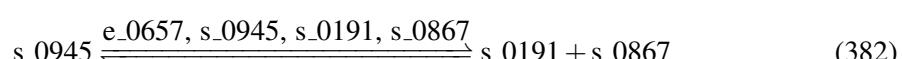
6.191 Reaction r_0744

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name GTP cyclohydrolase I

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 765: Properties of each reactant.

Id	Name	SBO
s_0945	GTP	

Modifiers

Table 766: Properties of each modifier.

Id	Name	SBO
e_0657	foLE	0000460
s_0945	GTP	
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	
s_0867	Formate	

Products

Table 767: Properties of each product.

Id	Name	SBO
s_0191	2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate	
s_0867	Formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{191} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0945] - \frac{[s_0191] \cdot [s_0867]}{K_{eq}} \right)}{1 + \frac{[s_0945]}{Km0945} + \left(1 + \frac{[s_0191]}{Km0191} \right) \cdot \left(1 + \frac{[s_0867]}{Km0867} \right) - 1} \quad (383)$$

Table 768: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0945		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0191		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0867		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

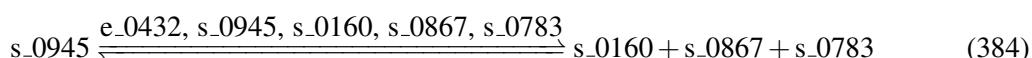
6.192 Reaction r_0745

This is a reversible reaction of one reactant forming three products influenced by five modifiers.

Name GTP cyclohydrolase II (25drapp)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 769: Properties of each reactant.

Id	Name	SBO
s_0945	GTP	

Modifiers

Table 770: Properties of each modifier.

Id	Name	SBO
e_0432	ribA	0000460
s_0945	GTP	
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	
s_0867	Formate	
s_0783	Diphosphate	

Products

Table 771: Properties of each product.

Id	Name	SBO
s_0160	2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate	
s_0867	Formate	

Id	Name	SBO
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{192} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0945}] - \frac{[s_{0160}] \cdot [s_{0867}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0945}} \quad (385)$$

$$1 + \frac{[s_{0945}]}{K_{m0945}} + \left(1 + \frac{[s_{0160}]}{K_{m0160}} \right) \cdot \left(1 + \frac{[s_{0867}]}{K_{m0867}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1$$

Table 772: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	<input checked="" type="checkbox"/>
K _{m0945}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0160}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0867}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

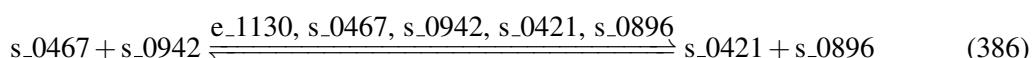
6.193 Reaction r_0754

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name guanylate kinase (GMP:ATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 773: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0942	GMP	

Modifiers

Table 774: Properties of each modifier.

Id	Name	SBO
e_1130	gmk	0000460
s_0467	ATP	
s_0942	GMP	
s_0421	ADP	
s_0896	GDP	

Products

Table 775: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0896	GDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{193} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0942] - \frac{[s_0421] \cdot [s_0896]}{K_{eq}} \right)}{Km0467 \cdot Km0942} \quad (387)$$

$$\frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0942]}{Km0942} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_0896]}{Km0896} \right) - 1}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0942]}{Km0942} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_0896]}{Km0896} \right) - 1}$$

Table 776: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.473	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0942		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0896		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

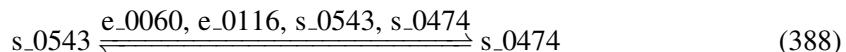
6.194 Reaction r_0755

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name HCO3 equilibration reaction

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 777: Properties of each reactant.

Id	Name	SBO
s_{.0543}	CO2	

Modifiers

Table 778: Properties of each modifier.

Id	Name	SBO
e_{.0060}	can	0000460
e_{.0116}	cynT	0000460
s_{.0543}	CO2	
s_{.0474}	Bicarbonate	

Product

Table 779: Properties of each product.

Id	Name	SBO
s_{.0474}	Bicarbonate	

Kinetic Law

Derived unit contains undeclared units

$$v_{194} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{.0543}] - \frac{[s_{.0474}]}{K_{eq}} \right)}{1 + \frac{[s_{.0543}]}{K_{m0543}} + 1 + \frac{[s_{.0474}]}{K_{m0474}} - 1} \quad (389)$$

Table 780: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.072	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.433	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0543		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0474		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

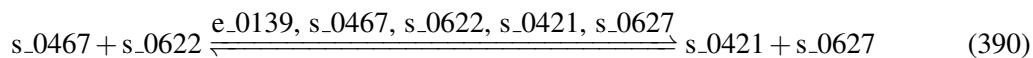
6.195 Reaction r_0761

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name hexokinase (D-fructose:ATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 781: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0622	D-Fructose	

Modifiers

Table 782: Properties of each modifier.

Id	Name	SBO
e_0139	mak	0000460
s_0467	ATP	
s_0622	D-Fructose	
s_0421	ADP	
s_0627	D-Fructose 6-phosphate	

Products

Table 783: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0627	D-Fructose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{195} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0622}] - \frac{[s_{0421}] \cdot [s_{0627}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0622}} \quad (391)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0622}]}{K_{m0622}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0627}]}{K_{m0627}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0622}]}{K_{m0622}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0627}]}{K_{m0627}} \right) - 1}$$

Table 784: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.055	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.763	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0622		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0627		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

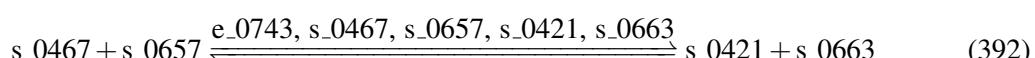
6.196 Reaction r_0762

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name hexokinase (D-glucose:ATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 785: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0657	D-Glucose	

Modifiers

Table 786: Properties of each modifier.

Id	Name	SBO
e_0743	glk	0000460
s_0467	ATP	
s_0657	D-Glucose	
s_0421	ADP	
s_0663	D-Glucose 6-phosphate	

Products

Table 787: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0663	D-Glucose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{196} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0657] - \frac{[s_0421] \cdot [s_0663]}{K_{eq}} \right)}{Km0467 \cdot Km0657} \quad (393)$$

$$\frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0657]}{Km0657} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_0663]}{Km0663} \right) - 1}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0657]}{Km0657} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_0663]}{Km0663} \right) - 1}$$

Table 788: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.912	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	12.771	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0657		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0663		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

6.197 Reaction r_0763

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name histidinol dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 789: Properties of each reactant.

Id	Name	SBO
s_{-1109}	L-Histidinol	
s_{-1333}	Nicotinamide adenine dinucleotide	

Modifiers

Table 790: Properties of each modifier.

Id	Name	SBO
e_{-0606}	hisD	0000460
s_{-1109}	L-Histidinol	
s_{-1333}	Nicotinamide adenine dinucleotide	
s_{-1106}	L-Histidine	
s_{-1334}	Nicotinamide adenine dinucleotide - reduced	

Products

Table 791: Properties of each product.

Id	Name	SBO
s_1106	L-Histidine	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{197} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1109}] \cdot [s_{1333}]^2 - \frac{[s_{1106}] \cdot [s_{1334}]^2}{K_{eq}} \right)}{K_{m1109} \cdot K_{m1333}^2} \quad (395)$$

$$\frac{\left(1 + \frac{[s_{1109}]}{K_{m1109}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right)^2 + \left(1 + \frac{[s_{1106}]}{K_{m1106}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right)^2 - 1}{\left(1 + \frac{[s_{1109}]}{K_{m1109}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right)^2 + \left(1 + \frac{[s_{1106}]}{K_{m1106}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right)^2 - 1}$$

Table 792: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.394	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1109		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1106		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

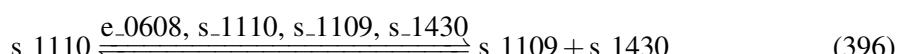
6.198 Reaction r_0764

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name histidinol-phosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 793: Properties of each reactant.

Id	Name	SBO
s_1110	L-Histidinol phosphate	

Modifiers

Table 794: Properties of each modifier.

Id	Name	SBO
e_0608	hisB	0000460
s_1110	L-Histidinol phosphate	
s_1109	L-Histidinol	
s_1430	Phosphate	

Products

Table 795: Properties of each product.

Id	Name	SBO
s_1109	L-Histidinol	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{198} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1110}] - \frac{[s_{1109}] \cdot [s_{1430}]}{K_{eq}} \right)}{1 + \frac{[s_{1110}]}{K_{m1110}} + \left(1 + \frac{[s_{1109}]}{K_{m1109}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1} \quad (397)$$

Table 796: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.131	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1110}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1109}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

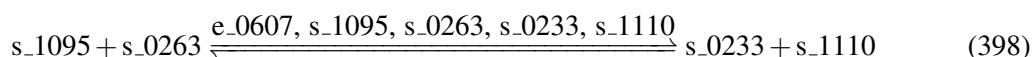
6.199 Reaction r_0765

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name histidinol-phosphate transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 797: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	

Modifiers

Table 798: Properties of each modifier.

Id	Name	SBO
e_0607	hisC	0000460
s_1095	L-Glutamate	
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	
s_0233	2-Oxoglutarate	
s_1110	L-Histidinol phosphate	

Products

Table 799: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1110	L-Histidinol phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{199} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1095}] \cdot [s_{0263}] - \frac{[s_{0233}] \cdot [s_{1110}]}{K_{eq}} \right)}{K_{m1095} \cdot K_{m0263}} \quad (399)$$

$$\frac{\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{0263}]}{K_{m0263}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1110}]}{K_{m1110}} \right) - 1}{\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{0263}]}{K_{m0263}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1110}]}{K_{m1110}} \right) - 1}$$

Table 800: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.184	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0263		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1110		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

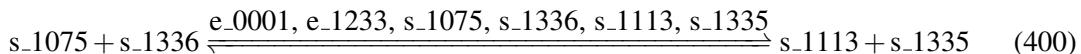
6.200 Reaction r_0769

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name homoserine dehydrogenase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 801: Properties of each reactant.

Id	Name	SBO
s_1075	L-Aspartate 4-semialdehyde	
s_1336	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 802: Properties of each modifier.

Id	Name	SBO
e_0001	thrA	0000460

Id	Name	SBO
e_1233	metL	0000460
s_1075	L-Aspartate 4-semialdehyde	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1113	L-Homoserine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 803: Properties of each product.

Id	Name	SBO
s_1113	L-Homoserine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{200} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1075}] \cdot [s_{1336}] - \frac{[s_{1113}] \cdot [s_{1335}]}{K_{eq}} \right)}{(1 + \frac{[s_{1075}]}{K_{m1075}}) \cdot (1 + \frac{[s_{1336}]}{K_{m1336}}) + (1 + \frac{[s_{1113}]}{K_{m1113}}) \cdot (1 + \frac{[s_{1335}]}{K_{m1335}}) - 1} \quad (401)$$

Table 804: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.180	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	2.514	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1075}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1336}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1113}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1335}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

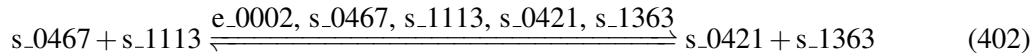
6.201 Reaction r_0770

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name homoserine kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 805: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1113	L-Homoserine	

Modifiers

Table 806: Properties of each modifier.

Id	Name	SBO
e_0002	thrB	0000460
s_0467	ATP	
s_1113	L-Homoserine	
s_0421	ADP	
s_1363	O-Phospho-L-homoserine	

Products

Table 807: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1363	O-Phospho-L-homoserine	

Kinetic Law

Derived unit contains undeclared units

$$v_{201} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1113}] - \frac{[s_{0421}] \cdot [s_{1363}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{0467}]}{Km0467} \right) \cdot \left(1 + \frac{[s_{1113}]}{Km1113} \right) + \left(1 + \frac{[s_{0421}]}{Km0421} \right) \cdot \left(1 + \frac{[s_{1363}]}{Km1363} \right) - 1} \quad (403)$$

Table 808: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.158	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	2.215	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1113		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1363		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

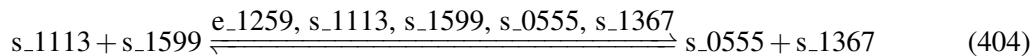
6.202 Reaction r_0771

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name homoserine O-succinyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 809: Properties of each reactant.

Id	Name	SBO
s_{.1113}	L-Homoserine	
s_{.1599}	Succinyl-CoA	

Modifiers

Table 810: Properties of each modifier.

Id	Name	SBO
e_{.1259}	metA	0000460
s_{.1113}	L-Homoserine	
s_{.1599}	Succinyl-CoA	
s_{.0555}	Coenzyme A	
s_{.1367}	O-Succinyl-L-homoserine	

Products

Table 811: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_1367	O-Succinyl-L-homoserine	

Kinetic Law

Derived unit contains undeclared units

$$v_{202} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1113}] \cdot [s_{1599}] - \frac{[s_{0555}] \cdot [s_{1367}]}{K_{eq}} \right)}{K_m1113 \cdot K_m1599} \quad (405)$$

$$\frac{\left(1 + \frac{[s_{1113}]}{K_m1113} \right) \cdot \left(1 + \frac{[s_{1599}]}{K_m1599} \right) + \left(1 + \frac{[s_{0555}]}{K_m0555} \right) \cdot \left(1 + \frac{[s_{1367}]}{K_m1367} \right) - 1}{\left(1 + \frac{[s_{1113}]}{K_m1113} \right) \cdot \left(1 + \frac{[s_{1599}]}{K_m1599} \right) + \left(1 + \frac{[s_{0555}]}{K_m0555} \right) \cdot \left(1 + \frac{[s_{1367}]}{K_m1367} \right) - 1}$$

Table 812: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.298	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1113		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1599		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1367		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

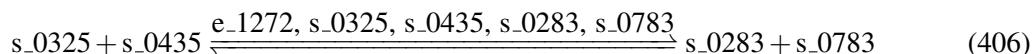
6.203 Reaction r_0775

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Hydroxybenzoate octaprenyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 813: Properties of each reactant.

Id	Name	SBO
s_0325	4-Hydroxybenzoate	
s_0435	all-trans-Octaprenyl diphosphate	

Modifiers

Table 814: Properties of each modifier.

Id	Name	SBO
e_1272	ubiA	0000460
s_0325	4-Hydroxybenzoate	
s_0435	all-trans-Octaprenyl diphosphate	
s_0283	3-Octaprenyl-4-hydroxybenzoate	
s_0783	Diphosphate	

Products

Table 815: Properties of each product.

Id	Name	SBO
s_0283	3-Octaprenyl-4-hydroxybenzoate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{203} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0325}] \cdot [s_{0435}] - \frac{[s_{0283}] \cdot [s_{0783}]}{K_{eq}} \right)}{Km0325 \cdot Km0435} \quad (407)$$

$$\frac{\left(1 + \frac{[s_{0325}]}{Km0325} \right) \cdot \left(1 + \frac{[s_{0435}]}{Km0435} \right) + \left(1 + \frac{[s_{0283}]}{Km0283} \right) \cdot \left(1 + \frac{[s_{0783}]}{Km0783} \right) - 1}{\left(1 + \frac{[s_{0325}]}{Km0325} \right) \cdot \left(1 + \frac{[s_{0435}]}{Km0435} \right) + \left(1 + \frac{[s_{0283}]}{Km0283} \right) \cdot \left(1 + \frac{[s_{0783}]}{Km0783} \right) - 1}$$

Table 816: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0325		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0435		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0283		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

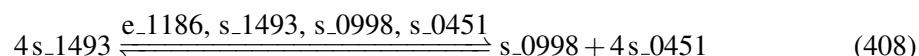
6.204 Reaction r_0777

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name hydroxymethylbilane synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 817: Properties of each reactant.

Id	Name	SBO
s_{-1493}	Porphobilinogen	

Modifiers

Table 818: Properties of each modifier.

Id	Name	SBO
e_{-1186}	hemC	0000460
s_{-1493}	Porphobilinogen	
s_{-0998}	Hydroxymethylbilane	
s_{-0451}	Ammonium	

Products

Table 819: Properties of each product.

Id	Name	SBO
s_{-0998}	Hydroxymethylbilane	
s_{-0451}	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{204} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1493}]^4 - \frac{[s_{0998}] \cdot [s_{0451}]^4}{K_{eq}} \right)}{K_{m1493}^4} \quad (409)$$

$$\frac{1}{\left(1 + \frac{[s_{1493}]}{K_{m1493}} \right)^4} + \left(1 + \frac{[s_{0998}]}{K_{m0998}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right)^4 - 1$$

Table 820: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			6.1778463445417 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.006	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1493}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0998}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0451}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

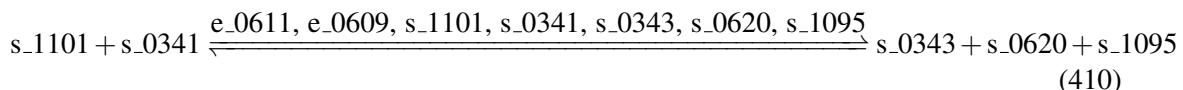
6.205 Reaction r_0784

This is a reversible reaction of two reactants forming three products influenced by seven modifiers.

Name Imidazole-glycerol-3-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 821: Properties of each reactant.

Id	Name
s_1101	L-Glutamine
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxylic acid

Modifiers

Table 822: Properties of each modifier.

Id	Name
e_0611	hisF
e_0609	hisH
s_1101	L-Glutamine
s_0341	5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxamide
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate
s_1095	L-Glutamate

Products

Table 823: Properties of each product.

Id	Name	SBO
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	
s_1095	L-Glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{205} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1101}] \cdot [s_{0341}] - \frac{[s_{0343}] \cdot [s_{0620}] \cdot [s_{1095}]}{K_{eq}} \right)}{K_{m1101} \cdot K_{m0341}} \\ \frac{\left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{0341}]}{K_{m0341}} \right) + \left(1 + \frac{[s_{0343}]}{K_{m0343}} \right) \cdot \left(1 + \frac{[s_{0620}]}{K_{m0620}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) - 1}{(411)}$$

Table 824: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.289	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0341		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0343		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0620		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1095		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

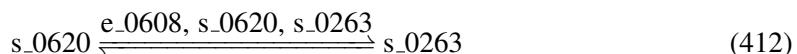
6.206 Reaction r_0785

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name imidazoleglycerol-phosphate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 825: Properties of each reactant.

Id	Name	SBO
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	

Modifiers

Table 826: Properties of each modifier.

Id	Name	SBO
e_0608	hisB	0000460
s_0620	D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate	
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	

Product

Table 827: Properties of each product.

Id	Name	SBO
s_0263	3-(Imidazol-4-yl)-2-oxopropyl phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{206} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0620}] - \frac{[s_{0263}]}{K_{eq}} \right)}{1 + \frac{[s_{0620}]}{K_{m0620}} + 1 + \frac{[s_{0263}]}{K_{m0263}} - 1} \quad (413)$$

Table 828: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.079	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0620		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0263		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

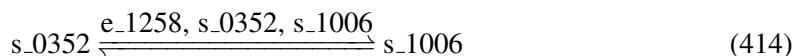
6.207 Reaction r_0786

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name IMP cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 829: Properties of each reactant.

Id	Name	SBO
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	

Modifiers

Table 830: Properties of each modifier.

Id	Name	SBO
e_1258	purH	0000460
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	
s_1006	IMP	

Product

Table 831: Properties of each product.

Id	Name	SBO
s_1006	IMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{207} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0352}] - \frac{[s_{1006}]}{K_{eq}} \right)}{1 + \frac{[s_{0352}]}{K_{m0352}} + 1 + \frac{[s_{1006}]}{K_{m1006}} - 1} \quad (415)$$

Table 832: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.075	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.447	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0352		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1006		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

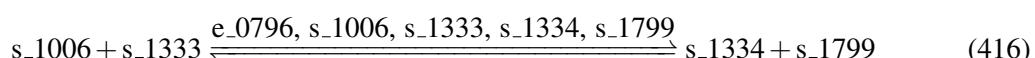
6.208 Reaction r_0787

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name IMP dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 833: Properties of each reactant.

Id	Name	SBO
s_1006	IMP	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 834: Properties of each modifier.

Id	Name	SBO
e_0796	guab	0000460
s_1006	IMP	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1799	Xanthosine 5'-phosphate	

Products

Table 835: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1799	Xanthosine 5'-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{208} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1006}] \cdot [s_{1333}] - \frac{[s_{1334}] \cdot [s_{1799}]}{K_{eq}} \right)}{(1 + \frac{[s_{1006}]}{Km1006}) \cdot (1 + \frac{[s_{1333}]}{Km1333}) + (1 + \frac{[s_{1334}]}{Km1334}) \cdot (1 + \frac{[s_{1799}]}{Km1799}) - 1} \quad (417)$$

Table 836: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.473	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1006		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1799		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

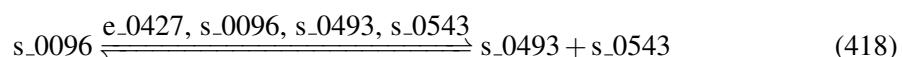
6.209 Reaction r_0788

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name indole-3-glycerol-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 837: Properties of each reactant.

Id	Name	SBO
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Modifiers

Table 838: Properties of each modifier.

Id	Name	SBO
e_0427	trpC	0000460
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	
s_0493	C’-(3-Indolyl)-glycerol 3-phosphate	
s_0543	CO2	

Products

Table 839: Properties of each product.

Id	Name	SBO
s_0493	C’-(3-Indolyl)-glycerol 3-phosphate	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{209} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{.0096}] - \frac{[s_{.0493}] \cdot [s_{.0543}]}{K_{\text{eq}}} \right)}{K_{\text{m0096}}}}{1 + \frac{[s_{.0096}]}{K_{\text{m0096}}} + \left(1 + \frac{[s_{.0493}]}{K_{\text{m0493}}} \right) \cdot \left(1 + \frac{[s_{.0543}]}{K_{\text{m0543}}} \right) - 1} \quad (419)$$

Table 840: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.079	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0096		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0493		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

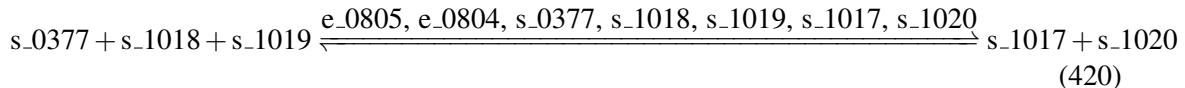
6.210 Reaction r_0796

This is a reversible reaction of three reactants forming two products influenced by seven modifiers.

Name ISC [2Fe-2S] regeneration

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 841: Properties of each reactant.

Id	Name	SBO
s_{.0377}	[2Fe-1S] desulfurated iron-sulfur cluster	
s_{.1018}	IscS with bound sulfur	
s_{.1019}	IscU scaffold protein	

Modifiers

Table 842: Properties of each modifier.

Id	Name	SBO
e_0805	iscS	0000460
e_0804	nifU	0000460
s_0377	[2Fe-1S] desulfurated iron-sulfur cluster	
s_1018	IscS with bound sulfur	
s_1019	IscU scaffold protein	
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Products

Table 843: Properties of each product.

Id	Name	SBO
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Kinetic Law

Derived unit contains undeclared units

$$v_{210} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0377] \cdot [s_1018] \cdot [s_1019] - \frac{[s_1017] \cdot [s_1020]}{K_{eq}} \right)}{K_{m0377} \cdot K_{m1018} \cdot K_{m1019}} \\ \frac{\left(1 + \frac{[s_0377]}{K_{m0377}} \right) \cdot \left(1 + \frac{[s_1018]}{K_{m1018}} \right) \cdot \left(1 + \frac{[s_1019]}{K_{m1019}} \right) + \left(1 + \frac{[s_1017]}{K_{m1017}} \right) \cdot \left(1 + \frac{[s_1020]}{K_{m1020}} \right) - 1}{(421)}$$

Table 844: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467753811 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$6.09473629058384 \cdot 10^{-6}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
K _{m0377}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1018}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1019}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1017}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1020}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

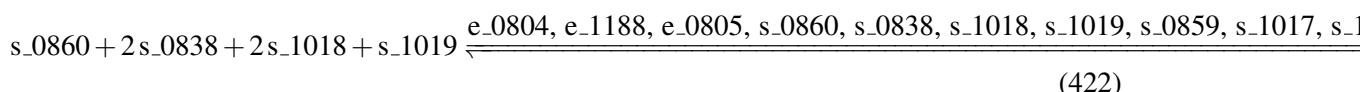
6.211 Reaction r_0797

This is a reversible reaction of four reactants forming three products influenced by ten modifiers.

Name ISC [2Fe-2S] Synthesis

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 845: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1019	IscU scaffold protein	

Modifiers

Table 846: Properties of each modifier.

Id	Name	SBO
e_0804	nifU	0000460
e_1188	cyaY	0000460
e_0805	iscS	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1019	IscU scaffold protein	
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Products

Table 847: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1020	IscU with bound [2Fe-2S] cluster	

Kinetic Law

Derived unit contains undeclared units

v_{211}

$$= \frac{v_{211}}{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0860}] \cdot [s_{0838}]^2 \cdot [s_{1018}]^2 \cdot [s_{1019}] - \frac{[s_{0859}] \cdot [s_{1017}]^2 \cdot [s_{1020}]}{K_{\text{eq}}} }{K_{\text{m0860}} \cdot K_{\text{m0838}}^2 \cdot K_{\text{m1018}}^2 \cdot K_{\text{m1019}}} \right)} \\ = \frac{\left(1 + \frac{[s_{0860}]}{K_{\text{m0860}}}\right) \cdot \left(1 + \frac{[s_{0838}]}{K_{\text{m0838}}}\right)^2 \cdot \left(1 + \frac{[s_{1018}]}{K_{\text{m1018}}}\right)^2 \cdot \left(1 + \frac{[s_{1019}]}{K_{\text{m1019}}}\right) + \left(1 + \frac{[s_{0859}]}{K_{\text{m0859}}}\right) \cdot \left(1 + \frac{[s_{1017}]}{K_{\text{m1017}}}\right)^2 \cdot \left(1 + \frac{[s_{1020}]}{K_{\text{m1020}}}\right)}{1}$$
(423)

Table 848: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.96157859771697 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	200.000	$\text{mmol}^{-2} \cdot \text{l}^2$	<input checked="" type="checkbox"/>
K _{m0860}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0838}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1018}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1019}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0859}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1017}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1020}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

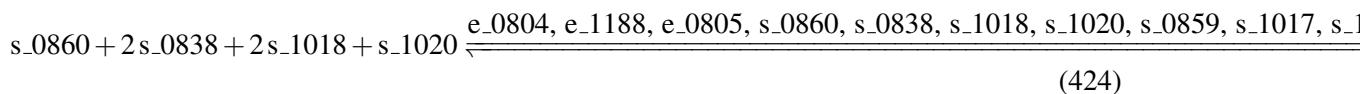
6.212 Reaction r_0798

This is a reversible reaction of four reactants forming three products influenced by ten modifiers.

Name ISC [2Fe-2S] Synthesis II

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 849: Properties of each reactant.

Id	Name	SBO
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1020	IscU with bound [2Fe-2S] cluster	

Modifiers

Table 850: Properties of each modifier.

Id	Name	SBO
e_0804	nifU	0000460
e_1188	cyaY	0000460
e_0805	iscS	0000460
s_0860	Flavin adenine dinucleotide reduced	
s_0838	Fe2+	
s_1018	IscS with bound sulfur	
s_1020	IscU with bound [2Fe-2S] cluster	
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1022	IscU with two bound [2Fe-2S] clusters	

Products

Table 851: Properties of each product.

Id	Name	SBO
s_0859	Flavin adenine dinucleotide oxidized	
s_1017	IscS sulfur acceptor protein	
s_1022	IscU with two bound [2Fe-2S] clusters	

Kinetic Law

Derived unit contains undeclared units

$$v_{212} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0860}] \cdot [s_{0838}]^2 \cdot [s_{1018}]^2 \cdot [s_{1020}] - \frac{[s_{0859}] \cdot [s_{1017}]^2 \cdot [s_{1022}]}{K_{eq}} \right)}{K_{m0860} \cdot K_{m0838}^2 \cdot K_{m1018}^2 \cdot K_{m1020}} \\ = \frac{\left(1 + \frac{[s_{0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{0838}]}{K_{m0838}} \right)^2 \cdot \left(1 + \frac{[s_{1018}]}{K_{m1018}} \right)^2 \cdot \left(1 + \frac{[s_{1020}]}{K_{m1020}} \right) + \left(1 + \frac{[s_{0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{1017}]}{K_{m1017}} \right)^2 \cdot \left(1 + \frac{[s_{1022}]}{K_{m1022}} \right)}{(1 + \frac{[s_{0860}]}{K_{m0860}}) \cdot (1 + \frac{[s_{0838}]}{K_{m0838}})^2 \cdot (1 + \frac{[s_{1018}]}{K_{m1018}})^2 \cdot (1 + \frac{[s_{1020}]}{K_{m1020}}) + (1 + \frac{[s_{0859}]}{K_{m0859}}) \cdot (1 + \frac{[s_{1017}]}{K_{m1017}})^2 \cdot (1 + \frac{[s_{1022}]}{K_{m1022}})}$$
(425)

Table 852: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.60143508877284 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	200.000	$\text{mmol}^{-2} \cdot \text{l}^2$	<input checked="" type="checkbox"/>
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0838		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1018		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1020		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1017		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1022		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

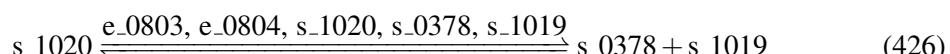
6.213 Reaction r_0799

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name ISC [2Fe-2S] Transfer

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 853: Properties of each reactant.

Id	Name	SBO
s_1020	IscU with bound [2Fe-2S] cluster	

Modifiers

Table 854: Properties of each modifier.

Id	Name	SBO
e_0803	iscA	0000460
e_0804	nifU	0000460
s_1020	IscU with bound [2Fe-2S] cluster	
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Products

Table 855: Properties of each product.

Id	Name	SBO
s_0378	[2Fe-2S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{213} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1020}] - \frac{[s_{0378}] \cdot [s_{1019}]}{K_{eq}} \right)}{1 + \frac{[s_{1020}]}{K_{m1020}} + \left(1 + \frac{[s_{0378}]}{K_{m0378}} \right) \cdot \left(1 + \frac{[s_{1019}]}{K_{m1019}} \right) - 1} \quad (427)$$

Table 856: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.87846855703637 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.87846855703637 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1020}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0378}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1019}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

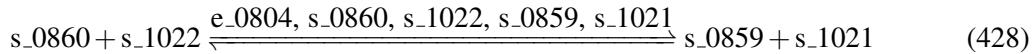
6.214 Reaction r_0800

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ISC [4Fe-4S] Reduction

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 857: Properties of each reactant.

Id	Name	SBO
s_{_0860}	Flavin adenine dinucleotide reduced	
s_{_1022}	IscU with two bound [2Fe-2S] clusters	

Modifiers

Table 858: Properties of each modifier.

Id	Name	SBO
e_{_0804}	nifU	0000460
s_{_0860}	Flavin adenine dinucleotide reduced	
s_{_1022}	IscU with two bound [2Fe-2S] clusters	
s_{_0859}	Flavin adenine dinucleotide oxidized	
s_{_1021}	IscU with bound [4Fe-4S] cluster	

Products

Table 859: Properties of each product.

Id	Name	SBO
s_{_0859}	Flavin adenine dinucleotide oxidized	
s_{_1021}	IscU with bound [4Fe-4S] cluster	

Kinetic Law

Derived unit contains undeclared units

$$v_{214} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{_0860}] \cdot [s_{_1022}] - \frac{[s_{_0859}] \cdot [s_{_1021}]}{K_{\text{eq}}} \right)}{K_{m0860} \cdot K_{m1022}} \quad (429)$$

$$= \frac{\left(1 + \frac{[s_{_0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{_1022}]}{K_{m1022}} \right) + \left(1 + \frac{[s_{_0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{_1021}]}{K_{m1021}} \right) - 1}{\left(1 + \frac{[s_{_0860}]}{K_{m0860}} \right) \cdot \left(1 + \frac{[s_{_1022}]}{K_{m1022}} \right) + \left(1 + \frac{[s_{_0859}]}{K_{m0859}} \right) \cdot \left(1 + \frac{[s_{_1021}]}{K_{m1021}} \right) - 1}$$

Table 860: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.60143508877284 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$5.04200912428198 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0860		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1022		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0859		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1021		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

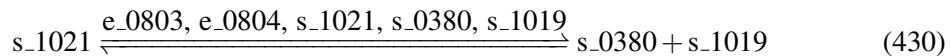
6.215 Reaction r_0801

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name ISC [4Fe-4S] Transfer

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 861: Properties of each reactant.

Id	Name	SBO
s_1021	IscU with bound [4Fe-4S] cluster	

Modifiers

Table 862: Properties of each modifier.

Id	Name	SBO
e_0803	iscA	0000460
e_0804	nifU	0000460
s_1021	IscU with bound [4Fe-4S] cluster	
s_0380	[4Fe-4S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Products

Table 863: Properties of each product.

Id	Name	SBO
s_0380	[4Fe-4S] iron-sulfur cluster	
s_1019	IscU scaffold protein	

Kinetic Law

Derived unit contains undeclared units

$$v_{215} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1021}] - \frac{[s_{0380}] \cdot [s_{1019}]}{K_{eq}} \right)}{K_{m1021} + 1 + \left(1 + \frac{[s_{1021}]}{K_{m0380}} \right) \cdot \left(1 + \frac{[s_{1019}]}{K_{m1019}} \right) - 1} \quad (431)$$

Table 864: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.60143508877284 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.60143508877284 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1021}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0380}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1019}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

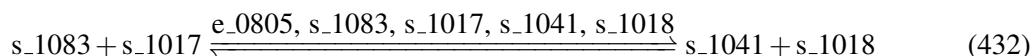
6.216 Reaction r_0802

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ISC Cysteine desulfuration

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 865: Properties of each reactant.

Id	Name	SBO
s_1083	L-Cysteine	
s_1017	IscS sulfur acceptor protein	

Modifiers

Table 866: Properties of each modifier.

Id	Name	SBO
e_0805	iscS	0000460
s_1083	L-Cysteine	
s_1017	IscS sulfur acceptor protein	
s_1041	L-Alanine	
s_1018	IscS with bound sulfur	

Products

Table 867: Properties of each product.

Id	Name	SBO
s_1041	L-Alanine	
s_1018	IscS with bound sulfur	

Kinetic Law

Derived unit contains undeclared units

$$v_{216} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1083}] \cdot [s_{1017}] - \frac{[s_{1041}] \cdot [s_{1018}]}{K_{eq}} \right)}{K_{m1083} \cdot K_{m1017}} \quad (433)$$

$$\frac{\left(1 + \frac{[s_{1083}]}{K_{m1083}} \right) \cdot \left(1 + \frac{[s_{1017}]}{K_{m1017}} \right) + \left(1 + \frac{[s_{1041}]}{K_{m1041}} \right) \cdot \left(1 + \frac{[s_{1018}]}{K_{m1018}} \right) - 1}{\left(1 + \frac{[s_{1083}]}{K_{m1083}} \right) \cdot \left(1 + \frac{[s_{1017}]}{K_{m1017}} \right) + \left(1 + \frac{[s_{1041}]}{K_{m1041}} \right) \cdot \left(1 + \frac{[s_{1018}]}{K_{m1018}} \right) - 1}$$

Table 868: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.50022705200688 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1083}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1017		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1041		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1018		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

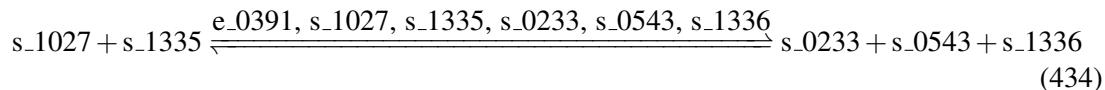
6.217 Reaction r_0806

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name isocitrate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 869: Properties of each reactant.

Id	Name	SBO
s_1027	Isocitrate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 870: Properties of each modifier.

Id	Name	SBO
e_0391	icd	0000460
s_1027	Isocitrate	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0233	2-Oxoglutarate	
s_0543	CO2	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 871: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_0543	CO2	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{217} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1027}] \cdot [s_{1335}] - \frac{[s_{0233}] \cdot [s_{0543}] \cdot [s_{1336}]}{K_{eq}} \right)}{K_m1027 \cdot K_m1335} \\ \frac{\left(1 + \frac{[s_{1027}]}{K_m1027} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_m1335} \right) + \left(1 + \frac{[s_{0233}]}{K_m0233} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_m0543} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_m1336} \right) - 1}{(435)}$$

Table 872: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.149	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	3.277	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1027		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1336		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

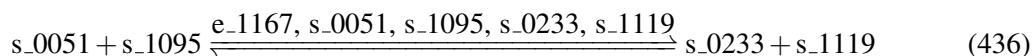
6.218 Reaction r_0808

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name isoleucine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 873: Properties of each reactant.

Id	Name	SBO
s_0051	(S)-3-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	

Modifiers

Table 874: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
s_0051	(S)-3-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1119	L-Isoleucine	

Products

Table 875: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1119	L-Isoleucine	

Kinetic Law

Derived unit contains undeclared units

$$v_{218} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0051] \cdot [s_1095] - \frac{[s_0233] \cdot [s_1119]}{K_{eq}} \right)}{\left(1 + \frac{[s_0051]}{Km0051} \right) \cdot \left(1 + \frac{[s_1095]}{Km1095} \right) + \left(1 + \frac{[s_0233]}{Km0233} \right) \cdot \left(1 + \frac{[s_1119]}{Km1119} \right) - 1} \quad (437)$$

Table 876: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.563	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0051		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1095		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1119		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

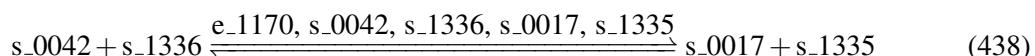
6.219 Reaction r_0811

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ketol-acid reductoisomerase (2,3-dihydroxy-3-methylbutanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 877: Properties of each reactant.

Id	Name	SBO
s_0042	(S)-2-Acetolactate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 878: Properties of each modifier.

Id	Name	SBO
e_1170	ilvC	0000460
s_0042	(S)-2-Acetolactate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 879: Properties of each product.

Id	Name	SBO
s_0017	(R)-2,3-Dihydroxy-3-methylbutanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{219} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0042}] \cdot [s_{1336}] - \frac{[s_{0017}] \cdot [s_{1335}]}{K_{eq}} \right)}{K_{m0042} \cdot K_{m1336}} \quad (439)$$

$$\frac{\left(1 + \frac{[s_{0042}]}{K_{m0042}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{0017}]}{K_{m0017}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1}{\left(1 + \frac{[s_{0042}]}{K_{m0042}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{0017}]}{K_{m0017}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) - 1}$$

Table 880: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.695	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0042		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0017		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

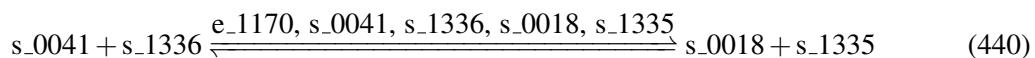
6.220 Reaction r_0812

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name ketol-acid reductoisomerase (2-Acetolactate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 881: Properties of each reactant.

Id	Name	SBO
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 882: Properties of each modifier.

Id	Name	SBO
e_1170	ilvC	0000460
s_0041	(S)-2-Aceto-2-hydroxybutanoate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 883: Properties of each product.

Id	Name	SBO
s_0018	(R)-2,3-Dihydroxy-3-methylpentanoate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{220} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0041] \cdot [s_1336] - \frac{[s_0018] \cdot [s_1335]}{K_{eq}} \right)}{K_{m0041} \cdot K_{m1336}} \quad (441)$$

$$\frac{\left(1 + \frac{[s_0041]}{K_{m0041}} \right) \cdot \left(1 + \frac{[s_1336]}{K_{m1336}} \right) + \left(1 + \frac{[s_0018]}{K_{m0018}} \right) \cdot \left(1 + \frac{[s_1335]}{K_{m1335}} \right) - 1}{}$$

Table 884: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.563	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0041		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1336		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0018		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

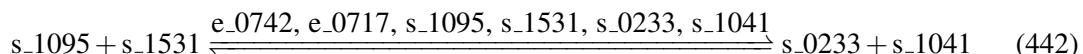
6.221 Reaction r_0815

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name L-alanine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 885: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1531	Pyruvate	

Modifiers

Table 886: Properties of each modifier.

Id	Name	SBO
e_0742	yfdZ	0000460
e_0717	yfbQ	0000460
s_1095	L-Glutamate	
s_1531	Pyruvate	
s_0233	2-Oxoglutarate	
s_1041	L-Alanine	

Products

Table 887: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1041	L-Alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{221} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1095}] \cdot [s_{1531}] - \frac{[s_{0233}] \cdot [s_{1041}]}{K_{eq}} \right)}{K_{m1095} \cdot K_{m1531}} \quad (443)$$

$$\frac{\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1041}]}{K_{m1041}} \right) - 1}{\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1041}]}{K_{m1041}} \right) - 1}$$

Table 888: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.081	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.127	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1531		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1041		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

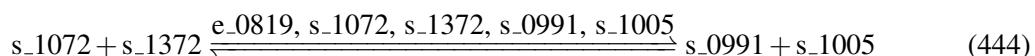
6.222 Reaction r_0829

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name L-aspartate oxidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 889: Properties of each reactant.

Id	Name	SBO
s_1072	L-Aspartate	
s_1372	O2	

Modifiers

Table 890: Properties of each modifier.

Id	Name	SBO
e_0819	nadB	0000460
s_1072	L-Aspartate	
s_1372	O2	
s_0991	Hydrogen peroxide	
s_1005	Iminoaspartate	

Products

Table 891: Properties of each product.

Id	Name	SBO
s_0991	Hydrogen peroxide	
s_1005	Iminoaspartate	

Kinetic Law

Derived unit contains undeclared units

$$v_{222} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1072}] \cdot [s_{1372}] - \frac{[s_{0991}] \cdot [s_{1005}]}{K_{eq}} \right)}{K_{m1072} \cdot K_{m1372}} \quad (445)$$

$$\frac{\left(1 + \frac{[s_{1072}]}{K_{m1072}} \right) \cdot \left(1 + \frac{[s_{1372}]}{K_{m1372}} \right) + \left(1 + \frac{[s_{0991}]}{K_{m0991}} \right) \cdot \left(1 + \frac{[s_{1005}]}{K_{m1005}} \right) - 1}{}$$

Table 892: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120488056 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1072		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1372		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0991		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1005		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

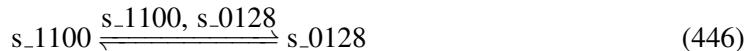
6.223 Reaction r_0835

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name L-glutamate 5-semialdehyde dehydratase (spontaneous)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 893: Properties of each reactant.

Id	Name	SBO
s_1100	L-Glutamate 5-semialdehyde	

Modifiers

Table 894: Properties of each modifier.

Id	Name	SBO
s_1100	L-Glutamate 5-semialdehyde	
s_0128	1-Pyrroline-5-carboxylate	

Product

Table 895: Properties of each product.

Id	Name	SBO
s_0128	1-Pyrroline-5-carboxylate	

Kinetic Law

Derived unit contains undeclared units

$$v_{223} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1100}] - \frac{[s_{0128}]}{K_{eq}} \right)}{1 + \frac{[s_{1100}]}{K_{m1100}} + 1 + \frac{[s_{0128}]}{K_{m0128}} - 1} \quad (447)$$

Table 896: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.184	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1100		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0128		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

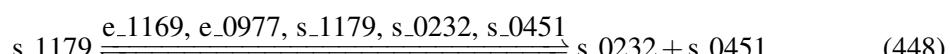
6.224 Reaction r_0847

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name L-threonine deaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 897: Properties of each reactant.

Id	Name	SBO
s_1179	L-Threonine	

Modifiers

Table 898: Properties of each modifier.

Id	Name	SBO
e_1169	ilvA	0000460

Id	Name	SBO
e_0977	tdcB	0000460
s_1179	L-Threonine	
s_0232	2-Oxobutanoate	
s_0451	Ammonium	

Products

Table 899: Properties of each product.

Id	Name	SBO
s_0232	2-Oxobutanoate	
s_0451	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{224} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1179}] - \frac{[s_{0232}] \cdot [s_{0451}]}{K_{eq}} \right)}{1 + \frac{[s_{1179}]}{K_{m1179}} + \left(1 + \frac{[s_{0232}]}{K_{m0232}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right) - 1} \quad (449)$$

Table 900: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.040	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.402	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1179}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0232}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0451}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

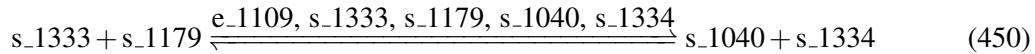
6.225 Reaction r_0848

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name L-threonine dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 901: Properties of each reactant.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1179	L-Threonine	

Modifiers

Table 902: Properties of each modifier.

Id	Name	SBO
e_1109	tdh	0000460
s_1333	Nicotinamide adenine dinucleotide	
s_1179	L-Threonine	
s_1040	L-2-Amino-3-oxobutanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 903: Properties of each product.

Id	Name	SBO
s_1040	L-2-Amino-3-oxobutanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{225} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1333}] \cdot [s_{1179}] - \frac{[s_{1040}] \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m1333} \cdot K_{m1179}} \quad (451)$$

$$\frac{\left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1179}]}{K_{m1179}} \right) + \left(1 + \frac{[s_{1040}]}{K_{m1040}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}{\left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1179}]}{K_{m1179}} \right) + \left(1 + \frac{[s_{1040}]}{K_{m1040}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}$$

Table 904: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.580	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1179		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1040		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

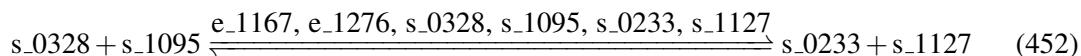
6.226 Reaction r_0854

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name leucine transaminase (irreversible)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 905: Properties of each reactant.

Id	Name	SBO
s_0328	4-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	

Modifiers

Table 906: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
e_1276	tyrB	0000460
s_0328	4-Methyl-2-oxopentanoate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1127	L-Leucine	

Products

Table 907: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1127	L-Leucine	

Kinetic Law

Derived unit contains undeclared units

$$v_{226} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0328}] \cdot [s_{1095}] - \frac{[s_{0233}] \cdot [s_{1127}]}{K_{eq}} \right)}{Km_{0328} \cdot Km_{1095}} \quad (453)$$

$$\frac{\left(1 + \frac{[s_{0328}]}{Km_{0328}} \right) \cdot \left(1 + \frac{[s_{1095}]}{Km_{1095}} \right) + \left(1 + \frac{[s_{0233}]}{Km_{0233}} \right) \cdot \left(1 + \frac{[s_{1127}]}{Km_{1127}} \right) - 1}{\left(1 + \frac{[s_{0328}]}{Km_{0328}} \right) \cdot \left(1 + \frac{[s_{1095}]}{Km_{1095}} \right) + \left(1 + \frac{[s_{0233}]}{Km_{0233}} \right) \cdot \left(1 + \frac{[s_{1127}]}{Km_{1127}} \right) - 1}$$

Table 908: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.062	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.874	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0328		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1127		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

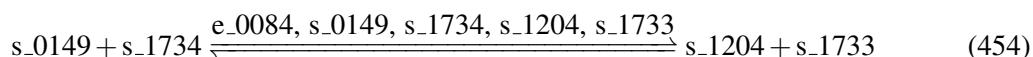
6.227 Reaction r_0857

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Lipid A disaccharide synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 909: Properties of each reactant.

Id	Name	SBO
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Modifiers

Table 910: Properties of each modifier.

Id	Name	SBO
e_0084	lpxB	0000460
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	
s_1204	Lipid A Disaccharide	
s_1733	UDP	

Products

Table 911: Properties of each product.

Id	Name	SBO
s_1204	Lipid A Disaccharide	
s_1733	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{227} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0149}] \cdot [s_{1734}] - \frac{[s_{1204}] \cdot [s_{1733}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{0149}]}{Km0149} \right) \cdot \left(1 + \frac{[s_{1734}]}{Km1734} \right) + \left(1 + \frac{[s_{1204}]}{Km1204} \right) \cdot \left(1 + \frac{[s_{1733}]}{Km1733} \right) - 1} \quad (455)$$

Table 912: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.038	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0149		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1734		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1204		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1733		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

6.228 Reaction r_0925

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name malate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 913: Properties of each reactant.

Id	Name	SBO
s_1138	L-Malate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 914: Properties of each modifier.

Id	Name	SBO
e_1004	mdh	0000460
s_1138	L-Malate	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1399	Oxaloacetate	

Products

Table 915: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1399	Oxaloacetate	

Kinetic Law

Derived unit contains undeclared units

$$v_{228} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1138}] \cdot [s_{1333}] - \frac{[s_{1334}] \cdot [s_{1399}]}{K_{eq}} \right)}{K_m1138 \cdot K_m1333} \quad (457)$$

$$= \frac{\left(1 + \frac{[s_{1138}]}{K_m1138} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_m1333} \right) + \left(1 + \frac{[s_{1334}]}{K_m1334} \right) \cdot \left(1 + \frac{[s_{1399}]}{K_m1399} \right) - 1}{\left(1 + \frac{[s_{1138}]}{K_m1138} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_m1333} \right) + \left(1 + \frac{[s_{1334}]}{K_m1334} \right) \cdot \left(1 + \frac{[s_{1399}]}{K_m1399} \right) - 1}$$

Table 916: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.143	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	2.008	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1138		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1399		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

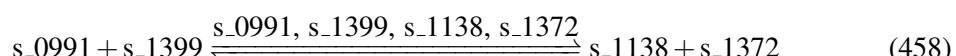
6.229 Reaction r_0928

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name malate oxidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 917: Properties of each reactant.

Id	Name	SBO
s_0991	Hydrogen peroxide	
s_1399	Oxaloacetate	

Modifiers

Table 918: Properties of each modifier.

Id	Name	SBO
s_0991	Hydrogen peroxide	
s_1399	Oxaloacetate	
s_1138	L-Malate	
s_1372	O2	

Products

Table 919: Properties of each product.

Id	Name	SBO
s_1138	L-Malate	
s_1372	O2	

Kinetic Law

Derived unit contains undeclared units

$$v_{229} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0991}] \cdot [s_{1399}] - \frac{[s_{1138}] \cdot [s_{1372}]}{K_{eq}} \right)}{Km0991 \cdot Km1399} \quad (459)$$

$$v_{229} = \frac{\left(1 + \frac{[s_{0991}]}{Km0991} \right) \cdot \left(1 + \frac{[s_{1399}]}{Km1399} \right) + \left(1 + \frac{[s_{1138}]}{Km1138} \right) \cdot \left(1 + \frac{[s_{1372}]}{Km1372} \right) - 1}{\left(1 + \frac{[s_{0991}]}{Km0991} \right) \cdot \left(1 + \frac{[s_{1399}]}{Km1399} \right) + \left(1 + \frac{[s_{1138}]}{Km1138} \right) \cdot \left(1 + \frac{[s_{1372}]}{Km1372} \right) - 1} \quad (459)$$

Table 920: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120779209 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0991		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1399		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1138		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1372		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

6.230 Reaction r_0934

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Malonyl-CoA methyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 921: Properties of each reactant.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1217	Malonyl-CoA	

Modifiers

Table 922: Properties of each modifier.

Id	Name	SBO
e_0277	bioC	0000460
s_1552	S-Adenosyl-L-methionine	
s_1217	Malonyl-CoA	
s_1551	S-Adenosyl-L-homocysteine	
s_1218	malonyl-CoA methyl ester	

Products

Table 923: Properties of each product.

Id	Name	SBO
s_1551	S-Adenosyl-L-homocysteine	

Id	Name	SBO
s_1218	malonyl-CoA methyl ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{230} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1552}] \cdot [s_{1217}] - \frac{[s_{1551}] \cdot [s_{1218}]}{K_{eq}} \right)}{K_{m1552} \cdot K_{m1217}} \quad (461)$$

$$\frac{\left(1 + \frac{[s_{1552}]}{K_{m1552}} \right) \cdot \left(1 + \frac{[s_{1217}]}{K_{m1217}} \right) + \left(1 + \frac{[s_{1551}]}{K_{m1551}} \right) \cdot \left(1 + \frac{[s_{1218}]}{K_{m1218}} \right) - 1}{}$$

Table 924: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			2.77033467884759 · 10 ⁻⁷	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	3.87846855038663 · 10 ⁻⁶	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1552}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1217}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1551}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1218}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

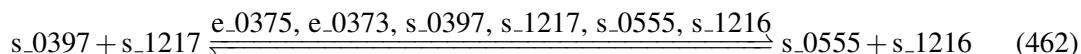
6.231 Reaction r_0935

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name Malonyl-CoA-ACP transacylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 925: Properties of each reactant.

Id	Name	SBO
s_0397	acyl carrier protein	
s_1217	Malonyl-CoA	

Modifiers

Table 926: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0373	fabD	0000460
s_0397	acyl carrier protein	
s_1217	Malonyl-CoA	
s_0555	Coenzyme A	
s_1216	Malonyl-[acyl-carrier protein]	

Products

Table 927: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_1216	Malonyl-[acyl-carrier protein]	

Kinetic Law

Derived unit contains undeclared units

$$v_{231} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0397}] \cdot [s_{1217}] - \frac{[s_{0555}] \cdot [s_{1216}]}{K_{eq}} \right)}{(1 + \frac{[s_{0397}]}{Km0397}) \cdot (1 + \frac{[s_{1217}]}{Km1217}) + (1 + \frac{[s_{0555}]}{Km0555}) \cdot (1 + \frac{[s_{1216}]}{Km1216}) - 1} \quad (463)$$

Table 928: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.151	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0397		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1217		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1216		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.232 Reaction r_0950

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name methenyltetrahydrofolate cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 929: Properties of each reactant.

Id	Name	SBO
s_0335	5,10-Methenyltetrahydrofolate	

Modifiers

Table 930: Properties of each modifier.

Id	Name	SBO
e_0188	fold	0000460
s_0335	5,10-Methenyltetrahydrofolate	
s_0133	10-Formyltetrahydrofolate	

Product

Table 931: Properties of each product.

Id	Name	SBO
s_0133	10-Formyltetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{232} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0335}] - \frac{[s_{0133}]}{K_{eq}} \right)}{1 + \frac{[s_{0335}]}{K_{m0335}} + 1 + \frac{[s_{0133}]}{K_{m0133}} - 1} \quad (465)$$

Table 932: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.038	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.230	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0335		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0133		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

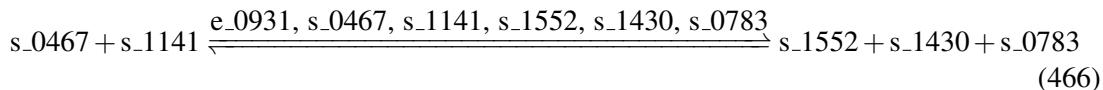
6.233 Reaction r_0951

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name methionine adenosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 933: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1141	L-Methionine	

Modifiers

Table 934: Properties of each modifier.

Id	Name	SBO
e_0931	metK	0000460
s_0467	ATP	
s_1141	L-Methionine	
s_1552	S-Adenosyl-L-methionine	
s_1430	Phosphate	
s_0783	Diphosphate	

Products

Table 935: Properties of each product.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1430	Phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{233} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1141}] - \frac{[s_{1552}] \cdot [s_{1430}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m1141}} \\ \frac{1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1141}]}{K_{m1141}} \right) + \left(1 + \frac{[s_{1552}]}{K_{m1552}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1} \quad (467)$$

Table 936: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.24388027294171 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.003	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1141}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1552}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

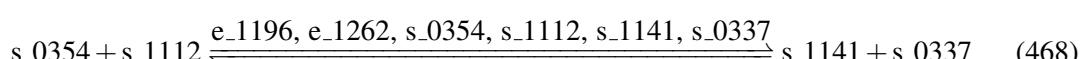
6.234 Reaction r_0954

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name methionine synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 937: Properties of each reactant.

Id	Name	SBO
s_0354	5-Methyltetrahydrofolate	
s_1112	L-Homocysteine	

Modifiers

Table 938: Properties of each modifier.

Id	Name	SBO
e_1196	metE	0000460
e_1262	metH	0000460
s_0354	5-Methyltetrahydrofolate	
s_1112	L-Homocysteine	
s_1141	L-Methionine	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 939: Properties of each product.

Id	Name	SBO
s_1141	L-Methionine	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{234} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0354] \cdot [s_1112] - \frac{[s_1141] \cdot [s_0337]}{K_{eq}} \right)}{Km0354 \cdot Km1112} \quad (469)$$

$$\frac{\left(1 + \frac{[s_0354]}{Km0354} \right) \cdot \left(1 + \frac{[s_1112]}{Km1112} \right) + \left(1 + \frac{[s_1141]}{Km1141} \right) \cdot \left(1 + \frac{[s_0337]}{Km0337} \right) - 1}{\left(1 + \frac{[s_0354]}{Km0354} \right) \cdot \left(1 + \frac{[s_1112]}{Km1112} \right) + \left(1 + \frac{[s_1141]}{Km1141} \right) \cdot \left(1 + \frac{[s_0337]}{Km0337} \right) - 1}$$

Table 940: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.299	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0354		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1112		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1141		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0337		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

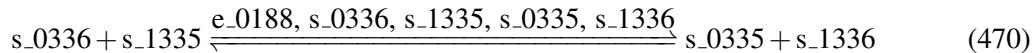
6.235 Reaction r_0957

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name methylenetetrahydrofolate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 941: Properties of each reactant.

Id	Name	SBO
s_0336	5,10-Methylenetetrahydrofolate	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 942: Properties of each modifier.

Id	Name	SBO
e_0188	fold	0000460
s_0336	5,10-Methylenetetrahydrofolate	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0335	5,10-Methenyltetrahydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 943: Properties of each product.

Id	Name	SBO
s_0335	5,10-Methenyltetrahydrofolate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{235} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0336}] \cdot [s_{1335}] - \frac{[s_{0335}] \cdot [s_{1336}]}{K_{eq}} \right)}{Km0336 \cdot Km1335} \quad (471)$$

$$= \frac{\left(1 + \frac{[s_{0336}]}{Km0336} \right) \cdot \left(1 + \frac{[s_{1335}]}{Km1335} \right) + \left(1 + \frac{[s_{0335}]}{Km0335} \right) \cdot \left(1 + \frac{[s_{1336}]}{Km1336} \right) - 1}{\left(1 + \frac{[s_{0336}]}{Km0336} \right) \cdot \left(1 + \frac{[s_{1335}]}{Km1335} \right) + \left(1 + \frac{[s_{0335}]}{Km0335} \right) \cdot \left(1 + \frac{[s_{1336}]}{Km1336} \right) - 1}$$

Table 944: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.038	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.536	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0336		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0335		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1336		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

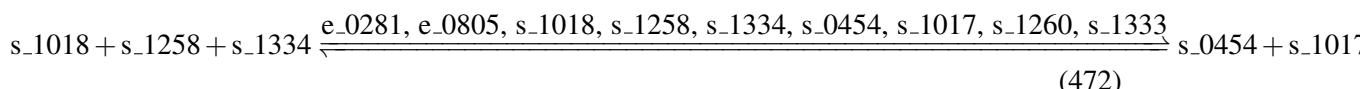
6.236 Reaction r_0963

This is a reversible reaction of three reactants forming four products influenced by nine modifiers.

Name MoaD sulfuration (nadph, assumed)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 945: Properties of each reactant.

Id	Name	SBO
s_1018	IscS with bound sulfur	
s_1258	MoaD Protein with bound AMP	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 946: Properties of each modifier.

Id	Name	SBO
e_0281	moaD	0000460
e_0805	iscS	0000460
s_1018	IscS with bound sulfur	
s_1258	MoaD Protein with bound AMP	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0454	AMP	
s_1017	IscS sulfur acceptor protein	
s_1260	MoaD Protein with thiocarboxylate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 947: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1017	IscS sulfur acceptor protein	
s_1260	MoaD Protein with thiocarboxylate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

v_{236}

(473)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1018}] \cdot [s_{1258}] \cdot [s_{1334}] - \frac{[s_{0454}] \cdot [s_{1017}] \cdot [s_{1260}] \cdot [s_{1333}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{1018}]}{K_{m1018}} \right) \cdot \left(1 + \frac{[s_{1258}]}{K_{m1258}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{1017}]}{K_{m1017}} \right) \cdot \left(1 + \frac{[s_{1260}]}{K_{m1260}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right)}$$

Table 948: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.75961662815825 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1018		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1258		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1017		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1260		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

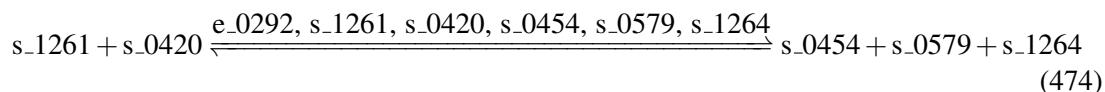
6.237 Reaction r_0964

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name molybdenum cofactor synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 949: Properties of each reactant.

Id	Name	SBO
s_1261	Molybdate	
s_0420	adenylated molybdopterin	

Modifiers

Table 950: Properties of each modifier.

Id	Name	SBO
e_0292	moeA	0000460
s_1261	Molybdate	

Id	Name	SBO
s_0420	adenylated molybdopterin	
s_0454	AMP	
s_0579	Cu2+	
s_1264	molybdenum cofactor	

Products

Table 951: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0579	Cu2+	
s_1264	molybdenum cofactor	

Kinetic Law

Derived unit contains undeclared units

$$v_{237} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{1261}] \cdot [s_{0420}] - \frac{[s_{0454}] \cdot [s_{0579}] \cdot [s_{1264}]}{K_{\text{eq}}} \right)}{K_{m1261} \cdot K_{m0420}} \\ \left(1 + \frac{[s_{1261}]}{K_{m1261}} \right) \cdot \left(1 + \frac{[s_{0420}]}{K_{m0420}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{0579}]}{K_{m0579}} \right) \cdot \left(1 + \frac{[s_{1264}]}{K_{m1264}} \right) - 1 \quad (475)$$

Table 952: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.68990415703956 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.71778914548703 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1261		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0420		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0579		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1264		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

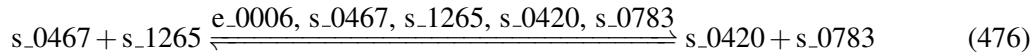
6.238 Reaction r_0965

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name molybdopterin adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 953: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1265	molybdopterin	

Modifiers

Table 954: Properties of each modifier.

Id	Name	SBO
e_0006	mog	0000460
s_0467	ATP	
s_1265	molybdopterin	
s_0420	adenylated molybdopterin	
s_0783	Diphosphate	

Products

Table 955: Properties of each product.

Id	Name	SBO
s_0420	adenylated molybdopterin	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{238} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_1265] - \frac{[s_0420] \cdot [s_0783]}{K_{\text{eq}}} \right)}{(1 + \frac{[s_0467]}{K_{m0467}}) \cdot (1 + \frac{[s_1265]}{K_{m1265}}) + (1 + \frac{[s_0420]}{K_{m0420}}) \cdot (1 + \frac{[s_0783]}{K_{m0783}}) - 1} \quad (477)$$

Table 956: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.37980831407913 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.73173163971078 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1265		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0420		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

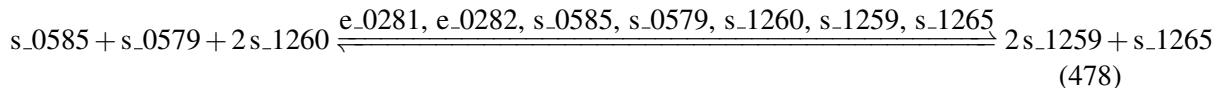
6.239 Reaction r_0968

This is a reversible reaction of three reactants forming two products influenced by seven modifiers.

Name molybdopterin synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 957: Properties of each reactant.

Id	Name	SBO
s_0585	cyclic pyranopterin monophosphate	
s_0579	Cu ²⁺	
s_1260	MoaD Protein with thiocarboxylate	

Modifiers

Table 958: Properties of each modifier.

Id	Name	SBO
e_0281	moaD	0000460
e_0282	moaE	0000460
s_0585	cyclic pyranopterin monophosphate	

Id	Name	SBO
s_0579	Cu2+	
s_1260	MoaD Protein with thiocarboxylate	
s_1259	MoaD Protein with carboxylate	
s_1265	molybdopterin	

Products

Table 959: Properties of each product.

Id	Name	SBO
s_1259	MoaD Protein with carboxylate	
s_1265	molybdopterin	

Kinetic Law

Derived unit contains undeclared units

$$v_{239} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0585}] \cdot [s_{0579}] \cdot [s_{1260}]^2 - \frac{[s_{1259}]^2 \cdot [s_{1265}]}{K_{eq}} \right)}{(1 + \frac{[s_{0585}]}{K_{m0585}}) \cdot (1 + \frac{[s_{0579}]}{K_{m0579}}) \cdot (1 + \frac{[s_{1260}]}{K_{m1260}})^2 + (1 + \frac{[s_{1259}]}{K_{m1259}})^2 \cdot (1 + \frac{[s_{1265}]}{K_{m1265}}) - 1} \quad (479)$$

Table 960: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.37980831407913 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
K _{m0585}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0579}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1260}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1259}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1265}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

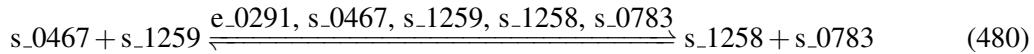
6.240 Reaction r_0969

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name molybdopterin synthase sulfurylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 961: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1259	MoaD Protein with carboxylate	

Modifiers

Table 962: Properties of each modifier.

Id	Name	SBO
e_0291	moeB	0000460
s_0467	ATP	
s_1259	MoaD Protein with carboxylate	
s_1258	MoaD Protein with bound AMP	
s_0783	Diphosphate	

Products

Table 963: Properties of each product.

Id	Name	SBO
s_1258	MoaD Protein with bound AMP	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{240} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_1259] - \frac{[s_1258] \cdot [s_0783]}{K_{eq}} \right)}{\left(1 + \frac{[s_0467]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_1259]}{K_{m1259}} \right) + \left(1 + \frac{[s_1258]}{K_{m1258}} \right) \cdot \left(1 + \frac{[s_0783]}{K_{m0783}} \right) - 1} \quad (481)$$

Table 964: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.75961662815825 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$9.46346327942155 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1259		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1258		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

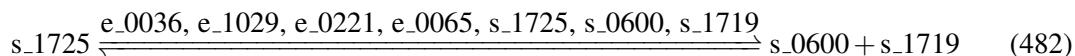
6.241 Reaction r_0970

This is a reversible reaction of one reactant forming two products influenced by seven modifiers.

Name murein crosslinking transpeptidase 1A:(A2pm->D-ala) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 965: Properties of each reactant.

Id	Name	SBO
s_1725	two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)	

Modifiers

Table 966: Properties of each modifier.

Id	Name
e_0036	ftsI
e_1029	mrcA
e_0221	mrdA
e_0065	mrcB
s_1725	two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)
s_0600	D-Alanine
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of chain)

Products

Table 967: Properties of each product.

Id	Name
s_0600	D-Alanine
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of cl

Kinetic Law

Derived unit contains undeclared units

$$v_{241} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1725}] - \frac{[s_{0600}] \cdot [s_{1719}]}{K_{eq}} \right)}{1 + \frac{[s_{1725}]}{K_{m1725}} + \left(1 + \frac{[s_{0600}]}{K_{m0600}} \right) \cdot \left(1 + \frac{[s_{1719}]}{K_{m1719}} \right) - 1} \quad (483)$$

Table 968: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.019	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1725}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0600}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1719}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

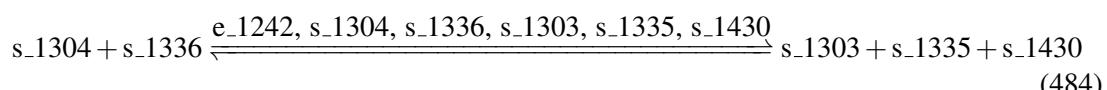
6.242 Reaction r_0996

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name N-acetyl-g-glutamyl-phosphate reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 969: Properties of each reactant.

Id	Name	SBO
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 970: Properties of each modifier.

Id	Name	SBO
e_1242	argC	0000460
s_1304	N-Acetyl-L-glutamyl 5-phosphate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Products

Table 971: Properties of each product.

Id	Name	SBO
s_1303	N-Acetyl-L-glutamate 5-semialdehyde	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{242} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_1304] \cdot [s_1336] - \frac{[s_1303] \cdot [s_1335] \cdot [s_1430]}{K_{eq}} \right)}{K_{m1304} \cdot K_{m1336}} \\ \left(1 + \frac{[s_1304]}{K_{m1304}} \right) \cdot \left(1 + \frac{[s_1336]}{K_{m1336}} \right) + \left(1 + \frac{[s_1303]}{K_{m1303}} \right) \cdot \left(1 + \frac{[s_1335]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_1430]}{K_{m1430}} \right) - 1 \quad (485)$$

Table 972: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.901	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1304		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1303		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

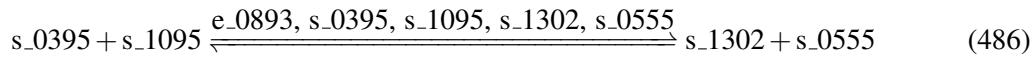
6.243 Reaction r_0999

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name N-acetylglutamate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 973: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1095	L-Glutamate	

Modifiers

Table 974: Properties of each modifier.

Id	Name	SBO
e_0893	argA	0000460
s_0395	Acetyl-CoA	
s_1095	L-Glutamate	
s_1302	N-Acetyl-L-glutamate	
s_0555	Coenzyme A	

Products

Table 975: Properties of each product.

Id	Name	SBO
s_1302	N-Acetyl-L-glutamate	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{243} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0395}] \cdot [s_{1095}] - \frac{[s_{1302}] \cdot [s_{0555}]}{K_{eq}} \right)}{K_{m0395} \cdot K_{m1095}} \quad (487)$$

$$\frac{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{1302}]}{K_{m1302}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{1302}]}{K_{m1302}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}$$

Table 976: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.574	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1302		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

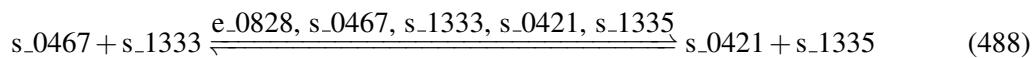
6.244 Reaction r_1006

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name NAD kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 977: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 978: Properties of each modifier.

Id	Name	SBO
e_0828	ppnK	0000460
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	
s_0421	ADP	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 979: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{244} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_1333] - \frac{[s_0421] \cdot [s_1335]}{K_{eq}} \right)}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_1335]}{Km1335} \right) - 1} \quad (489)$$

Table 980: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			6.1916980210075 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	8.6683772294105 · 10 ⁻⁴	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1333		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

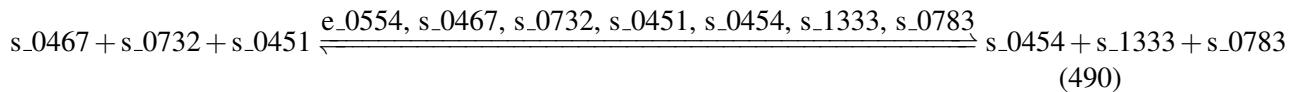
6.245 Reaction r_1008

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name NAD synthase (nh3)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 981: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0732	Deamino-NAD+	
s_0451	Ammonium	

Modifiers

Table 982: Properties of each modifier.

Id	Name	SBO
e_0554	nadE	0000460
s_0467	ATP	
s_0732	Deamino-NAD+	
s_0451	Ammonium	
s_0454	AMP	
s_1333	Nicotinamide adenine dinucleotide	
s_0783	Diphosphate	

Products

Table 983: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_1333	Nicotinamide adenine dinucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{245} = \frac{vol(cell) \cdot Vmax \cdot \left([s_0467] \cdot [s_0732] \cdot [s_0451] - \frac{[s_0454] \cdot [s_1333] \cdot [s_0783]}{K_{eq}} \right)}{Km0467 \cdot Km0732 \cdot Km0451} \\ = \frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0732]}{Km0732} \right) \cdot \left(1 + \frac{[s_0451]}{Km0451} \right) + \left(1 + \frac{[s_0454]}{Km0454} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) \cdot \left(1 + \frac{[s_0783]}{Km0783} \right) - 1}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0732]}{Km0732} \right) \cdot \left(1 + \frac{[s_0451]}{Km0451} \right) + \left(1 + \frac{[s_0454]}{Km0454} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) \cdot \left(1 + \frac{[s_0783]}{Km0783} \right) - 1} \quad (491)$$

Table 984: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120476312 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.009	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0732		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0451		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

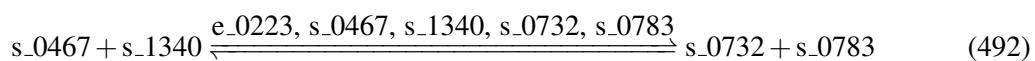
6.246 Reaction r_1019

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name nicotinate-nucleotide adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 985: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1340	Nicotinate D-ribonucleotide	

Modifiers

Table 986: Properties of each modifier.

Id	Name	SBO
e_0223	nadD	0000460
s_0467	ATP	
s_1340	Nicotinate D-ribonucleotide	
s_0732	Deamino-NAD+	
s_0783	Diphosphate	

Products

Table 987: Properties of each product.

Id	Name	SBO
s_0732	Deamino-NAD+	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{246} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1340}] - \frac{[s_{0732}] \cdot [s_{0783}]}{K_{eq}} \right)}{(1 + \frac{[s_{0467}]}{Km0467}) \cdot (1 + \frac{[s_{1340}]}{Km1340}) + (1 + \frac{[s_{0732}]}{Km0732}) \cdot (1 + \frac{[s_{0783}]}{Km0783}) - 1} \quad (493)$$

Table 988: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120469206 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.004	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1340		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0732		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

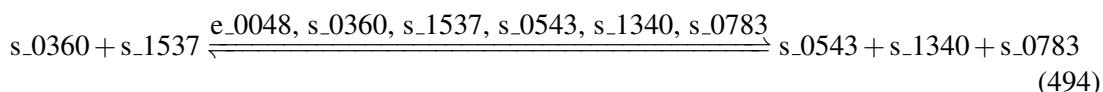
6.247 Reaction r_1021

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name nicotinate-nucleotide diphosphorylase (carboxylating)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 989: Properties of each reactant.

Id	Name	SBO
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_1537	Quinolinate	

Modifiers

Table 990: Properties of each modifier.

Id	Name	SBO
e_0048	nadC	0000460
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	
s_1537	Quinolinate	
s_0543	CO2	
s_1340	Nicotinate D-ribonucleotide	
s_0783	Diphosphate	

Products

Table 991: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1340	Nicotinate D-ribonucleotide	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{247} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0360}] \cdot [s_{1537}] - \frac{[s_{0543}] \cdot [s_{1340}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0360} \cdot K_{m1537}} \\ \frac{\left(1 + \frac{[s_{0360}]}{K_{m0360}} \right) \cdot \left(1 + \frac{[s_{1537}]}{K_{m1537}} \right) + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1340}]}{K_{m1340}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{(495)}$$

Table 992: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120467916 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.007	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0360}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1537}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1340}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

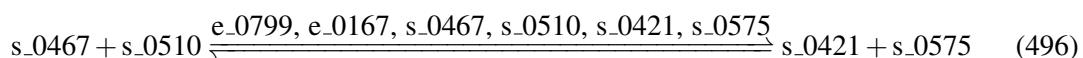
6.248 Reaction r_1039

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:CDP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 993: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0510	CDP	

Modifiers

Table 994: Properties of each modifier.

Id	Name	SBO
e_0799	ndk	0000460
e_0167	adk	0000460
s_0467	ATP	
s_0510	CDP	
s_0421	ADP	
s_0575	CTP	

Products

Table 995: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0575	CTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{248} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0510] - \frac{[s_0421] \cdot [s_0575]}{K_{eq}} \right)}{(1 + \frac{[s_0467]}{Km0467}) \cdot (1 + \frac{[s_0510]}{Km0510}) + (1 + \frac{[s_0421]}{Km0421}) \cdot (1 + \frac{[s_0575]}{Km0575}) - 1} \quad (497)$$

Table 996: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.025	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.351	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0510		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0575		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

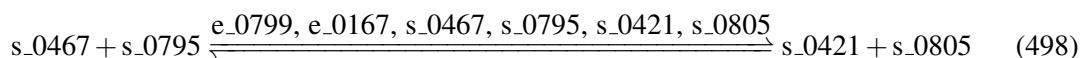
6.249 Reaction r_1043

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:dTDP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 997: Properties of each reactant.

Id	Name	SBO
s_{-0467}	ATP	
s_{-0795}	dTDP	

Modifiers

Table 998: Properties of each modifier.

Id	Name	SBO
e_{-0799}	ndk	0000460
e_{-0167}	adk	0000460
s_{-0467}	ATP	
s_{-0795}	dTDP	
s_{-0421}	ADP	
s_{-0805}	dTTP	

Products

Table 999: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0805	dTTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{249} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0795}] - \frac{[s_{0421}] \cdot [s_{0805}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0795}} \quad (499)$$

$$= \frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0795}]}{K_{m0795}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0805}]}{K_{m0805}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0795}]}{K_{m0795}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0805}]}{K_{m0805}} \right) - 1}$$

Table 1000: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.051	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0795		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0805		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

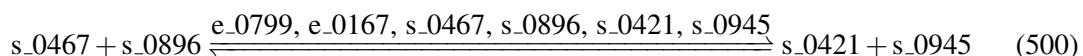
6.250 Reaction r_1045

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:GDP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1001: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0896	GDP	

Modifiers

Table 1002: Properties of each modifier.

Id	Name	SBO
e_0799	ndk	0000460
e_0167	adk	0000460
s_0467	ATP	
s_0896	GDP	
s_0421	ADP	
s_0945	GTP	

Products

Table 1003: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0945	GTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{250} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0896] - \frac{[s_0421] \cdot [s_0945]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0896}} \quad (501)$$

$$\left(1 + \frac{[s_0467]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_0896]}{K_{m0896}} \right) + \left(1 + \frac{[s_0421]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_0945]}{K_{m0945}} \right) - 1$$

Table 1004: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.109	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.524	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0896		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0945		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

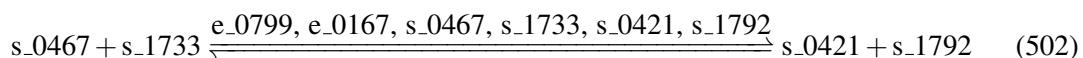
6.251 Reaction r_1046

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name nucleoside-diphosphate kinase (ATP:UDP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1005: Properties of each reactant.

Id	Name	SBO
s_{-0467}	ATP	
s_{-1733}	UDP	

Modifiers

Table 1006: Properties of each modifier.

Id	Name	SBO
e_{-0799}	ndk	0000460
e_{-0167}	adk	0000460
s_{-0467}	ATP	
s_{-1733}	UDP	
s_{-0421}	ADP	
s_{-1792}	UTP	

Products

Table 1007: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1792	UTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{251} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1733}] - \frac{[s_{0421}] \cdot [s_{1792}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m1733}} \quad (503)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1733}]}{K_{m1733}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1792}]}{K_{m1792}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1733}]}{K_{m1733}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1792}]}{K_{m1792}} \right) - 1} - 1$$

Table 1008: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.059	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.825	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1733		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1792		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

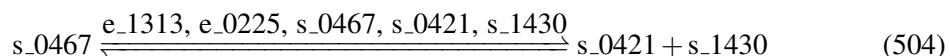
6.252 Reaction r_1047

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name nucleoside-triphosphatase (ATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1009: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	

Modifiers

Table 1010: Properties of each modifier.

Id	Name	SBO
e_1313	rsgA	0000460
e_0225	hscC	0000460
s_0467	ATP	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 1011: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{252} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0467] - \frac{[s_0421] \cdot [s_1430]}{K_{\text{eq}}} \right)}{1 + \frac{[s_0467]}{K_{0467}} + \left(1 + \frac{[s_0421]}{K_{0421}} \right) \cdot \left(1 + \frac{[s_1430]}{K_{1430}} \right) - 1} \quad (505)$$

Table 1012: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			3.150	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	31.500	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K ₀₄₆₇		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K ₀₄₂₁		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K ₁₄₃₀		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

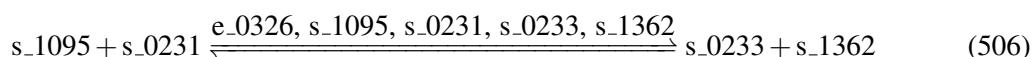
6.253 Reaction r_1054

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name O-Phospho-4-hydroxy-L-threonine:2-oxoglutarate aminotransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1013: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	

Modifiers

Table 1014: Properties of each modifier.

Id	Name	SBO
e_0326	serC	0000460
s_1095	L-Glutamate	
s_0231	2-Oxo-3-hydroxy-4-phosphobutanoate	
s_0233	2-Oxoglutarate	
s_1362	O-Phospho-4-hydroxy-L-threonine	

Products

Table 1015: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1362	O-Phospho-4-hydroxy-L-threonine	

Kinetic Law

Derived unit contains undeclared units

$$v_{253} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1095}] \cdot [s_{0231}] - \frac{[s_{0233}] \cdot [s_{1362}]}{K_{eq}} \right)}{\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{0231}]}{K_{m0231}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1362}]}{K_{m1362}} \right) - 1} \quad (507)$$

Table 1016: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.32449244111493 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0231		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1362		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

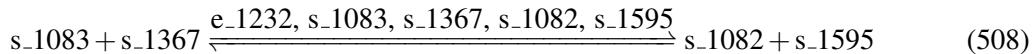
6.254 Reaction r_1057

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name O-succinylhomoserine lyase (L-cysteine)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1017: Properties of each reactant.

Id	Name	SBO
s_1083	L-Cysteine	
s_1367	O-Succinyl-L-homoserine	

Modifiers

Table 1018: Properties of each modifier.

Id	Name	SBO
e_1232	metB	0000460

Id	Name	SBO
s_1083	L-Cysteine	
s_1367	O-Succinyl-L-homoserine	
s_1082	L-Cystathionine	
s_1595	Succinate	

Products

Table 1019: Properties of each product.

Id	Name	SBO
s_1082	L-Cystathionine	
s_1595	Succinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{254} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1083}] \cdot [s_{1367}] - \frac{[s_{1082}] \cdot [s_{1595}]}{K_{eq}} \right)}{K_{m1083} \cdot K_{m1367}} \quad (509)$$

$$\frac{\left(1 + \frac{[s_{1083}]}{K_{m1083}} \right) \cdot \left(1 + \frac{[s_{1367}]}{K_{m1367}} \right) + \left(1 + \frac{[s_{1082}]}{K_{m1082}} \right) \cdot \left(1 + \frac{[s_{1595}]}{K_{m1595}} \right) - 1}{\left(1 + \frac{[s_{1083}]}{K_{m1083}} \right) \cdot \left(1 + \frac{[s_{1367}]}{K_{m1367}} \right) + \left(1 + \frac{[s_{1082}]}{K_{m1082}} \right) \cdot \left(1 + \frac{[s_{1595}]}{K_{m1595}} \right) - 1}$$

Table 1020: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.021	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.298	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1083}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1367}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1082}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1595}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

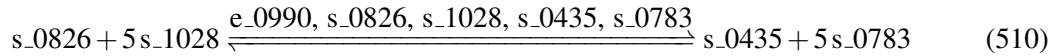
6.255 Reaction r_1063

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Octaprenyl pyrophosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1021: Properties of each reactant.

Id	Name	SBO
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 1022: Properties of each modifier.

Id	Name	SBO
e_0990	ispB	0000460
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0435	all-trans-Octaprenyl diphosphate	
s_0783	Diphosphate	

Products

Table 1023: Properties of each product.

Id	Name	SBO
s_0435	all-trans-Octaprenyl diphosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{255} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0826}] \cdot [s_{1028}]^5 - \frac{[s_{0435}] \cdot [s_{0783}]^5}{K_{eq}} \right)}{K_{m0826} \cdot K_{m1028}^5} \quad (511)$$

$$\frac{\left(1 + \frac{[s_{0826}]}{K_{m0826}} \right) \cdot \left(1 + \frac{[s_{1028}]}{K_{m1028}} \right)^5 + \left(1 + \frac{[s_{0435}]}{K_{m0435}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right)^5 - 1}{\left(1 + \frac{[s_{0826}]}{K_{m0826}} \right) \cdot \left(1 + \frac{[s_{1028}]}{K_{m1028}} \right)^5 + \left(1 + \frac{[s_{0435}]}{K_{m0435}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right)^5 - 1}$$

Table 1024: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229362 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.008	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0826		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1028		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0435		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

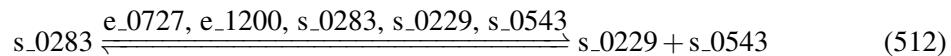
6.256 Reaction r_1064

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name Octaprenyl-hydroxybenzoate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1025: Properties of each reactant.

Id	Name	SBO
s_0283	3-Octaprenyl-4-hydroxybenzoate	

Modifiers

Table 1026: Properties of each modifier.

Id	Name	SBO
e_0727	ubiX	0000460
e_1200	ubiD	0000460
s_0283	3-Octaprenyl-4-hydroxybenzoate	
s_0229	2-Octaprenylphenol	
s_0543	CO2	

Products

Table 1027: Properties of each product.

Id	Name	SBO
s_0229	2-Octaprenylphenol	
s_0543	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{256} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0283}] - \frac{[s_{0229}] \cdot [s_{0543}]}{K_{eq}} \right)}{K_{m0283}} \quad (513)$$

$$1 + \frac{[s_{0283}]}{K_{m0283}} + \left(1 + \frac{[s_{0229}]}{K_{m0229}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) - 1$$

Table 1028: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.08892317229363 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0283		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0229		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

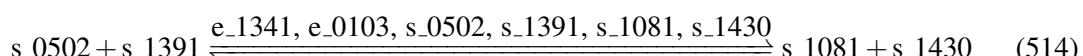
6.257 Reaction r_1065

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name ornithine carbamoyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1029: Properties of each reactant.

Id	Name	SBO
s_0502	Carbamoyl phosphate	
s_1391	Ornithine	

Modifiers

Table 1030: Properties of each modifier.

Id	Name	SBO
e_1341	argI	0000460
e_0103	argF	0000460
s_0502	Carbamoyl phosphate	
s_1391	Ornithine	
s_1081	L-Citrulline	
s_1430	Phosphate	

Products

Table 1031: Properties of each product.

Id	Name	SBO
s_1081	L-Citrulline	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{257} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0502] \cdot [s_1391] - \frac{[s_1081] \cdot [s_1430]}{K_{eq}} \right)}{\left(1 + \frac{[s_0502]}{Km0502} \right) \cdot \left(1 + \frac{[s_1391]}{Km1391} \right) + \left(1 + \frac{[s_1081]}{Km1081} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1} \quad (515)$$

Table 1032: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.574	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0502		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1391		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1081		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

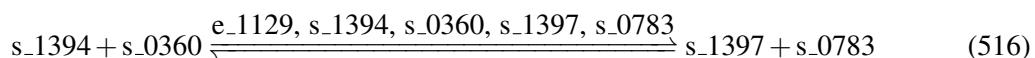
6.258 Reaction r_1067

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name orotate phosphoribosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1033: Properties of each reactant.

Id	Name	SBO
s_{-1394}	Orotate	
s_{-0360}	5-Phospho-alpha-D-ribose 1-diphosphate	

Modifiers

Table 1034: Properties of each modifier.

Id	Name	SBO
e_{-1129}	pyrE	0000460
s_{-1394}	Orotate	
s_{-0360}	5-Phospho-alpha-D-ribose 1-diphosphate	
s_{-1397}	Orotidine 5'-phosphate	
s_{-0783}	Diphosphate	

Products

Table 1035: Properties of each product.

Id	Name	SBO
s_1397	Orotidine 5'-phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{258} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1394}] \cdot [s_{0360}] - \frac{[s_{1397}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m1394} \cdot K_{m0360}} \quad (517)$$

$$\frac{\left(1 + \frac{[s_{1394}]}{K_{m1394}} \right) \cdot \left(1 + \frac{[s_{0360}]}{K_{m0360}} \right) + \left(1 + \frac{[s_{1397}]}{K_{m1397}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{1394}]}{K_{m1394}} \right) \cdot \left(1 + \frac{[s_{0360}]}{K_{m0360}} \right) + \left(1 + \frac{[s_{1397}]}{K_{m1397}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1} - 1$$

Table 1036: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.641	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1394		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0360		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1397		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

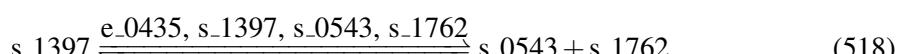
6.259 Reaction r_1068

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name orotidine-5'-phosphate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1037: Properties of each reactant.

Id	Name	SBO
s_1397	Orotidine 5'-phosphate	

Modifiers

Table 1038: Properties of each modifier.

Id	Name	SBO
e_0435	pyrF	0000460
s_1397	Orotidine 5'-phosphate	
s_0543	CO2	
s_1762	UMP	

Products

Table 1039: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1762	UMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{259} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1397}] - \frac{[s_{0543}] \cdot [s_{1762}]}{K_{eq}} \right)}{1 + \frac{[s_{1397}]}{K_{m1397}} + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1762}]}{K_{m1762}} \right) - 1} \quad (519)$$

Table 1040: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.046	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.458	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1397}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1762}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

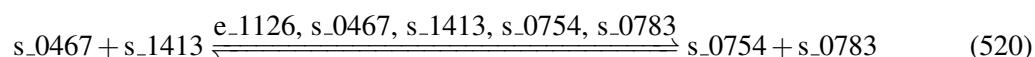
6.260 Reaction r_1074

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name pantetheine-phosphate adenylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1041: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1413	Pantetheine 4'-phosphate	

Modifiers

Table 1042: Properties of each modifier.

Id	Name	SBO
e_1126	coaD	0000460
s_0467	ATP	
s_1413	Pantetheine 4'-phosphate	
s_0754	Dephospho-CoA	
s_0783	Diphosphate	

Products

Table 1043: Properties of each product.

Id	Name	SBO
s_0754	Dephospho-CoA	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{260} = \frac{\text{vol(cell)} \cdot V_{\text{max}} \cdot \left([s_0467] \cdot [s_1413] - \frac{[s_0754] \cdot [s_0783]}{K_{\text{eq}}} \right)}{K_{\text{m0467}} \cdot K_{\text{m1413}}} \quad (521)$$

$$\frac{\left(1 + \frac{[s_0467]}{K_{\text{m0467}}} \right) \cdot \left(1 + \frac{[s_1413]}{K_{\text{m1413}}} \right) + \left(1 + \frac{[s_0754]}{K_{\text{m0754}}} \right) \cdot \left(1 + \frac{[s_0783]}{K_{\text{m0783}}} \right) - 1}{\left(1 + \frac{[s_0467]}{K_{\text{m0467}}} \right) \cdot \left(1 + \frac{[s_1413]}{K_{\text{m1413}}} \right) + \left(1 + \frac{[s_0754]}{K_{\text{m0754}}} \right) \cdot \left(1 + \frac{[s_0783]}{K_{\text{m0783}}} \right) - 1}$$

Table 1044: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1413		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0754		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

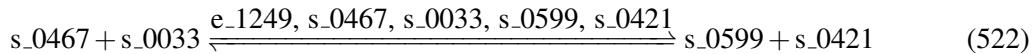
6.261 Reaction r_1075

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name pantothenate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1045: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0033	(R)-Pantothenate	

Modifiers

Table 1046: Properties of each modifier.

Id	Name	SBO
e_1249	coaA	0000460

Id	Name	SBO
s_0467	ATP	
s_0033	(R)-Pantothenate	
s_0599	D-4'-Phosphopantothenate	
s_0421	ADP	

Products

Table 1047: Properties of each product.

Id	Name	SBO
s_0599	D-4'-Phosphopantothenate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{261} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_0467] \cdot [s_0033] - \frac{[s_0599] \cdot [s_0421]}{K_{\text{eq}}} \right)}{K_{\text{m0467}} \cdot K_{\text{m0033}}} \quad (523)$$

$$\left(1 + \frac{[s_0467]}{K_{\text{m0467}}} \right) \cdot \left(1 + \frac{[s_0033]}{K_{\text{m0033}}} \right) + \left(1 + \frac{[s_0599]}{K_{\text{m0599}}} \right) \cdot \left(1 + \frac{[s_0421]}{K_{\text{m0421}}} \right) - 1$$

Table 1048: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0033}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0599}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

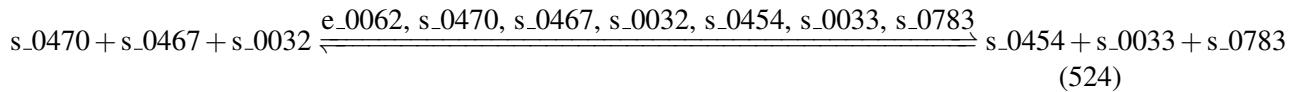
6.262 Reaction r_1076

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name pantothenate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1049: Properties of each reactant.

Id	Name	SBO
s_0470	beta-Alanine	
s_0467	ATP	
s_0032	(R)-Pantoate	

Modifiers

Table 1050: Properties of each modifier.

Id	Name	SBO
e_0062	panC	0000460
s_0470	beta-Alanine	
s_0467	ATP	
s_0032	(R)-Pantoate	
s_0454	AMP	
s_0033	(R)-Pantothenate	
s_0783	Diphosphate	

Products

Table 1051: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0033	(R)-Pantothenate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{262} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{0470}] \cdot [s_{0467}] \cdot [s_{0032}] - \frac{[s_{0454}] \cdot [s_{0033}] \cdot [s_{0783}]}{K_{\text{eq}}} \right)}{K_{m0470} \cdot K_{m0467} \cdot K_{m0032}} \\ = \frac{\left(1 + \frac{[s_{0470}]}{K_{m0470}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0032}]}{K_{m0032}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{0033}]}{K_{m0033}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - 1}{\left(1 + \frac{[s_{0470}]}{K_{m0470}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0032}]}{K_{m0032}} \right) + \left(1 + \frac{[s_{0454}]}{K_{m0454}} \right) \cdot \left(1 + \frac{[s_{0033}]}{K_{m0033}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right)} \quad (525)$$

Table 1052: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388884133 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0470}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0032}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0454}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0033}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

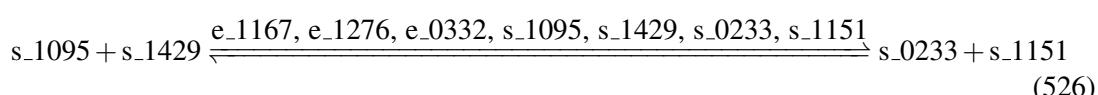
6.263 Reaction r_1081

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name phenylalanine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1053: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1429	Phenylpyruvate	

Modifiers

Table 1054: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
e_1276	tyrB	0000460
e_0332	aspC	0000460
s_1095	L-Glutamate	
s_1429	Phenylpyruvate	
s_0233	2-Oxoglutarate	
s_1151	L-Phenylalanine	

Products

Table 1055: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1151	L-Phenylalanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{263} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1095}] \cdot [s_{1429}] - \frac{[s_{0233}] \cdot [s_{1151}]}{K_{eq}} \right)}{K_{m1095} \cdot K_{m1429}} \quad (527)$$

$$\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1429}]}{K_{m1429}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1151}]}{K_{m1151}} \right) - 1$$

Table 1056: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.026	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.359	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1429		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1151		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

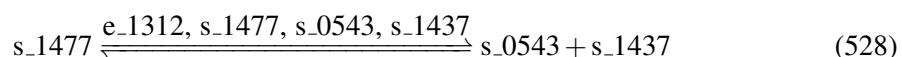
6.264 Reaction r_1123

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Phosphatidylserine decarboxylase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1057: Properties of each reactant.

Id	Name	SBO
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	

Modifiers

Table 1058: Properties of each modifier.

Id	Name	SBO
e_1312	psd	0000460
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	
s_0543	CO2	
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)	

Products

Table 1059: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{264} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1477}] - \frac{[s_{0543}] \cdot [s_{1437}]}{K_{eq}} \right)}{K_{m1477}} \quad (529)$$

$$1 + \frac{[s_{1477}]}{K_{m1477}} + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1437}]}{K_{m1437}} \right) - 1$$

Table 1060: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.088	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1477		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1437		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

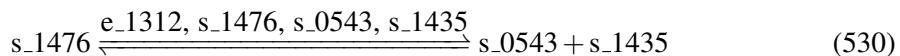
6.265 Reaction r_1124

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Phosphatidylserine decarboxylase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1061: Properties of each reactant.

Id	Name	SBO
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	

Modifiers

Table 1062: Properties of each modifier.

Id	Name	SBO
e_1312	psd	0000460
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	
s_0543	CO2	

Id	Name	SBO
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)	

Products

Table 1063: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)	

Kinetic Law

Derived unit contains undeclared units

$$v_{265} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1476}] - \frac{[s_{0543}] \cdot [s_{1435}]}{K_{eq}} \right)}{Km1476} \quad (531)$$

$$1 + \frac{[s_{1476}]}{Km1476} + \left(1 + \frac{[s_{0543}]}{Km0543} \right) \cdot \left(1 + \frac{[s_{1435}]}{Km1435} \right) - 1$$

Table 1064: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.104	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1476		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1435		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

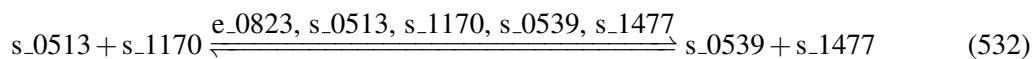
6.266 Reaction r_1130

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Phosphatidylserine syntase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1065: Properties of each reactant.

Id	Name	SBO
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_1170	L-Serine	

Modifiers

Table 1066: Properties of each modifier.

Id	Name	SBO
e_0823	pssA	0000460
s_0513	CDP-1,2-dihexadecanoylglycerol	
s_1170	L-Serine	
s_0539	CMP	
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	

Products

Table 1067: Properties of each product.

Id	Name	SBO
s_0539	CMP	
s_1477	phosphatidylserine (dihexadecanoyl, n-C16:0)	

Kinetic Law

Derived unit contains undeclared units

$$v_{266} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0513] \cdot [s_1170] - \frac{[s_0539] \cdot [s_1477]}{K_{eq}} \right)}{Km0513 \cdot Km1170} \quad (533)$$

$$\frac{\left(1 + \frac{[s_0513]}{Km0513} \right) \cdot \left(1 + \frac{[s_1170]}{Km1170} \right) + \left(1 + \frac{[s_0539]}{Km0539} \right) \cdot \left(1 + \frac{[s_1477]}{Km1477} \right) - 1}{}$$

Table 1068: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.124	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0513		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1170		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0539		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1477		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

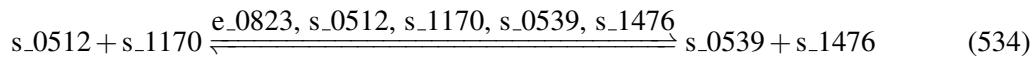
6.267 Reaction r_1131

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Phosphatidylserine syntase (n-C16:1)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1069: Properties of each reactant.

Id	Name	SBO
s_{.0512}	CDP-1,2-dihexadec-9-enoylglycerol	
s_{.1170}	L-Serine	

Modifiers

Table 1070: Properties of each modifier.

Id	Name	SBO
e_{.0823}	pssA	0000460
s_{.0512}	CDP-1,2-dihexadec-9-enoylglycerol	
s_{.1170}	L-Serine	
s_{.0539}	CMP	
s_{.1476}	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	

Products

Table 1071: Properties of each product.

Id	Name	SBO
s_0539	CMP	
s_1476	phosphatidylserine (dihexadec-9-enoyl, n-C16:1)	

Kinetic Law

Derived unit contains undeclared units

$$v_{267} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0512}] \cdot [s_{1170}] - \frac{[s_{0539}] \cdot [s_{1476}]}{K_{eq}} \right)}{Km_{0512} \cdot Km_{1170}} \quad (535)$$

$$\frac{\left(1 + \frac{[s_{0512}]}{Km_{0512}} \right) \cdot \left(1 + \frac{[s_{1170}]}{Km_{1170}} \right) + \left(1 + \frac{[s_{0539}]}{Km_{0539}} \right) \cdot \left(1 + \frac{[s_{1476}]}{Km_{1476}} \right) - 1}{\left(1 + \frac{[s_{0512}]}{Km_{0512}} \right) \cdot \left(1 + \frac{[s_{1170}]}{Km_{1170}} \right) + \left(1 + \frac{[s_{0539}]}{Km_{0539}} \right) \cdot \left(1 + \frac{[s_{1476}]}{Km_{1476}} \right) - 1} - 1$$

Table 1072: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.146	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0512		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1170		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0539		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1476		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

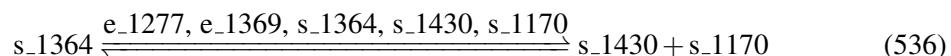
6.268 Reaction r_1134

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name phospho-L-serine phosphatase (periplasmic)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1073: Properties of each reactant.

Id	Name	SBO
s_1364	O-Phospho-L-serine	

Modifiers

Table 1074: Properties of each modifier.

Id	Name	SBO
e_1277	aphA	0000460
e_1369	serB	0000460
s_1364	O-Phospho-L-serine	
s_1430	Phosphate	
s_1170	L-Serine	

Products

Table 1075: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1170	L-Serine	

Kinetic Law

Derived unit contains undeclared units

$$v_{268} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1364}] - \frac{[s_{1430}] \cdot [s_{1170}]}{K_{eq}} \right)}{1 + \frac{[s_{1364}]}{K_{m1364}} + \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1170}]}{K_{m1170}} \right) - 1} \quad (537)$$

Table 1076: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.147	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.469	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1364		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1170		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

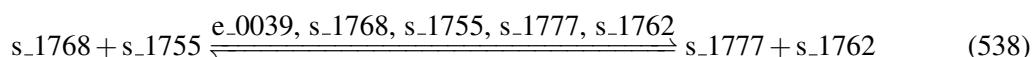
6.269 Reaction r_1137

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phospho-N-acetylmuramoyl-pentapeptide-transferase (meso-2,6-diaminopimelate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1077: Properties of each reactant.

Id	Name	SBO
s_1768	Undecaprenyl phosphate	
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	

Modifiers

Table 1078: Properties of each modifier.

Id	Name
e_0039	mraY
s_1768	Undecaprenyl phosphate
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine
s_1762	UMP

Products

Table 1079: Properties of each product.

Id	Name
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine
s_1762	UMP

Kinetic Law

Derived unit contains undeclared units

$$v_{269} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{-1768}] \cdot [s_{-1755}] - \frac{[s_{-1777}] \cdot [s_{-1762}]}{K_{eq}} \right)}{K_{m1768} \cdot K_{m1755}} \quad (539)$$

$$\frac{\left(1 + \frac{[s_{-1768}]}{K_{m1768}} \right) \cdot \left(1 + \frac{[s_{-1755}]}{K_{m1755}} \right) + \left(1 + \frac{[s_{-1777}]}{K_{m1777}} \right) \cdot \left(1 + \frac{[s_{-1762}]}{K_{m1762}} \right) - 1}{\left(1 + \frac{[s_{-1768}]}{K_{m1768}} \right) \cdot \left(1 + \frac{[s_{-1755}]}{K_{m1755}} \right) + \left(1 + \frac{[s_{-1777}]}{K_{m1777}} \right) \cdot \left(1 + \frac{[s_{-1762}]}{K_{m1762}} \right) - 1}$$

Table 1080: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.054	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1768		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1755		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1777		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1762		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

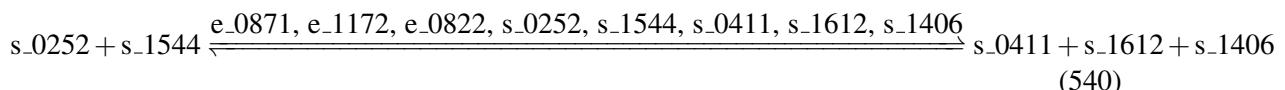
6.270 Reaction r_1139

This is a reversible reaction of two reactants forming three products influenced by eight modifiers.

Name phosphoadenylyl-sulfate reductase (thioredoxin)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1081: Properties of each reactant.

Id	Name	SBO
s_0252	3'-Phosphoadenylyl sulfate	
s_1544	Reduced thioredoxin	

Modifiers

Table 1082: Properties of each modifier.

Id	Name	SBO
e_0871	cysH	0000460
e_1172	trxA	0000460
e_0822	trxC	0000460
s_0252	3'-Phosphoadenylyl sulfate	
s_1544	Reduced thioredoxin	
s_0411	Adenosine 3',5'-bisphosphate	
s_1612	Sulfite	
s_1406	Oxidized thioredoxin	

Products

Table 1083: Properties of each product.

Id	Name	SBO
s_0411	Adenosine 3',5'-bisphosphate	
s_1612	Sulfite	
s_1406	Oxidized thioredoxin	

Kinetic Law

Derived unit contains undeclared units

$$v_{270} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0252}] \cdot [s_{1544}] - \frac{[s_{0411}] \cdot [s_{1612}] \cdot [s_{1406}]}{K_{eq}} \right)}{Km_{0252} \cdot Km_{1544}} \\ \frac{1 + \frac{[s_{0252}]}{Km_{0252}}}{\left(1 + \frac{[s_{0252}]}{Km_{0252}} \right) \cdot \left(1 + \frac{[s_{1544}]}{Km_{1544}} \right) + \left(1 + \frac{[s_{0411}]}{Km_{0411}} \right) \cdot \left(1 + \frac{[s_{1612}]}{Km_{1612}} \right) \cdot \left(1 + \frac{[s_{1406}]}{Km_{1406}} \right) - 1} \quad (541)$$

Table 1084: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.755	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0252		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1544		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0411		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1612		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1406		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

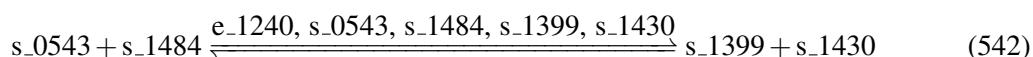
6.271 Reaction r_1141

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoenolpyruvate carboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1085: Properties of each reactant.

Id	Name	SBO
s_0543	CO2	
s_1484	Phosphoenolpyruvate	

Modifiers

Table 1086: Properties of each modifier.

Id	Name	SBO
e_1240	ppc	0000460
s_0543	CO2	
s_1484	Phosphoenolpyruvate	
s_1399	Oxaloacetate	
s_1430	Phosphate	

Products

Table 1087: Properties of each product.

Id	Name	SBO
s_1399	Oxaloacetate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{271} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0543] \cdot [s_1484] - \frac{[s_1399] \cdot [s_1430]}{K_{eq}} \right)}{Km0543 \cdot Km1484} \quad (543)$$

$$\frac{\left(1 + \frac{[s_0543]}{Km0543} \right) \cdot \left(1 + \frac{[s_1484]}{Km1484} \right) + \left(1 + \frac{[s_1399]}{Km1399} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1}{\left(1 + \frac{[s_0543]}{Km0543} \right) \cdot \left(1 + \frac{[s_1484]}{Km1484} \right) + \left(1 + \frac{[s_1399]}{Km1399} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1}$$

Table 1088: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.493	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	6.901	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0543		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1484		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1399		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

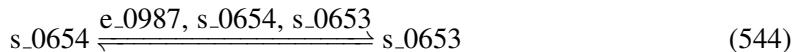
6.272 Reaction r_1150

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoglucomutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1089: Properties of each reactant.

Id	Name	SBO
s_0654	D-Glucosamine 6-phosphate	

Modifiers

Table 1090: Properties of each modifier.

Id	Name	SBO
e_0987	glmM	0000460
s_0654	D-Glucosamine 6-phosphate	

Id	Name	SBO
s_0653	D-Glucosamine 1-phosphate	

Product

Table 1091: Properties of each product.

Id	Name	SBO
s_0653	D-Glucosamine 1-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{272} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0654}] - \frac{[s_{0653}]}{K_{eq}} \right)}{K_{m0654}} \quad (545)$$

$$\frac{1 + \frac{[s_{0654}]}{K_{m0654}} + 1 + \frac{[s_{0653}]}{K_{m0653}} - 1}{}$$

Table 1092: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.079	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0654}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0653}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

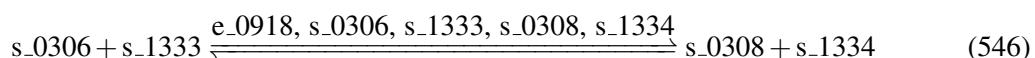
6.273 Reaction r_1151

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoglycerate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1093: Properties of each reactant.

Id	Name	SBO
s_0306	3-Phospho-D-glycerate	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 1094: Properties of each modifier.

Id	Name	SBO
e_0918	serA	0000460
s_0306	3-Phospho-D-glycerate	
s_1333	Nicotinamide adenine dinucleotide	
s_0308	3-Phosphohydroxypyruvate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 1095: Properties of each product.

Id	Name	SBO
s_0308	3-Phosphohydroxypyruvate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{273} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0306] \cdot [s_1333] - \frac{[s_0308] \cdot [s_1334]}{K_{eq}} \right)}{\left(1 + \frac{[s_0306]}{Km0306} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) + \left(1 + \frac{[s_0308]}{Km0308} \right) \cdot \left(1 + \frac{[s_1334]}{Km1334} \right) - 1} \quad (547)$$

Table 1096: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.147	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	2.057	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0306		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1333		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0308		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

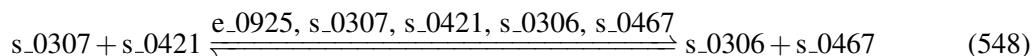
6.274 Reaction r_1152

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoglycerate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1097: Properties of each reactant.

Id	Name	SBO
s_0307	3-Phospho-D-glyceroyl phosphate	
s_0421	ADP	

Modifiers

Table 1098: Properties of each modifier.

Id	Name	SBO
e_0925	pgk	0000460
s_0307	3-Phospho-D-glyceroyl phosphate	
s_0421	ADP	
s_0306	3-Phospho-D-glycerate	
s_0467	ATP	

Products

Table 1099: Properties of each product.

Id	Name	SBO
s_0306	3-Phospho-D-glycerate	
s_0467	ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{274} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0307}] \cdot [s_{0421}] - \frac{[s_{0306}] \cdot [s_{0467}]}{K_{eq}} \right)}{K_{m0307} \cdot K_{m0421}} \quad (549)$$

$$\frac{\left(1 + \frac{[s_{0307}]}{K_{m0307}} \right) \cdot \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) + \left(1 + \frac{[s_{0306}]}{K_{m0306}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) - 1}{\left(1 + \frac{[s_{0307}]}{K_{m0307}} \right) \cdot \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) + \left(1 + \frac{[s_{0306}]}{K_{m0306}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) - 1} - 1$$

Table 1100: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.788	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	11.030	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0307}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0421}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0306}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0467}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

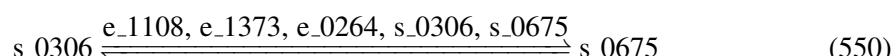
6.275 Reaction r_1153

This is a reversible reaction of one reactant forming one product influenced by five modifiers.

Name phosphoglycerate mutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1101: Properties of each reactant.

Id	Name	SBO
s_0306	3-Phospho-D-glycerate	

Modifiers

Table 1102: Properties of each modifier.

Id	Name	SBO
e_1108	gpmI	0000460
e_1373	gpmB	0000460
e_0264	gpmA	0000460
s_0306	3-Phospho-D-glycerate	
s_0675	D-Glycerate 2-phosphate	

Product

Table 1103: Properties of each product.

Id	Name	SBO
s_0675	D-Glycerate 2-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{275} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0306] - \frac{[s_0675]}{K_{\text{eq}}} \right)}{1 + \frac{[s_0306]}{K_{m0306}} + 1 + \frac{[s_0675]}{K_{m0675}} - 1} \quad (551)$$

Table 1104: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.641	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	3.846	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0306}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0675}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

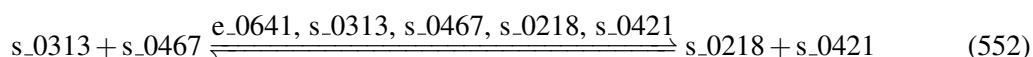
6.276 Reaction r_1198

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphomethylpyrimidine kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1105: Properties of each reactant.

Id	Name	SBO
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0467	ATP	

Modifiers

Table 1106: Properties of each modifier.

Id	Name	SBO
e_0641	thiD	0000460
s_0313	4-Amino-2-methyl-5-phosphomethylpyrimidine	
s_0467	ATP	
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0421	ADP	

Products

Table 1107: Properties of each product.

Id	Name	SBO
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0421	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{276} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0313}] \cdot [s_{0467}] - \frac{[s_{0218}] \cdot [s_{0421}]}{K_{eq}} \right)}{K_{m0313} \cdot K_{m0467}}}{\left(1 + \frac{[s_{0313}]}{K_{m0313}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) + \left(1 + \frac{[s_{0218}]}{K_{m0218}} \right) \cdot \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) - 1} \quad (553)$$

Table 1108: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0313		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0218		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

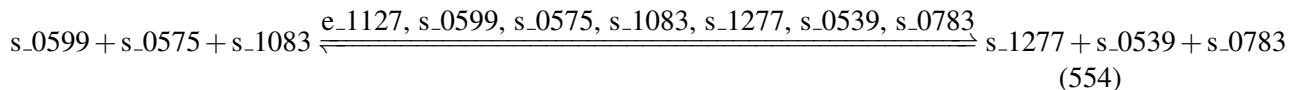
6.277 Reaction r_1200

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphopantetheate-cysteine ligase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1109: Properties of each reactant.

Id	Name	SBO
s_0599	D-4'-Phosphopantetheate	
s_0575	CTP	
s_1083	L-Cysteine	

Modifiers

Table 1110: Properties of each modifier.

Id	Name	SBO
e_1127	coaBC	0000460
s_0599	D-4'-Phosphopantetheate	
s_0575	CTP	
s_1083	L-Cysteine	
s_1277	N-((R)-4-Phosphopantethoyl)-L-cysteine	
s_0539	CMP	
s_0783	Diphosphate	

Products

Table 1111: Properties of each product.

Id	Name	SBO
s_1277	N-((R)-4-Phosphopantethoyl)-L-cysteine	
s_0539	CMP	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{277} = \frac{vol(cell) \cdot Vmax \cdot \left([s_0599] \cdot [s_0575] \cdot [s_1083] - \frac{[s_1277] \cdot [s_0539] \cdot [s_0783]}{K_{eq}} \right)}{(1 + \frac{[s_0599]}{Km0599}) \cdot (1 + \frac{[s_0575]}{Km0575}) \cdot (1 + \frac{[s_1083]}{Km1083}) + (1 + \frac{[s_1277]}{Km1277}) \cdot (1 + \frac{[s_0539]}{Km0539}) \cdot (1 + \frac{[s_0783]}{Km0783}) - 1} \quad (555)$$

Table 1112: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0599		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0575		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1083		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1277		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0539		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

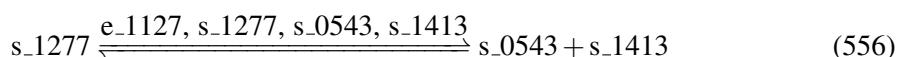
6.278 Reaction r_1201

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name phosphopantothenoylcysteine decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1113: Properties of each reactant.

Id	Name	SBO
s_1277	N-((R)-4-Phosphopantothenoyl)-L-cysteine	

Modifiers

Table 1114: Properties of each modifier.

Id	Name	SBO
e_1127	coaBC	0000460
s_1277	N-((R)-4-Phosphopantothenoyl)-L-cysteine	
s_0543	CO2	
s_1413	Pantetheine 4'-phosphate	

Products

Table 1115: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1413	Pantetheine 4'-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{278} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1277}] - \frac{[s_{0543}][s_{1413}]}{K_{eq}} \right)}{1 + \frac{[s_{1277}]}{K_{m1277}} + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1413}]}{K_{m1413}} \right) - 1} \quad (557)$$

Table 1116: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.97856388897518 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$7.97856388897518 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1277}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1413}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

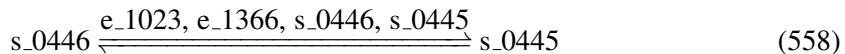
6.279 Reaction r_1202

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name phosphopentomutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1117: Properties of each reactant.

Id	Name	SBO
s_0446	alpha-D-Ribose 5-phosphate	

Modifiers

Table 1118: Properties of each modifier.

Id	Name	SBO
e_1023	yhfW	0000460
e_1366	deoB	0000460
s_0446	alpha-D-Ribose 5-phosphate	

Id	Name	SBO
s_0445	alpha-D-Ribose 1-phosphate	

Product

Table 1119: Properties of each product.

Id	Name	SBO
s_0445	alpha-D-Ribose 1-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{279} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0446}] - \frac{[s_{0445}]}{K_{eq}} \right)}{1 + \frac{[s_{0446}]}{K_{m0446}} + 1 + \frac{[s_{0445}]}{K_{m0445}} - 1} \quad (559)$$

Table 1120: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.32217621775477 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$5.59330573065286 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0446}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0445}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

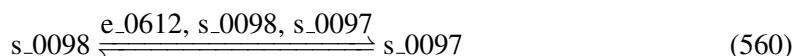
6.280 Reaction r_1204

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoribosyl-AMP cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1121: Properties of each reactant.

Id	Name	SBO
s_0098	1-(5-Phosphoribosyl)-AMP	

Modifiers

Table 1122: Properties of each modifier.

Id	Name	SBO
e_0612	hisI	00004
s_0098	1-(5-Phosphoribosyl)-AMP	
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	

Product

Table 1123: Properties of each product.

Id	Name	SBO
s_0097	1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide	

Kinetic Law

Derived unit contains undeclared units

$$v_{280} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0098] - \frac{[s_0097]}{K_{\text{eq}}} \right)}{1 + \frac{[s_0098]}{K_{m0098}} + 1 + \frac{[s_0097]}{K_{m0097}} - 1} \quad (561)$$

Table 1124: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.079	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0098}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0097}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.281 Reaction r_1205

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name phosphoribosyl-ATP pyrophosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1125: Properties of each reactant.

Id	Name	SBO
s_0099	1-(5-Phosphoribosyl)-ATP	

Modifiers

Table 1126: Properties of each modifier.

Id	Name	SBO
e_0612	hisI	0000460
s_0099	1-(5-Phosphoribosyl)-ATP	
s_0783	Diphosphate	
s_0098	1-(5-Phosphoribosyl)-AMP	

Products

Table 1127: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_0098	1-(5-Phosphoribosyl)-AMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{281} = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot \left([\text{s_0099}] - \frac{[\text{s_0783}] \cdot [\text{s_0098}]}{\text{K}_{\text{eq}}} \right)}{\text{Km0099}}}{1 + \frac{[\text{s_0099}]}{\text{Km0099}} + \left(1 + \frac{[\text{s_0783}]}{\text{Km0783}} \right) \cdot \left(1 + \frac{[\text{s_0098}]}{\text{Km0098}} \right) - 1} \quad (563)$$

Table 1128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.131	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0099		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0098		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

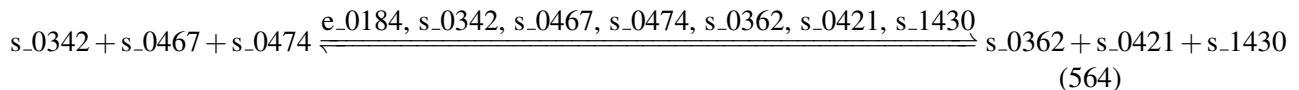
6.282 Reaction r_1206

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphoribosylaminoimidazole carboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1129: Properties of each reactant.

Id	Name	SBO
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_0467	ATP	
s_0474	Bicarbonate	

Modifiers

Table 1130: Properties of each modifier.

Id	Name	SBO
e_0184	purK	0000460
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_0467	ATP	
s_0474	Bicarbonate	
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 1131: Properties of each product.

Id	Name	SBO
s_0362	5-phosphoribosyl-5-carboxyaminoimidazole	
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{282} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0342}] \cdot [s_{0467}] \cdot [s_{0474}] - \frac{[s_{0362}] \cdot [s_{0421}] \cdot [s_{1430}]}{K_{eq}} \right)}{(1 + \frac{[s_{0342}]}{K_{m0342}}) \cdot (1 + \frac{[s_{0467}]}{K_{m0467}}) \cdot (1 + \frac{[s_{0474}]}{K_{m0474}}) + (1 + \frac{[s_{0362}]}{K_{m0362}}) \cdot (1 + \frac{[s_{0421}]}{K_{m0421}}) \cdot (1 + \frac{[s_{1430}]}{K_{m1430}}) - 1} \quad (565)$$

Table 1132: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.842	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0342		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0474		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0362		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

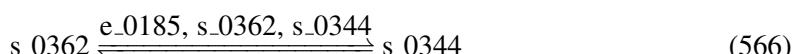
6.283 Reaction r_1207

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoribosylaminoimidazole carboxylase (mutase rxn)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1133: Properties of each reactant.

Id	Name	SBO
s_{_0362}	5-phosphoribosyl-5-carboxyaminoimidazole	

Modifiers

Table 1134: Properties of each modifier.

Id	Name	SBO
e_{_0185}	purE	0000460
s_{_0362}	5-phosphoribosyl-5-carboxyaminoimidazole	
s_{_0344}	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	

Product

Table 1135: Properties of each product.

Id	Name	SBO
s_{_0344}	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	

Kinetic Law

Derived unit contains undeclared units

$$v_{283} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{_0362}] - \frac{[s_{_0344}]}{K_{\text{eq}}} \right)}{1 + \frac{[s_{_0362}]}{K_{m0362}} + 1 + \frac{[s_{_0344}]}{K_{m0344}} - 1} \quad (567)$$

Table 1136: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.368	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0362		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0344		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

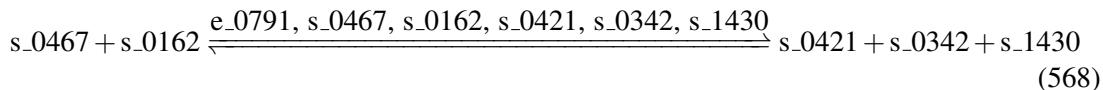
6.284 Reaction r_1208

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name phosphoribosylaminoimidazole synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1137: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	

Modifiers

Table 1138: Properties of each modifier.

Id	Name	SBO
e_0791	purM	0000460
s_0467	ATP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	
s_0421	ADP	
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1430	Phosphate	

Products

Table 1139: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0342	5-amino-1-(5-phospho-D-ribosyl)imidazole	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{284} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0162}] - \frac{[s_{0421}] \cdot [s_{0342}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0162}} \\ \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0162}]}{K_{m0162}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0342}]}{K_{m0342}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1 \quad (569)$$

Table 1140: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.351	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0162		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0342		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

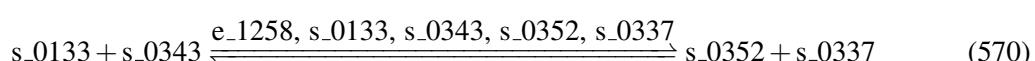
6.285 Reaction r_1209

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoribosylaminoimidazolecarboxamide formyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1141: Properties of each reactant.

Id	Name	SBO
s_0133	10-Formyltetrahydrofolate	
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	

Modifiers

Table 1142: Properties of each modifier.

Id	Name	SBO
e_1258	purH	0000460
s_0133	10-Formyltetrahydrofolate	
s_0343	5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide	
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	
s_0337	5,6,7,8-Tetrahydrofolate	

Products

Table 1143: Properties of each product.

Id	Name	SBO
s_0352	5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	
s_0337	5,6,7,8-Tetrahydrofolate	

Kinetic Law

Derived unit contains undeclared units

$$v_{285} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0133] \cdot [s_0343] - \frac{[s_0352] \cdot [s_0337]}{K_{eq}} \right)}{(1 + \frac{[s_0133]}{Km0133}) \cdot (1 + \frac{[s_0343]}{Km0343}) + (1 + \frac{[s_0352]}{Km0352}) \cdot (1 + \frac{[s_0337]}{Km0337}) - 1} \quad (571)$$

Table 1144: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.075	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.043	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0133		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0343		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0352		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0337		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

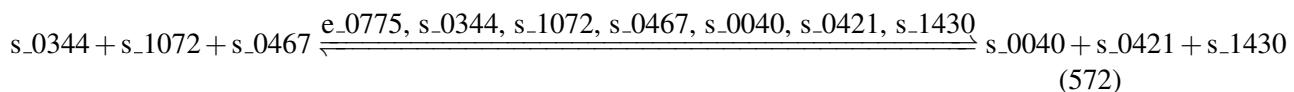
6.286 Reaction r_1210

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphoribosylaminoimidazolesuccinocarboxamide synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1145: Properties of each reactant.

Id	Name	SBO
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	
s_1072	L-Aspartate	
s_0467	ATP	

Modifiers

Table 1146: Properties of each modifier.

Id	Name	SBO
e_0775	purC	0000460
s_0344	5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate	
s_1072	L-Aspartate	
s_0467	ATP	
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	
s_0421	ADP	
s_1430	Phosphate	

Products

Table 1147: Properties of each product.

Id	Name	SBO
s_0040	(S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate	
s_0421	ADP	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{286} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{0344}] \cdot [s_{1072}] \cdot [s_{0467}] - \frac{[s_{0040}] \cdot [s_{0421}] \cdot [s_{1430}]}{K_{eq}} \right)}{Km0344 \cdot Km1072 \cdot Km0467} \\ = \frac{\left(1 + \frac{[s_{0344}]}{Km0344} \right) \cdot \left(1 + \frac{[s_{1072}]}{Km1072} \right) \cdot \left(1 + \frac{[s_{0467}]}{Km0467} \right) + \left(1 + \frac{[s_{0040}]}{Km0040} \right) \cdot \left(1 + \frac{[s_{0421}]}{Km0421} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km1430} \right) - 1}{\left(1 + \frac{[s_{0344}]}{Km0344} \right) \cdot \left(1 + \frac{[s_{1072}]}{Km1072} \right) \cdot \left(1 + \frac{[s_{0467}]}{Km0467} \right) + \left(1 + \frac{[s_{0040}]}{Km0040} \right) \cdot \left(1 + \frac{[s_{0421}]}{Km0421} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km1430} \right) - 1}$$
 (573)

Table 1148: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.842	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0344		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1072		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0040		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.287 Reaction r_1211

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name phosphoribosylanthranilate isomerase (irreversible)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1149: Properties of each reactant.

Id	Name	SBO
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	

Modifiers

Table 1150: Properties of each modifier.

Id	Name	SBO
e_0427	trpC	0000460
s_1278	N-(5-Phospho-D-ribosyl)anthranilate	
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Product

Table 1151: Properties of each product.

Id	Name	SBO
s_0096	1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{287} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1278}] - \frac{[s_{0096}]}{K_{eq}} \right)}{1 + \frac{[s_{1278}]}{K_{m1278}} + 1 + \frac{[s_{0096}]}{K_{m0096}} - 1} \quad (575)$$

Table 1152: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.047	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1278}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0096}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

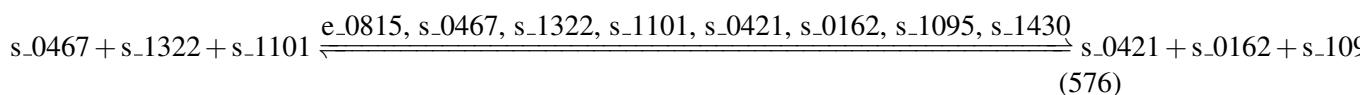
6.288 Reaction r_1212

This is a reversible reaction of three reactants forming four products influenced by eight modifiers.

Name phosphoribosylformylglycinamide synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1153: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1101	L-Glutamine	

Modifiers

Table 1154: Properties of each modifier.

Id	Name	SBO
e_0815	purL	0000460
s_0467	ATP	
s_1322	N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide	
s_1101	L-Glutamine	
s_0421	ADP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	
s_1095	L-Glutamate	
s_1430	Phosphate	

Products

Table 1155: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0162	2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine	
s_1095	L-Glutamate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

v_{288}

(577)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1322}] \cdot [s_{1101}] - \frac{[s_{0421}] \cdot [s_{0162}] \cdot [s_{1095}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m1322} \cdot K_{m1101}} \\ = \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1322}]}{K_{m1322}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0162}]}{K_{m0162}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) -$$

Table 1156: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	2.825	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1322}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1101}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0162}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1095}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

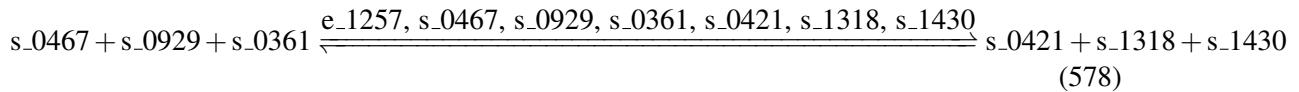
6.289 Reaction r_1214

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name phosphoribosylglycinamide synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1157: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0929	Glycine	
s_0361	5-Phospho-beta-D-ribosylamine	

Modifiers

Table 1158: Properties of each modifier.

Id	Name	SBO
e_1257	purD	0000460
s_0467	ATP	
s_0929	Glycine	
s_0361	5-Phospho-beta-D-ribosylamine	
s_0421	ADP	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Products

Table 1159: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1318	N1-(5-Phospho-D-ribosyl)glycinamide	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{289} \quad (579)$$

$$= \frac{\text{vol}(cell) \cdot V_{\text{max}} \cdot \left([s_0467] \cdot [s_0929] \cdot [s_0361] - \frac{[s_0421] \cdot [s_1318] \cdot [s_1430]}{K_{\text{eq}}} \right)}{K_{m0467} \cdot K_{m0929} \cdot K_{m0361}}$$

$$= \frac{\left(1 + \frac{[s_0467]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_0929]}{K_{m0929}} \right) \cdot \left(1 + \frac{[s_0361]}{K_{m0361}} \right) + \left(1 + \frac{[s_0421]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_1318]}{K_{m1318}} \right) \cdot \left(1 + \frac{[s_1430]}{K_{m1430}} \right) - 1}{\left(1 + \frac{[s_0467]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_0929]}{K_{m0929}} \right) \cdot \left(1 + \frac{[s_0361]}{K_{m0361}} \right) + \left(1 + \frac{[s_0421]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_1318]}{K_{m1318}} \right) \cdot \left(1 + \frac{[s_1430]}{K_{m1430}} \right) - 1}$$

Table 1160: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.061	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	1.843	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0929}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0361}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1318}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

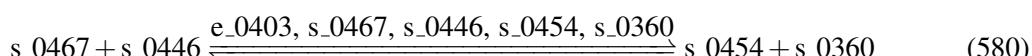
6.290 Reaction r_1215

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoribosylpyrophosphate synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1161: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0446	alpha-D-Ribose 5-phosphate	

Modifiers

Table 1162: Properties of each modifier.

Id	Name	SBO
e_0403	prs	0000460
s_0467	ATP	
s_0446	alpha-D-Ribose 5-phosphate	
s_0454	AMP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Products

Table 1163: Properties of each product.

Id	Name	SBO
s_0454	AMP	
s_0360	5-Phospho-alpha-D-ribose 1-diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{290} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0446] - \frac{[s_0454] \cdot [s_0360]}{K_{eq}} \right)}{Km0467 \cdot Km0446} \quad (581)$$

$$\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_0446]}{Km0446} \right) + \left(1 + \frac{[s_0454]}{Km0454} \right) \cdot \left(1 + \frac{[s_0360]}{Km0360} \right) - 1$$

Table 1164: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.129	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.800	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0446		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0360		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

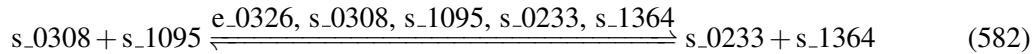
6.291 Reaction r_1217

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name phosphoserine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1165: Properties of each reactant.

Id	Name	SBO
s_{_0308}	3-Phosphohydroxypyruvate	
s_{_1095}	L-Glutamate	

Modifiers

Table 1166: Properties of each modifier.

Id	Name	SBO
e_{_0326}	serC	0000460
s_{_0308}	3-Phosphohydroxypyruvate	
s_{_1095}	L-Glutamate	
s_{_0233}	2-Oxoglutarate	
s_{_1364}	O-Phospho-L-serine	

Products

Table 1167: Properties of each product.

Id	Name	SBO
s_{_0233}	2-Oxoglutarate	
s_{_1364}	O-Phospho-L-serine	

Kinetic Law

Derived unit contains undeclared units

$$v_{291} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{_0308}] \cdot [s_{_1095}] - \frac{[s_{_0233}] \cdot [s_{_1364}]}{K_{\text{eq}}} \right)}{K_{m0308} \cdot K_{m1095}} \quad (583)$$

$$\frac{\left(1 + \frac{[s_{_0308}]}{K_{m0308}} \right) \cdot \left(1 + \frac{[s_{_1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{_0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{_1364}]}{K_{m1364}} \right) - 1}{\left(1 + \frac{[s_{_0308}]}{K_{m0308}} \right) \cdot \left(1 + \frac{[s_{_1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{_0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{_1364}]}{K_{m1364}} \right) - 1}$$

Table 1168: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.147	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	2.057	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0308		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1364		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

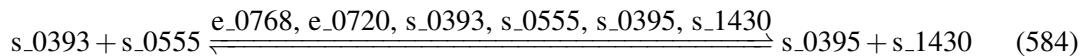
6.292 Reaction r_1218

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name phosphotransacetylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1169: Properties of each reactant.

Id	Name	SBO
s_0393	Acetyl phosphate	
s_0555	Coenzyme A	

Modifiers

Table 1170: Properties of each modifier.

Id	Name	SBO
e_0768	eutD	0000460
e_0720	pta	0000460
s_0393	Acetyl phosphate	
s_0555	Coenzyme A	
s_0395	Acetyl-CoA	
s_1430	Phosphate	

Products

Table 1171: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{292} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0393}] \cdot [s_{0555}] - \frac{[s_{0395}] \cdot [s_{1430}]}{K_{eq}} \right)}{Km0393 \cdot Km0555} \quad (585)$$

$$\frac{\left(1 + \frac{[s_{0393}]}{Km0393} \right) \cdot \left(1 + \frac{[s_{0555}]}{Km0555} \right) + \left(1 + \frac{[s_{0395}]}{Km0395} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km1430} \right) - 1}{\left(1 + \frac{[s_{0393}]}{Km0393} \right) \cdot \left(1 + \frac{[s_{0555}]}{Km0555} \right) + \left(1 + \frac{[s_{0395}]}{Km0395} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km1430} \right) - 1}$$

Table 1172: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.081	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.130	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0393		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0555		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0395		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

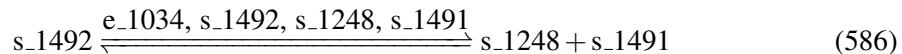
6.293 Reaction r_1220

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name Pimeloyl-[ACP] methyl ester esterase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1173: Properties of each reactant.

Id	Name	SBO
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	

Modifiers

Table 1174: Properties of each modifier.

Id	Name	SBO
e_1034	bioH	0000460
s_1492	Pimeloyl-[acyl-carrier protein] methyl ester	
s_1248	Methanol	
s_1491	Pimeloyl-[acyl-carrier protein]	

Products

Table 1175: Properties of each product.

Id	Name	SBO
s_1248	Methanol	
s_1491	Pimeloyl-[acyl-carrier protein]	

Kinetic Law

Derived unit contains undeclared units

$$v_{293} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1492}] - \frac{[s_{1248}] \cdot [s_{1491}]}{K_{eq}} \right)}{1 + \frac{[s_{1492}]}{K_{m1492}} + \left(1 + \frac{[s_{1248}]}{K_{m1248}} \right) \cdot \left(1 + \frac{[s_{1491}]}{K_{m1491}} \right) - 1} \quad (587)$$

Table 1176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			2.77033467884759 · 10 ⁻⁷	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	2.77033467884759 · 10 ⁻⁶	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1492}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1248}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1491}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

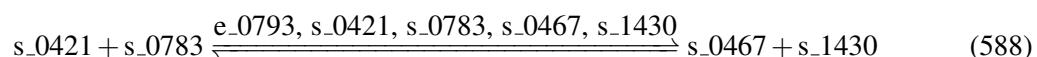
6.294 Reaction r_1222

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name polyphosphate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1177: Properties of each reactant.

Id	Name	SBO
s_{_0421}	ADP	
s_{_0783}	Diphosphate	

Modifiers

Table 1178: Properties of each modifier.

Id	Name	SBO
e_{_0793}	ppk	0000460
s_{_0421}	ADP	
s_{_0783}	Diphosphate	
s_{_0467}	ATP	
s_{_1430}	Phosphate	

Products

Table 1179: Properties of each product.

Id	Name	SBO
s_{_0467}	ATP	
s_{_1430}	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{294} = \frac{\frac{\text{vol(cell)} \cdot V_{\text{max}} \cdot \left([s_{0421}] \cdot [s_{0783}] - \frac{[s_{0467}] \cdot [s_{1430}]}{K_{\text{eq}}} \right)}{K_{m0421} \cdot K_{m0783}}}{\left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) + \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1} \quad (589)$$

Table 1180: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.485	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	6.785	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0421		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0783		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

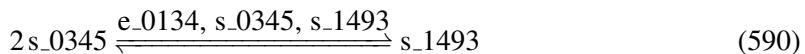
6.295 Reaction r_1223

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name porphobilinogen synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1181: Properties of each reactant.

Id	Name	SBO
s_0345	5-Amino-4-oxopentanoate	

Modifiers

Table 1182: Properties of each modifier.

Id	Name	SBO
e_0134	hemB	0000460
s_0345	5-Amino-4-oxopentanoate	

Id	Name	SBO
s_1493	Porphobilinogen	

Product

Table 1183: Properties of each product.

Id	Name	SBO
s_1493	Porphobilinogen	

Kinetic Law

Derived unit contains undeclared units

$$v_{295} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0345}]^2 - \frac{[s_{1493}]}{K_{eq}} \right)}{K_{m0345}^2}}{\left(1 + \frac{[s_{0345}]}{K_{m0345}} \right)^2 + 1 + \frac{[s_{1493}]}{K_{m1493}} - 1} \quad (591)$$

Table 1184: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.47113853781668 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.002	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	20.000	mmol ⁻¹ · 1	<input checked="" type="checkbox"/>
K _{m0345}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1493}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

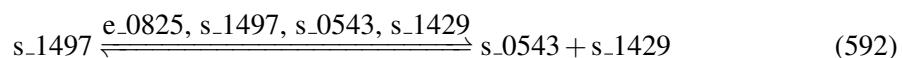
6.296 Reaction r_1224

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name prephenate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1185: Properties of each reactant.

Id	Name	SBO
s_1497	Prephenate	

Modifiers

Table 1186: Properties of each modifier.

Id	Name	SBO
e_0825	pheA	0000460
s_1497	Prephenate	
s_0543	CO2	
s_1429	Phenylpyruvate	

Products

Table 1187: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1429	Phenylpyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{296} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1497}] - \frac{[s_{0543}] \cdot [s_{1429}]}{K_{eq}} \right)}{1 + \frac{[s_{1497}]}{K_{m1497}} + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1429}]}{K_{m1429}} \right) - 1} \quad (593)$$

Table 1188: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.026	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.257	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1497}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1429}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

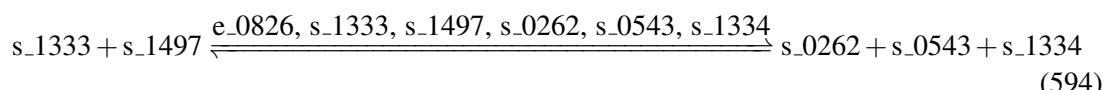
6.297 Reaction r_1225

This is a reversible reaction of two reactants forming three products influenced by six modifiers.

Name prephenate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1189: Properties of each reactant.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1497	Prephenate	

Modifiers

Table 1190: Properties of each modifier.

Id	Name	SBO
e_0826	tyrA	0000460
s_1333	Nicotinamide adenine dinucleotide	
s_1497	Prephenate	
s_0262	3-(4-Hydroxyphenyl)pyruvate	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 1191: Properties of each product.

Id	Name	SBO
s_0262	3-(4-Hydroxyphenyl)pyruvate	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{297} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1333}] \cdot [s_{1497}] - \frac{[s_{0262}] \cdot [s_{0543}] \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m1333} \cdot K_{m1497}} \\ \frac{\left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1497}]}{K_{m1497}} \right) + \left(1 + \frac{[s_{0262}]}{K_{m0262}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}{(595)}$$

Table 1192: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.019	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.421	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1333}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1497}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0262}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0543}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1334}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

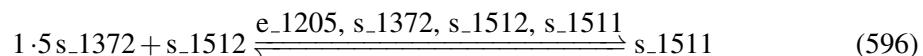
6.298 Reaction r_1230

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name protoporphyrinogen oxidase (aerobic)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1193: Properties of each reactant.

Id	Name	SBO
s_1372	O ₂	
s_1512	Protoporphyrinogen IX	

Modifiers

Table 1194: Properties of each modifier.

Id	Name	SBO
e_1205	hemG	0000460
s_1372	O2	
s_1512	Protoporphyrinogen IX	
s_1511	Protoporphyrin	

Product

Table 1195: Properties of each product.

Id	Name	SBO
s_1511	Protoporphyrin	

Kinetic Law

Derived unit contains undeclared units

$$v_{298} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1372}] \cdot [s_{1512}] - \frac{[s_{1511}]}{K_{eq}} \right)}{K_{m1372} \cdot K_{m1512}} \quad (597)$$

$$\frac{1}{\left(1 + \frac{[s_{1372}]}{K_{m1372}} \right) \cdot \left(1 + \frac{[s_{1512}]}{K_{m1512}} \right) + 1 + \frac{[s_{1511}]}{K_{m1511}} - 1}$$

Table 1196: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222945 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.08892317222945 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
Km1372		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1512		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1511		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

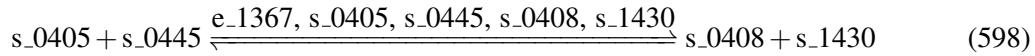
6.299 Reaction r_1232

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name purine-nucleoside phosphorylase (Adenosine)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1197: Properties of each reactant.

Id	Name	SBO
s_0405	Adenine	
s_0445	alpha-D-Ribose 1-phosphate	

Modifiers

Table 1198: Properties of each modifier.

Id	Name	SBO
e_1367	deoD	0000460
s_0405	Adenine	
s_0445	alpha-D-Ribose 1-phosphate	
s_0408	Adenosine	
s_1430	Phosphate	

Products

Table 1199: Properties of each product.

Id	Name	SBO
s_0408	Adenosine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{299} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0405] \cdot [s_0445] - \frac{[s_0408] \cdot [s_1430]}{K_{eq}} \right)}{\left(1 + \frac{[s_0405]}{Km0405} \right) \cdot \left(1 + \frac{[s_0445]}{Km0445} \right) + \left(1 + \frac{[s_0408]}{Km0408} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1} \quad (599)$$

Table 1200: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.32217619764956 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0405		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0445		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0408		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

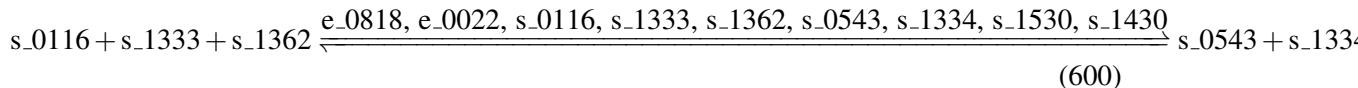
6.300 Reaction r_1245

This is a reversible reaction of three reactants forming four products influenced by nine modifiers.

Name Pyridoxine 5'-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1201: Properties of each reactant.

Id	Name	SBO
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1333	Nicotinamide adenine dinucleotide	
s_1362	O-Phospho-4-hydroxy-L-threonine	

Modifiers

Table 1202: Properties of each modifier.

Id	Name	SBO
e_0818	pdxJ	0000460
e_0022	pdxA	0000460
s_0116	1-deoxy-D-xylulose 5-phosphate	

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1362	O-Phospho-4-hydroxy-L-threonine	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1530	Pyridoxine 5'-phosphate	
s_1430	Phosphate	

Products

Table 1203: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1530	Pyridoxine 5'-phosphate	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{300} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{0116}] \cdot [s_{1333}] \cdot [s_{1362}] - \frac{[s_{0543}] \cdot [s_{1334}] \cdot [s_{1530}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0116} \cdot K_{m1333} \cdot K_{m1362}} \quad (601)$$

$$= \frac{\left(1 + \frac{[s_{0116}]}{K_{m0116}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1362}]}{K_{m1362}} \right) + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{1530}]}{K_{m1530}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) -}{\left(1 + \frac{[s_{0116}]}{K_{m0116}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1362}]}{K_{m1362}} \right) + \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{1530}]}{K_{m1530}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) -}$$

Table 1204: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317222495 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0116		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1362		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1530		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

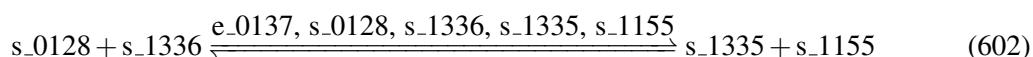
6.301 Reaction r_1250

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name pyrroline-5-carboxylate reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1205: Properties of each reactant.

Id	Name	SBO
s_0128	1-Pyrroline-5-carboxylate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 1206: Properties of each modifier.

Id	Name	SBO
e_0137	procC	0000460
s_0128	1-Pyrroline-5-carboxylate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1155	L-Proline	

Products

Table 1207: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1155	L-Proline	

Kinetic Law

Derived unit contains undeclared units

$$v_{301} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0128}] \cdot [s_{1336}] - \frac{[s_{1335}] \cdot [s_{1155}]}{K_{eq}} \right)}{K_{m0128} \cdot K_{m1336}} \quad (603)$$

$$\frac{\left(1 + \frac{[s_{0128}]}{K_{m0128}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{1155}]}{K_{m1155}} \right) - 1}{\left(1 + \frac{[s_{0128}]}{K_{m0128}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{1155}]}{K_{m1155}} \right) - 1}$$

Table 1208: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.031	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.429	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0128		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1155		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

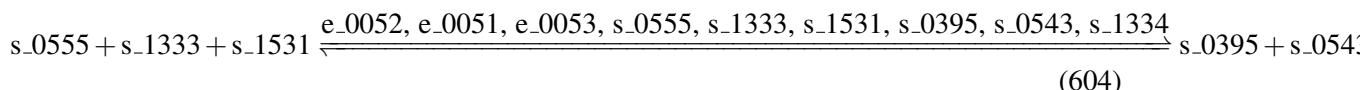
6.302 Reaction r_1251

This is a reversible reaction of three reactants forming three products influenced by nine modifiers.

Name pyruvate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1209: Properties of each reactant.

Id	Name	SBO
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	
s_1531	Pyruvate	

Modifiers

Table 1210: Properties of each modifier.

Id	Name	SBO
e_0052	aceF	0000460
e_0051	aceE	0000460
e_0053	lpdA	0000460
s_0555	Coenzyme A	
s_1333	Nicotinamide adenine dinucleotide	
s_1531	Pyruvate	
s_0395	Acetyl-CoA	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Products

Table 1211: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0543	CO2	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 & v_{302} \\
 & = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0555}] \cdot [s_{1333}] \cdot [s_{1531}] - \frac{[s_{0395}] \cdot [s_{0543}] \cdot [s_{1334}]}{K_{eq}} \right)}{K_{m0555} \cdot K_{m1333} \cdot K_{m1531}} \\
 & = \frac{\left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) + \left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1}{\left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) + \left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{0543}]}{K_{m0543}} \right) \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) - 1} \quad (605)
 \end{aligned}$$

Table 1212: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.407	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	12.222	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0555}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1333}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1531}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0395}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0543		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

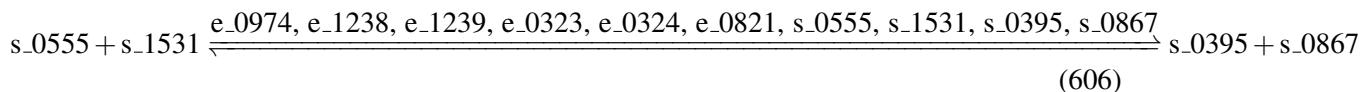
6.303 Reaction r_1252

This is a reversible reaction of two reactants forming two products influenced by ten modifiers.

Name pyruvate formate lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1213: Properties of each reactant.

Id	Name	SBO
s_{_0555}	Coenzyme A	
s_{_1531}	Pyruvate	

Modifiers

Table 1214: Properties of each modifier.

Id	Name	SBO
e_{_0974}	tdcE	0000460
e_{_1238}	pflD	0000460
e_{_1239}	pflC	0000460
e_{_0323}	pflA	0000460
e_{_0324}	pflB	0000460
e_{_0821}	grcA	0000460
s_{_0555}	Coenzyme A	
s_{_1531}	Pyruvate	
s_{_0395}	Acetyl-CoA	
s_{_0867}	Formate	

Products

Table 1215: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0867	Formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{303} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0555}] \cdot [s_{1531}] - \frac{[s_{0395}] \cdot [s_{0867}]}{K_{eq}} \right)}{Km0555 \cdot Km1531} \quad (607)$$

$$\frac{\left(1 + \frac{[s_{0555}]}{Km0555} \right) \cdot \left(1 + \frac{[s_{1531}]}{Km1531} \right) + \left(1 + \frac{[s_{0395}]}{Km0395} \right) \cdot \left(1 + \frac{[s_{0867}]}{Km0867} \right) - 1}{\left(1 + \frac{[s_{0555}]}{Km0555} \right) \cdot \left(1 + \frac{[s_{1531}]}{Km1531} \right) + \left(1 + \frac{[s_{0395}]}{Km0395} \right) \cdot \left(1 + \frac{[s_{0867}]}{Km0867} \right) - 1}$$

Table 1216: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.097	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.362	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0555		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1531		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0395		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0867		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

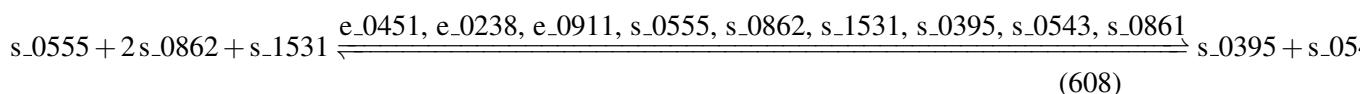
6.304 Reaction r_1255

This is a reversible reaction of three reactants forming three products influenced by nine modifiers.

Name pyruvate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1217: Properties of each reactant.

Id	Name	SBO
s_0555	Coenzyme A	
s_0862	flavodoxin semi oxidized	
s_1531	Pyruvate	

Modifiers

Table 1218: Properties of each modifier.

Id	Name	SBO
e_0451	ydbK	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0555	Coenzyme A	
s_0862	flavodoxin semi oxidized	
s_1531	Pyruvate	
s_0395	Acetyl-CoA	
s_0543	CO2	
s_0861	Flavodoxin reduced	

Products

Table 1219: Properties of each product.

Id	Name	SBO
s_0395	Acetyl-CoA	
s_0543	CO2	
s_0861	Flavodoxin reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{304} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0555] \cdot [s_0862]^2 \cdot [s_1531] - \frac{[s_0395] \cdot [s_0543] \cdot [s_0861]^2}{K_{eq}} \right)}{(1 + \frac{[s_0555]}{Km0555}) \cdot (1 + \frac{[s_0862]}{Km0862})^2 \cdot (1 + \frac{[s_1531]}{Km1531}) + (1 + \frac{[s_0395]}{Km0395}) \cdot (1 + \frac{[s_0543]}{Km0543}) \cdot (1 + \frac{[s_0861]}{Km0861})^2 - 1} \quad (609)$$

Table 1220: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.015	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.934	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0555		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0862		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0395		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0861		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

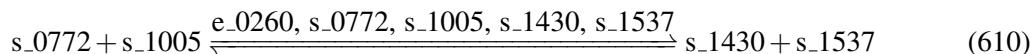
6.305 Reaction r_1259

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name quinolinate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1221: Properties of each reactant.

Id	Name	SBO
s_0772	Dihydroxyacetone phosphate	
s_1005	Iminoaspartate	

Modifiers

Table 1222: Properties of each modifier.

Id	Name	SBO
e_0260	nadA	0000460
s_0772	Dihydroxyacetone phosphate	
s_1005	Iminoaspartate	
s_1430	Phosphate	

Id	Name	SBO
s_1537	Quinolinate	

Products

Table 1223: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1537	Quinolinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{305} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0772}] \cdot [s_{1005}] - \frac{[s_{1430}] \cdot [s_{1537}]}{K_{eq}} \right)}{Km0772 \cdot Km1005} \quad (611)$$

$$\frac{\left(1 + \frac{[s_{0772}]}{Km0772} \right) \cdot \left(1 + \frac{[s_{1005}]}{Km1005} \right) + \left(1 + \frac{[s_{1430}]}{Km1430} \right) \cdot \left(1 + \frac{[s_{1537}]}{Km1537} \right) - 1}{\left(1 + \frac{[s_{0772}]}{Km0772} \right) \cdot \left(1 + \frac{[s_{1005}]}{Km1005} \right) + \left(1 + \frac{[s_{1430}]}{Km1430} \right) \cdot \left(1 + \frac{[s_{1537}]}{Km1537} \right) - 1}$$

Table 1224: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.15541120467916 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0772		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1005		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1537		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

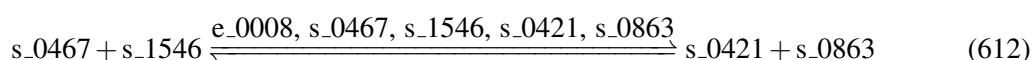
6.306 Reaction r_1264

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name riboflavin kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1225: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1546	Riboflavin	

Modifiers

Table 1226: Properties of each modifier.

Id	Name	SBO
e_0008	ribF	0000460
s_0467	ATP	
s_1546	Riboflavin	
s_0421	ADP	
s_0863	FMN	

Products

Table 1227: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_0863	FMN	

Kinetic Law

Derived unit contains undeclared units

$$v_{306} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0467] \cdot [s_1546] - \frac{[s_0421] \cdot [s_0863]}{K_{eq}} \right)}{(1 + \frac{[s_0467]}{Km0467}) \cdot (1 + \frac{[s_1546]}{Km1546}) + (1 + \frac{[s_0421]}{Km0421}) \cdot (1 + \frac{[s_0863]}{Km0863}) - 1} \quad (613)$$

Table 1228: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229329 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$4.32449244121061 \cdot 10^{-4}$	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1546		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0863		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

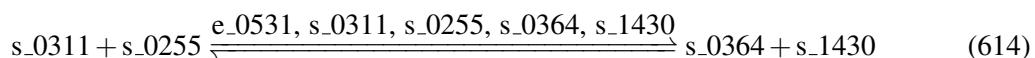
6.307 Reaction r_1265

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name riboflavin synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1229: Properties of each reactant.

Id	Name	SBO
s_{_0311}	4-(1-D-Ribitylamino)-5-aminouracil	
s_{_0255}	3,4-dihydroxy-2-butanone 4-phosphate	

Modifiers

Table 1230: Properties of each modifier.

Id	Name	SBO
e_{_0531}	ribE	0000460
s_{_0311}	4-(1-D-Ribitylamino)-5-aminouracil	
s_{_0255}	3,4-dihydroxy-2-butanone 4-phosphate	
s_{_0364}	6,7-Dimethyl-8-(1-D-ribityl)lumazine	
s_{_1430}	Phosphate	

Products

Table 1231: Properties of each product.

Id	Name	SBO
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{307} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0311}] \cdot [s_{0255}] - \frac{[s_{0364}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0311} \cdot K_{m0255}} \quad (615)$$

$$\frac{\left(1 + \frac{[s_{0311}]}{K_{m0311}} \right) \cdot \left(1 + \frac{[s_{0255}]}{K_{m0255}} \right) + \left(1 + \frac{[s_{0364}]}{K_{m0364}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}{\left(1 + \frac{[s_{0311}]}{K_{m0311}} \right) \cdot \left(1 + \frac{[s_{0255}]}{K_{m0255}} \right) + \left(1 + \frac{[s_{0364}]}{K_{m0364}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1}$$

Table 1232: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.23556926891731 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0311}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0255}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0364}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

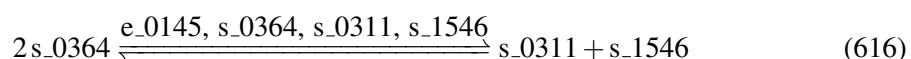
6.308 Reaction r_1266

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name riboflavin synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1233: Properties of each reactant.

Id	Name	SBO
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	

Modifiers

Table 1234: Properties of each modifier.

Id	Name	SBO
e_0145	ribH	0000460
s_0364	6,7-Dimethyl-8-(1-D-ribityl)lumazine	
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_1546	Riboflavin	

Products

Table 1235: Properties of each product.

Id	Name	SBO
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_1546	Riboflavin	

Kinetic Law

Derived unit contains undeclared units

$$v_{308} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0364]^2 - \frac{[s_0311] \cdot [s_1546]}{K_{eq}} \right)}{Km0364^2} \quad (617)$$

$$\frac{\left(1 + \frac{[s_0364]}{Km0364} \right)^2 + \left(1 + \frac{[s_0311]}{Km0311} \right) \cdot \left(1 + \frac{[s_1546]}{Km1546} \right) - 1}{\left(1 + \frac{[s_0364]}{Km0364} \right)^2 + \left(1 + \frac{[s_0311]}{Km0311} \right) \cdot \left(1 + \frac{[s_1546]}{Km1546} \right) - 1}$$

Table 1236: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$8.64898488242119 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0364		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0311		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1546		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

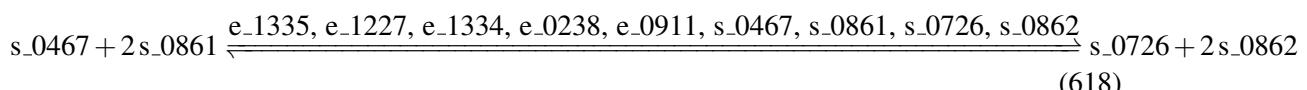
6.309 Reaction r_1276

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (ATP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1237: Properties of each reactant.

Id	Name	SBO
s_{_0467}	ATP	
s_{_0861}	Flavodoxin reduced	

Modifiers

Table 1238: Properties of each modifier.

Id	Name	SBO
e_{_1335}	nrdD	0000460
e_{_1227}	fpr	0000460
e_{_1334}	nrdG	0000460
e_{_0238}	fldA	0000460
e_{_0911}	fldB	0000460
s_{_0467}	ATP	
s_{_0861}	Flavodoxin reduced	
s_{_0726}	dATP	
s_{_0862}	flavodoxin semi oxidized	

Products

Table 1239: Properties of each product.

Id	Name	SBO
s_{_0726}	dATP	

Id	Name	SBO
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{309} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{0861}]^2 - \frac{[s_{0726}] \cdot [s_{0862}]^2}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0861}^2} \quad (619)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0861}]}{K_{m0861}} \right)^2 + \left(1 + \frac{[s_{0726}]}{K_{m0726}} \right) \cdot \left(1 + \frac{[s_{0862}]}{K_{m0862}} \right)^2 - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0861}]}{K_{m0861}} \right)^2 + \left(1 + \frac{[s_{0726}]}{K_{m0726}} \right) \cdot \left(1 + \frac{[s_{0862}]}{K_{m0862}} \right)^2 - 1}$$

Table 1240: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.109	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0861		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0726		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0862		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

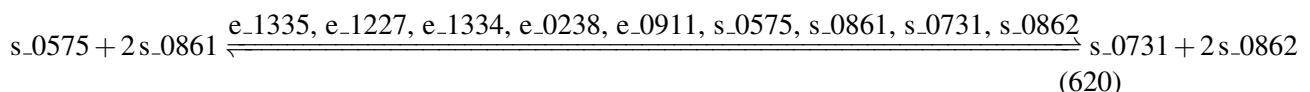
6.310 Reaction r_1277

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (CTP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1241: Properties of each reactant.

Id	Name	SBO
s_0575	CTP	

Id	Name	SBO
s_0861	Flavodoxin reduced	

Modifiers

Table 1242: Properties of each modifier.

Id	Name	SBO
e_1335	nrdD	0000460
e_1227	fpr	0000460
e_1334	nrdG	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0575	CTP	
s_0861	Flavodoxin reduced	
s_0731	dCTP	
s_0862	flavodoxin semi oxidized	

Products

Table 1243: Properties of each product.

Id	Name	SBO
s_0731	dCTP	
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{310} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0575}] \cdot [s_{0861}]^2 - \frac{[s_{0731}] \cdot [s_{0862}]^2}{K_{eq}} \right)}{K_{m0575} \cdot K_{m0861}^2} \quad (621)$$

$$\frac{\left(1 + \frac{[s_{0575}]}{K_{m0575}} \right) \cdot \left(1 + \frac{[s_{0861}]}{K_{m0861}} \right)^2 + \left(1 + \frac{[s_{0731}]}{K_{m0731}} \right) \cdot \left(1 + \frac{[s_{0862}]}{K_{m0862}} \right)^2 - 1}{\left(1 + \frac{[s_{0575}]}{K_{m0575}} \right) \cdot \left(1 + \frac{[s_{0861}]}{K_{m0861}} \right)^2 + \left(1 + \frac{[s_{0731}]}{K_{m0731}} \right) \cdot \left(1 + \frac{[s_{0862}]}{K_{m0862}} \right)^2 - 1}$$

Table 1244: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.112	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0575		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0861		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0731		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0862		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

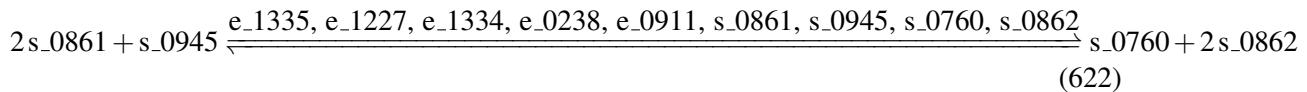
6.311 Reaction r_1278

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (GTP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1245: Properties of each reactant.

Id	Name	SBO
s_{_0861}	Flavodoxin reduced	
s_{_0945}	GTP	

Modifiers

Table 1246: Properties of each modifier.

Id	Name	SBO
e_{_1335}	nrdD	0000460
e_{_1227}	fpr	0000460
e_{_1334}	nrdG	0000460
e_{_0238}	fldA	0000460
e_{_0911}	fldB	0000460
s_{_0861}	Flavodoxin reduced	
s_{_0945}	GTP	
s_{_0760}	dGTP	
s_{_0862}	flavodoxin semi oxidized	

Products

Table 1247: Properties of each product.

Id	Name	SBO
s_0760	dGTP	
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{311} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0861]^2 \cdot [s_0945] - \frac{[s_0760] \cdot [s_0862]^2}{K_{eq}} \right)}{(1 + \frac{[s_0861]}{Km0861})^2 \cdot \left(1 + \frac{[s_0945]}{Km0945} \right) + \left(1 + \frac{[s_0760]}{Km0760} \right) \cdot \left(1 + \frac{[s_0862]}{Km0862} \right)^2 - 1} \quad (623)$$

Table 1248: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.112	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0861		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0945		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0760		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0862		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

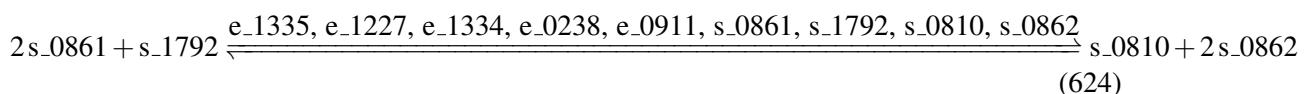
6.312 Reaction r_1279

This is a reversible reaction of two reactants forming two products influenced by nine modifiers.

Name ribonucleoside-triphosphate reductase (UTP) (flavodoxin)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1249: Properties of each reactant.

Id	Name	SBO
s_0861	Flavodoxin reduced	
s_1792	UTP	

Modifiers

Table 1250: Properties of each modifier.

Id	Name	SBO
e_1335	nrdD	0000460
e_1227	fpr	0000460
e_1334	nrdG	0000460
e_0238	fldA	0000460
e_0911	fldB	0000460
s_0861	Flavodoxin reduced	
s_1792	UTP	
s_0810	dUTP	
s_0862	flavodoxin semi oxidized	

Products

Table 1251: Properties of each product.

Id	Name	SBO
s_0810	dUTP	
s_0862	flavodoxin semi oxidized	

Kinetic Law

Derived unit contains undeclared units

$$v_{312} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0861}]^2 \cdot [s_{1792}] - \frac{[s_{0810}] \cdot [s_{0862}]^2}{K_{eq}} \right)}{\left(1 + \frac{[s_{0861}]}{K_{m0861}} \right)^2 \cdot \left(1 + \frac{[s_{1792}]}{K_{m1792}} \right) + \left(1 + \frac{[s_{0810}]}{K_{m0810}} \right) \cdot \left(1 + \frac{[s_{0862}]}{K_{m0862}} \right)^2 - 1} \quad (625)$$

Table 1252: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.109	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0861		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1792		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0810		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0862		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

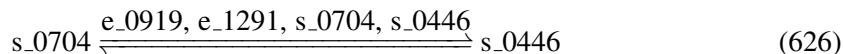
6.313 Reaction r_1284

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name ribose-5-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1253: Properties of each reactant.

Id	Name	SBO
s_0704	D-Ribulose 5-phosphate	

Modifiers

Table 1254: Properties of each modifier.

Id	Name	SBO
e_0919	rpiA	0000460
e_1291	rpiB	0000460
s_0704	D-Ribulose 5-phosphate	
s_0446	alpha-D-Ribose 5-phosphate	

Product

Table 1255: Properties of each product.

Id	Name	SBO
s_0446	alpha-D-Ribose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{313} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0704}] - \frac{[s_{0446}]}{K_{eq}} \right)}{1 + \frac{[s_{0704}]}{K_{m0704}} + 1 + \frac{[s_{0446}]}{K_{m0446}} - 1} \quad (627)$$

Table 1256: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.102	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.609	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0704		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0446		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

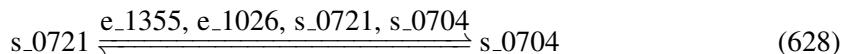
6.314 Reaction r_1285

This is a reversible reaction of one reactant forming one product influenced by four modifiers.

Name ribulose 5-phosphate 3-epimerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1257: Properties of each reactant.

Id	Name	SBO
s_0721	D-Xylulose 5-phosphate	

Modifiers

Table 1258: Properties of each modifier.

Id	Name	SBO
e_1355	sgcE	0000460
e_1026	rpe	0000460
s_0721	D-Xylulose 5-phosphate	
s_0704	D-Ribulose 5-phosphate	

Product

Table 1259: Properties of each product.

Id	Name	SBO
s_0704	D-Ribulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{314} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0721}] - \frac{[s_{0704}]}{K_{eq}} \right)}{1 + \frac{[s_{0721}]}{K_{m0721}} + 1 + \frac{[s_{0704}]}{K_{m0704}} - 1} \quad (629)$$

Table 1260: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.107	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.642	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0721}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0704}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

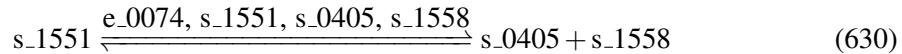
6.315 Reaction r_1288

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name S-adenosylhomocysteine nucleosidase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1261: Properties of each reactant.

Id	Name	SBO
s_1551	S-Adenosyl-L-homocysteine	

Modifiers

Table 1262: Properties of each modifier.

Id	Name	SBO
e_0074	mtnN	0000460
s_1551	S-Adenosyl-L-homocysteine	
s_0405	Adenine	
s_1558	S-Ribosyl-L-homocysteine	

Products

Table 1263: Properties of each product.

Id	Name	SBO
s_0405	Adenine	
s_1558	S-Ribosyl-L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{315} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1551}] - \frac{[s_{0405}] \cdot [s_{1558}]}{K_{eq}} \right)}{K_{m1551}} \quad (631)$$
$$\frac{1 + \frac{[s_{1551}]}{K_{m1551}} + \left(1 + \frac{[s_{0405}]}{K_{m0405}} \right) \cdot \left(1 + \frac{[s_{1558}]}{K_{m1558}} \right) - 1}{}$$

Table 1264: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax	0000324		$6.20554969142397 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq	0000281		0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1551	0000322		0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0405	0000323		0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1558	0000323		0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

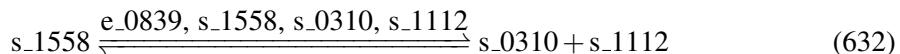
6.316 Reaction r_1291

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name S-ribosylhomocysteine cleavage enzyme

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1265: Properties of each reactant.

Id	Name	SBO
s_1558	S-Ribosyl-L-homocysteine	

Modifiers

Table 1266: Properties of each modifier.

Id	Name	SBO
e_0839	luxS	0000460
s_1558	S-Ribosyl-L-homocysteine	
s_0310	4,5-dihydroxy-2,3-pentanedione	
s_1112	L-Homocysteine	

Products

Table 1267: Properties of each product.

Id	Name	SBO
s_0310	4,5-dihydroxy-2,3-pentanedione	
s_1112	L-Homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{316} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1558}] - \frac{[s_{0310}] \cdot [s_{1112}]}{K_{eq}} \right)}{1 + \frac{[s_{1558}]}{K_{m1558}} + \left(1 + \frac{[s_{0310}]}{K_{m0310}} \right) \cdot \left(1 + \frac{[s_{1112}]}{K_{m1112}} \right) - 1} \quad (633)$$

Table 1268: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.20554969142397 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$6.20554969142397 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1558}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0310}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1112}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

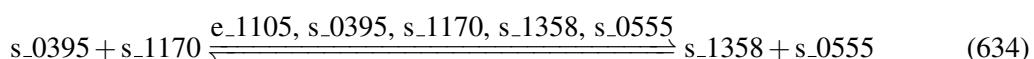
6.317 Reaction r_1301

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name serine O-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1269: Properties of each reactant.

Id	Name	SBO
s_0395	Acetyl-CoA	

Id	Name	SBO
s_1170	L-Serine	

Modifiers

Table 1270: Properties of each modifier.

Id	Name	SBO
e_1105	cysE	0000460
s_0395	Acetyl-CoA	
s_1170	L-Serine	
s_1358	O-Acetyl-L-serine	
s_0555	Coenzyme A	

Products

Table 1271: Properties of each product.

Id	Name	SBO
s_1358	O-Acetyl-L-serine	
s_0555	Coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{317} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0395}] \cdot [s_{1170}] - \frac{[s_{1358}] \cdot [s_{0555}]}{K_{eq}} \right)}{K_{m0395} \cdot K_{m1170}} \quad (635)$$

$$\frac{\left(1 + \frac{[s_{0395}]}{K_{m0395}} \right) \cdot \left(1 + \frac{[s_{1170}]}{K_{m1170}} \right) + \left(1 + \frac{[s_{1358}]}{K_{m1358}} \right) \cdot \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) - 1}{}$$

Table 1272: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.481	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0395		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1170		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1358		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

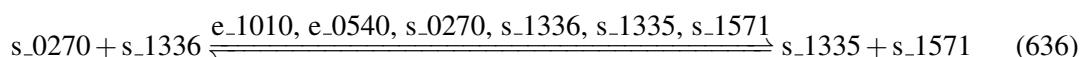
6.318 Reaction r_1304

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name shikimate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1273: Properties of each reactant.

Id	Name	SBO
s_0270	3-Dehydroshikimate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 1274: Properties of each modifier.

Id	Name	SBO
e_1010	aroE	0000460
e_0540	ydiB	0000460
s_0270	3-Dehydroshikimate	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1571	Shikimate	

Products

Table 1275: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1571	Shikimate	

Kinetic Law

Derived unit contains undeclared units

$$v_{318} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0270}] \cdot [s_{1336}] - \frac{[s_{1335}] \cdot [s_{1571}]}{K_{eq}} \right)}{K_{m0270} \cdot K_{m1336}} \quad (637)$$

$$\left(1 + \frac{[s_{0270}]}{K_{m0270}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{1571}]}{K_{m1571}} \right) - 1$$

Table 1276: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.739	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0270		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1571		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

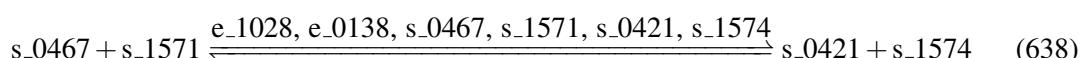
6.319 Reaction r_1305

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name shikimate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1277: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1571	Shikimate	

Modifiers

Table 1278: Properties of each modifier.

Id	Name	SBO
e_1028	aroK	0000460
e_0138	aroL	0000460
s_0467	ATP	
s_1571	Shikimate	
s_0421	ADP	
s_1574	Shikimate 5-phosphate	

Products

Table 1279: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1574	Shikimate 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{319} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0467] \cdot [s_1571] - \frac{[s_0421] \cdot [s_1574]}{K_{eq}} \right)}{Km0467 \cdot Km1571} \quad (639)$$

$$\frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_1571]}{Km1571} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_1574]}{Km1574} \right) - 1}{}$$

Table 1280: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.739	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1571		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1574		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

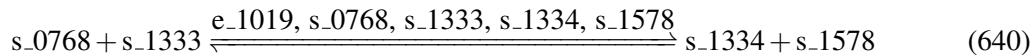
6.320 Reaction r_1306

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name sirohydrochlorin dehydrogenase (NAD)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1281: Properties of each reactant.

Id	Name	SBO
s_0768	dihydrosirohydrochlorin	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 1282: Properties of each modifier.

Id	Name	SBO
e_1019	cysG	0000460
s_0768	dihydrosirohydrochlorin	
s_1333	Nicotinamide adenine dinucleotide	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1578	sirohydrochlorin	

Products

Table 1283: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1578	sirohydrochlorin	

Kinetic Law

Derived unit contains undeclared units

$$v_{320} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0768] \cdot [s_1333] - \frac{[s_1334] \cdot [s_1578]}{K_{eq}} \right)}{\left(1 + \frac{[s_0768]}{Km0768} \right) \cdot \left(1 + \frac{[s_1333]}{Km1333} \right) + \left(1 + \frac{[s_1334]}{Km1334} \right) \cdot \left(1 + \frac{[s_1578]}{Km1578} \right) - 1} \quad (641)$$

Table 1284: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.32449244121108 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0768		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1578		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

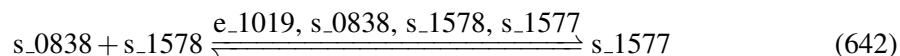
6.321 Reaction r_1307

This is a reversible reaction of two reactants forming one product influenced by four modifiers.

Name sirohydrochlorin ferrochelatase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1285: Properties of each reactant.

Id	Name	SBO
s_0838	Fe2+	
s_1578	sirohydrochlorin	

Modifiers

Table 1286: Properties of each modifier.

Id	Name	SBO
e_1019	cysG	0000460
s_0838	Fe2+	
s_1578	sirohydrochlorin	
s_1577	Siroheme	

Product

Table 1287: Properties of each product.

Id	Name	SBO
s_1577	Siroheme	

Kinetic Law

Derived unit contains undeclared units

$$v_{321} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0838}] \cdot [s_{1578}] - \frac{[s_{1577}]}{K_{eq}} \right)}{K_{m0838} \cdot K_{m1578}} \quad (643)$$

$$\frac{1}{\left(1 + \frac{[s_{0838}]}{K_{m0838}} \right) \cdot \left(1 + \frac{[s_{1578}]}{K_{m1578}} \right) + 1 + \frac{[s_{1577}]}{K_{m1577}} - 1}$$

Table 1288: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.08892317229363 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
Km0838		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1578		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1577		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

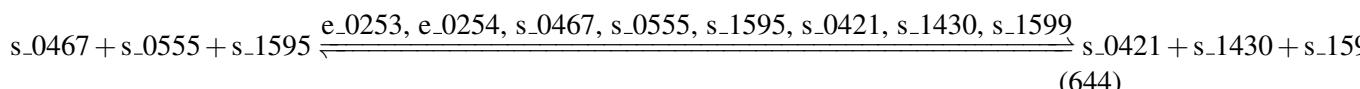
6.322 Reaction r_1315

This is a reversible reaction of three reactants forming three products influenced by eight modifiers.

Name succinyl-CoA synthetase (ADP-forming)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1289: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0555	Coenzyme A	
s_1595	Succinate	

Modifiers

Table 1290: Properties of each modifier.

Id	Name	SBO
e_0253	sucC	0000460
e_0254	sucD	0000460
s_0467	ATP	
s_0555	Coenzyme A	
s_1595	Succinate	
s_0421	ADP	
s_1430	Phosphate	
s_1599	Succinyl-CoA	

Products

Table 1291: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1599	Succinyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 & v_{322} \\
 & = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0467] \cdot [s_0555] \cdot [s_1595] - \frac{[s_0421] \cdot [s_1430] \cdot [s_1599]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0555} \cdot K_{m1595}} \\
 & = \frac{\left(1 + \frac{[s_0467]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_0555]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_1595]}{K_{m1595}} \right) + \left(1 + \frac{[s_0421]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_1430]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_1599]}{K_{m1599}} \right) - 1}{\left(1 + \frac{[s_0467]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_0555]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_1595]}{K_{m1595}} \right) + \left(1 + \frac{[s_0421]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_1430]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_1599]}{K_{m1599}} \right) - 1} \quad (645)
 \end{aligned}$$

Table 1292: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.073	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	2.181	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0555		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1595		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1599		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

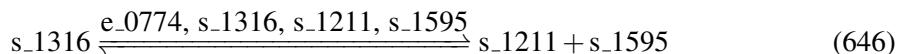
6.323 Reaction r_1316

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name succinyl-diaminopimelate desuccinylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1293: Properties of each reactant.

Id	Name	SBO
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	

Modifiers

Table 1294: Properties of each modifier.

Id	Name	SBO
e_0774	dapE	0000460
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	
s_1211	LL-2,6-Diaminoheptanedioate	
s_1595	Succinate	

Products

Table 1295: Properties of each product.

Id	Name	SBO
s_1211	LL-2,6-Diaminoheptanedioate	
s_1595	Succinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{323} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1316}] - \frac{[s_{1211}] \cdot [s_{1595}]}{K_{eq}} \right)}{K_{m1316}} \quad (647)$$

$$1 + \frac{[s_{1316}]}{K_{m1316}} + \left(1 + \frac{[s_{1211}]}{K_{m1211}} \right) \cdot \left(1 + \frac{[s_{1595}]}{K_{m1595}} \right) - 1$$

Table 1296: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.514	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1316}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1211}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1595}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

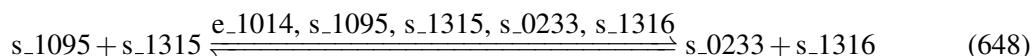
6.324 Reaction r_1318

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name succinylaminopimelate transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1297: Properties of each reactant.

Id	Name	SBO
s_1095	L-Glutamate	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	

Modifiers

Table 1298: Properties of each modifier.

Id	Name	SBO
e_1014	argD	0000460
s_1095	L-Glutamate	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	
s_0233	2-Oxoglutarate	
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	

Products

Table 1299: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1316	N-Succinyl-LL-2,6-diaminoheptanedioate	

Kinetic Law

Derived unit contains undeclared units

$$v_{324} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1095}] \cdot [s_{1315}] - \frac{[s_{0233}] \cdot [s_{1316}]}{K_{eq}} \right)}{K_{m1095} \cdot K_{m1315}} \quad (649)$$

$$\frac{\left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) \cdot \left(1 + \frac{[s_{1315}]}{K_{m1315}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1316}]}{K_{m1316}} \right) - 1}{}$$

Table 1300: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.719	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1095}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1315		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1316		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

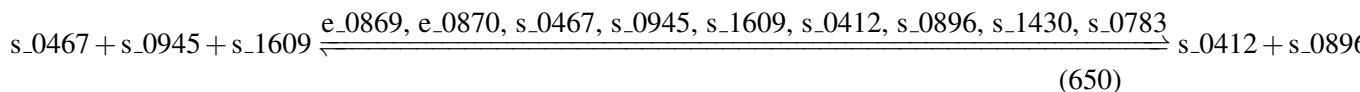
6.325 Reaction r_1329

This is a reversible reaction of three reactants forming four products influenced by nine modifiers.

Name Sulfate adenyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1301: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0945	GTP	
s_1609	Sulfate	

Modifiers

Table 1302: Properties of each modifier.

Id	Name	SBO
e_0869	cysN	0000460
e_0870	cysD	0000460
s_0467	ATP	
s_0945	GTP	
s_1609	Sulfate	
s_0412	Adenosine 5'-phosphosulfate	
s_0896	GDP	
s_1430	Phosphate	
s_0783	Diphosphate	

Products

Table 1303: Properties of each product.

Id	Name	SBO
s_0412	Adenosine 5'-phosphosulfate	
s_0896	GDP	
s_1430	Phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{325} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{0467}] \cdot [s_{0945}] \cdot [s_{1609}] - \frac{[s_{0412}] \cdot [s_{0896}] \cdot [s_{1430}] \cdot [s_{0783}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m0945} \cdot K_{m1609}} \quad (651)$$

$$= \frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0945}]}{K_{m0945}} \right) \cdot \left(1 + \frac{[s_{1609}]}{K_{m1609}} \right) + \left(1 + \frac{[s_{0412}]}{K_{m0412}} \right) \cdot \left(1 + \frac{[s_{0896}]}{K_{m0896}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) - \frac{[s_{0412}] \cdot [s_{0896}] \cdot [s_{1430}] \cdot [s_{0783}]}{K_{eq}}}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0945}]}{K_{m0945}} \right) \cdot \left(1 + \frac{[s_{1609}]}{K_{m1609}} \right) + \left(1 + \frac{[s_{0412}]}{K_{m0412}} \right) \cdot \left(1 + \frac{[s_{0896}]}{K_{m0896}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right)}$$

Table 1304: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.579	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0945}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1609}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0412}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0896}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0783}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

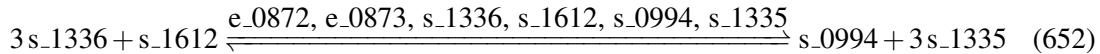
6.326 Reaction r_1330

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name sulfite reductase (NADPH2)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1305: Properties of each reactant.

Id	Name	SBO
s_{-1336}	Nicotinamide adenine dinucleotide phosphate - reduced	
s_{-1612}	Sulfite	

Modifiers

Table 1306: Properties of each modifier.

Id	Name	SBO
e_{-0872}	cysI	0000460
e_{-0873}	cysJ	0000460
s_{-1336}	Nicotinamide adenine dinucleotide phosphate - reduced	
s_{-1612}	Sulfite	
s_{-0994}	Hydrogen sulfide	
s_{-1335}	Nicotinamide adenine dinucleotide phosphate	

Products

Table 1307: Properties of each product.

Id	Name	SBO
s_{-0994}	Hydrogen sulfide	
s_{-1335}	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{326} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{-1336}]^3 \cdot [s_{-1612}] - \frac{[s_{-0994}] \cdot [s_{-1335}]^3}{K_{eq}} \right)}{K_{m1336}^3 \cdot K_{m1612}} \quad (653)$$

$$\frac{\left(1 + \frac{[s_{-1336}]}{K_{m1336}} \right)^3 \cdot \left(1 + \frac{[s_{-1612}]}{K_{m1612}} \right) + \left(1 + \frac{[s_{-0994}]}{K_{m0994}} \right) \cdot \left(1 + \frac{[s_{-1335}]}{K_{m1335}} \right)^3 - 1}{}$$

Table 1308: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	2.129	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1612		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0994		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

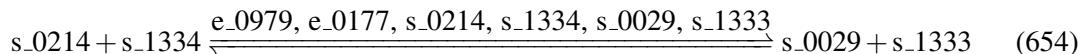
6.327 Reaction r_1335

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name tartronate semialdehyde reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1309: Properties of each reactant.

Id	Name	SBO
s_0214	2-Hydroxy-3-oxopropanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	

Modifiers

Table 1310: Properties of each modifier.

Id	Name	SBO
e_0979	garR	0000460
e_0177	glxR	0000460
s_0214	2-Hydroxy-3-oxopropanoate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_0029	(R)-Glycerate	
s_1333	Nicotinamide adenine dinucleotide	

Products

Table 1311: Properties of each product.

Id	Name	SBO
s_0029	(R)-Glycerate	
s_1333	Nicotinamide adenine dinucleotide	

Kinetic Law

Derived unit contains undeclared units

$$v_{327} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0214}] \cdot [s_{1334}] - \frac{[s_{0029}] \cdot [s_{1333}]}{K_{eq}} \right)}{Km0214 \cdot Km1334} \quad (655)$$

$$\frac{\left(1 + \frac{[s_{0214}]}{Km0214} \right) \cdot \left(1 + \frac{[s_{1334}]}{Km1334} \right) + \left(1 + \frac{[s_{0029}]}{Km0029} \right) \cdot \left(1 + \frac{[s_{1333}]}{Km1333} \right) - 1}{\left(1 + \frac{[s_{0214}]}{Km0214} \right) \cdot \left(1 + \frac{[s_{1334}]}{Km1334} \right) + \left(1 + \frac{[s_{0029}]}{Km0029} \right) \cdot \left(1 + \frac{[s_{1333}]}{Km1333} \right) - 1}$$

Table 1312: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.63338474645892 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$6.48673864504249 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0214		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0029		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1333		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

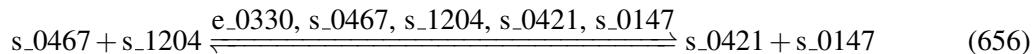
6.328 Reaction r_1337

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Tetraacyldisaccharide 4'kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1313: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1204	Lipid A Disaccharide	

Modifiers

Table 1314: Properties of each modifier.

Id	Name
e_0330	lpxK
s_0467	ATP
s_1204	Lipid A Disaccharide
s_0421	ADP
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

Products

Table 1315: Properties of each product.

Id	Name
s_0421	ADP
s_0147	2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

Kinetic Law

Derived unit contains undeclared units

$$v_{328} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0467] \cdot [s_1204] - \frac{[s_0421] \cdot [s_0147]}{K_{eq}} \right)}{Km0467 \cdot Km1204} \quad (657)$$

$$\frac{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_1204]}{Km1204} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_0147]}{Km0147} \right) - 1}{\left(1 + \frac{[s_0467]}{Km0467} \right) \cdot \left(1 + \frac{[s_1204]}{Km1204} \right) + \left(1 + \frac{[s_0421]}{Km0421} \right) \cdot \left(1 + \frac{[s_0147]}{Km0147} \right) - 1}$$

Table 1316: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.038	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1204		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0147		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

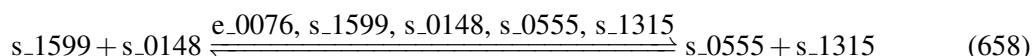
6.329 Reaction r_1338

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name tetrahydridopicolinate succinylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1317: Properties of each reactant.

Id	Name	SBO
s_1599	Succinyl-CoA	
s_0148	2,3,4,5-Tetrahydridopicolinate	

Modifiers

Table 1318: Properties of each modifier.

Id	Name	SBO
e_0076	dapD	0000460
s_1599	Succinyl-CoA	
s_0148	2,3,4,5-Tetrahydridopicolinate	
s_0555	Coenzyme A	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	

Products

Table 1319: Properties of each product.

Id	Name	SBO
s_0555	Coenzyme A	
s_1315	N-Succinyl-2-L-amino-6-oxoheptanedioate	

Kinetic Law

Derived unit contains undeclared units

$$v_{329} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1599}] \cdot [s_{0148}] - \frac{[s_{0555}] \cdot [s_{1315}]}{K_{eq}} \right)}{K_{m1599} \cdot K_{m0148}} \quad (659)$$

$$\frac{\left(1 + \frac{[s_{1599}]}{K_{m1599}} \right) \cdot \left(1 + \frac{[s_{0148}]}{K_{m0148}} \right) + \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{1315}]}{K_{m1315}} \right) - 1}{\left(1 + \frac{[s_{1599}]}{K_{m1599}} \right) \cdot \left(1 + \frac{[s_{0148}]}{K_{m0148}} \right) + \left(1 + \frac{[s_{0555}]}{K_{m0555}} \right) \cdot \left(1 + \frac{[s_{1315}]}{K_{m1315}} \right) - 1}$$

Table 1320: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.719	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1599		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0148		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0555		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1315		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

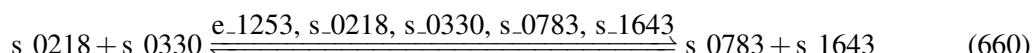
6.330 Reaction r_1344

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name thiamine-phosphate diphosphorylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1321: Properties of each reactant.

Id	Name	SBO
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	

Modifiers

Table 1322: Properties of each modifier.

Id	Name	SBO
e_1253	thiE	0000460
s_0218	2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate	
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	
s_0783	Diphosphate	
s_1643	Thiamin monophosphate	

Products

Table 1323: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1643	Thiamin monophosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{330} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0218] \cdot [s_0330] - \frac{[s_0783] \cdot [s_1643]}{K_{eq}} \right)}{Km0218 \cdot Km0330} \quad (661)$$

$$\frac{\left(1 + \frac{[s_0218]}{Km0218} \right) \cdot \left(1 + \frac{[s_0330]}{Km0330} \right) + \left(1 + \frac{[s_0783]}{Km0783} \right) \cdot \left(1 + \frac{[s_1643]}{Km1643} \right) - 1}{\left(1 + \frac{[s_0218]}{Km0218} \right) \cdot \left(1 + \frac{[s_0330]}{Km0330} \right) + \left(1 + \frac{[s_0783]}{Km0783} \right) \cdot \left(1 + \frac{[s_1643]}{Km1643} \right) - 1}$$

Table 1324: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$4.32449244121108 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0218		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0330		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1643		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

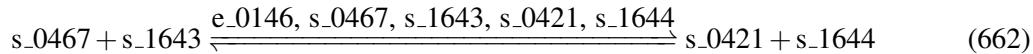
6.331 Reaction r_1345

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name thiamine-phosphate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1325: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1643	Thiamin monophosphate	

Modifiers

Table 1326: Properties of each modifier.

Id	Name	SBO
e_0146	thiL	0000460
s_0467	ATP	
s_1643	Thiamin monophosphate	
s_0421	ADP	
s_1644	Thiamine diphosphate	

Products

Table 1327: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1644	Thiamine diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{331} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1643}] - \frac{[s_{0421}] \cdot [s_{1644}]}{K_{eq}} \right)}{Km0467 \cdot Km1643} \quad (663)$$

$$= \frac{\left(1 + \frac{[s_{0467}]}{Km0467} \right) \cdot \left(1 + \frac{[s_{1643}]}{Km1643} \right) + \left(1 + \frac{[s_{0421}]}{Km0421} \right) \cdot \left(1 + \frac{[s_{1644}]}{Km1644} \right) - 1}{\left(1 + \frac{[s_{0467}]}{Km0467} \right) \cdot \left(1 + \frac{[s_{1643}]}{Km1643} \right) + \left(1 + \frac{[s_{0421}]}{Km0421} \right) \cdot \left(1 + \frac{[s_{1644}]}{Km1644} \right) - 1}$$

Table 1328: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$4.32449244121108 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1643		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1644		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

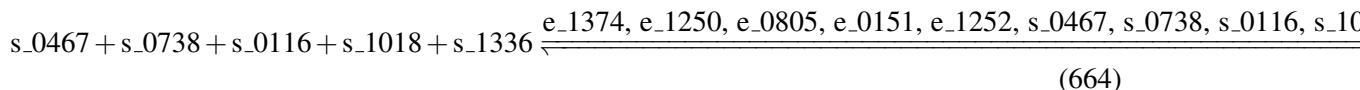
6.332 Reaction r_1346

This is a reversible reaction of five reactants forming six products influenced by 16 modifiers.

Name thiazole phosphate synthesis

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1329: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0738	dehydroglycine	
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1018	IscS with bound sulfur	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Modifiers

Table 1330: Properties of each modifier.

Id	Name	SBO
e_1374	thiS	0000460
e_1250	thiH	0000460
e_0805	iscS	0000460
e_0151	thiI	0000460
e_1252	thiF	0000460
s_0467	ATP	
s_0738	dehydroglycine	
s_0116	1-deoxy-D-xylulose 5-phosphate	
s_1018	IscS with bound sulfur	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	
s_0454	AMP	
s_0543	CO2	
s_1017	IscS sulfur acceptor protein	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0783	Diphosphate	

Products

Table 1331: Properties of each product.

Id	Name	SBO
s_0330	4-Methyl-5-(2-phosphoethyl)-thiazole	
s_0454	AMP	
s_0543	CO2	
s_1017	IscS sulfur acceptor protein	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_0783	Diphosphate	

Id	Name	SBO
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Kinetic Law

Derived unit contains undeclared units

$$v_{332} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot ([s_{0467}] \cdot [s_{0738}] \cdot [s_{0116}] \cdot [s_{1018}] \cdot [s_{1336}] - \frac{[s_{0330}] \cdot [s_{0454}] \cdot [s_{0543}] \cdot [s_{1017}] \cdot [s_{1335}]}{K_{\text{eq}}})}{(1 + \frac{[s_{0467}]}{K_{0467}}) \cdot (1 + \frac{[s_{0738}]}{K_{0738}}) \cdot (1 + \frac{[s_{0116}]}{K_{0116}}) \cdot (1 + \frac{[s_{1018}]}{K_{1018}}) \cdot (1 + \frac{[s_{1336}]}{K_{1336}}) + (1 + \frac{[s_{0330}]}{K_{0330}}) \cdot (1 + \frac{[s_{0454}]}{K_{0454}}) \cdot (1 + \frac{[s_{0543}]}{K_{0543}})}$$
(665)

Table 1332: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₀₄₆₇		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₀₇₃₈		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₀₁₁₆		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₁₀₁₈		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₁₃₃₆		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₀₃₃₀		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₀₄₅₄		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₀₅₄₃		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₁₀₁₇		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K ₁₃₃₅		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
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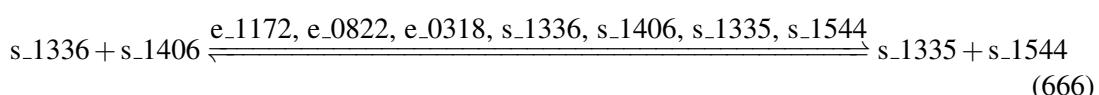
6.333 Reaction r_1347

This is a reversible reaction of two reactants forming two products influenced by seven modifiers.

Name thioredoxin reductase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1333: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1406	Oxidized thioredoxin	

Modifiers

Table 1334: Properties of each modifier.

Id	Name	SBO
e_1172	trxA	0000460
e_0822	trxC	0000460
e_0318	trxB	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1406	Oxidized thioredoxin	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1544	Reduced thioredoxin	

Products

Table 1335: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1544	Reduced thioredoxin	

Kinetic Law

Derived unit contains undeclared units

$$v_{333} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1336}] \cdot [s_{1406}] - \frac{[s_{1335}] \cdot [s_{1544}]}{K_{eq}} \right)}{K_{m1336} \cdot K_{m1406}} \quad (667)$$

$$\frac{1}{\left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{1406}]}{K_{m1406}} \right) + \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) \cdot \left(1 + \frac{[s_{1544}]}{K_{m1544}} \right) - 1}$$

Table 1336: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.481	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1406		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1544		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

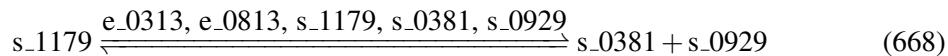
6.334 Reaction r_1348

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name Threonine aldolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1337: Properties of each reactant.

Id	Name	SBO
s_1179	L-Threonine	

Modifiers

Table 1338: Properties of each modifier.

Id	Name	SBO
e_0313	ItaE	0000460
e_0813	glyA	0000460
s_1179	L-Threonine	
s_0381	Acetaldehyde	
s_0929	Glycine	

Products

Table 1339: Properties of each product.

Id	Name	SBO
s_0381	Acetaldehyde	
s_0929	Glycine	

Kinetic Law

Derived unit contains undeclared units

$$v_{334} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1179}] - \frac{[s_{0381}] \cdot [s_{0929}]}{K_{eq}} \right)}{K_{m1179}} \quad (669)$$

$$1 + \frac{[s_{1179}]}{K_{m1179}} + \left(1 + \frac{[s_{0381}]}{K_{m0381}} \right) \cdot \left(1 + \frac{[s_{0929}]}{K_{m0929}} \right) - 1$$

Table 1340: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.041	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.414	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1179		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0381		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0929		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

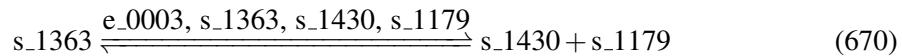
6.335 Reaction r_1349

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name threonine synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1341: Properties of each reactant.

Id	Name	SBO
s_1363	O-Phospho-L-homoserine	

Modifiers

Table 1342: Properties of each modifier.

Id	Name	SBO
e_0003	thrC	0000460
s_1363	O-Phospho-L-homoserine	
s_1430	Phosphate	
s_1179	L-Threonine	

Products

Table 1343: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1179	L-Threonine	

Kinetic Law

Derived unit contains undeclared units

$$v_{335} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1363}] - \frac{[s_{1430}] \cdot [s_{1179}]}{K_{eq}} \right)}{1 + \frac{[s_{1363}]}{K_{m1363}} + \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1179}]}{K_{m1179}} \right) - 1} \quad (671)$$

Table 1344: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.158	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	1.582	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1363}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1179}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

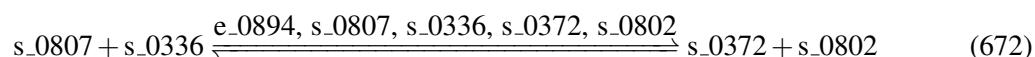
6.336 Reaction r_1353

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name thymidylate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1345: Properties of each reactant.

Id	Name	SBO
s_0807	dUMP	
s_0336	5,10-Methylenetetrahydrofolate	

Modifiers

Table 1346: Properties of each modifier.

Id	Name	SBO
e_0894	thyA	0000460
s_0807	dUMP	
s_0336	5,10-Methylenetetrahydrofolate	
s_0372	7,8-Dihydrofolate	
s_0802	dTMP	

Products

Table 1347: Properties of each product.

Id	Name	SBO
s_0372	7,8-Dihydrofolate	
s_0802	dTMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{336} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0807}] \cdot [s_{0336}] - \frac{[s_{0372}] \cdot [s_{0802}]}{K_{eq}} \right)}{K_{m0807} \cdot K_{m0336}} \quad (673)$$

$$\frac{\left(1 + \frac{[s_{0807}]}{K_{m0807}} \right) \cdot \left(1 + \frac{[s_{0336}]}{K_{m0336}} \right) + \left(1 + \frac{[s_{0372}]}{K_{m0372}} \right) \cdot \left(1 + \frac{[s_{0802}]}{K_{m0802}} \right) - 1}{\left(1 + \frac{[s_{0807}]}{K_{m0807}} \right) \cdot \left(1 + \frac{[s_{0336}]}{K_{m0336}} \right) + \left(1 + \frac{[s_{0372}]}{K_{m0372}} \right) \cdot \left(1 + \frac{[s_{0802}]}{K_{m0802}} \right) - 1}$$

Table 1348: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.051	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0807		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0336		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0372		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0802		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

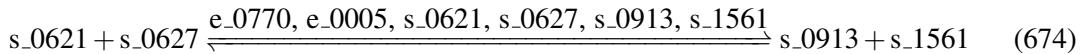
6.337 Reaction r_1356

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name transaldolase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1349: Properties of each reactant.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_0627	D-Fructose 6-phosphate	

Modifiers

Table 1350: Properties of each modifier.

Id	Name	SBO
e_0770	talA	0000460

Id	Name	SBO
e_0005	talB	0000460
s_0621	D-Erythrose 4-phosphate	
s_0627	D-Fructose 6-phosphate	
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	

Products

Table 1351: Properties of each product.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{337} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0621}] \cdot [s_{0627}] - \frac{[s_{0913}] \cdot [s_{1561}]}{K_{eq}} \right)}{(1 + \frac{[s_{0621}]}{Km0621}) \cdot (1 + \frac{[s_{0627}]}{Km0627}) + (1 + \frac{[s_{0913}]}{Km0913}) \cdot (1 + \frac{[s_{1561}]}{Km1561}) - 1} \quad (675)$$

Table 1352: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.027	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.380	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0621		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0627		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0913		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1561		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

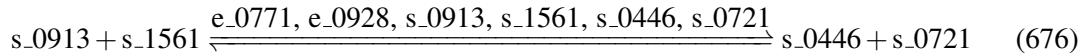
6.338 Reaction r_1357

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name transketolase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1353: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	

Modifiers

Table 1354: Properties of each modifier.

Id	Name	SBO
e_0771	tktB	0000460
e_0928	tktA	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_1561	Sedoheptulose 7-phosphate	
s_0446	alpha-D-Ribose 5-phosphate	
s_0721	D-Xylulose 5-phosphate	

Products

Table 1355: Properties of each product.

Id	Name	SBO
s_0446	alpha-D-Ribose 5-phosphate	
s_0721	D-Xylulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{338} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0913}] \cdot [s_{1561}] - \frac{[s_{0446}] \cdot [s_{0721}]}{K_{eq}} \right)}{K_m0913 \cdot K_m1561} \quad (677)$$

$$\frac{\left(1 + \frac{[s_{0913}]}{K_m0913} \right) \cdot \left(1 + \frac{[s_{1561}]}{K_m1561} \right) + \left(1 + \frac{[s_{0446}]}{K_m0446} \right) \cdot \left(1 + \frac{[s_{0721}]}{K_m0721} \right) - 1}{\left(1 + \frac{[s_{0913}]}{K_m0913} \right) \cdot \left(1 + \frac{[s_{1561}]}{K_m1561} \right) + \left(1 + \frac{[s_{0446}]}{K_m0446} \right) \cdot \left(1 + \frac{[s_{0721}]}{K_m0721} \right) - 1}$$

Table 1356: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.027	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.380	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0913		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1561		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0446		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0721		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

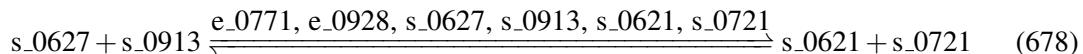
6.339 Reaction r_1358

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name transketolase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1357: Properties of each reactant.

Id	Name	SBO
s_0627	D-Fructose 6-phosphate	
s_0913	Glyceraldehyde 3-phosphate	

Modifiers

Table 1358: Properties of each modifier.

Id	Name	SBO
e_0771	tktB	0000460
e_0928	tktA	0000460
s_0627	D-Fructose 6-phosphate	
s_0913	Glyceraldehyde 3-phosphate	
s_0621	D-Erythrose 4-phosphate	
s_0721	D-Xylulose 5-phosphate	

Products

Table 1359: Properties of each product.

Id	Name	SBO
s_0621	D-Erythrose 4-phosphate	
s_0721	D-Xylulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{339} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0627}] \cdot [s_{0913}] - \frac{[s_{0621}] \cdot [s_{0721}]}{K_{eq}} \right)}{K_{m0627} \cdot K_{m0913}} \quad (679)$$

$$\left(1 + \frac{[s_{0627}]}{K_{m0627}} \right) \cdot \left(1 + \frac{[s_{0913}]}{K_{m0913}} \right) + \left(1 + \frac{[s_{0621}]}{K_{m0621}} \right) \cdot \left(1 + \frac{[s_{0721}]}{K_{m0721}} \right) - 1$$

Table 1360: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.080	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.119	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0627		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0913		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0621		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0721		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

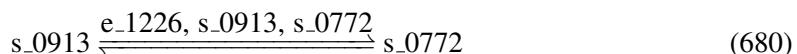
6.340 Reaction r_1363

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name triose-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1361: Properties of each reactant.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	

Modifiers

Table 1362: Properties of each modifier.

Id	Name	SBO
e_1226	tpiA	0000460
s_0913	Glyceraldehyde 3-phosphate	
s_0772	Dihydroxyacetone phosphate	

Product

Table 1363: Properties of each product.

Id	Name	SBO
s_0772	Dihydroxyacetone phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{340} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0913}] - \frac{[s_{0772}]}{K_{eq}} \right)}{1 + \frac{[s_{0913}]}{K_{m0913}} + 1 + \frac{[s_{0772}]}{K_{m0772}} - 1} \quad (681)$$

Table 1364: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.020	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.117	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0913}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0772}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

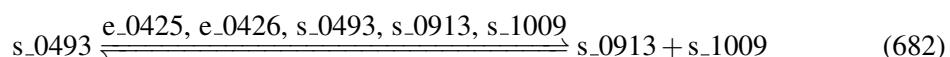
6.341 Reaction r_1367

This is a reversible reaction of one reactant forming two products influenced by five modifiers.

Name tryptophan synthase (indoleglycerol phosphate)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1365: Properties of each reactant.

Id	Name	SBO
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	

Modifiers

Table 1366: Properties of each modifier.

Id	Name	SBO
e_0425	trpA	0000460
e_0426	trpB	0000460
s_0493	C'-(3-Indolyl)-glycerol 3-phosphate	
s_0913	Glyceraldehyde 3-phosphate	
s_1009	Indole	

Products

Table 1367: Properties of each product.

Id	Name	SBO
s_0913	Glyceraldehyde 3-phosphate	
s_1009	Indole	

Kinetic Law

Derived unit contains undeclared units

$$v_{341} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0493}] - \frac{[s_{0913}] \cdot [s_{1009}]}{K_{eq}} \right)}{K_{m0493}}}{1 + \frac{[s_{0493}]}{K_{m0493}} + \left(1 + \frac{[s_{0913}]}{K_{m0913}} \right) \cdot \left(1 + \frac{[s_{1009}]}{K_{m1009}} \right) - 1} \quad (683)$$

Table 1368: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.079	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0493		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0913		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1009		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

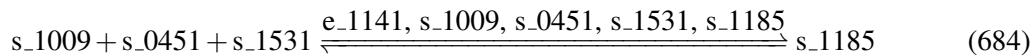
6.342 Reaction r_1368

This is a reversible reaction of three reactants forming one product influenced by five modifiers.

Name Tryptophanase (L-tryptophan)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1369: Properties of each reactant.

Id	Name	SBO
s_1009	Indole	
s_0451	Ammonium	
s_1531	Pyruvate	

Modifiers

Table 1370: Properties of each modifier.

Id	Name	SBO
e_1141	tnaA	0000460

Id	Name	SBO
s_1009	Indole	
s_0451	Ammonium	
s_1531	Pyruvate	
s_1185	L-Tryptophan	

Product

Table 1371: Properties of each product.

Id	Name	SBO
s_1185	L-Tryptophan	

Kinetic Law

Derived unit contains undeclared units

$$v_{342} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1009}] \cdot [s_{0451}] \cdot [s_{1531}] - \frac{[s_{1185}]}{K_{eq}} \right)}{K_{m1009} \cdot K_{m0451} \cdot K_{m1531}} \quad (685)$$

$$\frac{\left(1 + \frac{[s_{1009}]}{K_{m1009}} \right) \cdot \left(1 + \frac{[s_{0451}]}{K_{m0451}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) + 1 + \frac{[s_{1185}]}{K_{m1185}} - 1}{}$$

Table 1372: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.142	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	200.000	$\text{mmol}^{-2} \cdot \text{l}^2$	<input checked="" type="checkbox"/>
Km1009		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0451		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1531		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1185		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

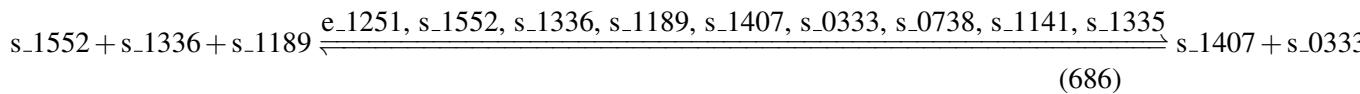
6.343 Reaction r_1375

This is a reversible reaction of three reactants forming five products influenced by nine modifiers.

Name tyrosine lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1373: Properties of each reactant.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1189	L-Tyrosine	

Modifiers

Table 1374: Properties of each modifier.

Id	Name	SBO
e_1251	thiG	0000460
s_1552	S-Adenosyl-L-methionine	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1189	L-Tyrosine	
s_1407	p-Cresol	
s_0333	5'-Deoxyadenosine	
s_0738	dehydroglycine	
s_1141	L-Methionine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Products

Table 1375: Properties of each product.

Id	Name	SBO
s_1407	p-Cresol	
s_0333	5'-Deoxyadenosine	
s_0738	dehydroglycine	
s_1141	L-Methionine	
s_1335	Nicotinamide adenine dinucleotide phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{343} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1552}] \cdot [s_{1336}] \cdot [s_{1189}] - \frac{[s_{1407}] \cdot [s_{0333}] \cdot [s_{0738}] \cdot [s_{1141}] \cdot [s_{1335}]}{K_{eq}} \right)}{K_{m1552} \cdot K_{m1336} \cdot K_{m1189}} \\ = \frac{\left(1 + \frac{[s_{1552}]}{K_{m1552}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{1189}]}{K_{m1189}} \right) + \left(1 + \frac{[s_{1407}]}{K_{m1407}} \right) \cdot \left(1 + \frac{[s_{0333}]}{K_{m0333}} \right) \cdot \left(1 + \frac{[s_{0738}]}{K_{m0738}} \right) \cdot \left(1 + \frac{[s_{1141}]}{K_{m1141}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right)}{\left(1 + \frac{[s_{1552}]}{K_{m1552}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) \cdot \left(1 + \frac{[s_{1189}]}{K_{m1189}} \right) + \left(1 + \frac{[s_{1407}]}{K_{m1407}} \right) \cdot \left(1 + \frac{[s_{0333}]}{K_{m0333}} \right) \cdot \left(1 + \frac{[s_{0738}]}{K_{m0738}} \right) \cdot \left(1 + \frac{[s_{1141}]}{K_{m1141}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right)} \quad (687)$$

Table 1376: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.002	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.020	mmol ² · l ⁻²	<input checked="" type="checkbox"/>
K _{m1552}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1336}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1189}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1407}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0333}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0738}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1141}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1335}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

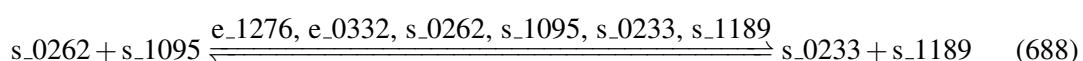
6.344 Reaction r_1376

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name tyrosine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1377: Properties of each reactant.

Id	Name	SBO
s_0262	3-(4-Hydroxyphenyl)pyruvate	

Id	Name	SBO
s_1095	L-Glutamate	

Modifiers

Table 1378: Properties of each modifier.

Id	Name	SBO
e_1276	tyrB	0000460
e_0332	aspC	0000460
s_0262	3-(4-Hydroxyphenyl)pyruvate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1189	L-Tyrosine	

Products

Table 1379: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1189	L-Tyrosine	

Kinetic Law

Derived unit contains undeclared units

$$v_{344} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0262}] \cdot [s_{1095}] - \frac{[s_{0233}] \cdot [s_{1189}]}{K_{eq}} \right)}{K_{m0262} \cdot K_{m1095}} \quad (689)$$

$$\frac{\left(1 + \frac{[s_{0262}]}{K_{m0262}} \right) \cdot \left(1 + \frac{[s_{1095}]}{K_{m1095}} \right) + \left(1 + \frac{[s_{0233}]}{K_{m0233}} \right) \cdot \left(1 + \frac{[s_{1189}]}{K_{m1189}} \right) - 1}{}$$

Table 1380: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.019	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.268	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0262		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1189		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

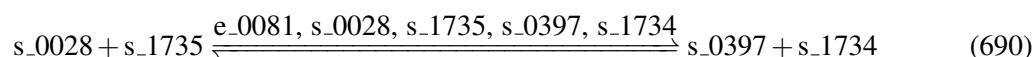
6.345 Reaction r_1378

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-3-O-(3-hydroxymyristoyl)glucosamine acyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1381: Properties of each reactant.

Id	Name	SBO
s_{_0028}	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_{_1735}	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	

Modifiers

Table 1382: Properties of each modifier.

Id	Name	SBO
e_{_0081}	lpxD	0000460
s_{_0028}	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_{_1735}	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	
s_{_0397}	acyl carrier protein	
s_{_1734}	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Products

Table 1383: Properties of each product.

Id	Name	SBO
s_{_0397}	acyl carrier protein	
s_{_1734}	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{345} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0028}] \cdot [s_{1735}] - \frac{[s_{0397}] \cdot [s_{1734}]}{K_{eq}} \right)}{K_{m0028} \cdot K_{m1735}} \quad (691)$$

$$\frac{\left(1 + \frac{[s_{0028}]}{K_{m0028}} \right) \cdot \left(1 + \frac{[s_{1735}]}{K_{m1735}} \right) + \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{1734}]}{K_{m1734}} \right) - 1}{\left(1 + \frac{[s_{0028}]}{K_{m0028}} \right) \cdot \left(1 + \frac{[s_{1735}]}{K_{m1735}} \right) + \left(1 + \frac{[s_{0397}]}{K_{m0397}} \right) \cdot \left(1 + \frac{[s_{1734}]}{K_{m1734}} \right) - 1}$$

Table 1384: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.075	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0028		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1735		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0397		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1734		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

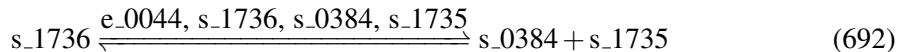
6.346 Reaction r_1379

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name UDP-3-O-acetylglucosamine deacetylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1385: Properties of each reactant.

Id	Name	SBO
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Modifiers

Table 1386: Properties of each modifier.

Id	Name	SBO
e_0044	lpxC	0000460
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Id	Name	SBO
s_0384	Acetate	
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	

Products

Table 1387: Properties of each product.

Id	Name	SBO
s_0384	Acetate	
s_1735	UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{346} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1736}] - \frac{[s_{0384}] \cdot [s_{1735}]}{K_{eq}} \right)}{K_{m1736} + \left(1 + \frac{[s_{1736}]}{K_{m1736}} \right) \cdot \left(1 + \frac{[s_{0384}]}{K_{m0384}} \right) - 1} \quad (693)$$

Table 1388: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.054	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1736}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0384}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1735}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

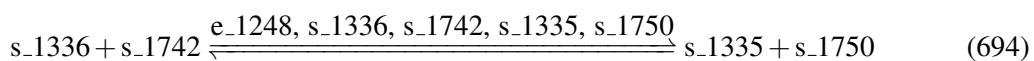
6.347 Reaction r_1388

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylenolpyruvoylglucosamine reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1389: Properties of each reactant.

Id	Name	SBO
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	

Modifiers

Table 1390: Properties of each modifier.

Id	Name	SBO
e_1248	murB	0000460
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1750	UDP-N-acetylmuramate	

Products

Table 1391: Properties of each product.

Id	Name	SBO
s_1335	Nicotinamide adenine dinucleotide phosphate	
s_1750	UDP-N-acetylmuramate	

Kinetic Law

Derived unit contains undeclared units

$$v_{347} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1336}] \cdot [s_{1742}] - \frac{[s_{1335}] \cdot [s_{1750}]}{K_{eq}} \right)}{(1 + \frac{[s_{1336}]}{K_{m1336}}) \cdot (1 + \frac{[s_{1742}]}{K_{m1742}}) + (1 + \frac{[s_{1335}]}{K_{m1335}}) \cdot (1 + \frac{[s_{1750}]}{K_{m1750}}) - 1} \quad (695)$$

Table 1392: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.054	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1336		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1742		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1335		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1750		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

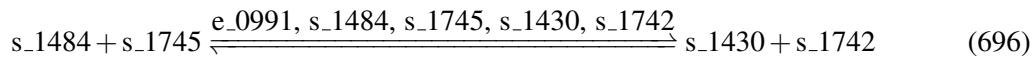
6.348 Reaction r_1389

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylglucosamine 1-carboxyvinyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1393: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_1745	UDP-N-acetyl-D-glucosamine	

Modifiers

Table 1394: Properties of each modifier.

Id	Name	SBO
e_0991	murA	0000460
s_1484	Phosphoenolpyruvate	
s_1745	UDP-N-acetyl-D-glucosamine	
s_1430	Phosphate	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	

Products

Table 1395: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1742	UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{348} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1484}] \cdot [s_{1745}] - \frac{[s_{1430}] \cdot [s_{1742}]}{K_{eq}} \right)}{K_{m1484} \cdot K_{m1745}} \quad (697)$$

$$\frac{\left(1 + \frac{[s_{1484}]}{K_{m1484}} \right) \cdot \left(1 + \frac{[s_{1745}]}{K_{m1745}} \right) + \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1742}]}{K_{m1742}} \right) - 1}{\left(1 + \frac{[s_{1484}]}{K_{m1484}} \right) \cdot \left(1 + \frac{[s_{1745}]}{K_{m1745}} \right) + \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1742}]}{K_{m1742}} \right) - 1}$$

Table 1396: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.054	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1484		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1745		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1742		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

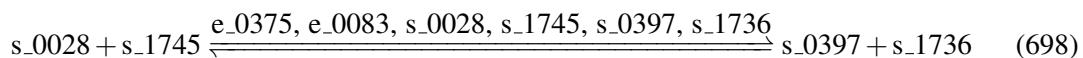
6.349 Reaction r_1391

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name UDP-N-acetylglucosamine acyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1397: Properties of each reactant.

Id	Name	SBO
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1745	UDP-N-acetyl-D-glucosamine	

Modifiers

Table 1398: Properties of each modifier.

Id	Name	SBO
e_0375	acpP	0000460
e_0083	lpxA	0000460
s_0028	(R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]	
s_1745	UDP-N-acetyl-D-glucosamine	
s_0397	acyl carrier protein	
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Products

Table 1399: Properties of each product.

Id	Name	SBO
s_0397	acyl carrier protein	
s_1736	UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{349} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0028}] \cdot [s_{1745}] - \frac{[s_{0397}] \cdot [s_{1736}]}{K_{eq}} \right)}{(1 + \frac{[s_{0028}]}{Km0028}) \cdot (1 + \frac{[s_{1745}]}{Km1745}) + (1 + \frac{[s_{0397}]}{Km0397}) \cdot (1 + \frac{[s_{1736}]}{Km1736}) - 1} \quad (699)$$

Table 1400: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.075	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0028		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1745		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0397		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1736		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

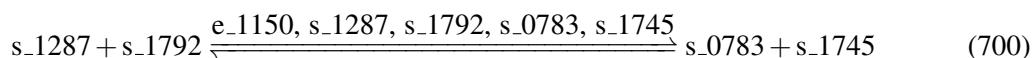
6.350 Reaction r_1392

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylglucosamine diphosphorylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1401: Properties of each reactant.

Id	Name	SBO
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_1792	UTP	

Modifiers

Table 1402: Properties of each modifier.

Id	Name	SBO
e_1150	glmU	0000460
s_1287	N-Acetyl-D-glucosamine 1-phosphate	
s_1792	UTP	
s_0783	Diphosphate	
s_1745	UDP-N-acetyl-D-glucosamine	

Products

Table 1403: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1745	UDP-N-acetyl-D-glucosamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{350} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1287}] \cdot [s_{1792}] - \frac{[s_{0783}] \cdot [s_{1745}]}{K_{eq}} \right)}{K_{m1287} \cdot K_{m1792}} \quad (701)$$

$$= \frac{\left(1 + \frac{[s_{1287}]}{K_{m1287}} \right) \cdot \left(1 + \frac{[s_{1792}]}{K_{m1792}} \right) + \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) \cdot \left(1 + \frac{[s_{1745}]}{K_{m1745}} \right) - 1}{\left(1 + \frac{[s_{1287}]}{K_{m1287}} \right) \cdot \left(1 + \frac{[s_{1792}]}{K_{m1792}} \right) + \left(1 + \frac{[s_{0783}]}{K_{m0783}} \right) \cdot \left(1 + \frac{[s_{1745}]}{K_{m1745}} \right) - 1}$$

Table 1404: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.183	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1287		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1792		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1745		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

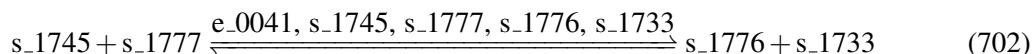
6.351 Reaction r_1393

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name UDP-N-acetylglucosamine-N-acetylmuramyl-(pentapeptide)pyrophosphoryl-undecaprenol N-acetylglucosamine transferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1405: Properties of each reactant.

Id	Name
s_1745	UDP-N-acetyl-D-glucosamine
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl

Modifiers

Table 1406: Properties of each modifier.

Id	Name
e_0041	murG
s_1745	UDP-N-acetyl-D-glucosamine
s_1777	Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim
s_1733	UDP

Products

Table 1407: Properties of each product.

Id	Name
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim
s_1733	UDP

Kinetic Law

Derived unit contains undeclared units

$$v_{351} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1745}] \cdot [s_{1777}] - \frac{[s_{1776}] \cdot [s_{1733}]}{K_{eq}} \right)}{K_{m1745} \cdot K_{m1777}} \quad (703)$$

$$\frac{\left(1 + \frac{[s_{1745}]}{K_{m1745}} \right) \cdot \left(1 + \frac{[s_{1777}]}{K_{m1777}} \right) + \left(1 + \frac{[s_{1776}]}{K_{m1776}} \right) \cdot \left(1 + \frac{[s_{1733}]}{K_{m1733}} \right) - 1}{}$$

Table 1408: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.054	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1745		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1777		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1776		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1733		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

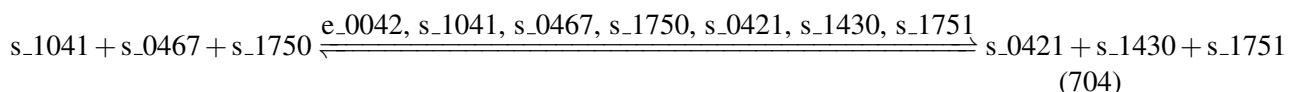
6.352 Reaction r_1397

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanine synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1409: Properties of each reactant.

Id	Name	SBO
s_1041	L-Alanine	
s_0467	ATP	
s_1750	UDP-N-acetylmuramate	

Modifiers

Table 1410: Properties of each modifier.

Id	Name	SBO
e_0042	murC	0000460
s_1041	L-Alanine	
s_0467	ATP	
s_1750	UDP-N-acetylmuramate	
s_0421	ADP	
s_1430	Phosphate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	

Products

Table 1411: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{352} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{1041}] \cdot [s_{0467}] \cdot [s_{1750}] - \frac{[s_{0421}] \cdot [s_{1430}] \cdot [s_{1751}]}{K_{eq}} \right)}{K_{m1041} \cdot K_{m0467} \cdot K_{m1750}} \quad (705)$$

$$= \frac{\left(1 + \frac{[s_{1041}]}{K_{m1041}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1750}]}{K_{m1750}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1751}]}{K_{m1751}} \right) - 1}{\left(1 + \frac{[s_{1041}]}{K_{m1041}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1750}]}{K_{m1750}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1751}]}{K_{m1751}} \right) - 1}$$

Table 1412: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.115	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1041}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1750}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1751}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

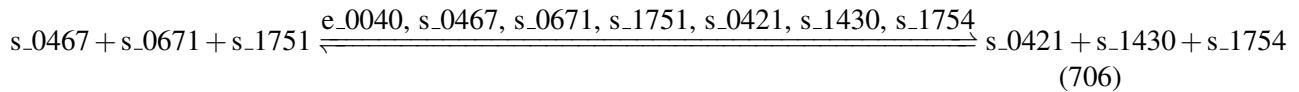
6.353 Reaction r_1399

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamate synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1413: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_0671	D-Glutamate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	

Modifiers

Table 1414: Properties of each modifier.

Id	Name	SBO
e_0040	murD	0000460
s_0467	ATP	
s_0671	D-Glutamate	
s_1751	UDP-N-acetylmuramoyl-L-alanine	
s_0421	ADP	
s_1430	Phosphate	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	

Products

Table 1415: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{353} \quad (707)$$

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{0467}] \cdot [s_{0671}] \cdot [s_{1751}] - \frac{[s_{0421}] \cdot [s_{1430}] \cdot [s_{1754}]}{K_{\text{eq}}} \right)}{K_{m0467} \cdot K_{m0671} \cdot K_{m1751}} \\ = \frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0671}]}{K_{m0671}} \right) \cdot \left(1 + \frac{[s_{1751}]}{K_{m1751}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1754}]}{K_{m1754}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{0671}]}{K_{m0671}} \right) \cdot \left(1 + \frac{[s_{1751}]}{K_{m1751}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1754}]}{K_{m1754}} \right) - 1}$$

Table 1416: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.115	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0671}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1751}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1754}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

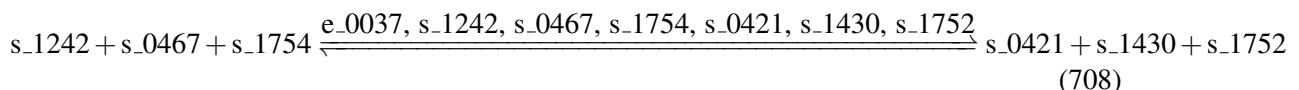
6.354 Reaction r_1400

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimelate synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1417: Properties of each reactant.

Id	Name	SBO
s_1242	meso-2,6-Diaminoheptanedioate	
s_0467	ATP	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	

Modifiers

Table 1418: Properties of each modifier.

Id	Name	SBO
e_0037	murE	0000460
s_1242	meso-2,6-Diaminoheptanedioate	
s_0467	ATP	
s_1754	UDP-N-acetylmuramoyl-L-alanyl-D-glutamate	
s_0421	ADP	
s_1430	Phosphate	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	

Products

Table 1419: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	

Kinetic Law

Derived unit contains undeclared units

$$v_{354} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{1242}] \cdot [s_{0467}] \cdot [s_{1754}] - \frac{[s_{0421}] \cdot [s_{1430}] \cdot [s_{1752}]}{K_{eq}} \right)}{K_{m1242} \cdot K_{m0467} \cdot K_{m1754}} \\ = \frac{\left(1 + \frac{[s_{1242}]}{K_{m1242}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1754}]}{K_{m1754}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1752}]}{K_{m1752}} \right) - 1}{\left(1 + \frac{[s_{1242}]}{K_{m1242}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1754}]}{K_{m1754}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1752}]}{K_{m1752}} \right) - 1} \quad (709)$$

Table 1420: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.115	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1242		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1754		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1430		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1752		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

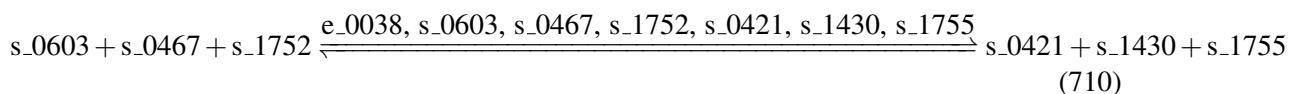
6.355 Reaction r_1401

This is a reversible reaction of three reactants forming three products influenced by seven modifiers.

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1421: Properties of each reactant.

Id	Name	SBO
s_0603	D-Alanyl-D-alanine	
s_0467	ATP	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	

Modifiers

Table 1422: Properties of each modifier.

Id	Name	SBO
e_0038	murF	000046
s_0603	D-Alanyl-D-alanine	
s_0467	ATP	
s_1752	UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate	
s_0421	ADP	
s_1430	Phosphate	
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	

Products

Table 1423: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_1755	UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{355} = \frac{vol(cell) \cdot Vmax \cdot \left([s_{0603}] \cdot [s_{0467}] \cdot [s_{1752}] - \frac{[s_{0421}] \cdot [s_{1430}] \cdot [s_{1755}]}{K_{eq}} \right)}{Km_{0603} \cdot Km_{0467} \cdot Km_{1752}} \\ = \frac{\left(1 + \frac{[s_{0603}]}{Km_{0603}} \right) \cdot \left(1 + \frac{[s_{0467}]}{Km_{0467}} \right) \cdot \left(1 + \frac{[s_{1752}]}{Km_{1752}} \right) + \left(1 + \frac{[s_{0421}]}{Km_{0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km_{1430}} \right) \cdot \left(1 + \frac{[s_{1755}]}{Km_{1755}} \right) - 1}{\left(1 + \frac{[s_{0603}]}{Km_{0603}} \right) \cdot \left(1 + \frac{[s_{0467}]}{Km_{0467}} \right) \cdot \left(1 + \frac{[s_{1752}]}{Km_{1752}} \right) + \left(1 + \frac{[s_{0421}]}{Km_{0421}} \right) \cdot \left(1 + \frac{[s_{1430}]}{Km_{1430}} \right) \cdot \left(1 + \frac{[s_{1755}]}{Km_{1755}} \right) - 1}$$
(711)

Table 1424: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.115	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km ₀₆₀₃		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km ₀₄₆₇		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km ₁₇₅₂		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km ₀₄₂₁		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km ₁₄₃₀		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km ₁₇₅₅		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

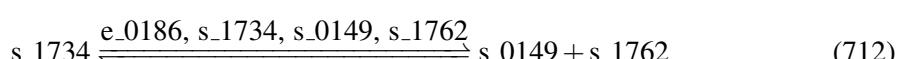
6.356 Reaction r_1402

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name UDP-sugar hydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1425: Properties of each reactant.

Id	Name	SBO
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	

Modifiers

Table 1426: Properties of each modifier.

Id	Name	SBO
e_0186	lpxH	0000460
s_1734	UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine	
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1762	UMP	

Products

Table 1427: Properties of each product.

Id	Name	SBO
s_0149	2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate	
s_1762	UMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{356} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1734}] - \frac{[s_{0149}] \cdot [s_{1762}]}{K_{eq}} \right)}{1 + \frac{[s_{1734}]}{K_{m1734}} + \left(1 + \frac{[s_{0149}]}{K_{m0149}} \right) \cdot \left(1 + \frac{[s_{1762}]}{K_{m1762}} \right) - 1} \quad (713)$$

Table 1428: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.027	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1734}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km0149		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1762		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

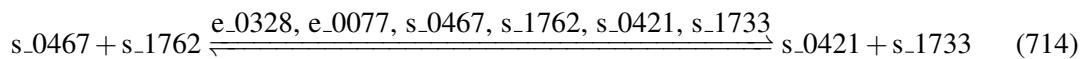
6.357 Reaction r_1409

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name UMP kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1429: Properties of each reactant.

Id	Name	SBO
s_0467	ATP	
s_1762	UMP	

Modifiers

Table 1430: Properties of each modifier.

Id	Name	SBO
e_0328	cmk	0000460
e_0077	pyrH	0000460
s_0467	ATP	
s_1762	UMP	
s_0421	ADP	
s_1733	UDP	

Products

Table 1431: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1733	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{357} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0467}] \cdot [s_{1762}] - \frac{[s_{0421}] \cdot [s_{1733}]}{K_{eq}} \right)}{K_{m0467} \cdot K_{m1762}} \quad (715)$$

$$\frac{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1762}]}{K_{m1762}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1733}]}{K_{m1733}} \right) - 1}{\left(1 + \frac{[s_{0467}]}{K_{m0467}} \right) \cdot \left(1 + \frac{[s_{1762}]}{K_{m1762}} \right) + \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right) \cdot \left(1 + \frac{[s_{1733}]}{K_{m1733}} \right) - 1} - 1$$

Table 1432: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.052	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.733	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0467		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1762		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0421		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1733		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

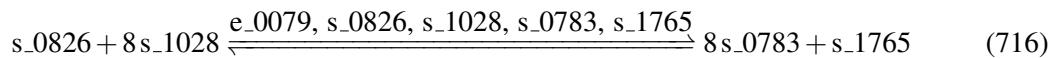
6.358 Reaction r_1410

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name Undecaprenyl diphosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1433: Properties of each reactant.

Id	Name	SBO
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	

Modifiers

Table 1434: Properties of each modifier.

Id	Name	SBO
e_0079	uppS	0000460
s_0826	Farnesyl diphosphate	
s_1028	Isopentenyl diphosphate	
s_0783	Diphosphate	
s_1765	Undecaprenyl diphosphate	

Products

Table 1435: Properties of each product.

Id	Name	SBO
s_0783	Diphosphate	
s_1765	Undecaprenyl diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{358} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0826}] \cdot [s_{1028}]^8 - \frac{[s_{0783}]^8 \cdot [s_{1765}]}{K_{eq}} \right)}{(1 + \frac{[s_{0826}]}{Km_{0826}}) \cdot \left(1 + \frac{[s_{1028}]}{Km_{1028}} \right)^8 + \left(1 + \frac{[s_{0783}]}{Km_{0783}} \right)^8 \cdot \left(1 + \frac{[s_{1765}]}{Km_{1765}} \right) - 1} \quad (717)$$

Table 1436: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.61842038009631 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.016	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0826		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1028		0000322	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km0783		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1765		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

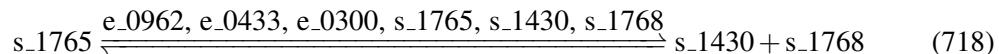
6.359 Reaction r_1413

This is a reversible reaction of one reactant forming two products influenced by six modifiers.

Name undecaprenyl-diphosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1437: Properties of each reactant.

Id	Name	SBO
s_1765	Undecaprenyl diphosphate	

Modifiers

Table 1438: Properties of each modifier.

Id	Name	SBO
e_0962	uppP	0000460
e_0433	pgpB	0000460
e_0300	ybjG	0000460
s_1765	Undecaprenyl diphosphate	
s_1430	Phosphate	
s_1768	Undecaprenyl phosphate	

Products

Table 1439: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	
s_1768	Undecaprenyl phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{359} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1765}] - \frac{[s_{1430}] \cdot [s_{1768}]}{K_{eq}} \right)}{1 + \frac{[s_{1765}]}{K_{m1765}} + \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) \cdot \left(1 + \frac{[s_{1768}]}{K_{m1768}} \right) - 1} \quad (719)$$

Table 1440: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.038	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1765}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1768}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

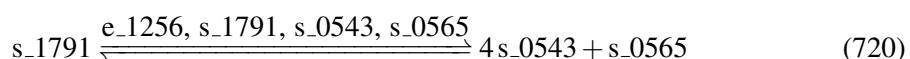
6.360 Reaction r_1421

This is a reversible reaction of one reactant forming two products influenced by four modifiers.

Name uroporphyrinogen decarboxylase (uroporphyrinogen III)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1441: Properties of each reactant.

Id	Name	SBO
s_1791	Uroporphyrinogen III	

Id	Name	SBO

Modifiers

Table 1442: Properties of each modifier.

Id	Name	SBO
e_1256	hemE	0000460
s_1791	Uroporphyrinogen III	
s_0543	CO2	
s_0565	Coproporphyrinogen III	

Products

Table 1443: Properties of each product.

Id	Name	SBO
s_0543	CO2	
s_0565	Coproporphyrinogen III	

Kinetic Law

Derived unit contains undeclared units

$$v_{360} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1791}] - \frac{[s_{0543}]^4 \cdot [s_{0565}]}{K_{eq}} \right)}{1 + \frac{[s_{1791}]}{Km1791} + \left(1 + \frac{[s_{0543}]}{Km0543} \right)^4 \cdot \left(1 + \frac{[s_{0565}]}{Km0565} \right) - 1} \quad (721)$$

Table 1444: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317225085 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	$2 \cdot 10^{-4}$	$\text{mmol}^4 \cdot \text{l}^{-4}$	<input checked="" type="checkbox"/>
Km1791		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0565		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

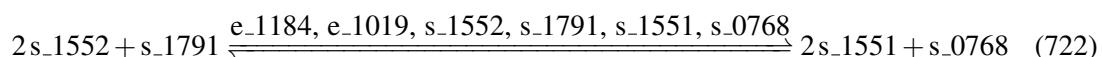
6.361 Reaction r_1422

This is a reversible reaction of two reactants forming two products influenced by six modifiers.

Name uroporphyrinogen methyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1445: Properties of each reactant.

Id	Name	SBO
s_1552	S-Adenosyl-L-methionine	
s_1791	Uroporphyrinogen III	

Modifiers

Table 1446: Properties of each modifier.

Id	Name	SBO
e_1184	hemX	0000460
e_1019	cysG	0000460
s_1552	S-Adenosyl-L-methionine	
s_1791	Uroporphyrinogen III	
s_1551	S-Adenosyl-L-homocysteine	
s_0768	dihydrosirohydrochlorin	

Products

Table 1447: Properties of each product.

Id	Name	SBO
s_1551	S-Adenosyl-L-homocysteine	
s_0768	dihydrosirohydrochlorin	

Kinetic Law

Derived unit contains undeclared units

$$v_{361} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1552}]^2 \cdot [s_{1791}] - \frac{[s_{1551}]^2 \cdot [s_{0768}]}{K_{eq}} \right)}{K_{m1552}^2 \cdot K_{m1791}} \quad (723)$$

$$\frac{\left(1 + \frac{[s_{1552}]}{K_{m1552}} \right)^2 \cdot \left(1 + \frac{[s_{1791}]}{K_{m1791}} \right) + \left(1 + \frac{[s_{1551}]}{K_{m1551}} \right)^2 \cdot \left(1 + \frac{[s_{0768}]}{K_{m0768}} \right) - 1}{\left(1 + \frac{[s_{1552}]}{K_{m1552}} \right)^2 \cdot \left(1 + \frac{[s_{1791}]}{K_{m1791}} \right) + \left(1 + \frac{[s_{1551}]}{K_{m1551}} \right)^2 \cdot \left(1 + \frac{[s_{0768}]}{K_{m0768}} \right) - 1}$$

Table 1448: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$9.26676951688089 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1552}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1791}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1551}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0768}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

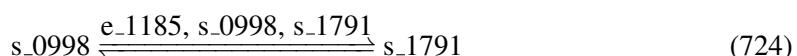
6.362 Reaction r_1423

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name uroporphyrinogen-III synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1449: Properties of each reactant.

Id	Name	SBO
s_0998	Hydroxymethylbilane	

Modifiers

Table 1450: Properties of each modifier.

Id	Name	SBO
e_1185	hemD	0000460
s_0998	Hydroxymethylbilane	
s_1791	Uroporphyrinogen III	

Product

Table 1451: Properties of each product.

Id	Name	SBO
s_1791	Uroporphyrinogen III	

Kinetic Law

Derived unit contains undeclared units

$$v_{362} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0998}] - \frac{[s_{1791}]}{K_{eq}} \right)}{K_{m0998}}}{1 + \frac{[s_{0998}]}{K_{m0998}} + 1 + \frac{[s_{1791}]}{K_{m1791}} - 1} \quad (725)$$

Table 1452: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.1778463445417 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.70670780672502 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0998}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1791}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

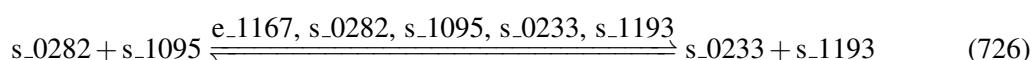
6.363 Reaction r_1425

This is a reversible reaction of two reactants forming two products influenced by five modifiers.

Name valine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1453: Properties of each reactant.

Id	Name	SBO
s_0282	3-Methyl-2-oxobutanoate	
s_1095	L-Glutamate	

Modifiers

Table 1454: Properties of each modifier.

Id	Name	SBO
e_1167	ilvE	0000460
s_0282	3-Methyl-2-oxobutanoate	
s_1095	L-Glutamate	
s_0233	2-Oxoglutarate	
s_1193	L-Valine	

Products

Table 1455: Properties of each product.

Id	Name	SBO
s_0233	2-Oxoglutarate	
s_1193	L-Valine	

Kinetic Law

Derived unit contains undeclared units

$$v_{363} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0282] \cdot [s_1095] - \frac{[s_0233] \cdot [s_1193]}{K_{eq}} \right)}{Km0282 \cdot Km1095} \quad (727)$$

$$\frac{\left(1 + \frac{[s_0282]}{Km0282} \right) \cdot \left(1 + \frac{[s_1095]}{Km1095} \right) + \left(1 + \frac{[s_0233]}{Km0233} \right) \cdot \left(1 + \frac{[s_1193]}{Km1193} \right) - 1}{\left(1 + \frac{[s_0282]}{Km0282} \right) \cdot \left(1 + \frac{[s_1095]}{Km1095} \right) + \left(1 + \frac{[s_0233]}{Km0233} \right) \cdot \left(1 + \frac{[s_1193]}{Km1193} \right) - 1}$$

Table 1456: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.059	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.821	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0282		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1095		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0233		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1193		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

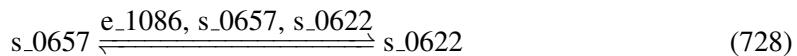
6.364 Reaction r_1432

This is a reversible reaction of one reactant forming one product influenced by three modifiers.

Name xylose isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1457: Properties of each reactant.

Id	Name	SBO
s_0657	D-Glucose	

Modifiers

Table 1458: Properties of each modifier.

Id	Name	SBO
e_1086	xylA	0000460
s_0657	D-Glucose	
s_0622	D-Fructose	

Product

Table 1459: Properties of each product.

Id	Name	SBO
s_0622	D-Fructose	

Kinetic Law

Derived unit contains undeclared units

$$v_{364} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0657}] - \frac{[s_{0622}]}{K_{eq}} \right)}{1 + \frac{[s_{0657}]}{K_{m0657}} + 1 + \frac{[s_{0622}]}{K_{m0622}} - 1} \quad (729)$$

Table 1460: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.066	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.394	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0657		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0622		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.365 Reaction r_1511

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name ammonia transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1461: Properties of each reactant.

Id	Name	SBO
s_0453	Ammonium	

Modifiers

Table 1462: Properties of each modifier.

Id	Name	SBO
s_0453	Ammonium	

Id	Name	SBO
s_0451	Ammonium	

Product

Table 1463: Properties of each product.

Id	Name	SBO
s_0451	Ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{365} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{0453}] - [s_{0451}])}{K_{m0453}}}{1 + \frac{[s_{0453}]}{K_{m0453}} + 1 + \frac{[s_{0451}]}{K_{m0451}} - 1} \quad (731)$$

Table 1464: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.493	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	4.976	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{m0453}		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0451}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

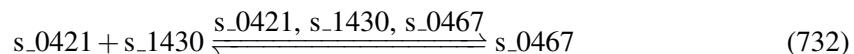
6.366 Reaction r_1521

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name ATP synthase (four protons for one ATP) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1465: Properties of each reactant.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	

Modifiers

Table 1466: Properties of each modifier.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_0467	ATP	

Product

Table 1467: Properties of each product.

Id	Name	SBO
s_0467	ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{366} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0421] \cdot [s_1430] - \frac{[s_0467]}{K_{eq}} \right)}{(1 + \frac{[s_0421]}{Km0421}) \cdot (1 + \frac{[s_1430]}{Km1430}) + 1 + \frac{[s_0467]}{Km0467} - 1} \quad (733)$$

Table 1468: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			12.851	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	128.512	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	20.000	mmol ⁻¹ · l	<input checked="" type="checkbox"/>
Km0421		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1430		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0467		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.367 Reaction r_1536

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name calcium (Ca+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1469: Properties of each reactant.

Id	Name	SBO
s_0499	Calcium	

Modifiers

Table 1470: Properties of each modifier.

Id	Name	SBO
s_0499	Calcium	
s_0497	Calcium	

Product

Table 1471: Properties of each product.

Id	Name	SBO
s_0497	Calcium	

Kinetic Law

Derived unit contains undeclared units

$$v_{367} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{0499}] - [s_{0497}])}{1 + \frac{[s_{0499}]}{K_{m0499}} + 1 + \frac{[s_{0497}]}{K_{m0497}} - 1} \quad (735)$$

Table 1472: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.20979601425486 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km0499		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0497		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.368 Reaction r_1543

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name chloride (Cl-1) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1473: Properties of each reactant.

Id	Name	SBO
s_0522	Chloride	

Modifiers

Table 1474: Properties of each modifier.

Id	Name	SBO
s_0522	Chloride	
s_0520	Chloride	

Product

Table 1475: Properties of each product.

Id	Name	SBO
s_0520	Chloride	

Kinetic Law

Derived unit contains undeclared units

$$v_{368} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{0522}] - [s_{0520}])}{K_{m0522}} \quad (737)$$

$$1 + \frac{[s_{0522}]}{K_{m0522}} + 1 + \frac{[s_{0520}]}{K_{m0520}} - 1$$

Table 1476: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.20979601425486 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{m0522}		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0520}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.369 Reaction r_1551

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name CO2 transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1477: Properties of each reactant.

Id	Name	SBO
s_0543	CO2	

Modifier

Table 1478: Properties of each modifier.

Id	Name	SBO
s_0543	CO2	

Product

Table 1479: Properties of each product.

Id	Name	SBO
s_0545	CO2	

Kinetic Law

Derived unit contains undeclared units

$$v_{369} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} [\text{s_0543}]}{\text{Km0543}}}{1 + \frac{[\text{s_0543}]}{\text{Km0543}}} \quad (739)$$

Table 1480: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.321	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.641	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km0543		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.370 Reaction r_1557

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name cobalt (Co+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1481: Properties of each reactant.

Id	Name	SBO
s_0548	Co2+	

Modifiers

Table 1482: Properties of each modifier.

Id	Name	SBO
s_0548	Co2+	
s_0546	Co2+	

Product

Table 1483: Properties of each product.

Id	Name	SBO
s_0546	Co2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{370} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s_0548}] - [\text{s_0546}])}{\text{Km0548}}}{1 + \frac{[\text{s_0548}]}{\text{Km0548}} + 1 + \frac{[\text{s_0546}]}{\text{Km0546}} - 1} \quad (741)$$

Table 1484: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			3.46291835458927 · 10 ⁻⁶	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.15430611819642 · 10 ⁻⁵	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Km0548		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0546		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.371 Reaction r_1565

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name copper (Cu+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1485: Properties of each reactant.

Id	Name	SBO
s_0581	Cu2+	

Modifiers

Table 1486: Properties of each modifier.

Id	Name	SBO
s_0581	Cu2+	
s_0579	Cu2+	

Product

Table 1487: Properties of each product.

Id	Name	SBO
s_0579	Cu2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{371} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s_0581}] - [\text{s_0579}])}{\text{Km0581}}}{1 + \frac{[\text{s_0581}]}{\text{Km0581}} + 1 + \frac{[\text{s_0579}]}{\text{Km0579}} - 1} \quad (743)$$

Table 1488: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			9.82083645361517 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	3.27361215120506 · 10 ⁻⁴	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Km0581		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0579		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

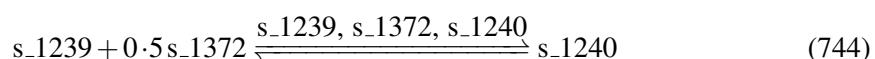
6.372 Reaction r_1581

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name cytochrome oxidase bd (menaquinol-8: 2 protons) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1489: Properties of each reactant.

Id	Name	SBO
s_1239	Menaquinol 8	
s_1372	O2	

Modifiers

Table 1490: Properties of each modifier.

Id	Name	SBO
s_1239	Menaquinol 8	
s_1372	O2	
s_1240	Menaquinone 8	

Product

Table 1491: Properties of each product.

Id	Name	SBO
s_1240	Menaquinone 8	

Kinetic Law

Derived unit contains undeclared units

$$v_{372} = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot \left([s_{-1239}] \cdot [s_{-1372}] - \frac{[s_{-1240}]}{K_{\text{eq}}} \right)}{K_{\text{m1239}} \cdot K_{\text{m1372}}}}{\left(1 + \frac{[s_{-1239}]}{K_{\text{m1239}}} \right) \cdot \left(1 + \frac{[s_{-1372}]}{K_{\text{m1372}}} \right) + 1 + \frac{[s_{-1240}]}{K_{\text{m1240}}} - 1} \quad (745)$$

Table 1492: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.230	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
K _{m1239}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1372}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1240}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

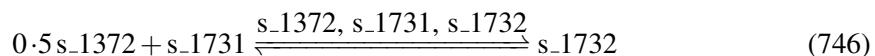
6.373 Reaction r_1582

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name cytochrome oxidase bd (ubiquinol-8: 2 protons) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1493: Properties of each reactant.

Id	Name	SBO
s_{-1372}	O2	
s_{-1731}	Ubiquinol-8	

Modifiers

Table 1494: Properties of each modifier.

Id	Name	SBO
s_{-1372}	O2	
s_{-1731}	Ubiquinol-8	

Id	Name	SBO
s_1732	Ubiquinone-8	

Product

Table 1495: Properties of each product.

Id	Name	SBO
s_1732	Ubiquinone-8	

Kinetic Law

Derived unit contains undeclared units

$$v_{373} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1372}] \cdot [s_{1731}] - \frac{[s_{1732}]}{K_{eq}} \right)}{K_{m1372} \cdot K_{m1731}} \quad (747)$$

$$\frac{1}{\left(1 + \frac{[s_{1372}]}{K_{m1372}} \right) \cdot \left(1 + \frac{[s_{1731}]}{K_{m1731}} \right) + 1 + \frac{[s_{1732}]}{K_{m1732}} - 1}$$

Table 1496: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.230	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	20.000	mmol ⁻¹ · l	<input checked="" type="checkbox"/>
K _{m1372}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1731}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1732}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.374 Reaction r_1621

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name D-glucose transport via diffusion (extracellular to periplasm) irreversible

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1497: Properties of each reactant.

Id	Name	SBO
s_0659	D-Glucose	

Modifiers

Table 1498: Properties of each modifier.

Id	Name	SBO
s_0659	D-Glucose	
s_0657	D-Glucose	

Product

Table 1499: Properties of each product.

Id	Name	SBO
s_0657	D-Glucose	

Kinetic Law

Derived unit contains undeclared units

$$v_{374} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{0659}] - [s_{0657}])}{K_{m0659}} \quad (749)$$

$$1 + \frac{[s_{0659}]}{K_{m0659}} + 1 + \frac{[s_{0657}]}{K_{m0657}} - 1$$

Table 1500: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.000	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	3.333	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{m0659}		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0657}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

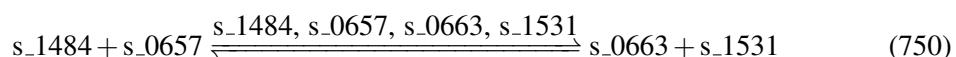
6.375 Reaction r_1622

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name D-glucose transport via PEP:Pyr PTS (periplasm)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1501: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_0657	D-Glucose	

Modifiers

Table 1502: Properties of each modifier.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_0657	D-Glucose	
s_0663	D-Glucose 6-phosphate	
s_1531	Pyruvate	

Products

Table 1503: Properties of each product.

Id	Name	SBO
s_0663	D-Glucose 6-phosphate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{375} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1484}] \cdot [s_{0657}] - \frac{[s_{0663}] \cdot [s_{1531}]}{K_{eq}} \right)}{K_{m1484} \cdot K_{m0657}}}{\left(1 + \frac{[s_{1484}]}{K_{m1484}} \right) \cdot \left(1 + \frac{[s_{0657}]}{K_{m0657}} \right) + \left(1 + \frac{[s_{0663}]}{K_{m0663}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) - 1} \quad (751)$$

Table 1504: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.022	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.310	mmol · l⁻¹ · s⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1484		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0657		0000322	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km0663		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>
Km1531		0000323	0.100	mmol · l⁻¹	<input checked="" type="checkbox"/>

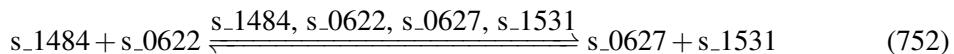
6.376 Reaction r_1714

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name Fructose transport via PEP:Pyr PTS (f6p generating) (periplasm)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1505: Properties of each reactant.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	
s_0622	D-Fructose	

Modifiers

Table 1506: Properties of each modifier.

Id	Name	SBO
s_1484	Phosphoenolpyruvate	

Id	Name	SBO
s_0622	D-Fructose	
s_0627	D-Fructose 6-phosphate	
s_1531	Pyruvate	

Products

Table 1507: Properties of each product.

Id	Name	SBO
s_0627	D-Fructose 6-phosphate	
s_1531	Pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{376} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1484}] \cdot [s_{0622}] - \frac{[s_{0627}] \cdot [s_{1531}]}{K_{eq}} \right)}{K_{m1484} \cdot K_{m0622}} \quad (753)$$

$$\frac{\left(1 + \frac{[s_{1484}]}{K_{m1484}} \right) \cdot \left(1 + \frac{[s_{0622}]}{K_{m0622}} \right) + \left(1 + \frac{[s_{0627}]}{K_{m0627}} \right) \cdot \left(1 + \frac{[s_{1531}]}{K_{m1531}} \right) - 1}{}$$

Table 1508: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.155	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1484		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0622		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0627		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1531		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.377 Reaction r_1792

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name iron (II) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1509: Properties of each reactant.

Id	Name	SBO
s_0840	Fe2+	

Modifiers

Table 1510: Properties of each modifier.

Id	Name	SBO
s_0840	Fe2+	
s_0838	Fe2+	

Product

Table 1511: Properties of each product.

Id	Name	SBO
s_0838	Fe2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{377} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{_0840}] - [s_{_0838}])}{K_{m0840} + \frac{[s_{_0840}]}{K_{m0840}} + 1 + \frac{[s_{_0838}]}{K_{m0838}} - 1} \quad (755)$$

Table 1512: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km0840		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0838		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.378 Reaction r_1793

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name iron (III) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1513: Properties of each reactant.

Id	Name	SBO
s_0843	Fe3+	

Modifiers

Table 1514: Properties of each modifier.

Id	Name	SBO
s_0843	Fe3+	
s_0841	Fe3+	

Product

Table 1515: Properties of each product.

Id	Name	SBO
s_0841	Fe3+	

Kinetic Law

Derived unit contains undeclared units

$$v_{378} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_0843] - [s_0841])}{1 + \frac{[s_0843]}{K_{m0843}} + 1 + \frac{[s_0841]}{K_{m0841}} - 1} \quad (757)$$

Table 1516: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km0843		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0841		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.379 Reaction r_1906

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name magnesium (Mg+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1517: Properties of each reactant.

Id	Name	SBO
s_1214	magnesium	

Modifiers

Table 1518: Properties of each modifier.

Id	Name	SBO
s_1214	magnesium	
s_1212	magnesium	

Product

Table 1519: Properties of each product.

Id	Name	SBO
s_1212	magnesium	

Kinetic Law

Derived unit contains undeclared units

$$v_{379} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{1214}] - [s_{1212}])}{K_{m1214}} \quad (759)$$

$$1 + \frac{[s_{1214}]}{K_{m1214}} + 1 + \frac{[s_{1212}]}{K_{m1212}} - 1$$

Table 1520: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km1214		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.380 Reaction r_1923

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name Manganese (Mn+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1521: Properties of each reactant.

Id	Name	SBO
s_1257	Mn2+	

Modifiers

Table 1522: Properties of each modifier.

Id	Name	SBO
s_1257	Mn2+	
s_1255	Mn2+	

Product

Table 1523: Properties of each product.

Id	Name	SBO
s_1255	Mn2+	

Kinetic Law

Derived unit contains undeclared units

$$v_{380} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{1257}] - [s_{1255}])}{K_{m1257} + [s_{1257}] + 1 + \frac{[s_{1255}]}{K_{m1255}} - 1} \quad (761)$$

Table 1524: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.57150633208474 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$3.19050211069491 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{m1257}		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1255}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.381 Reaction r_1939

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Methanol transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1525: Properties of each reactant.

Id	Name	SBO
s_1248	Methanol	

Modifier

Table 1526: Properties of each modifier.

Id	Name	SBO
s_1248	Methanol	

Product

Table 1527: Properties of each product.

Id	Name	SBO
s_1250	Methanol	

Kinetic Law

Derived unit contains undeclared units

$$v_{381} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot [s_{1248}]}{K_{m1248}}}{1 + \frac{[s_{1248}]}{K_{m1248}}} \quad (763)$$

Table 1528: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467884759 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$5.54066935769518 \cdot 10^{-7}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{m1248}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.382 Reaction r_1943

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name molybdate transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1529: Properties of each reactant.

Id	Name	SBO
s_1263	Molybdate	

Modifiers

Table 1530: Properties of each modifier.

Id	Name	SBO
s_1263	Molybdate	
s_1261	Molybdate	

Product

Table 1531: Properties of each product.

Id	Name	SBO
s_1261	Molybdate	

Kinetic Law

Derived unit contains undeclared units

$$v_{382} = \frac{\frac{\text{vol}(\text{cell}) \cdot \text{Vmax} \cdot ([\text{s_1263}] - [\text{s_1261}])}{\text{Km1263}}}{1 + \frac{[\text{s_1263}]}{\text{Km1263}} + 1 + \frac{[\text{s_1261}]}{\text{Km1261}} - 1} \quad (765)$$

Table 1532: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.78686587096806 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$5.95621956989353 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km1263		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1261		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.383 Reaction r_1944

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name murein polymerizing transglycosylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1533: Properties of each reactant.

Id	Name
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim

Modifiers

Table 1534: Properties of each modifier.

Id	Name
s_1776	Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-ala-D-glu-meso-2,6-diaminopim
s_1765	Undecaprenyl diphosphate
s_1725	two linked disaccharide pentapeptide murein units (uncrosslinked, middle of chain)

Products

Table 1535: Properties of each product.

Id	Name	SBO
s_1765	Undecaprenyl diphosphate	
s_1725	two linked disaccharide pentapeptide murein units (uncrosslinked, middle of chain)	

Kinetic Law

Derived unit contains undeclared units

$$v_{383} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{-1776}]^2 - \frac{[s_{-1765}]^2 \cdot [s_{-1725}]}{K_{eq}} \right)}{K_{m1776}^2} \quad (767)$$

$$\frac{\left(1 + \frac{[s_{-1776}]}{K_{m1776}} \right)^2 + \left(1 + \frac{[s_{-1765}]}{K_{m1765}} \right)^2 \cdot \left(1 + \frac{[s_{-1725}]}{K_{m1725}} \right) - 1}{\left(1 + \frac{[s_{-1776}]}{K_{m1776}} \right)^2 + \left(1 + \frac{[s_{-1765}]}{K_{m1765}} \right)^2 \cdot \left(1 + \frac{[s_{-1725}]}{K_{m1725}} \right) - 1}$$

Table 1536: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.042	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1776		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1765		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1725		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

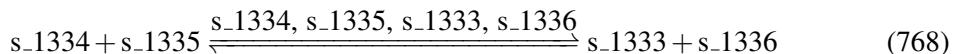
6.384 Reaction r_1962

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name NAD(P) transhydrogenase (periplasm)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1537: Properties of each reactant.

Id	Name	SBO
s_{-1334}	Nicotinamide adenine dinucleotide - reduced	
s_{-1335}	Nicotinamide adenine dinucleotide phosphate	

Modifiers

Table 1538: Properties of each modifier.

Id	Name	SBO
s_{-1334}	Nicotinamide adenine dinucleotide - reduced	
s_{-1335}	Nicotinamide adenine dinucleotide phosphate	

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Products

Table 1539: Properties of each product.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1336	Nicotinamide adenine dinucleotide phosphate - reduced	

Kinetic Law

Derived unit contains undeclared units

$$v_{384} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1334}] \cdot [s_{1335}] - \frac{[s_{1333}] \cdot [s_{1336}]}{K_{eq}} \right)}{K_{m1334} \cdot K_{m1335}} \quad (769)$$

$$\frac{\left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) + \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) - 1}{\left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{1335}]}{K_{m1335}} \right) + \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1336}]}{K_{m1336}} \right) - 1}$$

Table 1540: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.062	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	14.870	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m1334}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1335}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1333}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1336}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

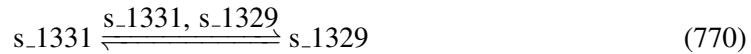
6.385 Reaction r_1968

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name nickel transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1541: Properties of each reactant.

Id	Name	SBO
s_{-1331}	nickel	

Modifiers

Table 1542: Properties of each modifier.

Id	Name	SBO
s_{-1331}	nickel	
s_{-1329}	nickel	

Product

Table 1543: Properties of each product.

Id	Name	SBO
s_{-1329}	nickel	

Kinetic Law

Derived unit contains undeclared units

$$v_{385} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([s_{-1331}] - [s_{-1329}])}{\text{Km1331}}}{1 + \frac{[s_{-1331}]}{\text{Km1331}} + 1 + \frac{[s_{-1329}]}{\text{Km1329}} - 1} \quad (771)$$

Table 1544: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.47409051412934 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$1.49136350470978 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km1331		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1329		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.386 Reaction r_2002

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name oxygen transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1545: Properties of each reactant.

Id	Name	SBO
s_{-1374}	O2	

Modifiers

Table 1546: Properties of each modifier.

Id	Name	SBO
s_{-1374}	O2	
s_{-1372}	O2	

Product

Table 1547: Properties of each product.

Id	Name	SBO
s_{-1372}	O2	

Kinetic Law

Derived unit contains undeclared units

$$v_{386} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{-1374}] - [s_{-1372}])}{1 + \frac{[s_{-1374}]}{K_{m1374}} + 1 + \frac{[s_{-1372}]}{K_{m1372}} - 1} \quad (773)$$

Table 1548: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.077	mmol·l ⁻¹ ·s ⁻¹	<input checked="" type="checkbox"/>
Km1374		0000322	1.000	mmol·l ⁻¹	<input checked="" type="checkbox"/>
Km1372		0000323	0.100	mmol·l ⁻¹	<input checked="" type="checkbox"/>

6.387 Reaction r_2011

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name phosphate transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1549: Properties of each reactant.

Id	Name	SBO
s_1432	Phosphate	

Modifiers

Table 1550: Properties of each modifier.

Id	Name	SBO
s_1432	Phosphate	
s_1430	Phosphate	

Product

Table 1551: Properties of each product.

Id	Name	SBO
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{387} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{1432}] - [s_{1430}])}{K_{m1432}} \quad (775)$$

$$1 + \frac{[s_{1432}]}{K_{m1432}} + 1 + \frac{[s_{1430}]}{K_{m1430}} - 1$$

Table 1552: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.131	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.437	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km1432		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.388 Reaction r_2047

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name potassium transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1553: Properties of each reactant.

Id	Name	SBO
s_1496	potassium	

Modifiers

Table 1554: Properties of each modifier.

Id	Name	SBO
s_1496	potassium	
s_1494	potassium	

Product

Table 1555: Properties of each product.

Id	Name	SBO
s_1494	potassium	

Kinetic Law

Derived unit contains undeclared units

$$v_{388} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{1496}] - [s_{1494}])}{1 + \frac{[s_{1496}]}{K_{m1496}} + 1 + \frac{[s_{1494}]}{K_{m1494}} - 1} \quad (777)$$

Table 1556: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.027	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.090	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{m1496}		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1494}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.389 Reaction r_2108

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name sulfate transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1557: Properties of each reactant.

Id	Name	SBO
s_1611	Sulfate	

Modifiers

Table 1558: Properties of each modifier.

Id	Name	SBO
s_1611	Sulfate	
s_1609	Sulfate	

Product

Table 1559: Properties of each product.

Id	Name	SBO
s_1609	Sulfate	

Kinetic Law

Derived unit contains undeclared units

$$v_{389} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot ([\text{s_1611}] - [\text{s_1609}])}{\text{Km1611}}}{1 + \frac{[\text{s_1611}]}{\text{Km1611}} + 1 + \frac{[\text{s_1609}]}{\text{Km1609}} - 1} \quad (779)$$

Table 1560: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.116	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km1611		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1609		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.390 Reaction r_2167

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name zinc (Zn+2) transport via diffusion (extracellular to periplasm)

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1561: Properties of each reactant.

Id	Name	SBO
s_1806	Zinc	

Modifiers

Table 1562: Properties of each modifier.

Id	Name	SBO
s_1806	Zinc	
s_1804	Zinc	

Product

Table 1563: Properties of each product.

Id	Name	SBO
s_1804	Zinc	

Kinetic Law

Derived unit contains undeclared units

$$v_{390} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot ([s_{1806}] - [s_{1804}])}{K_{m1806}}}{1 + \frac{[s_{1806}]}{K_{m1806}} + 1 + \frac{[s_{1804}]}{K_{m1804}} - 1} \quad (781)$$

Table 1564: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.72342063565976 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$1.57447354521992 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{m1806}		0000322	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1804}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

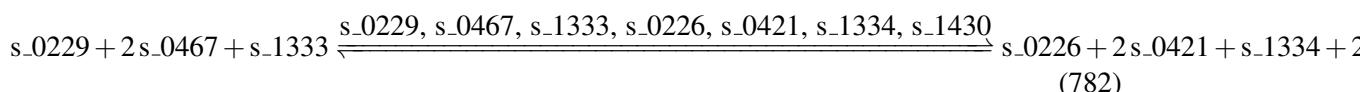
6.391 Reaction r_2195

This is a reversible reaction of three reactants forming four products influenced by seven modifiers.

Name 2-Octaprenylphenol hydroxylase (anaerobic)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1565: Properties of each reactant.

Id	Name	SBO
s_0229	2-Octaprenylphenol	
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	

Modifiers

Table 1566: Properties of each modifier.

Id	Name	SBO
s_0229	2-Octaprenylphenol	
s_0467	ATP	
s_1333	Nicotinamide adenine dinucleotide	
s_0226	2-Octaprenyl-6-hydroxyphenol	
s_0421	ADP	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1430	Phosphate	

Products

Table 1567: Properties of each product.

Id	Name	SBO
s_0226	2-Octaprenyl-6-hydroxyphenol	

Id	Name	SBO
s_0421	ADP	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

v_{391}

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0229}] \cdot [s_{0467}]^2 \cdot [s_{1333}] - \frac{[s_{0226}] \cdot [s_{0421}]^2 \cdot [s_{1334}] \cdot [s_{1430}]^2}{K_{eq}} \right)}{K_{m0229} \cdot K_{m0467}^2 \cdot K_{m1333}}$$

$$= \frac{\left(1 + \frac{[s_{0229}]}{K_{m0229}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{m0467}} \right)^2 \cdot \left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) + \left(1 + \frac{[s_{0226}]}{K_{m0226}} \right) \cdot \left(1 + \frac{[s_{0421}]}{K_{m0421}} \right)^2 \cdot \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right)}{1}$$
(783)

Table 1568: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317453432 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	0.005	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	<input checked="" type="checkbox"/>
K _{m0229}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0467}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1333}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0226}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0421}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1334}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

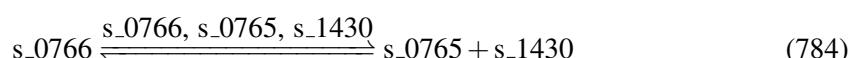
6.392 Reaction r_2310

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name Dihydronopterin monophosphate dephosphorylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1569: Properties of each reactant.

Id	Name	SBO
s_0766	Dihydronoopterin monophosphate	

Modifiers

Table 1570: Properties of each modifier.

Id	Name	SBO
s_0766	Dihydronoopterin monophosphate	
s_0765	Dihydronoopterin	
s_1430	Phosphate	

Products

Table 1571: Properties of each product.

Id	Name	SBO
s_0765	Dihydronoopterin	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{392} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_0766] - \frac{[s_0765] \cdot [s_1430]}{K_{eq}} \right)}{Km0766} \quad (785)$$

$$1 + \frac{[s_0766]}{Km0766} + \left(1 + \frac{[s_0765]}{Km0765} \right) \cdot \left(1 + \frac{[s_1430]}{Km1430} \right) - 1$$

Table 1572: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.26676951688061 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$9.26676951688061 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0766		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0765		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1430		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

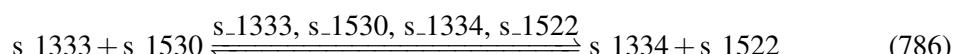
6.393 Reaction r_2519

This is a reversible reaction of two reactants forming two products influenced by four modifiers.

Name pyridoxine 5'-phosphate oxidase (anaerobic)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1573: Properties of each reactant.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1530	Pyridoxine 5'-phosphate	

Modifiers

Table 1574: Properties of each modifier.

Id	Name	SBO
s_1333	Nicotinamide adenine dinucleotide	
s_1530	Pyridoxine 5'-phosphate	
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1522	Pyridoxal 5'-phosphate	

Products

Table 1575: Properties of each product.

Id	Name	SBO
s_1334	Nicotinamide adenine dinucleotide - reduced	
s_1522	Pyridoxal 5'-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{393} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{1333}] \cdot [s_{1530}] - \frac{[s_{1334}] \cdot [s_{1522}]}{K_{eq}} \right)}{K_{m1333} \cdot K_{m1530}} \quad (787)$$

$$\frac{\left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1530}]}{K_{m1530}} \right) + \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{1522}]}{K_{m1522}} \right) - 1}{\left(1 + \frac{[s_{1333}]}{K_{m1333}} \right) \cdot \left(1 + \frac{[s_{1530}]}{K_{m1530}} \right) + \left(1 + \frac{[s_{1334}]}{K_{m1334}} \right) \cdot \left(1 + \frac{[s_{1522}]}{K_{m1522}} \right) - 1}$$

Table 1576: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892316991383 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.32449243787936 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1333		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1530		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1334		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1522		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.394 Reaction r_2521

This is a reversible reaction of one reactant forming two products influenced by three modifiers.

Name pyrimidine phosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1577: Properties of each reactant.

Id	Name	SBO
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	

Modifiers

Table 1578: Properties of each modifier.

Id	Name	SBO
s_0346	5-Amino-6-(5'-phosphoribitylamino)uracil	
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	

Id	Name	SBO
s_1430	Phosphate	

Products

Table 1579: Properties of each product.

Id	Name	SBO
s_0311	4-(1-D-Ribitylamino)-5-aminouracil	
s_1430	Phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{394} = \frac{\text{vol(cell)} \cdot V_{\max} \cdot \left([s_{0346}] - \frac{[s_{0311}] \cdot [s_{1430}]}{K_{eq}} \right)}{K_{m0346}} \quad (789)$$

$$1 + \frac{[s_{0346}]}{K_{m0346}} + \left(1 + \frac{[s_{0311}]}{K_{m0311}} \right) \cdot \left(1 + \frac{[s_{1430}]}{K_{m1430}} \right) - 1$$

Table 1580: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.17784634458656 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$6.17784634458656 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0346}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m0311}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _{m1430}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.395 Reaction r_2533

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran to leave system

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1581: Properties of each reactant.

Id	Name	SBO
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Modifier

Table 1582: Properties of each modifier.

Id	Name	SBO
s_0003	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Product

Table 1583: Properties of each product.

Id	Name	SBO
s_1807	(2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran	

Kinetic Law

Derived unit contains undeclared units

$$v_{395} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot [s_0003]}{K_m0003}}{1 + \frac{[s_0003]}{K_m0003}} \quad (791)$$

Table 1584: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			6.20554969142397 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	1.24110993828479 · 10 ⁻⁴	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _m 0003		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.396 Reaction r_2534

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow 5'-deoxyribose to leave system

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1585: Properties of each reactant.

Id	Name	SBO
s_0334	5'-deoxyribose	

Modifier

Table 1586: Properties of each modifier.

Id	Name	SBO
s_0334	5'-deoxyribose	

Product

Table 1587: Properties of each product.

Id	Name	SBO
s_1835	5'-deoxyribose	

Kinetic Law

Derived unit contains undeclared units

$$v_{396} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot [s_0334]}{K_{m0334}}}{1 + \frac{[s_0334]}{K_{m0334}}} \quad (793)$$

Table 1588: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			3.11662651885034 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	6.23325303770068 · 10 ⁻⁵	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{m0334}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.397 Reaction r_2537

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow p-Cresol to leave system

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1589: Properties of each reactant.

Id	Name	SBO
s_{-1407}	p-Cresol	

Modifier

Table 1590: Properties of each modifier.

Id	Name	SBO
s_{-1407}	p-Cresol	

Product

Table 1591: Properties of each product.

Id	Name	SBO
s_{-2072}	p-Cresol	

Kinetic Law

Derived unit contains undeclared units

$$v_{397} = \frac{\frac{\text{vol(cell)} \cdot \text{Vmax} \cdot [s_{-1407}]}{\text{Km1407}}}{1 + \frac{[s_{-1407}]}{\text{Km1407}}} \quad (795)$$

Table 1592: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.08892317229363 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$6.17784634458726 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Km1407		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.398 Reaction r_2538

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name Sink needed to allow S-Adenosyl-4-methylthio-2-oxobutanoate to leave system

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1593: Properties of each reactant.

Id	Name	SBO
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	

Modifier

Table 1594: Properties of each modifier.

Id	Name	SBO
s_1550	S-Adenosyl-4-methylthio-2-oxobutanoate	

Product

Table 1595: Properties of each product.

Id	Name	SBO
s_2093	S-Adenosyl-4-methylthio-2-oxobutanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{398} = \frac{\frac{\text{vol(cell)} \cdot V_{\max} \cdot [s_1550]}{K_m 1550}}{1 + \frac{[s_1550]}{K_m 1550}} \quad (797)$$

Table 1596: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.77033467995043 \cdot 10^{-7}$	dimensionless	<input checked="" type="checkbox"/>
V _{max}		0000324	$5.54066935990086 \cdot 10^{-7}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _m 1550		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.399 Reaction r_2584

This is an irreversible reaction of 65 reactants forming three products influenced by 65 modifiers.

Name growth

SBO:0000176 biochemical reaction

Reaction equation

$$2.23 \cdot 10^{-4} s_0133 + 2.6 \cdot 10^{-5} s_0378 + 2.23 \cdot 10^{-4} s_0226 + 2.6 \cdot 10^{-4} s_0380 + 0.5137 s_1041 + 2.23 \cdot 10^{-4} s_1552 + \dots \quad (798)$$

Reactants

Table 1597: Properties of each reactant.

Id	Name
s_0133	10-Formyltetrahydrofolate
s_0378	[2Fe-2S] iron-sulfur cluster
s_0226	2-Octaprenyl-6-hydroxyphenol
s_0380	[4Fe-4S] iron-sulfur cluster
s_1041	L-Alanine
s_1552	S-Adenosyl-L-methionine
s_1061	L-Arginine
s_1068	L-Asparagine
s_1072	L-Aspartate
s_0467	ATP

Id	Name
s_0480	bis-molybdopterin guanine dinucleotide
s_0476	Biotin
s_0497	Calcium
s_0520	Chloride
s_0555	Coenzyme A
s_0546	Co2+
s_0575	CTP
s_0579	Cu2+
s_1083	L-Cysteine
s_0726	dATP
s_0731	dCTP
s_0760	dGTP
s_0805	dTTP
s_0859	Flavin adenine dinucleotide oxidized
s_0838	Fe2+
s_0841	Fe3+
s_1101	L-Glutamine
s_1095	L-Glutamate
s_0929	Glycine
s_0945	GTP
s_1106	L-Histidine
s_1119	L-Isoleucine
s_1494	potassium
s_1127	L-Leucine
s_1131	L-Lysine
s_1141	L-Methionine
s_1212	magnesium
s_0336	5,10-Methylenetetrahydrofolate
s_1255	Mn2+
s_1261	Molybdate
s_1333	Nicotinamide adenine dinucleotide
s_1335	Nicotinamide adenine dinucleotide phosphate
s_0451	Ammonium
s_1329	nickel
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)
s_1151	L-Phenylalanine
s_1508	Protoheme
s_1155	L-Proline
s_1522	Pyridoxal 5'-phosphate
s_1546	Riboflavin
s_1170	L-Serine

Id	Name
s_1577	Siroheme
s_1609	Sulfate
s_0337	5,6,7,8-Tetrahydrofolate
s_1644	Thiamine diphosphate
s_1179	L-Threonine
s_1185	L-Tryptophan
s_1189	L-Tyrosine
s_1765	Undecaprenyl diphosphate
s_1792	UTP
s_1193	L-Valine
s_1804	Zinc
s_1033	KDO(2)-lipid IV(A)
s_1719	two disaccharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of chain)

Modifiers

Table 1598: Properties of each modifier.

Id	Name
s_0133	10-Formyltetrahydrofolate
s_0378	[2Fe-2S] iron-sulfur cluster
s_0226	2-Octaprenyl-6-hydroxyphenol
s_0380	[4Fe-4S] iron-sulfur cluster
s_1041	L-Alanine
s_1552	S-Adenosyl-L-methionine
s_1061	L-Arginine
s_1068	L-Asparagine
s_1072	L-Aspartate
s_0467	ATP
s_0480	bis-molybdopterin guanine dinucleotide
s_0476	Biotin
s_0497	Calcium
s_0520	Chloride
s_0555	Coenzyme A
s_0546	Co2+
s_0575	CTP
s_0579	Cu2+
s_1083	L-Cysteine
s_0726	dATP
s_0731	dCTP
s_0760	dGTP

Id	Name
s_0805	dTTP
s_0859	Flavin adenine dinucleotide oxidized
s_0838	Fe2+
s_0841	Fe3+
s_1101	L-Glutamine
s_1095	L-Glutamate
s_0929	Glycine
s_0945	GTP
s_1106	L-Histidine
s_1119	L-Isoleucine
s_1494	potassium
s_1127	L-Leucine
s_1131	L-Lysine
s_1141	L-Methionine
s_1212	magnesium
s_0336	5,10-Methylenetetrahydrofolate
s_1255	Mn2+
s_1261	Molybdate
s_1333	Nicotinamide adenine dinucleotide
s_1335	Nicotinamide adenine dinucleotide phosphate
s_0451	Ammonium
s_1329	nickel
s_1437	phosphatidylethanolamine (dihexadecanoyl, n-C16:0)
s_1435	phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)
s_1151	L-Phenylalanine
s_1508	Protoheme
s_1155	L-Proline
s_1522	Pyridoxal 5'-phosphate
s_1546	Riboflavin
s_1170	L-Serine
s_1577	Siroheme
s_1609	Sulfate
s_0337	5,6,7,8-Tetrahydrofolate
s_1644	Thiamine diphosphate
s_1179	L-Threonine
s_1185	L-Tryptophan
s_1189	L-Tyrosine
s_1765	Undecaprenyl diphosphate
s_1792	UTP
s_1193	L-Valine
s_1804	Zinc
s_1033	KDO(2)-lipid IV(A)

Id	Name
s_1719	two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-ala) (middle of chain)

Products

Table 1599: Properties of each product.

Id	Name	SBO
s_0421	ADP	
s_1430	Phosphate	
s_0783	Diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
v_{399} = \text{vol}(\text{cell}) & \quad (799) \\
& \cdot \max \left(V0 \cdot \left(1 + \text{ep}0133 \cdot \left(\frac{[s_0133]}{\text{ic}0133} \right) + \text{ep}0378 \cdot \left(\frac{[s_0378]}{\text{ic}0378} \right) + \text{ep}0226 \cdot \left(\frac{[s_0226]}{\text{ic}0226} \right) \right. \right. \\
& + \text{ep}0380 \cdot \left(\frac{[s_0380]}{\text{ic}0380} \right) + \text{ep}1041 \cdot \left(\frac{[s_1041]}{\text{ic}1041} \right) + \text{ep}1552 \cdot \left(\frac{[s_1552]}{\text{ic}1552} \right) + \text{ep}1061 \\
& \cdot \left(\frac{[s_1061]}{\text{ic}1061} \right) + \text{ep}1068 \cdot \left(\frac{[s_1068]}{\text{ic}1068} \right) + \text{ep}1072 \cdot \left(\frac{[s_1072]}{\text{ic}1072} \right) + \text{ep}0467 \cdot \left(\frac{[s_0467]}{\text{ic}0467} \right) \\
& + \text{ep}0480 \cdot \left(\frac{[s_0480]}{\text{ic}0480} \right) + \text{ep}0476 \cdot \left(\frac{[s_0476]}{\text{ic}0476} \right) + \text{ep}0497 \cdot \left(\frac{[s_0497]}{\text{ic}0497} \right) + \text{ep}0520 \\
& \cdot \left(\frac{[s_0520]}{\text{ic}0520} \right) + \text{ep}0555 \cdot \left(\frac{[s_0555]}{\text{ic}0555} \right) + \text{ep}0546 \cdot \left(\frac{[s_0546]}{\text{ic}0546} \right) + \text{ep}0575 \cdot \left(\frac{[s_0575]}{\text{ic}0575} \right) \\
& + \text{ep}0579 \cdot \left(\frac{[s_0579]}{\text{ic}0579} \right) + \text{ep}1083 \cdot \left(\frac{[s_1083]}{\text{ic}1083} \right) + \text{ep}0726 \cdot \left(\frac{[s_0726]}{\text{ic}0726} \right) + \text{ep}0731 \\
& \cdot \left(\frac{[s_0731]}{\text{ic}0731} \right) + \text{ep}0760 \cdot \left(\frac{[s_0760]}{\text{ic}0760} \right) + \text{ep}0805 \cdot \left(\frac{[s_0805]}{\text{ic}0805} \right) + \text{ep}0859 \cdot \left(\frac{[s_0859]}{\text{ic}0859} \right) \\
& + \text{ep}0838 \cdot \left(\frac{[s_0838]}{\text{ic}0838} \right) + \text{ep}0841 \cdot \left(\frac{[s_0841]}{\text{ic}0841} \right) + \text{ep}1101 \cdot \left(\frac{[s_1101]}{\text{ic}1101} \right) + \text{ep}1095 \\
& \cdot \left(\frac{[s_1095]}{\text{ic}1095} \right) + \text{ep}0929 \cdot \left(\frac{[s_0929]}{\text{ic}0929} \right) + \text{ep}0945 \cdot \left(\frac{[s_0945]}{\text{ic}0945} \right) + \text{ep}1106 \cdot \left(\frac{[s_1106]}{\text{ic}1106} \right) \\
& + \text{ep}1119 \cdot \left(\frac{[s_1119]}{\text{ic}1119} \right) + \text{ep}1494 \cdot \left(\frac{[s_1494]}{\text{ic}1494} \right) + \text{ep}1127 \cdot \left(\frac{[s_1127]}{\text{ic}1127} \right) + \text{ep}1131 \\
& \cdot \left(\frac{[s_1131]}{\text{ic}1131} \right) + \text{ep}1141 \cdot \left(\frac{[s_1141]}{\text{ic}1141} \right) + \text{ep}1212 \cdot \left(\frac{[s_1212]}{\text{ic}1212} \right) + \text{ep}0336 \cdot \left(\frac{[s_0336]}{\text{ic}0336} \right) \\
& + \text{ep}1255 \cdot \left(\frac{[s_1255]}{\text{ic}1255} \right) + \text{ep}1261 \cdot \left(\frac{[s_1261]}{\text{ic}1261} \right) + \text{ep}1333 \cdot \left(\frac{[s_1333]}{\text{ic}1333} \right) + \text{ep}1335 \cdot \left(\frac{[s_1335]}{\text{ic}1335} \right) \\
& + \text{ep}0451 \cdot \left(\frac{[s_0451]}{\text{ic}0451} \right) + \text{ep}1329 \cdot \left(\frac{[s_1329]}{\text{ic}1329} \right) + \text{ep}1437 \cdot \left(\frac{[s_1437]}{\text{ic}1437} \right) + \text{ep}1435 \cdot \left(\frac{[s_1435]}{\text{ic}1435} \right) \\
& + \text{ep}1151 \cdot \left(\frac{[s_1151]}{\text{ic}1151} \right) + \text{ep}1508 \cdot \left(\frac{[s_1508]}{\text{ic}1508} \right) + \text{ep}1155 \cdot \left(\frac{[s_1155]}{\text{ic}1155} \right) + \text{ep}1522 \cdot \left(\frac{[s_1522]}{\text{ic}1522} \right) \\
& + \text{ep}1546 \cdot \left(\frac{[s_1546]}{\text{ic}1546} \right) + \text{ep}1170 \cdot \left(\frac{[s_1170]}{\text{ic}1170} \right) + \text{ep}1577 \cdot \left(\frac{[s_1577]}{\text{ic}1577} \right) + \text{ep}1609 \cdot \left(\frac{[s_1609]}{\text{ic}1609} \right) \\
& + \text{ep}0337 \cdot \left(\frac{[s_0337]}{\text{ic}0337} \right) + \text{ep}1644 \cdot \left(\frac{[s_1644]}{\text{ic}1644} \right) + \text{ep}1179 \cdot \left(\frac{[s_1179]}{\text{ic}1179} \right) + \text{ep}1185 \cdot \left(\frac{[s_1185]}{\text{ic}1185} \right) \\
& + \text{ep}1189 \cdot \left(\frac{[s_1189]}{\text{ic}1189} \right) + \text{ep}1765 \cdot \left(\frac{[s_1765]}{\text{ic}1765} \right) + \text{ep}1792 \cdot \left(\frac{[s_1792]}{\text{ic}1792} \right) + \text{ep}1193 \cdot \left(\frac{[s_1193]}{\text{ic}1193} \right) \\
& \left. + \text{ep}1804 \cdot \left(\frac{[s_1804]}{\text{ic}1804} \right) + \text{ep}1033 \cdot \left(\frac{[s_1033]}{\text{ic}1033} \right) + \text{ep}1719 \cdot \left(\frac{[s_1719]}{\text{ic}1719} \right) \right), \text{zero_flux} \Big)
\end{aligned}$$

$$\max(x, y) = \frac{x + y + |x - y|}{2} \quad (800)$$

$$\max(x, y) = \frac{x + y + |x - y|}{2} \quad (801)$$

Table 1600: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.139	dimensionless	<input checked="" type="checkbox"/>
zero_flux			0.000	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
V0			0.139	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
ic0133			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0133			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0378			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0378			$2.6 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
ic0226			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0226			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0380			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0380			$2.6 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1041			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1041			0.514	dimensionless	<input checked="" type="checkbox"/>
ic1552			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1552			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1061			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1061			0.296	dimensionless	<input checked="" type="checkbox"/>
ic1068			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1068			0.241	dimensionless	<input checked="" type="checkbox"/>
ic1072			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1072			0.241	dimensionless	<input checked="" type="checkbox"/>
ic0467			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0467			54.120	dimensionless	<input checked="" type="checkbox"/>
ic0480			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0480			$1.22 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0476			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0476			$2 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
ic0497			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0497			0.005	dimensionless	<input checked="" type="checkbox"/>
ic0520			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0520			0.005	dimensionless	<input checked="" type="checkbox"/>
ic0555			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0555			$5.76 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0546			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0546			$2.5 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
ic0575			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0575			0.134	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
ic0579			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0579			$7.09 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1083			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1083			0.092	dimensionless	<input checked="" type="checkbox"/>
ic0726			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0726			0.026	dimensionless	<input checked="" type="checkbox"/>
ic0731			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0731			0.027	dimensionless	<input checked="" type="checkbox"/>
ic0760			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0760			0.027	dimensionless	<input checked="" type="checkbox"/>
ic0805			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0805			0.026	dimensionless	<input checked="" type="checkbox"/>
ic0859			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0859			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0838			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0838			0.007	dimensionless	<input checked="" type="checkbox"/>
ic0841			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0841			0.008	dimensionless	<input checked="" type="checkbox"/>
ic1101			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1101			0.263	dimensionless	<input checked="" type="checkbox"/>
ic1095			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1095			0.263	dimensionless	<input checked="" type="checkbox"/>
ic0929			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0929			0.613	dimensionless	<input checked="" type="checkbox"/>
ic0945			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0945			0.215	dimensionless	<input checked="" type="checkbox"/>
ic1106			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1106			0.095	dimensionless	<input checked="" type="checkbox"/>
ic1119			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1119			0.291	dimensionless	<input checked="" type="checkbox"/>
ic1494			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1494			0.195	dimensionless	<input checked="" type="checkbox"/>
ic1127			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1127			0.451	dimensionless	<input checked="" type="checkbox"/>
ic1131			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1131			0.343	dimensionless	<input checked="" type="checkbox"/>
ic1141			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1141			0.154	dimensionless	<input checked="" type="checkbox"/>
ic1212			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1212			0.009	dimensionless	<input checked="" type="checkbox"/>
ic0336			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0336			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
ic1255			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1255			$6.91 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1261			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1261			$7 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
ic1333			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1333			0.002	dimensionless	<input checked="" type="checkbox"/>
ic1335			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1335			$4.47 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0451			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0451			0.013	dimensionless	<input checked="" type="checkbox"/>
ic1329			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1329			$3.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1437			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1437			0.064	dimensionless	<input checked="" type="checkbox"/>
ic1435			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1435			0.075	dimensionless	<input checked="" type="checkbox"/>
ic1151			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1151			0.185	dimensionless	<input checked="" type="checkbox"/>
ic1508			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1508			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1155			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1155			0.221	dimensionless	<input checked="" type="checkbox"/>
ic1522			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1522			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1546			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1546			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1170			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1170			0.216	dimensionless	<input checked="" type="checkbox"/>
ic1577			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1577			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1609			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1609			0.004	dimensionless	<input checked="" type="checkbox"/>
ic0337			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0337			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1644			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1644			$2.23 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1179			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1179			0.254	dimensionless	<input checked="" type="checkbox"/>
ic1185			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1185			0.057	dimensionless	<input checked="" type="checkbox"/>
ic1189			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1189			0.138	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
ic1765			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1765			$5.5 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
ic1792			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1792			0.144	dimensionless	<input checked="" type="checkbox"/>
ic1193			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1193			0.423	dimensionless	<input checked="" type="checkbox"/>
ic1804			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1804			$3.41 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1033			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1033			0.019	dimensionless	<input checked="" type="checkbox"/>
ic1719			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1719			0.014	dimensionless	<input checked="" type="checkbox"/>

7 Derived Rate Equations

When interpreted as an ordinary differential equation framework, this model implies the following set of equations for the rates of change of each species.

7.1 Species s_0003

Name (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran

SBO:0000247 simple chemical

Notes iJO1366:M_mththf_c

Initial concentration 0.1 $\text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in r_2533 and as a product in r_0001 and as a modifier in r_0001, r_2533).

$$\frac{d}{dt}s_{0003} = v_1 - v_{395} \quad (802)$$

7.2 Species s_0004

Name (2R,4S)-2-methyl-2,4-dihydroxydihydrofuran-3-one

SBO:0000247 simple chemical

Notes iJO1366:M_mdhdhf_c

Initial concentration 0.1 $\text{mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0001](#) and as a product in [r_0176](#) and as a modifier in [r_0001](#), [r_0176](#)).

$$\frac{d}{dt}s_{-0004} = v_{55} - v_1 \quad (803)$$

7.3 Species [s_0017](#)

Name (R)-2,3-Dihydroxy-3-methylbutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_23dhmb_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0517](#) and as a product in [r_0811](#) and as a modifier in [r_0517](#), [r_0811](#)).

$$\frac{d}{dt}s_{-0017} = v_{219} - v_{146} \quad (804)$$

7.4 Species [s_0018](#)

Name (R)-2,3-Dihydroxy-3-methylpentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_23dhmp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0518](#) and as a product in [r_0812](#) and as a modifier in [r_0518](#), [r_0812](#)).

$$\frac{d}{dt}s_{-0018} = v_{220} - v_{147} \quad (805)$$

7.5 Species [s_0028](#)

Name (R)-3-Hydroxytetradecanoyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_3hmrsACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_1378](#), [r_1391](#) and as a product in [r_0154](#) and as a modifier in [r_0154](#), [r_1378](#), [r_1391](#)).

$$\frac{d}{dt}s_{-0028} = v_{52} - v_{345} - v_{349} \quad (806)$$

7.6 Species s_0029

Name (R)-Glycerate

SBO:0000247 simple chemical

Notes iJO1366:M_glyc_DASH_R_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0697](#) and as a product in [r_1335](#) and as a modifier in [r_0697](#), [r_1335](#)).

$$\frac{d}{dt}s_{0029} = v_{327} - v_{180} \quad (807)$$

7.7 Species s_0032

Name (R)-Pantoate

SBO:0000247 simple chemical

Notes iJO1366:M_pant_DASH_R_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1076](#) and as a product in [r_0063](#) and as a modifier in [r_0063](#), [r_1076](#)).

$$\frac{d}{dt}s_{0032} = v_{13} - v_{262} \quad (808)$$

7.8 Species s_0033

Name (R)-Pantothenate

SBO:0000247 simple chemical

Notes iJO1366:M_pnto_DASH_R_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1075](#) and as a product in [r_1076](#) and as a modifier in [r_1075](#), [r_1076](#)).

$$\frac{d}{dt}s_{0033} = v_{262} - v_{261} \quad (809)$$

7.9 Species s_0040

Name (S)-2-[5-Amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxamido]succinate

SBO:0000247 simple chemical

Notes iJO1366:M_25aics_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0302](#) and as a product in [r_1210](#) and as a modifier in [r_0302](#), [r_1210](#)).

$$\frac{d}{dt}s_{0040} = v_{286} - v_{96} \quad (810)$$

7.10 Species s_0041

Name (S)-2-Aceto-2-hydroxybutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2ahbut_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0812](#) and as a product in [r_0038](#) and as a modifier in [r_0038](#), [r_0812](#)).

$$\frac{d}{dt}s_{0041} = v_9 - v_{220} \quad (811)$$

7.11 Species s_0042

Name (S)-2-Acetolactate

SBO:0000247 simple chemical

Notes iJO1366:M_alac_DASH_S_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0811](#) and as a product in [r_0227](#) and as a modifier in [r_0227](#), [r_0811](#)).

$$\frac{d}{dt}s_{0042} = v_{69} - v_{219} \quad (812)$$

7.12 Species s_0043

Name (S)-3-Hydroxybutanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hbcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0120](#) and as a product in [r_0135](#) and as a modifier in [r_0120](#), [r_0135](#)).

$$\frac{d}{dt}s_{0043} = v_{42} - v_{29} \quad (813)$$

7.13 Species s_0044

Name (S)-3-Hydroxydecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hdcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0121](#) and as a product in [r_0128](#) and as a modifier in [r_0121](#), [r_0128](#)).

$$\frac{d}{dt}s_{0044} = v_{36} - v_{30} \quad (814)$$

7.14 Species s_0045

Name (S)-3-Hydroxydodecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hddcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0122](#) and as a product in [r_0129](#) and as a modifier in [r_0122](#), [r_0129](#)).

$$\frac{d}{dt}s_{0045} = v_{37} - v_{31} \quad (815)$$

7.15 Species s_0046

Name (S)-3-Hydroxyhexadecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hhdcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0123](#) and as a product in [r_0130](#) and as a modifier in [r_0123](#), [r_0130](#)).

$$\frac{d}{dt}s_{0046} = v_{38} - v_{32} \quad (816)$$

7.16 Species s_0047

Name (S)-3-Hydroxyhexanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hhcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0124](#) and as a product in [r_0131](#) and as a modifier in [r_0124](#), [r_0131](#)).

$$\frac{d}{dt}s_{0047} = v_{39} - v_{33} \quad (817)$$

7.17 Species s_0049

Name (S)-3-Hydroxyoctanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3hocoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0126](#) and as a product in [r_0133](#) and as a modifier in [r_0126](#), [r_0133](#)).

$$\frac{d}{dt}s_{0049} = v_{40} - v_{34} \quad (818)$$

7.18 Species s_0050

Name (S)-3-Hydroxytetradecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3htdcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0127](#) and as a product in [r_0134](#) and as a modifier in [r_0127](#), [r_0134](#)).

$$\frac{d}{dt}s_{0050} = v_{41} - v_{35} \quad (819)$$

7.19 Species s_0051

Name (S)-3-Methyl-2-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3mop_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0808](#) and as a product in [r_0518](#) and as a modifier in [r_0518](#), [r_0808](#)).

$$\frac{d}{dt}s_{0051} = v_{147} - v_{218} \quad (820)$$

7.20 Species s_0052

Name (S)-Dihydroorotate

SBO:0000247 simple chemical

Notes iJO1366:M_dhor_DASH_S_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0501](#), [r_0512](#) and as a product in [r_0511](#) and as a modifier in [r_0501](#), [r_0511](#), [r_0512](#)).

$$\frac{d}{dt}s_{0052} = v_{143} - v_{136} - v_{144} \quad (821)$$

7.21 Species s_0073

Name 1,2-dihexadec-9-enoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pa161_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0419](#) and as a product in [r_0012](#) and as a modifier in [r_0012](#), [r_0419](#)).

$$\frac{d}{dt}s_{0073} = v_5 - v_{119} \quad (822)$$

7.22 Species s_0075

Name 1,2-dihexadecanoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pa160_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0418](#) and as a product in [r_0013](#) and as a modifier in [r_0013](#), [r_0418](#)).

$$\frac{d}{dt}s_{0075} = v_6 - v_{118} \quad (823)$$

7.23 Species s_0096

Name 1-(2-Carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2cpr5p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0788](#) and as a product in [r_1211](#) and as a modifier in [r_0788](#), [r_1211](#)).

$$\frac{d}{dt}s_{0096} = v_{287} - v_{209} \quad (824)$$

7.24 Species s_0097

Name 1-(5-Phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_prfp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0008](#) and as a product in [r_1204](#) and as a modifier in [r_0008](#), [r_1204](#)).

$$\frac{d}{dt}s_{0097} = v_{280} - v_2 \quad (825)$$

7.25 Species s_0098

Name 1-(5-Phosphoribosyl)-AMP

SBO:0000247 simple chemical

Notes iJO1366:M_prbamp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1204](#) and as a product in [r_1205](#) and as a modifier in [r_1204](#), [r_1205](#)).

$$\frac{d}{dt}s_{0098} = v_{281} - v_{280} \quad (826)$$

7.26 Species s_0099

Name 1-(5-Phosphoribosyl)-ATP

SBO:0000247 simple chemical

Notes iJO1366:M_prbatp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1205](#) and as a product in [r_0374](#) and as a modifier in [r_0374](#), [r_1205](#)).

$$\frac{d}{dt}s_{0099} = v_{112} - v_{281} \quad (827)$$

7.27 Species s_0116

Name 1-deoxy-D-xylulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dxyl5p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_0011](#), [r_1245](#), [r_1346](#) and as a product in [r_0009](#) and as a modifier in [r_0009](#), [r_0011](#), [r_1245](#), [r_1346](#)).

$$\frac{d}{dt}s_{0116} = v_3 - v_4 - v_{300} - v_{332} \quad (828)$$

7.28 Species s_0119

Name 1-hexadec-9-enoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_1hdec9eg3p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0012](#) and as a product in [r_0707](#) and as a modifier in [r_0012](#), [r_0707](#)).

$$\frac{d}{dt}s_{0119} = v_{182} - v_5 \quad (829)$$

7.29 Species s_0121

Name 1-hexadecanoyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_1hdecg3p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0013](#) and as a product in [r_0706](#) and as a modifier in [r_0013](#), [r_0706](#)).

$$\frac{d}{dt}s_{0121} = v_{181} - v_6 \quad (830)$$

7.30 Species s_0123

Name 1-hydroxy-2-methyl-2-(E)-butenyl 4-diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_h2mb4p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0014](#), [r_0015](#) and as a product in [r_0084](#) and as a modifier in [r_0014](#), [r_0015](#), [r_0084](#)).

$$\frac{d}{dt}s_{0123} = v_{17} - v_7 - v_8 \quad (831)$$

7.31 Species s_0128

Name 1-Pyrroline-5-carboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_1pyr5c_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1250](#) and as a product in [r_0835](#) and as a modifier in [r_0835](#), [r_1250](#)).

$$\frac{d}{dt}s_{0128} = v_{223} - v_{301} \quad (832)$$

7.32 Species s_0133

Name 10-Formyltetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_10fthf_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_1209](#), [r_2584](#) and as a product in [r_0622](#), [r_0950](#) and as a modifier in [r_0622](#), [r_0950](#), [r_1209](#), [r_2584](#)).

$$\frac{d}{dt}s_{0133} = v_{162} + v_{232} - v_{285} - 2.23 \cdot 10^{-4}v_{399} \quad (833)$$

7.33 Species s_0147

Name 2,3,2'3'-Tetrakis(beta-hydroxymyristoyl)-D-glucosaminyl-1,6-beta-D-glucosamine 1,4'-bisphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_lipidA_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0102](#) and as a product in [r_1337](#) and as a modifier in [r_0102](#), [r_1337](#)).

$$\frac{d}{dt}s_{0147} = v_{328} - v_{25} \quad (834)$$

7.34 Species s_0148

Name 2,3,4,5-Tetrahydrodipicolinate

SBO:0000247 simple chemical

Notes iJO1366:M_thdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1338](#) and as a product in [r_0502](#) and as a modifier in [r_0502](#), [r_1338](#)).

$$\frac{d}{dt}s_{0148} = v_{137} - v_{329} \quad (835)$$

7.35 Species s_0149

Name 2,3-Bis(3-hydroxytetradecanoyl)-beta-D-glucosaminyl 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_lipidX_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0857](#) and as a product in [r_1402](#) and as a modifier in [r_0857](#), [r_1402](#)).

$$\frac{d}{dt}s_{0149} = v_{356} - v_{227} \quad (836)$$

7.36 Species s_0155

Name 2,3-Dihydripicolinate

SBO:0000247 simple chemical

Notes iJO1366:M_23dhdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0502](#) and as a product in [r_0503](#) and as a modifier in [r_0502](#), [r_0503](#)).

$$\frac{d}{dt}s_{0155} = v_{138} - v_{137} \quad (837)$$

7.37 Species s_0160

Name 2,5-Diamino-6-(ribosylamino)-4-(3H)-pyrimidinone 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_25drapp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0498](#) and as a product in [r_0745](#) and as a modifier in [r_0498](#), [r_0745](#)).

$$\frac{d}{dt}s_{0160} = v_{192} - v_{133} \quad (838)$$

7.38 Species s_0162

Name 2-(Formamido)-N1-(5-phospho-D-ribosyl)acetamidine

SBO:0000247 simple chemical

Notes iJO1366:M_fpram_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1208](#) and as a product in [r_1212](#) and as a modifier in [r_1208](#), [r_1212](#)).

$$\frac{d}{dt}s_{0162} = v_{288} - v_{284} \quad (839)$$

7.39 Species s_0191

Name 2-Amino-4-hydroxy-6-(erythro-1,2,3-trihydroxypropyl)dihydropteridine triphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ahdt_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0510](#) and as a product in [r_0744](#) and as a modifier in [r_0510](#), [r_0744](#)).

$$\frac{d}{dt}s_{0191} = v_{191} - v_{142} \quad (840)$$

7.40 Species s_0193

Name 2-C-methyl-D-erythritol 2,4-cyclodiphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2mecdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0084](#) and as a product in [r_0053](#) and as a modifier in [r_0053](#), [r_0084](#)).

$$\frac{d}{dt}s_{0193} = v_{10} - v_{17} \quad (841)$$

7.41 Species s_0194

Name 2-C-methyl-D-erythritol 4-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2me4p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0054](#) and as a product in [r_0011](#) and as a modifier in [r_0011](#), [r_0054](#)).

$$\frac{d}{dt}s_{0194} = v_4 - v_{11} \quad (842)$$

7.42 Species s_0195

Name 2-Dehydro-3-deoxy-D-arabino-heptonate 7-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2dda7p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0099](#) and as a product in [r_0101](#) and as a modifier in [r_0099](#), [r_0101](#)).

$$\frac{d}{dt}s_{0195} = v_{24} - v_{22} \quad (843)$$

7.43 Species s_0201

Name 2-Dehydro-3-deoxy-D-gluconate 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2ddg6p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0056](#) and as a product in [r_0217](#) and as a modifier in [r_0056](#), [r_0217](#)).

$$\frac{d}{dt}s_{0201} = v_{64} - v_{12} \quad (844)$$

7.44 Species s_0203

Name 2-Dehydropantoate

SBO:0000247 simple chemical

Notes iJO1366:M_2dhp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0063](#) and as a product in [r_0143](#) and as a modifier in [r_0063](#), [r_0143](#)).

$$\frac{d}{dt}s_{0203} = v_{45} - v_{13} \quad (845)$$

7.45 Species s_0214

Name 2-Hydroxy-3-oxopropanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2h3oppan_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1335](#) and as a product in [r_0739](#) and as a modifier in [r_0739](#), [r_1335](#)).

$$\frac{d}{dt}s_{0214} = v_{189} - v_{327} \quad (846)$$

7.46 Species s_0217

Name 2-Isopropylmaleate

SBO:0000247 simple chemical

Notes iJO1366:M_2ippm_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0138](#) and as a product in [r_0066](#) and as a modifier in [r_0066](#), [r_0138](#)).

$$\frac{d}{dt}s_{0217} = v_{14} - v_{43} \quad (847)$$

7.47 Species s_0218

Name 2-Methyl-4-amino-5-hydroxymethylpyrimidine diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2mahmp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1344](#) and as a product in [r_1198](#) and as a modifier in [r_1198](#), [r_1344](#)).

$$\frac{d}{dt}s_{0218} = v_{276} - v_{330} \quad (848)$$

7.48 Species s_0226

Name 2-Octaprenyl-6-hydroxyphenol

SBO:0000247 simple chemical

Notes iJO1366:M_2ohph_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_2195](#) and as a modifier in [r_2195](#), [r_2584](#)).

$$\frac{d}{dt}s_{0226} = v_{391} - 2.23 \cdot 10^{-4}v_{399} \quad (849)$$

7.49 Species s_0229

Name 2-Octaprenylphenol

SBO:0000247 simple chemical

Notes iJO1366:M_2oph_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2195](#) and as a product in [r_1064](#) and as a modifier in [r_1064](#), [r_2195](#)).

$$\frac{d}{dt}s_{0229} = v_{256} - v_{391} \quad (850)$$

7.50 Species s_0231

Name 2-Oxo-3-hydroxy-4-phosphobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_ohpb_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1054](#) and as a product in [r_0573](#) and as a modifier in [r_0573](#), [r_1054](#)).

$$\frac{d}{dt}s_{0231} = v_{154} - v_{253} \quad (851)$$

7.51 Species s_0232

Name 2-Oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2obut_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0038](#) and as a product in [r_0847](#) and as a modifier in [r_0038](#), [r_0847](#)).

$$\frac{d}{dt}s_{0232} = v_{224} - v_9 \quad (852)$$

7.52 Species s_0233

Name 2-Oxoglutarate

SBO:0000247 simple chemical

Notes iJO1366:M_akg_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 28 reactions (as a reactant in [r_0675](#) and as a product in [r_0245](#), [r_0370](#), [r_0765](#), [r_0806](#), [r_0808](#), [r_0815](#), [r_0854](#), [r_1054](#), [r_1081](#), [r_1217](#), [r_1318](#), [r_1376](#), [r_1425](#) and as a modifier in [r_0245](#), [r_0370](#), [r_0675](#), [r_0765](#), [r_0806](#), [r_0808](#), [r_0815](#), [r_0854](#), [r_1054](#), [r_1081](#), [r_1217](#), [r_1318](#), [r_1376](#), [r_1425](#)).

$$\begin{aligned} \frac{d}{dt}s_{0233} = & v_{80} + v_{110} + v_{199} + v_{217} + v_{218} + v_{221} + v_{226} \\ & + v_{253} + v_{263} + v_{291} + v_{324} + v_{344} + v_{363} - v_{170} \end{aligned} \quad (853)$$

7.53 Species s_0237

Name 2-phospho-4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol

SBO:0000247 simple chemical

Notes iJO1366:M_2p4c2me_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0053](#) and as a product in [r_0178](#) and as a modifier in [r_0053](#), [r_0178](#)).

$$\frac{d}{dt}s_{0237} = v_{56} - v_{10} \quad (854)$$

7.54 Species s_0252

Name 3'-Phosphoadenylyl sulfate

SBO:0000247 simple chemical

Notes iJO1366:M_paps_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1139](#) and as a product in [r_0305](#) and as a modifier in [r_0305](#), [r_1139](#)).

$$\frac{d}{dt}s_{0252} = v_{99} - v_{270} \quad (855)$$

7.55 Species s_0255

Name 3,4-dihydroxy-2-butanone 4-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_db4p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1265](#) and as a product in [r_0092](#) and as a modifier in [r_0092](#), [r_1265](#)).

$$\frac{d}{dt}s_{0255} = v_{19} - v_{307} \quad (856)$$

7.56 Species s_0262

Name 3-(4-Hydroxyphenyl)pyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_34hpp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1376](#) and as a product in [r_1225](#) and as a modifier in [r_1225](#), [r_1376](#)).

$$\frac{d}{dt}s_{0262} = v_{297} - v_{344} \quad (857)$$

7.57 Species s_0263

Name 3-(Imidazol-4-yl)-2-oxopropyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_imacp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0765](#) and as a product in [r_0785](#) and as a modifier in [r_0765](#), [r_0785](#)).

$$\frac{d}{dt}s_{0263} = v_{206} - v_{199} \quad (858)$$

7.58 Species s_0265

Name 3-Carboxy-2-hydroxy-4-methylpentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3c2hmp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0139](#) and as a product in [r_0138](#) and as a modifier in [r_0138](#), [r_0139](#)).

$$\frac{d}{dt}s_{0265} = v_{43} - v_{44} \quad (859)$$

7.59 Species s_0266

Name 3-Carboxy-3-hydroxy-4-methylpentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3c3hmp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0066](#) and as a product in [r_0067](#) and as a modifier in [r_0066](#), [r_0067](#)).

$$\frac{d}{dt}s_{0266} = v_{15} - v_{14} \quad (860)$$

7.60 Species s_0267

Name 3-Carboxy-4-methyl-2-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3c4mop_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0078](#) and as a product in [r_0139](#) and as a modifier in [r_0078](#), [r_0139](#)).

$$\frac{d}{dt}s_{0267} = v_{44} - v_{16} \quad (861)$$

7.61 Species s_0269

Name 3-Dehydroquinate

SBO:0000247 simple chemical

Notes iJO1366:M_3dhq_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0098](#) and as a product in [r_0099](#) and as a modifier in [r_0098](#), [r_0099](#)).

$$\frac{d}{dt}s_{0269} = v_{22} - v_{21} \quad (862)$$

7.62 Species s_0270

Name 3-Dehydroshikimate

SBO:0000247 simple chemical

Notes iJO1366:M_3dhsk_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1304](#) and as a product in [r_0098](#) and as a modifier in [r_0098](#), [r_1304](#)).

$$\frac{d}{dt}s_{0270} = v_{21} - v_{318} \quad (863)$$

7.63 Species s_0271

Name 3-Deoxy-D-manno-2-octulosonate

SBO:0000247 simple chemical

Notes iJO1366:M_kdo_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0105](#) and as a product in [r_0106](#) and as a modifier in [r_0105](#), [r_0106](#)).

$$\frac{d}{dt}s_{0271} = v_{28} - v_{27} \quad (864)$$

7.64 Species s_0272

Name 3-Deoxy-D-manno-octulosonate 8-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_kdo8p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0106](#) and as a product in [r_0100](#) and as a modifier in [r_0100](#), [r_0106](#)).

$$\frac{d}{dt}s_{0272} = v_{23} - v_{28} \quad (865)$$

7.65 Species s_0276

Name 3-Hydroxyglutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_hgmeACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0145](#) and as a product in [r_0146](#) and as a modifier in [r_0145](#), [r_0146](#)).

$$\frac{d}{dt}s_{0276} = v_{47} - v_{46} \quad (866)$$

7.66 Species s_0277

Name 3-Hydroxypimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_hpmeACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0148](#) and as a product in [r_0149](#) and as a modifier in [r_0148](#), [r_0149](#)).

$$\frac{d}{dt}s_{0277} = v_{50} - v_{49} \quad (867)$$

7.67 Species s_0282

Name 3-Methyl-2-oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_3mob_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_0067](#), [r_0143](#), [r_1425](#) and as a product in [r_0517](#) and as a modifier in [r_0067](#), [r_0143](#), [r_0517](#), [r_1425](#)).

$$\frac{d}{dt}s_{0282} = v_{146} - v_{15} - v_{45} - v_{363} \quad (868)$$

7.68 Species s_0283

Name 3-Octaprenyl-4-hydroxybenzoate

SBO:0000247 simple chemical

Notes iJO1366:M_3ophb_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1064](#) and as a product in [r_0775](#) and as a modifier in [r_0775](#), [r_1064](#)).

$$\frac{d}{dt}s_{0283} = v_{203} - v_{256} \quad (869)$$

7.69 Species s_0289

Name 3-Oxo-glutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_ogmeACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0146](#) and as a product in [r_0147](#) and as a modifier in [r_0146](#), [r_0147](#)).

$$\frac{d}{dt}s_{0289} = v_{48} - v_{47} \quad (870)$$

7.70 Species s_0290

Name 3-Oxo-pimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_opmeACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0149](#) and as a product in [r_0150](#) and as a modifier in [r_0149](#), [r_0150](#)).

$$\frac{d}{dt}s_{0290} = v_{51} - v_{50} \quad (871)$$

7.71 Species s_0293

Name 3-Oxodecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3odcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0128](#) and as a product in [r_0235](#) and as a modifier in [r_0128](#), [r_0235](#)).

$$\frac{d}{dt}s_{0293} = v_{75} - v_{36} \quad (872)$$

7.72 Species s_0295

Name 3-Oxododecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3oddcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0129](#) and as a product in [r_0232](#) and as a modifier in [r_0129](#), [r_0232](#)).

$$\frac{d}{dt}s_{0295} = v_{72} - v_{37} \quad (873)$$

7.73 Species s_0297

Name 3-Oxohexadecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3ohdcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0130](#) and as a product in [r_0236](#) and as a modifier in [r_0130](#), [r_0236](#)).

$$\frac{d}{dt}s_{0297} = v_{76} - v_{38} \quad (874)$$

7.74 Species s_0299

Name 3-Oxohexanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3ohcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0131](#) and as a product in [r_0231](#) and as a modifier in [r_0131](#), [r_0231](#)).

$$\frac{d}{dt}s_{0299} = v_{71} - v_{39} \quad (875)$$

7.75 Species s_0303

Name 3-Oxoctanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3oocoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0133](#) and as a product in [r_0234](#) and as a modifier in [r_0133](#), [r_0234](#)).

$$\frac{d}{dt}s_{0303} = v_{74} - v_{40} \quad (876)$$

7.76 Species s_0304

Name 3-Oxotetradecanoyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_3omrsACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0154](#) and as a product in [r_0166](#) and as a modifier in [r_0154](#), [r_0166](#)).

$$\frac{d}{dt}s_{0304} = v_{53} - v_{52} \quad (877)$$

7.77 Species s_0305

Name 3-Oxotetradecanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_3otdcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0134](#) and as a product in [r_0233](#) and as a modifier in [r_0134](#), [r_0233](#)).

$$\frac{d}{dt}s_{0305} = v_{73} - v_{41} \quad (878)$$

7.78 Species s_0306

Name 3-Phospho-D-glycerate

SBO:0000247 simple chemical

Notes iJO1366:M_3pg_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1151](#), [r_1153](#) and as a product in [r_1152](#) and as a modifier in [r_1151](#), [r_1152](#), [r_1153](#)).

$$\frac{d}{dt}s_{0306} = v_{274} - v_{273} - v_{275} \quad (879)$$

7.79 Species s_0307

Name 3-Phospho-D-glyceroyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_13dpg_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1152](#) and as a product in [r_0695](#) and as a modifier in [r_0695](#), [r_1152](#)).

$$\frac{d}{dt}s_{0307} = v_{179} - v_{274} \quad (880)$$

7.80 Species s_0308

Name 3-Phosphohydroxypyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_3php_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1217](#) and as a product in [r_1151](#) and as a modifier in [r_1151](#), [r_1217](#)).

$$\frac{d}{dt}s_{0308} = v_{273} - v_{291} \quad (881)$$

7.81 Species s_0310

Name 4,5-dihydroxy-2,3-pentanedione

SBO:0000247 simple chemical

Notes iJO1366:M_dhptd_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0176](#) and as a product in [r_1291](#) and as a modifier in [r_0176](#), [r_1291](#)).

$$\frac{d}{dt}s_{0310} = v_{316} - v_{55} \quad (882)$$

7.82 Species s_0311

Name 4-(1-D-Ribitylamino)-5-aminouracil

SBO:0000247 simple chemical

Notes iJO1366:M_4r5au_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_1265](#) and as a product in [r_1266](#), [r_2521](#) and as a modifier in [r_1265](#), [r_1266](#), [r_2521](#)).

$$\frac{d}{dt}s_{0311} = v_{308} + v_{394} - v_{307} \quad (883)$$

7.83 Species s_0312

Name 4-(cytidine 5'-diphospho)-2-C-methyl-D-erythritol

SBO:0000247 simple chemical

Notes iJO1366:M_4c2me_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0178](#) and as a product in [r_0054](#) and as a modifier in [r_0054](#), [r_0178](#)).

$$\frac{d}{dt}s_{0312} = v_{11} - v_{56} \quad (884)$$

7.84 Species s_0313

Name 4-Amino-2-methyl-5-phosphomethylpyrimidine

SBO:0000247 simple chemical

Notes iJO1366:M_4ampm_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1198](#) and as a product in [r_0179](#) and as a modifier in [r_0179](#), [r_1198](#)).

$$\frac{d}{dt}s_{0313} = v_{57} - v_{276} \quad (885)$$

7.85 Species s_0316

Name 4-amino-4-deoxychorismate

SBO:0000247 simple chemical

Notes iJO1366:M_4adcho_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0182](#) and as a product in [r_0181](#) and as a modifier in [r_0181](#), [r_0182](#)).

$$\frac{d}{dt}s_{0316} = v_{58} - v_{59} \quad (886)$$

7.86 Species s_0318

Name 4-Aminobenzoate

SBO:0000247 simple chemical

Notes iJO1366:M_4abz_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0515](#) and as a product in [r_0182](#) and as a modifier in [r_0182](#), [r_0515](#)).

$$\frac{d}{dt}s_{0318} = v_{59} - v_{145} \quad (887)$$

7.87 Species s_0325

Name 4-Hydroxybenzoate

SBO:0000247 simple chemical

Notes iJO1366:M_4hbz_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0775](#) and as a product in [r_0424](#) and as a modifier in [r_0424](#), [r_0775](#)).

$$\frac{d}{dt}s_{0325} = v_{121} - v_{203} \quad (888)$$

7.88 Species s_0328

Name 4-Methyl-2-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_4mop_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0854](#) and as a product in [r_0078](#) and as a modifier in [r_0078](#), [r_0854](#)).

$$\frac{d}{dt}s_{0328} = v_{16} - v_{226} \quad (889)$$

7.89 Species s_0330

Name 4-Methyl-5-(2-phosphoethyl)-thiazole

SBO:0000247 simple chemical

Notes iJO1366:M_4mpetz_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1344](#) and as a product in [r_1346](#) and as a modifier in [r_1344](#), [r_1346](#)).

$$\frac{d}{dt}s_{0330} = v_{332} - v_{330} \quad (890)$$

7.90 Species s_0331

Name 4-Phospho-D-erythronate

SBO:0000247 simple chemical

Notes iJO1366:M_4per_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0573](#) and as a product in [r_0574](#) and as a modifier in [r_0573](#), [r_0574](#)).

$$\frac{d}{dt}s_{0331} = v_{155} - v_{154} \quad (891)$$

7.91 Species s_0332

Name 4-Phospho-L-aspartate

SBO:0000247 simple chemical

Notes iJO1366:M_4pasp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0371](#) and as a product in [r_0369](#) and as a modifier in [r_0369](#), [r_0371](#)).

$$\frac{d}{dt}s_{0332} = v_{109} - v_{111} \quad (892)$$

7.92 Species s_0333

Name 5'-Deoxyadenosine

SBO:0000247 simple chemical

Notes iJO1366:M_dad_DASH_5_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0186](#) and as a product in [r_0383](#), [r_1375](#) and as a modifier in [r_0186](#), [r_0383](#), [r_1375](#)).

$$\frac{d}{dt}s_{0333} = v_{113} + v_{343} - v_{60} \quad (893)$$

7.93 Species s_0334

Name 5'-deoxyribose

SBO:0000247 simple chemical

Notes iJO1366:M_5drib_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2534](#) and as a product in [r_0186](#) and as a modifier in [r_0186](#), [r_2534](#)).

$$\frac{d}{dt}s_{0334} = v_{60} - v_{396} \quad (894)$$

7.94 Species s_0335

Name 5,10-Methenyltetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_methf_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0950](#) and as a product in [r_0957](#) and as a modifier in [r_0950](#), [r_0957](#)).

$$\frac{d}{dt}s_{0335} = v_{235} - v_{232} \quad (895)$$

7.95 Species s_0336

Name 5,10-Methylenetetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_mlthf_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0143](#), [r_0211](#), [r_0957](#), [r_1353](#), [r_2584](#) and as a product in [r_0726](#) and as a modifier in [r_0143](#), [r_0211](#), [r_0726](#), [r_0957](#), [r_1353](#), [r_2584](#)).

$$\frac{d}{dt}s_{0336} = v_{185} - v_{45} - v_{61} - v_{235} - v_{336} - 2.23 \cdot 10^{-4}v_{399} \quad (896)$$

7.96 Species s_0337

Name 5,6,7,8-Tetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_thf_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 14 reactions (as a reactant in [r_0622](#), [r_0726](#), [r_2584](#) and as a product in [r_0143](#), [r_0504](#), [r_0954](#), [r_1209](#) and as a modifier in [r_0143](#), [r_0504](#), [r_0622](#), [r_0726](#), [r_0954](#), [r_1209](#), [r_2584](#)).

$$\frac{d}{dt}s_{0337} = v_{45} + v_{139} + v_{234} + v_{285} - v_{162} - v_{185} - 2.23 \cdot 10^{-4}v_{399} \quad (897)$$

7.97 Species s_0341

Name 5-[(5-phospho-1-deoxyribulos-1-ylamino)methylideneamino]-1-(5-phosphoribosyl)imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_prlp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0784](#) and as a product in [r_0008](#) and as a modifier in [r_0008](#), [r_0784](#)).

$$\frac{d}{dt}s_{0341} = v_2 - v_{205} \quad (898)$$

7.98 Species s_0342

Name 5-amino-1-(5-phospho-D-ribosyl)imidazole

SBO:0000247 simple chemical

Notes iJO1366:M_air_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0179](#), [r_1206](#) and as a product in [r_1208](#) and as a modifier in [r_0179](#), [r_1206](#), [r_1208](#)).

$$\frac{d}{dt}s_{0342} = v_{284} - v_{57} - v_{282} \quad (899)$$

7.99 Species s_0343

Name 5-Amino-1-(5-Phospho-D-ribosyl)imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_aicar_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_1209](#) and as a product in [r_0302](#), [r_0784](#) and as a modifier in [r_0302](#), [r_0784](#), [r_1209](#)).

$$\frac{d}{dt}s_{0343} = v_{96} + v_{205} - v_{285} \quad (900)$$

7.100 Species s_0344

Name 5-amino-1-(5-phospho-D-ribosyl)imidazole-4-carboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_5aizc_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1210](#) and as a product in [r_1207](#) and as a modifier in [r_1207](#), [r_1210](#)).

$$\frac{d}{dt}s_{0344} = v_{283} - v_{286} \quad (901)$$

7.101 Species s_0345

Name 5-Amino-4-oxopentanoate

SBO:0000247 simple chemical

Notes iJO1366:M_5aop_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1223](#) and as a product in [r_0678](#) and as a modifier in [r_0678](#), [r_1223](#)).

$$\frac{d}{dt}s_{0345} = v_{172} - 2v_{295} \quad (902)$$

7.102 Species s_0346

Name 5-Amino-6-(5'-phosphoribitylamino)uracil

SBO:0000247 simple chemical

Notes iJO1366:M_5aprbu_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2521](#) and as a product in [r_0212](#) and as a modifier in [r_0212](#), [r_2521](#)).

$$\frac{d}{dt}s_{0346} = v_{62} - v_{394} \quad (903)$$

7.103 Species s_0347

Name 5-Amino-6-(5'-phosphoribosylamino)uracil

SBO:0000247 simple chemical

Notes iJO1366:M_5apru_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0212](#) and as a product in [r_0498](#) and as a modifier in [r_0212](#), [r_0498](#)).

$$\frac{d}{dt}s_{0347} = v_{133} - v_{62} \quad (904)$$

7.104 Species s_0352

Name 5-Formamido-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide

SBO:0000247 simple chemical

Notes iJO1366:M_fprica_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0786](#) and as a product in [r_1209](#) and as a modifier in [r_0786](#), [r_1209](#)).

$$\frac{d}{dt}s_{0352} = v_{285} - v_{207} \quad (905)$$

7.105 Species s_0354

Name 5-Methyltetrahydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_5mthf_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0954](#) and as a product in [r_0211](#) and as a modifier in [r_0211](#), [r_0954](#)).

$$\frac{d}{dt}s_{0354} = v_{61} - v_{234} \quad (906)$$

7.106 Species s_0359

Name 5-O-(1-Carboxyvinyl)-3-phosphoshikimate

SBO:0000247 simple chemical

Notes iJO1366:M_3psme_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0425](#) and as a product in [r_0175](#) and as a modifier in [r_0175](#), [r_0425](#)).

$$\frac{d}{dt}s_{0359} = v_{54} - v_{122} \quad (907)$$

7.107 Species s_0360

Name 5-Phospho-alpha-D-ribose 1-diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_prpp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in twelve reactions (as a reactant in [r_0348](#), [r_0374](#), [r_0682](#), [r_1021](#), [r_1067](#) and as a product in [r_1215](#) and as a modifier in [r_0348](#), [r_0374](#), [r_0682](#), [r_1021](#), [r_1067](#), [r_1215](#)).

$$\frac{d}{dt}s_{0360} = v_{290} - v_{101} - v_{112} - v_{174} - v_{247} - v_{258} \quad (908)$$

7.108 Species s_0361

Name 5-Phospho-beta-D-ribosylamine

SBO:0000247 simple chemical

Notes iJO1366:M_pram_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1214](#) and as a product in [r_0682](#) and as a modifier in [r_0682](#), [r_1214](#)).

$$\frac{d}{dt}s_{0361} = v_{174} - v_{289} \quad (909)$$

7.109 Species s_0362

Name 5-phosphoribosyl-5-carboxyaminoimidazole

SBO:0000247 simple chemical

Notes iJO1366:M_5caiz_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1207](#) and as a product in [r_1206](#) and as a modifier in [r_1206](#), [r_1207](#)).

$$\frac{d}{dt}s_{0362} = v_{282} - v_{283} \quad (910)$$

7.110 Species s_0364

Name 6,7-Dimethyl-8-(1-D-ribityl)lumazine

SBO:0000247 simple chemical

Notes iJO1366:M_dmlz_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1266](#) and as a product in [r_1265](#) and as a modifier in [r_1265](#), [r_1266](#)).

$$\frac{d}{dt}s_{0364} = v_{307} - 2v_{308} \quad (911)$$

7.111 Species s_0367

Name 6-hydroxymethyl dihydropterin

SBO:0000247 simple chemical

Notes iJO1366:M_6hmhpt_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0216](#) and as a product in [r_0507](#) and as a modifier in [r_0216](#), [r_0507](#)).

$$\frac{d}{dt}s_{0367} = v_{141} - v_{63} \quad (912)$$

7.112 Species s_0368

Name 6-hydroxymethyl-dihydropterin pyrophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_6hmhpptpp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0515](#) and as a product in [r_0216](#) and as a modifier in [r_0216](#), [r_0515](#)).

$$\frac{d}{dt}s_{0368} = v_{63} - v_{145} \quad (913)$$

7.113 Species s_0369

Name 6-Phospho-D-gluconate

SBO:0000247 simple chemical

Notes iJO1366:M_6pgc_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0217](#) and as a product in [r_0218](#) and as a modifier in [r_0217](#), [r_0218](#)).

$$\frac{d}{dt}s_{0369} = v_{65} - v_{64} \quad (914)$$

7.114 Species s_0370

Name 6-phospho-D-glucono-1,5-lactone

SBO:0000247 simple chemical

Notes iJO1366:M_6pgl_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0218](#) and as a product in [r_0660](#) and as a modifier in [r_0218](#), [r_0660](#)).

$$\frac{d}{dt}s_{0370} = v_{167} - v_{65} \quad (915)$$

7.115 Species s_0371

Name 7,8-Diaminononanoate

SBO:0000247 simple chemical

Notes iJO1366:M_dann_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0489](#) and as a product in [r_0297](#) and as a modifier in [r_0297](#), [r_0489](#)).

$$\frac{d}{dt}s_{0371} = v_{94} - v_{132} \quad (916)$$

7.116 Species s_0372

Name 7,8-Dihydrofolate

SBO:0000247 simple chemical

Notes iJO1366:M_dhf_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0504](#) and as a product in [r_0505](#), [r_1353](#) and as a modifier in [r_0504](#), [r_0505](#), [r_1353](#)).

$$\frac{d}{dt}s_{0372} = v_{140} + v_{336} - v_{139} \quad (917)$$

7.117 Species s_0376

Name 8-Amino-7-oxononanoate

SBO:0000247 simple chemical

Notes iJO1366:M_8aonn_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0297](#) and as a product in [r_0222](#) and as a modifier in [r_0222](#), [r_0297](#)).

$$\frac{d}{dt}s_{0376} = v_{66} - v_{94} \quad (918)$$

7.118 Species s_0377

Name [2Fe-1S] desulfurated iron-sulfur cluster

SBO:0000247 simple chemical

Notes iJO1366:M_2fe1s_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0796](#) and as a product in [r_0383](#) and as a modifier in [r_0383](#), [r_0796](#)).

$$\frac{d}{dt}s_{0377} = v_{113} - v_{210} \quad (919)$$

7.119 Species s_0378

Name [2Fe-2S] iron-sulfur cluster

SBO:0000247 simple chemical

Notes iJO1366:M_2fe2s_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0383](#), [r_2584](#) and as a product in [r_0799](#) and as a modifier in [r_0383](#), [r_0799](#), [r_2584](#)).

$$\frac{d}{dt}s_{0378} = v_{213} - v_{113} - 2.6 \cdot 10^{-5}v_{399} \quad (920)$$

7.120 Species s_0380

Name [4Fe-4S] iron-sulfur cluster

SBO:0000247 simple chemical

Notes iJO1366:M_4fe4s_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0801](#) and as a modifier in [r_0801](#), [r_2584](#)).

$$\frac{d}{dt}s_{0380} = v_{215} - 2.6 \cdot 10^{-4}v_{399} \quad (921)$$

7.121 Species s_0381

Name Acetaldehyde

SBO:0000247 simple chemical

Notes iJO1366:M_acald_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0224](#) and as a product in [r_1348](#) and as a modifier in [r_0224](#), [r_1348](#)).

$$\frac{d}{dt}s_{0381} = v_{334} - v_{67} \quad (922)$$

7.122 Species s_0384

Name Acetate

SBO:0000247 simple chemical

Notes iJO1366:M_ac_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0225](#) and as a product in [r_0244](#), [r_0452](#), [r_1379](#) and as a modifier in [r_0225](#), [r_0244](#), [r_0452](#), [r_1379](#)).

$$\frac{d}{dt}s_{0384} = v_{79} + v_{128} + v_{346} - v_{68} \quad (923)$$

7.123 Species s_0391

Name Acetoacetyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_aacoa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0135](#) and as a product in [r_0230](#) and as a modifier in [r_0135](#), [r_0230](#)).

$$\frac{d}{dt}s_{0391} = v_{70} - v_{42} \quad (924)$$

7.124 Species s_0393

Name Acetyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_actp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1218](#) and as a product in [r_0225](#) and as a modifier in [r_0225](#), [r_1218](#)).

$$\frac{d}{dt}s_{0393} = v_{68} - v_{292} \quad (925)$$

7.125 Species s_0395

Name Acetyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_accoa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 38 reactions (as a reactant in [r_0067](#), [r_0230](#), [r_0231](#), [r_0232](#), [r_0233](#), [r_0234](#), [r_0235](#), [r_0236](#), [r_0237](#), [r_0428](#), [r_0658](#), [r_0999](#), [r_1301](#) and as a product in [r_0224](#), [r_0724](#), [r_1218](#), [r_1251](#), [r_1252](#), [r_1255](#) and as a modifier in [r_0067](#), [r_0224](#), [r_0230](#), [r_0231](#), [r_0232](#), [r_0233](#), [r_0234](#), [r_0235](#), [r_0236](#), [r_0237](#), [r_0428](#), [r_0658](#), [r_0724](#), [r_0999](#), [r_1218](#), [r_1251](#), [r_1252](#), [r_1255](#), [r_1301](#)).

$$\begin{aligned} \frac{d}{dt}s_{0395} = & v_{67} + v_{184} + v_{292} + v_{302} + v_{303} + v_{304} - v_{15} - 2v_{70} - v_{71} - v_{72} \\ & - v_{73} - v_{74} - v_{75} - v_{76} - v_{77} - v_{123} - v_{166} - v_{243} - v_{317} \end{aligned} \quad (926)$$

7.126 Species s_0397

Name acyl carrier protein

SBO:0000247 simple chemical

Notes iJO1366:M_ACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 26 reactions (as a reactant in r_0257, r_0259, r_0260, r_0935 and as a product in r_0012, r_0013, r_0150, r_0166, r_0222, r_0706, r_0707, r_1378, r_1391 and as a modifier in r_0012, r_0013, r_0150, r_0166, r_0222, r_0257, r_0259, r_0260, r_0706, r_0707, r_0935, r_1378, r_1391).

$$\frac{d}{dt}s_{0397} = v_5 + v_6 + v_{51} + v_{53} + v_{66} + v_{181} + v_{182} + v_{345} + v_{349} - v_{83} - v_{84} - v_{85} - v_{231} \quad (927)$$

7.127 Species s_0405

Name Adenine

SBO:0000247 simple chemical

Notes iJO1366:M_ade_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in r_1232 and as a product in r_0186, r_1288 and as a modifier in r_0186, r_1232, r_1288).

$$\frac{d}{dt}s_{0405} = v_{60} + v_{315} - v_{299} \quad (928)$$

7.128 Species s_0408

Name Adenosine

SBO:0000247 simple chemical

Notes iJO1366:M_adn_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in r_0292 and as a product in r_1232 and as a modifier in r_0292, r_1232).

$$\frac{d}{dt}s_{0408} = v_{299} - v_{93} \quad (929)$$

7.129 Species s_0411

Name Adenosine 3',5'-bisphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pap_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0085](#) and as a product in [r_1139](#) and as a modifier in [r_0085](#), [r_1139](#)).

$$\frac{d}{dt}s_{0411} = v_{270} - v_{18} \quad (930)$$

7.130 Species s_0412

Name Adenosine 5'-phosphosulfate

SBO:0000247 simple chemical

Notes iJO1366:M_aps_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0305](#) and as a product in [r_1329](#) and as a modifier in [r_0305](#), [r_1329](#)).

$$\frac{d}{dt}s_{0412} = v_{325} - v_{99} \quad (931)$$

7.131 Species s_0420

Name adenylated molybdopterin

SBO:0000247 simple chemical

Notes iJO1366:M_mptamp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0384](#), [r_0964](#) and as a product in [r_0965](#) and as a modifier in [r_0384](#), [r_0964](#), [r_0965](#)).

$$\frac{d}{dt}s_{0420} = v_{238} - v_{114} - v_{237} \quad (932)$$

7.132 Species s_0421

Name ADP

SBO:0000247 simple chemical

Notes iJO1366:M_adp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 105 reactions (as a reactant in r_1152, r_1222, r_1521 and as a product in r_0178, r_0225, r_0237, r_0243, r_0292, r_0301, r_0305, r_0369, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0622, r_0648, r_0673, r_0683, r_0697, r_0754, r_0761, r_0762, r_0770, r_1006, r_1039, r_1043, r_1045, r_1046, r_1047, r_1075, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1264, r_1305, r_1315, r_1337, r_1345, r_1397, r_1399, r_1400, r_1401, r_1409, r_2195, r_2584 and as a modifier in r_0178, r_0225, r_0237, r_0243, r_0292, r_0301, r_0305, r_0369, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0622, r_0648, r_0673, r_0683, r_0697, r_0754, r_0761, r_0762, r_0770, r_1006, r_1039, r_1043, r_1045, r_1046, r_1047, r_1075, r_1152, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1222, r_1264, r_1305, r_1315, r_1337, r_1345, r_1397, r_1399, r_1400, r_1401, r_1409, r_1521, r_2195).

$$\begin{aligned} \frac{d}{dt}s_{0421} = & v_{56} + v_{68} + v_{77} + v_{78} + v_{93} + 2v_{95} + v_{99} + v_{109} + v_{117} + v_{125} + v_{129} + v_{130} \\ & + v_{131} + v_{132} + v_{140} + v_{149} + v_{162} + v_{164} + v_{169} + v_{175} + v_{180} + v_{193} \\ & + v_{195} + v_{196} + v_{201} + v_{244} + v_{248} + v_{249} + v_{250} + v_{251} + v_{252} + v_{261} \\ & + v_{276} + v_{282} + v_{284} + v_{286} + v_{288} + v_{289} + v_{306} + v_{319} + v_{322} + v_{328} + v_{331} \\ & + v_{352} + v_{353} + v_{354} + v_{355} + v_{357} + 2v_{391} + 53.95v_{399} - v_{274} - v_{294} - v_{366} \end{aligned} \quad (933)$$

7.133 Species s_0435

Name all-trans-Octaprenyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_octdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in r_0775 and as a product in r_1063 and as a modifier in r_0775, r_1063).

$$\frac{d}{dt}s_{0435} = v_{255} - v_{203} \quad (934)$$

7.134 Species s_0445

Name alpha-D-Ribose 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_r1p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1232](#) and as a product in [r_1202](#) and as a modifier in [r_1202](#), [r_1232](#)).

$$\frac{d}{dt}s_{0445} = v_{279} - v_{299} \quad (935)$$

7.135 Species s_0446

Name alpha-D-Ribose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_r5p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_1202](#), [r_1215](#) and as a product in [r_1284](#), [r_1357](#) and as a modifier in [r_1202](#), [r_1215](#), [r_1284](#), [r_1357](#)).

$$\frac{d}{dt}s_{0446} = v_{313} + v_{338} - v_{279} - v_{290} \quad (936)$$

7.136 Species s_0451

Name Ammonium

SBO:0000247 simple chemical

Notes iJO1366:M_nh4_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 24 reactions (as a reactant in [r_0365](#), [r_0388](#), [r_0675](#), [r_0683](#), [r_1008](#), [r_1368](#), [r_2584](#) and as a product in [r_0450](#), [r_0498](#), [r_0777](#), [r_0847](#), [r_1511](#) and as a modifier in [r_0365](#), [r_0388](#), [r_0450](#), [r_0498](#), [r_0675](#), [r_0683](#), [r_0777](#), [r_0847](#), [r_1008](#), [r_1368](#), [r_1511](#), [r_2584](#)).

$$\begin{aligned} \frac{d}{dt}s_{0451} = & v_{127} + v_{133} + 4v_{204} + v_{224} + v_{365} - v_{106} - v_{117} \\ & - v_{170} - v_{175} - v_{245} - v_{342} - 0.01301v_{399} \end{aligned} \quad (937)$$

7.137 Species s_0453

Name Ammonium

SBO:0000247 simple chemical

Notes iJO1366:M_nh4_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1511](#) and as a modifier in [r_1511](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0453} = 0 \quad (938)$$

7.138 Species s_0454

Name AMP

SBO:0000247 simple chemical

Notes iJO1366:M_amp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 38 reactions (as a reactant in [r_0301](#) and as a product in [r_0085](#), [r_0216](#), [r_0257](#), [r_0259](#), [r_0260](#), [r_0292](#), [r_0304](#), [r_0361](#), [r_0365](#), [r_0384](#), [r_0687](#), [r_0741](#), [r_0963](#), [r_0964](#), [r_1008](#), [r_1076](#), [r_1215](#), [r_1346](#) and as a modifier in [r_0085](#), [r_0216](#), [r_0257](#), [r_0259](#), [r_0260](#), [r_0292](#), [r_0301](#), [r_0304](#), [r_0361](#), [r_0365](#), [r_0384](#), [r_0687](#), [r_0741](#), [r_0963](#), [r_0964](#), [r_1008](#), [r_1076](#), [r_1215](#), [r_1346](#)).

$$\begin{aligned} \frac{d}{dt}s_{0454} = & v_{18} + v_{63} + v_{83} + v_{84} + v_{85} + v_{93} + v_{98} + v_{105} + v_{106} + v_{114} \\ & + v_{178} + v_{190} + v_{236} + v_{237} + v_{245} + v_{262} + v_{290} + v_{332} - v_{95} \end{aligned} \quad (939)$$

7.139 Species s_0457

Name Anthranilate

SBO:0000247 simple chemical

Notes iJO1366:M_anth_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0348](#) and as a product in [r_0349](#) and as a modifier in [r_0348](#), [r_0349](#)).

$$\frac{d}{dt}s_{0457} = v_{102} - v_{101} \quad (940)$$

7.140 Species s_0467

Name ATP

SBO:0000247 simple chemical

Notes iJO1366:M_atp_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 148 reactions (as a reactant in r_0178, r_0216, r_0225, r_0237, r_0243, r_0257, r_0259, r_0260, r_0292, r_0301, r_0305, r_0361, r_0365, r_0369, r_0374, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0611, r_0622, r_0648, r_0673, r_0683, r_0687, r_0697, r_0741, r_0754, r_0761, r_0762, r_0770, r_0951, r_0965, r_0969, r_1006, r_1008, r_1019, r_1039, r_1043, r_1045, r_1046, r_1047, r_1074, r_1075, r_1076, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1215, r_1264, r_1276, r_1305, r_1315, r_1329, r_1337, r_1345, r_1346, r_1397, r_1399, r_1400, r_1401, r_1409, r_2195, r_2584 and as a product in r_1152, r_1222, r_1521 and as a modifier in r_0178, r_0216, r_0225, r_0237, r_0243, r_0257, r_0259, r_0260, r_0292, r_0301, r_0305, r_0361, r_0365, r_0369, r_0374, r_0388, r_0440, r_0457, r_0463, r_0488, r_0489, r_0505, r_0532, r_0611, r_0622, r_0648, r_0673, r_0683, r_0687, r_0697, r_0741, r_0754, r_0761, r_0762, r_0770, r_0951, r_0965, r_0969, r_1006, r_1008, r_1019, r_1039, r_1043, r_1045, r_1046, r_1047, r_1074, r_1075, r_1076, r_1152, r_1198, r_1206, r_1208, r_1210, r_1212, r_1214, r_1215, r_1222, r_1264, r_1276, r_1305, r_1315, r_1329, r_1337, r_1345, r_1346, r_1397, r_1399, r_1400, r_1401, r_1409, r_1521, r_2195, r_2584).

$$\begin{aligned} \frac{d}{dt}s_{0467} = & v_{274} + v_{294} + v_{366} - v_{56} - v_{63} - v_{68} - v_{77} - v_{78} - v_{83} - v_{84} - v_{85} - v_{93} - v_{95} - v_{99} \\ & - v_{105} - v_{106} - v_{109} - v_{112} - v_{117} - v_{125} - v_{129} - v_{130} - v_{131} - v_{132} - v_{140} - v_{149} \\ & - v_{161} - v_{162} - v_{164} - v_{169} - v_{175} - v_{178} - v_{180} - v_{190} - v_{193} - v_{195} - v_{196} - v_{201} \\ & - v_{233} - v_{238} - v_{240} - v_{244} - v_{245} - v_{246} - v_{248} - v_{249} - v_{250} - v_{251} - v_{252} - v_{260} \\ & - v_{261} - v_{262} - v_{276} - v_{282} - v_{284} - v_{286} - v_{288} - v_{289} - v_{290} - v_{306} - v_{309} - v_{319} - v_{322} \\ & - v_{325} - v_{328} - v_{331} - v_{332} - v_{352} - v_{353} - v_{354} - v_{355} - v_{357} - 2v_{391} - 54.12v_{399} \end{aligned} \quad (941)$$

7.141 Species s_0470

Name beta-Alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ala_DASH_B_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in r_1076 and as a product in r_0367 and as a modifier in r_0367, r_1076).

$$\frac{d}{dt}s_{0470} = v_{107} - v_{262} \quad (942)$$

7.142 Species s_0474

Name Bicarbonate

SBO:0000247 simple chemical

Notes iJO1366:M_hco3_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0237](#), [r_1206](#) and as a product in [r_0755](#) and as a modifier in [r_0237](#), [r_0755](#), [r_1206](#)).

$$\frac{d}{dt}s_{0474} = v_{194} - v_{77} - v_{282} \quad (943)$$

7.143 Species s_0476

Name Biotin

SBO:0000247 simple chemical

Notes iJO1366:M_btn_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0383](#) and as a modifier in [r_0383](#), [r_2584](#)).

$$\frac{d}{dt}s_{0476} = v_{113} - 2 \cdot 10^{-6}v_{399} \quad (944)$$

7.144 Species s_0479

Name bis-molybdenum cofactor

SBO:0000247 simple chemical

Notes iJO1366:M_bmoco_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0386](#) and as a product in [r_0384](#) and as a modifier in [r_0384](#), [r_0386](#)).

$$\frac{d}{dt}s_{0479} = v_{114} - v_{116} \quad (945)$$

7.145 Species s_0480

Name bis-molybdopterin guanine dinucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_bmocogdp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0385](#) and as a modifier in [r_0385](#), [r_2584](#)).

$$\frac{d}{dt}s_{0480} = v_{115} - 1.22 \cdot 10^{-4}v_{399} \quad (946)$$

7.146 Species s_0481

Name bis-molybdopterin mono-guanine dinucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_bmoco1gdp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0385](#) and as a product in [r_0386](#) and as a modifier in [r_0385](#), [r_0386](#)).

$$\frac{d}{dt}s_{0481} = v_{116} - v_{115} \quad (947)$$

7.147 Species s_0488

Name Butanoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_btcoa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0231](#) and as a product in [r_0266](#) and as a modifier in [r_0231](#), [r_0266](#)).

$$\frac{d}{dt}s_{0488} = v_{86} - v_{71} \quad (948)$$

7.148 Species s_0493

Name C’-(3-Indolyl)-glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_3ig3p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1367](#) and as a product in [r_0788](#) and as a modifier in [r_0788](#), [r_1367](#)).

$$\frac{d}{dt}s_{0493} = v_{209} - v_{341} \quad (949)$$

7.149 Species s_0497

Name Calcium

SBO:0000247 simple chemical

Notes iJO1366:M_ca2_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1536](#) and as a modifier in [r_1536](#), [r_2584](#)).

$$\frac{d}{dt}s_{0497} = v_{367} - 0.005205v_{399} \quad (950)$$

7.150 Species s_0499

Name Calcium

SBO:0000247 simple chemical

Notes iJO1366:M_ca2_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1536](#) and as a modifier in [r_1536](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0499} = 0 \quad (951)$$

7.151 Species s_0502

Name Carbamoyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_cbp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0368](#), [r_1065](#) and as a product in [r_0388](#) and as a modifier in [r_0368](#), [r_0388](#), [r_1065](#)).

$$\frac{d}{dt}s_{0502} = v_{117} - v_{108} - v_{257} \quad (952)$$

7.152 Species s_0510

Name CDP

SBO:0000247 simple chemical

Notes iJO1366:M_cdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1039](#) and as a product in [r_0457](#) and as a modifier in [r_0457](#), [r_1039](#)).

$$\frac{d}{dt}s_{0510} = v_{129} - v_{248} \quad (953)$$

7.153 Species s_0512

Name CDP-1,2-dihexadec-9-enoylglycerol

SBO:0000247 simple chemical

Notes iJO1366:M_cdpdhdec9eg_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1131](#) and as a product in [r_0419](#) and as a modifier in [r_0419](#), [r_1131](#)).

$$\frac{d}{dt}s_{0512} = v_{119} - v_{267} \quad (954)$$

7.154 Species s_0513

Name CDP-1,2-dihexadecanoylglycerol

SBO:0000247 simple chemical

Notes iJO1366:M_cdpdhdecg_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1130](#) and as a product in [r_0418](#) and as a modifier in [r_0418](#), [r_1130](#)).

$$\frac{d}{dt}s_{0513} = v_{118} - v_{266} \quad (955)$$

7.155 Species s_0520

Name Chloride

SBO:0000247 simple chemical

Notes iJO1366:M_cl_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1543](#) and as a modifier in [r_1543](#), [r_2584](#)).

$$\frac{d}{dt}s_{0520} = v_{368} - 0.005205v_{399} \quad (956)$$

7.156 Species s_0522

Name Chloride

SBO:0000247 simple chemical

Notes iJO1366:M_cl_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1543](#) and as a modifier in [r_1543](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0522} = 0 \quad (957)$$

7.157 Species s_0526

Name chorismate

SBO:0000247 simple chemical

Notes iJO1366:M_chor_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in ten reactions (as a reactant in [r_0181](#), [r_0349](#), [r_0423](#), [r_0424](#) and as a product in [r_0425](#) and as a modifier in [r_0181](#), [r_0349](#), [r_0423](#), [r_0424](#), [r_0425](#)).

$$\frac{d}{dt}s_{0526} = v_{122} - v_{58} - v_{102} - v_{120} - v_{121} \quad (958)$$

7.158 Species s_0530

Name cis-Aconitate

SBO:0000247 simple chemical

Notes iJO1366:M_acon_DASH_C_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0247](#) and as a product in [r_0246](#) and as a modifier in [r_0246](#), [r_0247](#)).

$$\frac{d}{dt}s_{0530} = v_{81} - v_{82} \quad (959)$$

7.159 Species s_0533

Name cis-hexadec-9-enoyl-[acyl-carrier protein] (n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_hdeACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0012](#), [r_0707](#) and as a product in [r_0260](#) and as a modifier in [r_0012](#), [r_0260](#), [r_0707](#)).

$$\frac{d}{dt}s_{0533} = v_{85} - v_5 - v_{182} \quad (960)$$

7.160 Species s_0536

Name Citrate

SBO:0000247 simple chemical

Notes iJO1366:M_cit_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0246](#) and as a product in [r_0428](#) and as a modifier in [r_0246](#), [r_0428](#)).

$$\frac{d}{dt}s_{0536} = v_{123} - v_{81} \quad (961)$$

7.161 Species s_0539

Name CMP

SBO:0000247 simple chemical

Notes iJO1366:M_cmp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in [r_0457](#) and as a product in [r_0053](#), [r_0102](#), [r_0103](#), [r_1130](#), [r_1131](#), [r_1200](#) and as a modifier in [r_0053](#), [r_0102](#), [r_0103](#), [r_0457](#), [r_1130](#), [r_1131](#), [r_1200](#)).

$$\frac{d}{dt}s_{0539} = v_{10} + v_{25} + v_{26} + v_{266} + v_{267} + v_{277} - v_{129} \quad (962)$$

7.162 Species s_0542

Name CMP-3-deoxy-D-manno-octulosonate

SBO:0000247 simple chemical

Notes iJO1366:M_ckdo_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0102](#), [r_0103](#) and as a product in [r_0105](#) and as a modifier in [r_0102](#), [r_0103](#), [r_0105](#)).

$$\frac{d}{dt}s_{0542} = v_{27} - v_{25} - v_{26} \quad (963)$$

7.163 Species s_0543

Name CO2

SBO:0000247 simple chemical

Notes iJO1366:M_co2_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 64 reactions (as a reactant in r_0388, r_0489, r_0755, r_1141, r_1551 and as a product in r_0009, r_0038, r_0078, r_0147, r_0150, r_0166, r_0222, r_0227, r_0367, r_0436, r_0499, r_0739, r_0788, r_0806, r_1021, r_1064, r_1068, r_1123, r_1124, r_1201, r_1224, r_1225, r_1245, r_1251, r_1255, r_1346, r_1421 and as a modifier in r_0009, r_0038, r_0078, r_0147, r_0150, r_0166, r_0222, r_0227, r_0367, r_0388, r_0436, r_0489, r_0499, r_0739, r_0755, r_0788, r_0806, r_1021, r_1064, r_1068, r_1123, r_1124, r_1141, r_1201, r_1224, r_1225, r_1245, r_1251, r_1255, r_1346, r_1421, r_1551).

$$\frac{d}{dt}s_{0543} = v_3 + v_9 + v_{16} + v_{48} + v_{51} + v_{53} + v_{66} + v_{69} + v_{107} + 2v_{124} + v_{134} + v_{189} + v_{209} + v_{217} + v_{247} + v_{256} + v_{259} + v_{264} + v_{265} + v_{278} + v_{296} + v_{297} + v_{300} + v_{302} + v_{304} + v_{332} + 4v_{360} - v_{117} - v_{132} - v_{194} - v_{271} - v_{369} \quad (964)$$

7.164 Species s_0545

Name CO2

SBO:0000247 simple chemical

Notes iJO1366:M_co2_e

Initial concentration 0 mmol · l⁻¹

This species takes part in one reaction (as a product in r_1551), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0545} = 0 \quad (965)$$

7.165 Species s_0546

Name Co2+

SBO:0000247 simple chemical

Notes iJO1366:M_cobalt2_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1557](#) and as a modifier in [r_1557](#), [r_2584](#)).

$$\frac{d}{dt}s_{-0546} = v_{370} - 2.5 \cdot 10^{-5}v_{399} \quad (966)$$

7.166 Species s_-0548

Name Co2+

SBO:0000247 simple chemical

Notes iJO1366:M_cobalt2_e

Initial concentration 1 mmol · l⁻¹

This species takes part in two reactions (as a reactant in [r_1557](#) and as a modifier in [r_1557](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{-0548} = 0 \quad (967)$$

7.167 Species s_-0555

Name Coenzyme A

SBO:0000247 simple chemical

Notes iJO1366:M_coa_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 56 reactions (as a reactant in [r_0224](#), [r_0724](#), [r_1218](#), [r_1251](#), [r_1252](#), [r_1255](#), [r_1315](#), [r_2584](#) and as a product in [r_0067](#), [r_0147](#), [r_0230](#), [r_0231](#), [r_0232](#), [r_0233](#), [r_0234](#), [r_0235](#), [r_0236](#), [r_0428](#), [r_0488](#), [r_0579](#), [r_0580](#), [r_0581](#), [r_0658](#), [r_0771](#), [r_0935](#), [r_0999](#), [r_1301](#), [r_1338](#) and as a modifier in [r_0067](#), [r_0147](#), [r_0224](#), [r_0230](#), [r_0231](#), [r_0232](#), [r_0233](#), [r_0234](#), [r_0235](#), [r_0236](#), [r_0428](#), [r_0488](#), [r_0579](#), [r_0580](#), [r_0581](#), [r_0658](#), [r_0724](#), [r_0771](#), [r_0935](#), [r_0999](#), [r_1218](#), [r_1251](#), [r_1252](#), [r_1255](#), [r_1301](#), [r_1315](#), [r_1338](#), [r_2584](#)).

$$\begin{aligned} \frac{d}{dt}s_{-0555} = & v_{15} + v_{48} + v_{70} + v_{71} + v_{72} + v_{73} + v_{74} + v_{75} + v_{76} + v_{123} + v_{131} \\ & + v_{157} + v_{158} + v_{159} + v_{166} + v_{202} + v_{231} + v_{243} + v_{317} + v_{329} \\ & - v_{67} - v_{184} - v_{292} - v_{302} - v_{303} - v_{304} - v_{322} - 5.76 \cdot 10^{-4}v_{399} \end{aligned} \quad (968)$$

7.168 Species s_0565

Name Coproporphyrinogen III

SBO:0000247 simple chemical

Notes iJO1366:M_cppg3_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0436](#) and as a product in [r_1421](#) and as a modifier in [r_0436](#), [r_1421](#)).

$$\frac{d}{dt}s_{0565} = v_{360} - v_{124} \quad (969)$$

7.169 Species s_0574

Name Crotonoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_b2coa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0266](#) and as a product in [r_0120](#) and as a modifier in [r_0120](#), [r_0266](#)).

$$\frac{d}{dt}s_{0574} = v_{29} - v_{86} \quad (970)$$

7.170 Species s_0575

Name CTP

SBO:0000247 simple chemical

Notes iJO1366:M_ctp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 18 reactions (as a reactant in [r_0054](#), [r_0105](#), [r_0418](#), [r_0419](#), [r_1200](#), [r_1277](#), [r_2584](#) and as a product in [r_0440](#), [r_1039](#) and as a modifier in [r_0054](#), [r_0105](#), [r_0418](#), [r_0419](#), [r_0440](#), [r_1039](#), [r_1200](#), [r_1277](#), [r_2584](#)).

$$\frac{d}{dt}s_{0575} = v_{125} + v_{248} - v_{11} - v_{27} - v_{118} - v_{119} - v_{277} - v_{310} - 0.1335v_{399} \quad (971)$$

7.171 Species s_0579

Name Cu2+

SBO:0000247 simple chemical

Notes iJO1366:M_cu2_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in ten reactions (as a reactant in r_0968, r_2584 and as a product in r_0384, r_0964, r_1565 and as a modifier in r_0384, r_0964, r_0968, r_1565, r_2584).

$$\frac{d}{dt}s_{0579} = v_{114} + v_{237} + v_{371} - v_{239} - 7.09 \cdot 10^{-4}v_{399} \quad (972)$$

7.172 Species s_0581

Name Cu2+

SBO:0000247 simple chemical

Notes iJO1366:M_cu2_e

Initial concentration 1 mmol·l⁻¹

This species takes part in two reactions (as a reactant in r_1565 and as a modifier in r_1565), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0581} = 0 \quad (973)$$

7.173 Species s_0585

Name cyclic pyranopterin monophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_cpmp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in r_0968 and as a product in r_0445 and as a modifier in r_0445, r_0968).

$$\frac{d}{dt}s_{0585} = v_{126} - v_{239} \quad (974)$$

7.174 Species s_0599

Name D-4'-Phosphopantetheate

SBO:0000247 simple chemical

Notes iJO1366:M_4ppan_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1200](#) and as a product in [r_1075](#) and as a modifier in [r_1075](#), [r_1200](#)).

$$\frac{d}{dt}s_{0599} = v_{261} - v_{277} \quad (975)$$

7.175 Species s_0600

Name D-Alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ala_DASH_D_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0463](#) and as a product in [r_0310](#), [r_0970](#) and as a modifier in [r_0310](#), [r_0463](#), [r_0970](#)).

$$\frac{d}{dt}s_{0600} = v_{100} + v_{241} - 2v_{130} \quad (976)$$

7.176 Species s_0603

Name D-Alanyl-D-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_alaala_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1401](#) and as a product in [r_0463](#) and as a modifier in [r_0463](#), [r_1401](#)).

$$\frac{d}{dt}s_{0603} = v_{130} - v_{355} \quad (977)$$

7.177 Species s_0611

Name D-Arabinose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ara5p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0100](#) and as a product in [r_0355](#) and as a modifier in [r_0100](#), [r_0355](#)).

$$\frac{d}{dt}s_{0611} = v_{103} - v_{23} \quad (978)$$

7.178 Species s_0620

Name D-erythro-1-(Imidazol-4-yl)glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_eig3p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0785](#) and as a product in [r_0784](#) and as a modifier in [r_0784](#), [r_0785](#)).

$$\frac{d}{dt}s_{0620} = v_{205} - v_{206} \quad (979)$$

7.179 Species s_0621

Name D-Erythrose 4-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_e4p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_0101](#), [r_0574](#), [r_1356](#) and as a product in [r_1358](#) and as a modifier in [r_0101](#), [r_0574](#), [r_1356](#), [r_1358](#)).

$$\frac{d}{dt}s_{0621} = v_{339} - v_{24} - v_{155} - v_{337} \quad (980)$$

7.180 Species s_0622

Name D-Fructose

SBO:0000247 simple chemical

Notes iJO1366:M_fru_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0761](#), [r_1714](#) and as a product in [r_1432](#) and as a modifier in [r_0761](#), [r_1432](#), [r_1714](#)).

$$\frac{d}{dt}s_{0622} = v_{364} - v_{195} - v_{376} \quad (981)$$

7.181 Species s_0627

Name D-Fructose 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_f6p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0684](#), [r_1356](#), [r_1358](#) and as a product in [r_0664](#), [r_0761](#), [r_1714](#) and as a modifier in [r_0664](#), [r_0684](#), [r_0761](#), [r_1356](#), [r_1358](#), [r_1714](#)).

$$\frac{d}{dt}s_{0627} = v_{168} + v_{195} + v_{376} - v_{176} - v_{337} - v_{339} \quad (982)$$

7.182 Species s_0653

Name D-Glucosamine 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_gam1p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0658](#) and as a product in [r_1150](#) and as a modifier in [r_0658](#), [r_1150](#)).

$$\frac{d}{dt}s_{0653} = v_{272} - v_{166} \quad (983)$$

7.183 Species s_0654

Name D-Glucosamine 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_gam6p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1150](#) and as a product in [r_0684](#) and as a modifier in [r_0684](#), [r_1150](#)).

$$\frac{d}{dt}s_{0654} = v_{176} - v_{272} \quad (984)$$

7.184 Species s_0657

Name D-Glucose

SBO:0000247 simple chemical

Notes iJO1366:M_glc_DASH_D_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0762](#), [r_1432](#), [r_1622](#) and as a product in [r_1621](#) and as a modifier in [r_0762](#), [r_1432](#), [r_1621](#), [r_1622](#)).

$$\frac{d}{dt}s_{0657} = v_{374} - v_{196} - v_{364} - v_{375} \quad (985)$$

7.185 Species s_0659

Name D-Glucose

SBO:0000247 simple chemical

Notes iJO1366:M_glc_DASH_D_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1621](#) and as a modifier in [r_1621](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0659} = 0 \quad (986)$$

7.186 Species s_0663

Name D-Glucose 6-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_g6p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0660](#), [r_0664](#) and as a product in [r_0762](#), [r_1622](#) and as a modifier in [r_0660](#), [r_0664](#), [r_0762](#), [r_1622](#)).

$$\frac{d}{dt}s_{0663} = v_{196} + v_{375} - v_{167} - v_{168} \quad (987)$$

7.187 Species s_0671

Name D-Glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_glu_DASH_D_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1399](#) and as a product in [r_0676](#) and as a modifier in [r_0676](#), [r_1399](#)).

$$\frac{d}{dt}s_{0671} = v_{171} - v_{353} \quad (988)$$

7.188 Species s_0675

Name D-Glycerate 2-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_2pg_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0538](#) and as a product in [r_0697](#), [r_1153](#) and as a modifier in [r_0538](#), [r_0697](#), [r_1153](#)).

$$\frac{d}{dt}s_{0675} = v_{180} + v_{275} - v_{151} \quad (989)$$

7.189 Species s_0704

Name D-Ribulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ru5p_DASH_D_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_0092](#), [r_0355](#), [r_1284](#) and as a product in [r_1285](#) and as a modifier in [r_0092](#), [r_0355](#), [r_1284](#), [r_1285](#)).

$$\frac{d}{dt}s_{0704} = v_{314} - v_{19} - v_{103} - v_{313} \quad (990)$$

7.190 Species s_0721

Name D-Xylulose 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_xu5p_DASH_D_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_1285](#) and as a product in [r_1357](#), [r_1358](#) and as a modifier in [r_1285](#), [r_1357](#), [r_1358](#)).

$$\frac{d}{dt}s_{0721} = v_{338} + v_{339} - v_{314} \quad (991)$$

7.191 Species s_0726

Name dATP

SBO:0000247 simple chemical

Notes iJO1366:M_datp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1276](#) and as a modifier in [r_1276](#), [r_2584](#)).

$$\frac{d}{dt}s_{0726} = v_{309} - 0.02617v_{399} \quad (992)$$

7.192 Species s_0731

Name dCTP

SBO:0000247 simple chemical

Notes iJO1366:M_dctp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1277](#) and as a modifier in [r_1277](#), [r_2584](#)).

$$\frac{d}{dt}s_{0731} = v_{310} - 0.02702v_{399} \quad (993)$$

7.193 Species s_0732

Name Deamino-NAD+

SBO:0000247 simple chemical

Notes iJO1366:M_dnad_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1008](#) and as a product in [r_1019](#) and as a modifier in [r_1008](#), [r_1019](#)).

$$\frac{d}{dt}s_{0732} = v_{246} - v_{245} \quad (994)$$

7.194 Species s_0737

Name Decanoyl-CoA (n-C10:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_dcacoa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0232](#) and as a product in [r_0267](#) and as a modifier in [r_0232](#), [r_0267](#)).

$$\frac{d}{dt}s_{0737} = v_{87} - v_{72} \quad (995)$$

7.195 Species s_0738

Name dehydroglycine

SBO:0000247 simple chemical

Notes iJO1366:M_dhgly_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1346](#) and as a product in [r_1375](#) and as a modifier in [r_1346](#), [r_1375](#)).

$$\frac{d}{dt}s_{0738} = v_{343} - v_{332} \quad (996)$$

7.196 Species s_0754

Name Dephospho-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_dpcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0488](#) and as a product in [r_1074](#) and as a modifier in [r_0488](#), [r_1074](#)).

$$\frac{d}{dt}s_{0754} = v_{260} - v_{131} \quad (997)$$

7.197 Species s_0755

Name Dethiobiotin

SBO:0000247 simple chemical

Notes iJO1366:M_dtbt_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0383](#) and as a product in [r_0489](#) and as a modifier in [r_0383](#), [r_0489](#)).

$$\frac{d}{dt}s_{0755} = v_{132} - v_{113} \quad (998)$$

7.198 Species s_0760

Name dGTP

SBO:0000247 simple chemical

Notes iJO1366:M_dgtp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1278](#) and as a modifier in [r_1278](#), [r_2584](#)).

$$\frac{d}{dt}s_{0760} = v_{311} - 0.02702v_{399} \quad (999)$$

7.199 Species s_0765

Name Dihydronoopterin

SBO:0000247 simple chemical

Notes iJO1366:M_dhnpt_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0507](#) and as a product in [r_2310](#) and as a modifier in [r_0507](#), [r_2310](#)).

$$\frac{d}{dt}s_{0765} = v_{392} - v_{141} \quad (1000)$$

7.200 Species s_0766

Name Dihydronoopterin monophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dhpmp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2310](#) and as a product in [r_0510](#) and as a modifier in [r_0510](#), [r_2310](#)).

$$\frac{d}{dt}s_{0766} = v_{142} - v_{392} \quad (1001)$$

7.201 Species s_0767

Name Dihydropteroate

SBO:0000247 simple chemical

Notes iJO1366:M_dhpt_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0505](#) and as a product in [r_0515](#) and as a modifier in [r_0505](#), [r_0515](#)).

$$\frac{d}{dt}s_{0767} = v_{145} - v_{140} \quad (1002)$$

7.202 Species s_0768

Name dihydrosirohydrochlorin

SBO:0000247 simple chemical

Notes iJO1366:M_dscl_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1306](#) and as a product in [r_1422](#) and as a modifier in [r_1306](#), [r_1422](#)).

$$\frac{d}{dt}s_{0768} = v_{361} - v_{320} \quad (1003)$$

7.203 Species s_0772

Name Dihydroxyacetone phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dhap_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0712](#), [r_1259](#) and as a product in [r_1363](#) and as a modifier in [r_0712](#), [r_1259](#), [r_1363](#)).

$$\frac{d}{dt}s_{0772} = v_{340} - v_{183} - v_{305} \quad (1004)$$

7.204 Species s_0779

Name Dimethylallyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_dmpp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0522](#) and as a product in [r_0014](#) and as a modifier in [r_0014](#), [r_0522](#)).

$$\frac{d}{dt}s_{0779} = v_7 - v_{148} \quad (1005)$$

7.205 Species s_0783

Name Diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ppi_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 87 reactions (as a reactant in [r_1222](#) and as a product in [r_0054](#), [r_0105](#), [r_0257](#), [r_0259](#), [r_0260](#), [r_0348](#), [r_0361](#), [r_0365](#), [r_0374](#), [r_0385](#), [r_0386](#), [r_0418](#), [r_0419](#), [r_0445](#), [r_0510](#), [r_0515](#), [r_0522](#), [r_0533](#), [r_0611](#), [r_0655](#), [r_0682](#), [r_0687](#), [r_0741](#), [r_0745](#), [r_0775](#), [r_0951](#), [r_0965](#), [r_0969](#), [r_1008](#), [r_1019](#), [r_1021](#), [r_1063](#), [r_1067](#), [r_1074](#), [r_1076](#), [r_1200](#), [r_1205](#), [r_1329](#), [r_1344](#), [r_1346](#), [r_1392](#), [r_1410](#), [r_2584](#) and as a modifier in [r_0054](#), [r_0105](#), [r_0257](#), [r_0259](#), [r_0260](#), [r_0348](#), [r_0361](#), [r_0365](#), [r_0374](#), [r_0385](#), [r_0386](#), [r_0418](#), [r_0419](#), [r_0445](#), [r_0510](#), [r_0515](#), [r_0522](#), [r_0533](#), [r_0611](#), [r_0655](#), [r_0682](#), [r_0687](#), [r_0741](#), [r_0745](#), [r_0775](#), [r_0951](#), [r_0965](#), [r_0969](#), [r_1008](#), [r_1019](#), [r_1021](#), [r_1063](#), [r_1067](#), [r_1074](#), [r_1076](#), [r_1200](#), [r_1205](#), [r_1222](#), [r_1329](#), [r_1344](#), [r_1346](#), [r_1392](#), [r_1410](#)).

$$\begin{aligned} \frac{d}{dt}s_{0783} = & v_{11} + v_{27} + v_{83} + v_{84} + v_{85} + v_{101} + v_{105} + v_{106} + v_{112} + v_{115} + v_{116} + v_{118} \\ & + v_{119} + v_{126} + v_{142} + v_{145} + v_{148} + v_{150} + v_{161} + v_{165} + v_{174} + v_{178} + v_{190} \\ & + v_{192} + v_{203} + v_{233} + v_{238} + v_{240} + v_{245} + v_{246} + v_{247} + 5v_{255} + v_{258} + v_{260} \\ & + v_{262} + v_{277} + v_{281} + v_{325} + v_{330} + v_{332} + v_{350} + 8v_{358} + 0.7739v_{399} - v_{294} \end{aligned} \quad (1006)$$

7.206 Species s_0785

Name Dodecanoate (n-C12:0)

SBO:0000247 simple chemical

Notes iJO1366:M_ddca_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0257](#) and as a product in [r_0579](#) and as a modifier in [r_0257](#), [r_0579](#)).

$$\frac{d}{dt}s_{0785} = v_{157} - v_{83} \quad (1007)$$

7.207 Species s_0789

Name Dodecanoyl-ACP (n-C12:0ACP)

SBO:0000247 simple chemical

Notes iJO1366:M_ddcaACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0166](#) and as a product in [r_0257](#) and as a modifier in [r_0166](#), [r_0257](#)).

$$\frac{d}{dt}s_{0789} = v_{83} - v_{53} \quad (1008)$$

7.208 Species s_0790

Name Dodecanoyl-CoA (n-C12:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_ddcacoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0233](#), [r_0579](#) and as a product in [r_0268](#) and as a modifier in [r_0233](#), [r_0268](#), [r_0579](#)).

$$\frac{d}{dt}s_{0790} = v_{88} - v_{73} - v_{157} \quad (1009)$$

7.209 Species s_0795

Name dTDP

SBO:0000247 simple chemical

Notes iJO1366:M_dtdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1043](#) and as a product in [r_0532](#) and as a modifier in [r_0532](#), [r_1043](#)).

$$\frac{d}{dt}s_{0795} = v_{149} - v_{249} \quad (1010)$$

7.210 Species s_0802

Name dTMP

SBO:0000247 simple chemical

Notes iJO1366:M_dttmp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0532](#) and as a product in [r_1353](#) and as a modifier in [r_0532](#), [r_1353](#)).

$$\frac{d}{dt}s_{0802} = v_{336} - v_{149} \quad (1011)$$

7.211 Species s_0805

Name dTPP

SBO:0000247 simple chemical

Notes iJO1366:M_dttp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1043](#) and as a modifier in [r_1043](#), [r_2584](#)).

$$\frac{d}{dt}s_{0805} = v_{249} - 0.02617v_{399} \quad (1012)$$

7.212 Species s_0807

Name dUMP

SBO:0000247 simple chemical

Notes iJO1366:M_dump_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1353](#) and as a product in [r_0533](#) and as a modifier in [r_0533](#), [r_1353](#)).

$$\frac{d}{dt}s_{0807} = v_{150} - v_{336} \quad (1013)$$

7.213 Species s_0810

Name dUTP

SBO:0000247 simple chemical

Notes iJO1366:M_dutp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0533](#) and as a product in [r_1279](#) and as a modifier in [r_0533](#), [r_1279](#)).

$$\frac{d}{dt}s_{0810} = v_{312} - v_{150} \quad (1014)$$

7.214 Species s_0812

Name Enoylglutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_egmeACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0563](#) and as a product in [r_0145](#) and as a modifier in [r_0145](#), [r_0563](#)).

$$\frac{d}{dt}s_{0812} = v_{46} - v_{152} \quad (1015)$$

7.215 Species s_0813

Name Enoylpimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_epmeACP_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0564](#) and as a product in [r_0148](#) and as a modifier in [r_0148](#), [r_0564](#)).

$$\frac{d}{dt}s_{0813} = v_{49} - v_{153} \quad (1016)$$

7.216 Species s_0826

Name Farnesyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_frdp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1063](#), [r_1410](#) and as a product in [r_0655](#) and as a modifier in [r_0655](#), [r_1063](#), [r_1410](#)).

$$\frac{d}{dt}s_{0826} = v_{165} - v_{255} - v_{358} \quad (1017)$$

7.217 Species s_0838

Name Fe2+

SBO:0000247 simple chemical

Notes iJO1366:M_fe2_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0602](#), [r_0797](#), [r_0798](#), [r_1307](#), [r_2584](#) and as a product in [r_1792](#) and as a modifier in [r_0602](#), [r_0797](#), [r_0798](#), [r_1307](#), [r_1792](#), [r_2584](#)).

$$\frac{d}{dt}s_{0838} = v_{377} - v_{160} - 2v_{211} - 2v_{212} - v_{321} - 0.006715v_{399} \quad (1018)$$

7.218 Species s_0840

Name Fe2+

SBO:0000247 simple chemical

Notes iJO1366:M_fe2_e

Initial concentration 1 mmol·l⁻¹

This species takes part in two reactions (as a reactant in [r_1792](#) and as a modifier in [r_1792](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0840} = 0 \quad (1019)$$

7.219 Species s_0841

Name Fe3+

SBO:0000247 simple chemical

Notes iJO1366:M_fe3_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1793](#) and as a modifier in [r_1793](#), [r_2584](#)).

$$\frac{d}{dt}s_{0841} = v_{378} - 0.007808v_{399} \quad (1020)$$

7.220 Species s_0843

Name Fe3+

SBO:0000247 simple chemical

Notes iJO1366:M_fe3_e

Initial concentration 1 mmol·l⁻¹

This species takes part in two reactions (as a reactant in [r_1793](#) and as a modifier in [r_1793](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0843} = 0 \quad (1021)$$

7.221 Species s_0859

Name Flavin adenine dinucleotide oxidized

SBO:0000247 simple chemical

Notes iJO1366:M_fad_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 26 reactions (as a reactant in r_0576, r_2584 and as a product in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0611, r_0797, r_0798, r_0800 and as a modifier in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0576, r_0611, r_0797, r_0798, r_0800, r_2584).

$$\frac{d}{dt}s_{0859} = v_{86} + v_{87} + v_{88} + v_{89} + v_{90} + v_{91} + v_{92} + v_{161} + v_{211} + v_{212} + v_{214} - v_{156} - 2.23 \cdot 10^{-4}v_{399} \quad (1022)$$

7.222 Species s_0860

Name Flavin adenine dinucleotide reduced

SBO:0000247 simple chemical

Notes iJO1366:M_fadh2_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 22 reactions (as a reactant in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0797, r_0798, r_0800 and as a product in r_0576 and as a modifier in r_0266, r_0267, r_0268, r_0269, r_0270, r_0272, r_0273, r_0576, r_0797, r_0798, r_0800).

$$\frac{d}{dt}s_{0860} = v_{156} - v_{86} - v_{87} - v_{88} - v_{89} - v_{90} - v_{91} - v_{92} - v_{211} - v_{212} - v_{214} \quad (1023)$$

7.223 Species s_0861

Name Flavodoxin reduced

SBO:0000247 simple chemical

Notes iJO1366:M_flxr_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in twelve reactions (as a reactant in r_0084, r_1276, r_1277, r_1278, r_1279 and as a product in r_1255 and as a modifier in r_0084, r_1255, r_1276, r_1277, r_1278, r_1279).

$$\frac{d}{dt}s_{0861} = 2v_{304} - 2v_{17} - 2v_{309} - 2v_{310} - 2v_{311} - 2v_{312} \quad (1024)$$

7.224 Species s_0862

Name flavodoxin semi oxidized

SBO:0000247 simple chemical

Notes iJO1366:M_flxso_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in twelve reactions (as a reactant in [r_1255](#) and as a product in [r_0084](#), [r_1276](#), [r_1277](#), [r_1278](#), [r_1279](#) and as a modifier in [r_0084](#), [r_1255](#), [r_1276](#), [r_1277](#), [r_1278](#), [r_1279](#)).

$$\frac{d}{dt}s_{0862} = 2v_{17} + 2v_{309} + 2v_{310} + 2v_{311} + 2v_{312} - 2v_{304} \quad (1025)$$

7.225 Species s_0863

Name FMN

SBO:0000247 simple chemical

Notes iJO1366:M_fmn_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0611](#) and as a product in [r_1264](#) and as a modifier in [r_0611](#), [r_1264](#)).

$$\frac{d}{dt}s_{0863} = v_{306} - v_{161} \quad (1026)$$

7.226 Species s_0867

Name Formate

SBO:0000247 simple chemical

Notes iJO1366:M_for_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 14 reactions (as a reactant in [r_0622](#), [r_0648](#) and as a product in [r_0092](#), [r_0179](#), [r_0744](#), [r_0745](#), [r_1252](#) and as a modifier in [r_0092](#), [r_0179](#), [r_0622](#), [r_0648](#), [r_0744](#), [r_0745](#), [r_1252](#)).

$$\frac{d}{dt}s_{0867} = v_{19} + 2v_{57} + v_{191} + v_{192} + v_{303} - v_{162} - v_{164} \quad (1027)$$

7.227 Species s_0875

Name Fumarate

SBO:0000247 simple chemical

Notes iJO1366:M_fum_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0632](#) and as a product in [r_0302](#), [r_0304](#), [r_0360](#) and as a modifier in [r_0302](#), [r_0304](#), [r_0360](#), [r_0632](#)).

$$\frac{d}{dt}s_{0875} = v_{96} + v_{98} + v_{104} - v_{163} \quad (1028)$$

7.228 Species s_0896

Name GDP

SBO:0000247 simple chemical

Notes iJO1366:M_gdp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_1045](#) and as a product in [r_0303](#), [r_0754](#), [r_1329](#) and as a modifier in [r_0303](#), [r_0754](#), [r_1045](#), [r_1329](#)).

$$\frac{d}{dt}s_{0896} = v_{97} + v_{193} + v_{325} - v_{250} \quad (1029)$$

7.229 Species s_0903

Name Geranyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_grdp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0655](#) and as a product in [r_0522](#) and as a modifier in [r_0522](#), [r_0655](#)).

$$\frac{d}{dt}s_{0903} = v_{148} - v_{165} \quad (1030)$$

7.230 Species s_0910

Name Glutaryl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_gmeACP_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0150](#) and as a product in [r_0563](#) and as a modifier in [r_0150](#), [r_0563](#)).

$$\frac{d}{dt}s_{0910} = v_{152} - v_{51} \quad (1031)$$

7.231 Species s_0913

Name Glyceraldehyde 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_g3p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 16 reactions (as a reactant in [r_0009](#), [r_0695](#), [r_1357](#), [r_1358](#), [r_1363](#) and as a product in [r_0056](#), [r_1356](#), [r_1367](#) and as a modifier in [r_0009](#), [r_0056](#), [r_0695](#), [r_1356](#), [r_1357](#), [r_1358](#), [r_1363](#), [r_1367](#)).

$$\frac{d}{dt}s_{0913} = v_{12} + v_{337} + v_{341} - v_3 - v_{179} - v_{338} - v_{339} - v_{340} \quad (1032)$$

7.232 Species s_0920

Name Glycerol 3-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_glyc3p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0706](#), [r_0707](#) and as a product in [r_0712](#) and as a modifier in [r_0706](#), [r_0707](#), [r_0712](#)).

$$\frac{d}{dt}s_{0920} = v_{183} - v_{181} - v_{182} \quad (1033)$$

7.233 Species s_0929

Name Glycine

SBO:0000247 simple chemical

Notes iJO1366:M_gly_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_1214](#), [r_2584](#) and as a product in [r_0724](#), [r_0726](#), [r_1348](#) and as a modifier in [r_0724](#), [r_0726](#), [r_1214](#), [r_1348](#), [r_2584](#)).

$$\frac{d}{dt}s_{0929} = v_{184} + v_{185} + v_{334} - v_{289} - 0.6126v_{399} \quad (1034)$$

7.234 Species s_0936

Name Glycolaldehyde

SBO:0000247 simple chemical

Notes iJO1366:M_gcald_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0731](#) and as a product in [r_0507](#) and as a modifier in [r_0507](#), [r_0731](#)).

$$\frac{d}{dt}s_{0936} = v_{141} - v_{186} \quad (1035)$$

7.235 Species s_0937

Name Glycolate

SBO:0000247 simple chemical

Notes iJO1366:M_glyclt_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0734](#), [r_0735](#) and as a product in [r_0731](#) and as a modifier in [r_0731](#), [r_0734](#), [r_0735](#)).

$$\frac{d}{dt}s_{0937} = v_{186} - v_{187} - v_{188} \quad (1036)$$

7.236 Species s_0941

Name Glyoxylate

SBO:0000247 simple chemical

Notes iJO1366:M_glx_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0739](#) and as a product in [r_0734](#), [r_0735](#) and as a modifier in [r_0734](#), [r_0735](#), [r_0739](#)).

$$\frac{d}{dt}s_{0941} = v_{187} + v_{188} - 2v_{189} \quad (1037)$$

7.237 Species s_0942

Name GMP

SBO:0000247 simple chemical

Notes iJO1366:M_gmp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0754](#) and as a product in [r_0741](#) and as a modifier in [r_0741](#), [r_0754](#)).

$$\frac{d}{dt}s_{0942} = v_{190} - v_{193} \quad (1038)$$

7.238 Species s_0945

Name GTP

SBO:0000247 simple chemical

Notes iJO1366:M_gtp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 20 reactions (as a reactant in [r_0303](#), [r_0385](#), [r_0386](#), [r_0445](#), [r_0744](#), [r_0745](#), [r_1278](#), [r_1329](#), [r_2584](#) and as a product in [r_1045](#) and as a modifier in [r_0303](#), [r_0385](#), [r_0386](#), [r_0445](#), [r_0744](#), [r_0745](#), [r_1045](#), [r_1278](#), [r_1329](#), [r_2584](#)).

$$\frac{d}{dt}s_{0945} = v_{250} - v_{97} - v_{115} - v_{116} - v_{126} - v_{191} - v_{192} - v_{311} - v_{325} - 0.2151v_{399} \quad (1039)$$

7.239 Species s_0971

Name Hexadecanoate (n-C16:0)

SBO:0000247 simple chemical

Notes iJO1366:M_hdca_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0259](#) and as a product in [r_0580](#) and as a modifier in [r_0259](#), [r_0580](#)).

$$\frac{d}{dt}s_{0971} = v_{158} - v_{84} \quad (1040)$$

7.240 Species s_0976

Name Hexadecenoate (n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_hdcea_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0260](#) and as a product in [r_0581](#) and as a modifier in [r_0260](#), [r_0581](#)).

$$\frac{d}{dt}s_{0976} = v_{159} - v_{85} \quad (1041)$$

7.241 Species s_0979

Name Hexadecenoyl-CoA (n-C16:1CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_hdcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0581](#) and as a product in [r_0096](#) and as a modifier in [r_0096](#), [r_0581](#)).

$$\frac{d}{dt}s_{0979} = v_{20} - v_{159} \quad (1042)$$

7.242 Species s_0984

Name Hexanoyl-CoA (n-C6:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_hxcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0234](#) and as a product in [r_0270](#) and as a modifier in [r_0234](#), [r_0270](#)).

$$\frac{d}{dt}s_{0984} = v_{90} - v_{74} \quad (1043)$$

7.243 Species s_0991

Name Hydrogen peroxide

SBO:0000247 simple chemical

Notes iJO1366:M_h2o2_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0928](#) and as a product in [r_0829](#) and as a modifier in [r_0829](#), [r_0928](#)).

$$\frac{d}{dt}s_{0991} = v_{222} - v_{229} \quad (1044)$$

7.244 Species s_0994

Name Hydrogen sulfide

SBO:0000247 simple chemical

Notes iJO1366:M_h2s_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0452](#) and as a product in [r_1330](#) and as a modifier in [r_0452](#), [r_1330](#)).

$$\frac{d}{dt}s_{0994} = v_{326} - v_{128} \quad (1045)$$

7.245 Species s_0998

Name Hydroxymethylbilane

SBO:0000247 simple chemical

Notes iJO1366:M_hmbil_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1423](#) and as a product in [r_0777](#) and as a modifier in [r_0777](#), [r_1423](#)).

$$\frac{d}{dt}s_{0998} = v_{204} - v_{362} \quad (1046)$$

7.246 Species s_1005

Name Iminoaspartate

SBO:0000247 simple chemical

Notes iJO1366:M_iasp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1259](#) and as a product in [r_0829](#) and as a modifier in [r_0829](#), [r_1259](#)).

$$\frac{d}{dt}s_{1005} = v_{222} - v_{305} \quad (1047)$$

7.247 Species s_1006

Name IMP

SBO:0000247 simple chemical

Notes iJO1366:M_imp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0303](#), [r_0787](#) and as a product in [r_0786](#) and as a modifier in [r_0303](#), [r_0786](#), [r_0787](#)).

$$\frac{d}{dt}s_{1006} = v_{207} - v_{97} - v_{208} \quad (1048)$$

7.248 Species s_1009

Name Indole

SBO:0000247 simple chemical

Notes iJO1366:M_indole_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1368](#) and as a product in [r_1367](#) and as a modifier in [r_1367](#), [r_1368](#)).

$$\frac{d}{dt}s_{1009} = v_{341} - v_{342} \quad (1049)$$

7.249 Species s_1017

Name IscS sulfur acceptor protein

SBO:0000247 simple chemical

Notes iJO1366:M_iscs_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0802](#) and as a product in [r_0796](#), [r_0797](#), [r_0798](#), [r_0963](#), [r_1346](#) and as a modifier in [r_0796](#), [r_0797](#), [r_0798](#), [r_0802](#), [r_0963](#), [r_1346](#)).

$$\frac{d}{dt}s_{1017} = v_{210} + 2v_{211} + 2v_{212} + v_{236} + v_{332} - v_{216} \quad (1050)$$

7.250 Species s_1018

Name IscS with bound sulfur

SBO:0000247 simple chemical

Notes iJO1366:M_iscssh_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0796](#), [r_0797](#), [r_0798](#), [r_0963](#), [r_1346](#) and as a product in [r_0802](#) and as a modifier in [r_0796](#), [r_0797](#), [r_0798](#), [r_0802](#), [r_0963](#), [r_1346](#)).

$$\frac{d}{dt}s_{1018} = v_{216} - v_{210} - 2v_{211} - 2v_{212} - v_{236} - v_{332} \quad (1051)$$

7.251 Species s_1019

Name IscU scaffold protein

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in r_0796, r_0797 and as a product in r_0799, r_0801 and as a modifier in r_0796, r_0797, r_0799, r_0801).

$$\frac{d}{dt}s_{1019} = v_{213} + v_{215} - v_{210} - v_{211} \quad (1052)$$

7.252 Species s_1020

Name IscU with bound [2Fe-2S] cluster

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_DASH_2fe2s_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in r_0798, r_0799 and as a product in r_0796, r_0797 and as a modifier in r_0796, r_0797, r_0798, r_0799).

$$\frac{d}{dt}s_{1020} = v_{210} + v_{211} - v_{212} - v_{213} \quad (1053)$$

7.253 Species s_1021

Name IscU with bound [4Fe-4S] cluster

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_DASH_4fe4s_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in r_0801 and as a product in r_0800 and as a modifier in r_0800, r_0801).

$$\frac{d}{dt}s_{1021} = v_{214} - v_{215} \quad (1054)$$

7.254 Species s_1022

Name IscU with two bound [2Fe-2S] clusters

SBO:0000247 simple chemical

Notes iJO1366:M_iscu_DASH_2fe2s2_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0800](#) and as a product in [r_0798](#) and as a modifier in [r_0798](#), [r_0800](#)).

$$\frac{d}{dt}s_{1022} = v_{212} - v_{214} \quad (1055)$$

7.255 Species s_1027

Name Isocitrate

SBO:0000247 simple chemical

Notes iJO1366:M_icit_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0806](#) and as a product in [r_0247](#) and as a modifier in [r_0247](#), [r_0806](#)).

$$\frac{d}{dt}s_{1027} = v_{82} - v_{217} \quad (1056)$$

7.256 Species s_1028

Name Isopentenyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_ipdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in ten reactions (as a reactant in [r_0522](#), [r_0655](#), [r_1063](#), [r_1410](#) and as a product in [r_0015](#) and as a modifier in [r_0015](#), [r_0522](#), [r_0655](#), [r_1063](#), [r_1410](#)).

$$\frac{d}{dt}s_{1028} = v_8 - v_{148} - v_{165} - 5v_{255} - 8v_{358} \quad (1057)$$

7.257 Species s_1033

Name KDO(2)-lipid IV(A)

SBO:0000247 simple chemical

Notes iJO1366:M_kdo2lipid4_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0103](#) and as a modifier in [r_0103](#), [r_2584](#)).

$$\frac{d}{dt}s_{1033} = v_{26} - 0.01946v_{399} \quad (1058)$$

7.258 Species s_1038

Name KDO-lipid IV(A)

SBO:0000247 simple chemical

Notes iJO1366:M_kdolipid4_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0103](#) and as a product in [r_0102](#) and as a modifier in [r_0102](#), [r_0103](#)).

$$\frac{d}{dt}s_{1038} = v_{25} - v_{26} \quad (1059)$$

7.259 Species s_1040

Name L-2-Amino-3-oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_2aobut_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0724](#) and as a product in [r_0848](#) and as a modifier in [r_0724](#), [r_0848](#)).

$$\frac{d}{dt}s_{1040} = v_{225} - v_{184} \quad (1060)$$

7.260 Species s_1041

Name L-Alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ala_DASH.L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0222](#), [r_0310](#), [r_1397](#), [r_2584](#) and as a product in [r_0802](#), [r_0815](#) and as a modifier in [r_0222](#), [r_0310](#), [r_0802](#), [r_0815](#), [r_1397](#), [r_2584](#)).

$$\frac{d}{dt}s_{1041} = v_{216} + v_{221} - v_{66} - v_{100} - v_{352} - 0.5137v_{399} \quad (1061)$$

7.261 Species s_1061

Name L-Arginine

SBO:0000247 simple chemical

Notes iJO1366:M_arg_DASH.L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0360](#) and as a modifier in [r_0360](#), [r_2584](#)).

$$\frac{d}{dt}s_{1061} = v_{104} - 0.2958v_{399} \quad (1062)$$

7.262 Species s_1068

Name L-Asparagine

SBO:0000247 simple chemical

Notes iJO1366:M_asn_DASH.L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0365](#) and as a modifier in [r_0365](#), [r_2584](#)).

$$\frac{d}{dt}s_{1068} = v_{106} - 0.2411v_{399} \quad (1063)$$

7.263 Species s_1072

Name L-Aspartate

SBO:0000247 simple chemical

Notes iJO1366:M_asp_DASH_L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 20 reactions (as a reactant in r_0303, r_0361, r_0365, r_0367, r_0368, r_0369, r_0829, r_1210, r_2584 and as a product in r_0370 and as a modifier in r_0303, r_0361, r_0365, r_0367, r_0368, r_0369, r_0370, r_0829, r_1210, r_2584).

$$\frac{d}{dt}s_{1072} = v_{110} - v_{97} - v_{105} - v_{106} - v_{107} - v_{108} - v_{109} - v_{222} - v_{286} - 0.2411v_{399} \quad (1064)$$

7.264 Species s_1075

Name L-Aspartate 4-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_aspsa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in r_0503, r_0769 and as a product in r_0371 and as a modifier in r_0371, r_0503, r_0769).

$$\frac{d}{dt}s_{1075} = v_{111} - v_{138} - v_{200} \quad (1065)$$

7.265 Species s_1081

Name L-Citrulline

SBO:0000247 simple chemical

Notes iJO1366:M_citr_DASH_L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in r_0361 and as a product in r_1065 and as a modifier in r_0361, r_1065).

$$\frac{d}{dt}s_{1081} = v_{257} - v_{105} \quad (1066)$$

7.266 Species s_1082

Name L-Cystathionine

SBO:0000247 simple chemical

Notes iJO1366:M_cyst_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0450](#) and as a product in [r_1057](#) and as a modifier in [r_0450](#), [r_1057](#)).

$$\frac{d}{dt}s_{1082} = v_{254} - v_{127} \quad (1067)$$

7.267 Species s_1083

Name L-Cysteine

SBO:0000247 simple chemical

Notes iJO1366:M_cys_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0802](#), [r_1057](#), [r_1200](#), [r_2584](#) and as a product in [r_0452](#) and as a modifier in [r_0452](#), [r_0802](#), [r_1057](#), [r_1200](#), [r_2584](#)).

$$\frac{d}{dt}s_{1083} = v_{128} - v_{216} - v_{254} - v_{277} - 0.09158v_{399} \quad (1068)$$

7.268 Species s_1095

Name L-Glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_glu_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 56 reactions (as a reactant in [r_0245](#), [r_0370](#), [r_0505](#), [r_0673](#), [r_0676](#), [r_0683](#), [r_0687](#), [r_0765](#), [r_0808](#), [r_0815](#), [r_0854](#), [r_0999](#), [r_1054](#), [r_1081](#), [r_1217](#), [r_1318](#), [r_1376](#), [r_1425](#), [r_2584](#) and as a product in [r_0181](#), [r_0349](#), [r_0440](#), [r_0675](#), [r_0682](#), [r_0684](#), [r_0741](#), [r_0784](#), [r_1212](#) and as a modifier in [r_0181](#), [r_0245](#), [r_0349](#), [r_0370](#), [r_0440](#), [r_0505](#), [r_0673](#), [r_0675](#), [r_0676](#), [r_0682](#), [r_0683](#), [r_0684](#), [r_0687](#), [r_0741](#), [r_0765](#), [r_0784](#), [r_0808](#), [r_0815](#), [r_0854](#), [r_0999](#), [r_1054](#), [r_1081](#), [r_1212](#), [r_1217](#), [r_1318](#), [r_1376](#), [r_1425](#), [r_2584](#)).

$$\frac{d}{dt}s_{-1095} = v_{58} + v_{102} + v_{125} + v_{170} + v_{174} + v_{176} + v_{190} + v_{205} + v_{288} - v_{80} - v_{110} - v_{140} - v_{169} - v_{171} - v_{175} - v_{178} - v_{199} - v_{218} - v_{221} - v_{226} - v_{243} - v_{253} - v_{263} - v_{291} - v_{324} - v_{344} - v_{363} - 0.2632v_{399} \quad (1069)$$

7.269 Species s_-1098

Name L-Glutamate 1-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_glu1sa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0678](#) and as a product in [r_0686](#) and as a modifier in [r_0678](#), [r_0686](#)).

$$\frac{d}{dt}s_{-1098} = v_{177} - v_{172} \quad (1070)$$

7.270 Species s_-1099

Name L-Glutamate 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_glu5p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0679](#) and as a product in [r_0673](#) and as a modifier in [r_0673](#), [r_0679](#)).

$$\frac{d}{dt}s_{-1099} = v_{169} - v_{173} \quad (1071)$$

7.271 Species s_-1100

Name L-Glutamate 5-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_glu5sa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0835](#) and as a product in [r_0679](#) and as a modifier in [r_0679](#), [r_0835](#)).

$$\frac{d}{dt}s_{-1100} = v_{173} - v_{223} \quad (1072)$$

7.272 Species s_1101

Name L-Glutamine

SBO:0000247 simple chemical

Notes iJO1366:M_gln_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 20 reactions (as a reactant in [r_0181](#), [r_0349](#), [r_0440](#), [r_0682](#), [r_0684](#), [r_0741](#), [r_0784](#), [r_1212](#), [r_2584](#) and as a product in [r_0683](#) and as a modifier in [r_0181](#), [r_0349](#), [r_0440](#), [r_0682](#), [r_0683](#), [r_0684](#), [r_0741](#), [r_0784](#), [r_1212](#), [r_2584](#)).

$$\frac{d}{dt}s_{1101} = v_{175} - v_{58} - v_{102} - v_{125} - v_{174} - v_{176} - v_{190} - v_{205} - v_{288} - 0.2632v_{399} \quad (1073)$$

7.273 Species s_1105

Name L-Glutamyl-tRNA(Glu)

SBO:0000247 simple chemical

Notes iJO1366:M_glutrnna_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0686](#) and as a product in [r_0687](#) and as a modifier in [r_0686](#), [r_0687](#)).

$$\frac{d}{dt}s_{1105} = v_{178} - v_{177} \quad (1074)$$

7.274 Species s_1106

Name L-Histidine

SBO:0000247 simple chemical

Notes iJO1366:M_his_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0763](#) and as a modifier in [r_0763](#), [r_2584](#)).

$$\frac{d}{dt}s_{1106} = v_{197} - 0.09474v_{399} \quad (1075)$$

7.275 Species s_1109

Name L-Histidinol

SBO:0000247 simple chemical

Notes iJO1366:M_histd_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0763](#) and as a product in [r_0764](#) and as a modifier in [r_0763](#), [r_0764](#)).

$$\frac{d}{dt}s_{1109} = v_{198} - v_{197} \quad (1076)$$

7.276 Species s_1110

Name L-Histidinol phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_hisp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0764](#) and as a product in [r_0765](#) and as a modifier in [r_0764](#), [r_0765](#)).

$$\frac{d}{dt}s_{1110} = v_{199} - v_{198} \quad (1077)$$

7.277 Species s_1112

Name L-Homocysteine

SBO:0000247 simple chemical

Notes iJO1366:M_hcys_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0954](#) and as a product in [r_0450](#), [r_1291](#) and as a modifier in [r_0450](#), [r_0954](#), [r_1291](#)).

$$\frac{d}{dt}s_{1112} = v_{127} + v_{316} - v_{234} \quad (1078)$$

7.278 Species s_1113

Name L-Homoserine

SBO:0000247 simple chemical

Notes iJO1366:M_hom_DASH_L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0770](#), [r_0771](#) and as a product in [r_0769](#) and as a modifier in [r_0769](#), [r_0770](#), [r_0771](#)).

$$\frac{d}{dt}s_{1113} = v_{200} - v_{201} - v_{202} \quad (1079)$$

7.279 Species s_1119

Name L-Isoleucine

SBO:0000247 simple chemical

Notes iJO1366:M_ile_DASH_L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0808](#) and as a modifier in [r_0808](#), [r_2584](#)).

$$\frac{d}{dt}s_{1119} = v_{218} - 0.2905v_{399} \quad (1080)$$

7.280 Species s_1127

Name L-Leucine

SBO:0000247 simple chemical

Notes iJO1366:M_leu_DASH_L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0854](#) and as a modifier in [r_0854](#), [r_2584](#)).

$$\frac{d}{dt}s_{1127} = v_{226} - 0.4505v_{399} \quad (1081)$$

7.281 Species s_1131

Name L-Lysine

SBO:0000247 simple chemical

Notes iJO1366:M_lys_DASH.L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0499](#) and as a modifier in [r_0499](#), [r_2584](#)).

$$\frac{d}{dt}s_{1131} = v_{134} - 0.3432v_{399} \quad (1082)$$

7.282 Species s_1138

Name L-Malate

SBO:0000247 simple chemical

Notes iJO1366:M_mal_DASH.L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0925](#) and as a product in [r_0632](#), [r_0928](#) and as a modifier in [r_0632](#), [r_0925](#), [r_0928](#)).

$$\frac{d}{dt}s_{1138} = v_{163} + v_{229} - v_{228} \quad (1083)$$

7.283 Species s_1141

Name L-Methionine

SBO:0000247 simple chemical

Notes iJO1366:M_met_DASH.L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in ten reactions (as a reactant in [r_0951](#), [r_2584](#) and as a product in [r_0383](#), [r_0954](#), [r_1375](#) and as a modifier in [r_0383](#), [r_0951](#), [r_0954](#), [r_1375](#), [r_2584](#)).

$$\frac{d}{dt}s_{1141} = v_{113} + v_{234} + v_{343} - v_{233} - 0.1537v_{399} \quad (1084)$$

7.284 Species s_1151

Name L-Phenylalanine

SBO:0000247 simple chemical

Notes iJO1366:M_phe_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1081](#) and as a modifier in [r_1081](#), [r_2584](#)).

$$\frac{d}{dt}s_{1151} = v_{263} - 0.1853v_{399} \quad (1085)$$

7.285 Species s_1155

Name L-Proline

SBO:0000247 simple chemical

Notes iJO1366:M_pro_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1250](#) and as a modifier in [r_1250](#), [r_2584](#)).

$$\frac{d}{dt}s_{1155} = v_{301} - 0.2211v_{399} \quad (1086)$$

7.286 Species s_1170

Name L-Serine

SBO:0000247 simple chemical

Notes iJO1366:M_ser_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0726](#), [r_1130](#), [r_1131](#), [r_1301](#), [r_2584](#) and as a product in [r_1134](#) and as a modifier in [r_0726](#), [r_1130](#), [r_1131](#), [r_1134](#), [r_1301](#), [r_2584](#)).

$$\frac{d}{dt}s_{1170} = v_{268} - v_{185} - v_{266} - v_{267} - v_{317} - 0.2158v_{399} \quad (1087)$$

7.287 Species s_1179

Name L-Threonine

SBO:0000247 simple chemical

Notes iJO1366:M_thr_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0847](#), [r_0848](#), [r_1348](#), [r_2584](#) and as a product in [r_1349](#) and as a modifier in [r_0847](#), [r_0848](#), [r_1348](#), [r_1349](#), [r_2584](#)).

$$\frac{d}{dt}s_{1179} = v_{335} - v_{224} - v_{225} - v_{334} - 0.2537v_{399} \quad (1088)$$

7.288 Species s_1185

Name L-Tryptophan

SBO:0000247 simple chemical

Notes iJO1366:M_trp_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1368](#) and as a modifier in [r_1368](#), [r_2584](#)).

$$\frac{d}{dt}s_{1185} = v_{342} - 0.05684v_{399} \quad (1089)$$

7.289 Species s_1189

Name L-Tyrosine

SBO:0000247 simple chemical

Notes iJO1366:M_tyr_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1375](#), [r_2584](#) and as a product in [r_1376](#) and as a modifier in [r_1375](#), [r_1376](#), [r_2584](#)).

$$\frac{d}{dt}s_{1189} = v_{344} - v_{343} - 0.1379v_{399} \quad (1090)$$

7.290 Species s_1193

Name L-Valine

SBO:0000247 simple chemical

Notes iJO1366:M_val_DASH_L_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1425](#) and as a modifier in [r_1425](#), [r_2584](#)).

$$\frac{d}{dt}s_{1193} = v_{363} - 0.4232v_{399} \quad (1091)$$

7.291 Species s_1204

Name Lipid A Disaccharide

SBO:0000247 simple chemical

Notes iJO1366:M_lipidAds_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1337](#) and as a product in [r_0857](#) and as a modifier in [r_0857](#), [r_1337](#)).

$$\frac{d}{dt}s_{1204} = v_{227} - v_{328} \quad (1092)$$

7.292 Species s_1211

Name LL-2,6-Diaminoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_26dap_DASH_LL_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0500](#) and as a product in [r_1316](#) and as a modifier in [r_0500](#), [r_1316](#)).

$$\frac{d}{dt}s_{1211} = v_{323} - v_{135} \quad (1093)$$

7.293 Species s_1212

Name magnesium

SBO:0000247 simple chemical

Notes iJO1366:M_mg2_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1906](#) and as a modifier in [r_1906](#), [r_2584](#)).

$$\frac{d}{dt}s_{1212} = v_{379} - 0.008675v_{399} \quad (1094)$$

7.294 Species s_1214

Name magnesium

SBO:0000247 simple chemical

Notes iJO1366:M_mg2_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1906](#) and as a modifier in [r_1906](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1214} = 0 \quad (1095)$$

7.295 Species s_1216

Name Malonyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_malACP_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0147](#), [r_0150](#), [r_0166](#) and as a product in [r_0935](#) and as a modifier in [r_0147](#), [r_0150](#), [r_0166](#), [r_0935](#)).

$$\frac{d}{dt}s_{1216} = v_{231} - v_{48} - v_{51} - v_{53} \quad (1096)$$

7.296 Species s_1217

Name Malonyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_malcoa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0934](#), [r_0935](#) and as a product in [r_0237](#) and as a modifier in [r_0237](#), [r_0934](#), [r_0935](#)).

$$\frac{d}{dt}s_{1217} = v_{77} - v_{230} - v_{231} \quad (1097)$$

7.297 Species s_1218

Name malonyl-CoA methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_malcoame_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0147](#) and as a product in [r_0934](#) and as a modifier in [r_0147](#), [r_0934](#)).

$$\frac{d}{dt}s_{1218} = v_{230} - v_{48} \quad (1098)$$

7.298 Species s_1239

Name Menaquinol 8

SBO:0000247 simple chemical

Notes iJO1366:M_mql8_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1581](#) and as a product in [r_0512](#), [r_0735](#) and as a modifier in [r_0512](#), [r_0735](#), [r_1581](#)).

$$\frac{d}{dt}s_{1239} = v_{144} + v_{188} - v_{372} \quad (1099)$$

7.299 Species s_1240

Name Menaquinone 8

SBO:0000247 simple chemical

Notes iJO1366:M_mqn8_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in r_0512, r_0735 and as a product in r_1581 and as a modifier in r_0512, r_0735, r_1581).

$$\frac{d}{dt}s_{1240} = v_{372} - v_{144} - v_{188} \quad (1100)$$

7.300 Species s_1242

Name meso-2,6-Diaminoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_26dap_DASH_M_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in r_0499, r_1400 and as a product in r_0500 and as a modifier in r_0499, r_0500, r_1400).

$$\frac{d}{dt}s_{1242} = v_{135} - v_{134} - v_{354} \quad (1101)$$

7.301 Species s_1248

Name Methanol

SBO:0000247 simple chemical

Notes iJO1366:M_meoh_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in r_1939 and as a product in r_1220 and as a modifier in r_1220, r_1939).

$$\frac{d}{dt}s_{1248} = v_{293} - v_{381} \quad (1102)$$

7.302 Species s_1250

Name Methanol

SBO:0000247 simple chemical

Notes iJO1366:M_meoh_e

Initial concentration $0 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in [r_1939](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1250} = 0 \quad (1103)$$

7.303 Species s_1255

Name Mn²⁺

SBO:0000247 simple chemical

Notes iJO1366:M_mn2_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1923](#) and as a modifier in [r_1923](#), [r_2584](#)).

$$\frac{d}{dt}s_{1255} = v_{380} - 6.91 \cdot 10^{-4}v_{399} \quad (1104)$$

7.304 Species s_1257

Name Mn²⁺

SBO:0000247 simple chemical

Notes iJO1366:M_mn2_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1923](#) and as a modifier in [r_1923](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1257} = 0 \quad (1105)$$

7.305 Species s_1258

Name MoaD Protein with bound AMP

SBO:0000247 simple chemical

Notes iJO1366:M_moadamp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0963](#) and as a product in [r_0969](#) and as a modifier in [r_0963](#), [r_0969](#)).

$$\frac{d}{dt}s_{1258} = v_{240} - v_{236} \quad (1106)$$

7.306 Species s_1259

Name MoaD Protein with carboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_moadcoo_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0969](#) and as a product in [r_0968](#) and as a modifier in [r_0968](#), [r_0969](#)).

$$\frac{d}{dt}s_{1259} = 2v_{239} - v_{240} \quad (1107)$$

7.307 Species s_1260

Name MoaD Protein with thiocarboxylate

SBO:0000247 simple chemical

Notes iJO1366:M_moadcosh_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0968](#) and as a product in [r_0963](#) and as a modifier in [r_0963](#), [r_0968](#)).

$$\frac{d}{dt}s_{1260} = v_{236} - 2v_{239} \quad (1108)$$

7.308 Species s_1261

Name Molybdate

SBO:0000247 simple chemical

Notes iJO1366:M_mobd_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0964](#), [r_2584](#) and as a product in [r_1943](#) and as a modifier in [r_0964](#), [r_1943](#), [r_2584](#)).

$$\frac{d}{dt}s_{1261} = v_{382} - v_{237} - 7 \cdot 10^{-6}v_{399} \quad (1109)$$

7.309 Species s_1263

Name Molybdate

SBO:0000247 simple chemical

Notes iJO1366:M_mobd_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1943](#) and as a modifier in [r_1943](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1263} = 0 \quad (1110)$$

7.310 Species s_1264

Name molybdenum cofactor

SBO:0000247 simple chemical

Notes iJO1366:M_moco_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0384](#) and as a product in [r_0964](#) and as a modifier in [r_0384](#), [r_0964](#)).

$$\frac{d}{dt}s_{1264} = v_{237} - v_{114} \quad (1111)$$

7.311 Species s_1265

Name molybdopterin

SBO:0000247 simple chemical

Notes iJO1366:M_mpt_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0965](#) and as a product in [r_0968](#) and as a modifier in [r_0965](#), [r_0968](#)).

$$\frac{d}{dt}s_{1265} = v_{239} - v_{238} \quad (1112)$$

7.312 Species s_1274

Name N(omega)-(L-Arginino)succinate

SBO:0000247 simple chemical

Notes iJO1366:M_argsuc_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0360](#) and as a product in [r_0361](#) and as a modifier in [r_0360](#), [r_0361](#)).

$$\frac{d}{dt}s_{1274} = v_{105} - v_{104} \quad (1113)$$

7.313 Species s_1277

Name N-((R)-4-Phosphopantethenoyl)-L-cysteine

SBO:0000247 simple chemical

Notes iJO1366:M_4ppcys_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1201](#) and as a product in [r_1200](#) and as a modifier in [r_1200](#), [r_1201](#)).

$$\frac{d}{dt}s_{1277} = v_{277} - v_{278} \quad (1114)$$

7.314 Species s_1278

Name N-(5-Phospho-D-ribosyl)anthranilate

SBO:0000247 simple chemical

Notes iJO1366:M_pran_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1211](#) and as a product in [r_0348](#) and as a modifier in [r_0348](#), [r_1211](#)).

$$\frac{d}{dt}s_{1278} = v_{101} - v_{287} \quad (1115)$$

7.315 Species s_1287

Name N-Acetyl-D-glucosamine 1-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_acgam1p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1392](#) and as a product in [r_0658](#) and as a modifier in [r_0658](#), [r_1392](#)).

$$\frac{d}{dt}s_{1287} = v_{166} - v_{350} \quad (1116)$$

7.316 Species s_1302

Name N-Acetyl-L-glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_acglu_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0243](#) and as a product in [r_0999](#) and as a modifier in [r_0243](#), [r_0999](#)).

$$\frac{d}{dt}s_{1302} = v_{243} - v_{78} \quad (1117)$$

7.317 Species s_1303

Name N-Acetyl-L-glutamate 5-semialdehyde

SBO:0000247 simple chemical

Notes iJO1366:M_acg5sa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0245](#) and as a product in [r_0996](#) and as a modifier in [r_0245](#), [r_0996](#)).

$$\frac{d}{dt}s_{1303} = v_{242} - v_{80} \quad (1118)$$

7.318 Species s_1304

Name N-Acetyl-L-glutamyl 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_acg5p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0996](#) and as a product in [r_0243](#) and as a modifier in [r_0243](#), [r_0996](#)).

$$\frac{d}{dt}s_{1304} = v_{78} - v_{242} \quad (1119)$$

7.319 Species s_1312

Name N-Carbamoyl-L-aspartate

SBO:0000247 simple chemical

Notes iJO1366:M_cbaspc_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0511](#) and as a product in [r_0368](#) and as a modifier in [r_0368](#), [r_0511](#)).

$$\frac{d}{dt}s_{1312} = v_{108} - v_{143} \quad (1120)$$

7.320 Species s_1315

Name N-Succinyl-2-L-amino-6-oxoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_sl2a6o_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1318](#) and as a product in [r_1338](#) and as a modifier in [r_1318](#), [r_1338](#)).

$$\frac{d}{dt}s_{1315} = v_{329} - v_{324} \quad (1121)$$

7.321 Species s_1316

Name N-Succinyl-LL-2,6-diaminoheptanedioate

SBO:0000247 simple chemical

Notes iJO1366:M_sl26da_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1316](#) and as a product in [r_1318](#) and as a modifier in [r_1316](#), [r_1318](#)).

$$\frac{d}{dt}s_{1316} = v_{324} - v_{323} \quad (1122)$$

7.322 Species s_1318

Name N1-(5-Phospho-D-ribosyl)glycinamide

SBO:0000247 simple chemical

Notes iJO1366:M_gar_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0648](#) and as a product in [r_1214](#) and as a modifier in [r_0648](#), [r_1214](#)).

$$\frac{d}{dt}s_{1318} = v_{289} - v_{164} \quad (1123)$$

7.323 Species s_1321

Name N2-Acetyl-L-ornithine

SBO:0000247 simple chemical

Notes iJO1366:M_acorn_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0244](#) and as a product in [r_0245](#) and as a modifier in [r_0244](#), [r_0245](#)).

$$\frac{d}{dt}s_{1321} = v_{80} - v_{79} \quad (1124)$$

7.324 Species s_1322

Name N2-Formyl-N1-(5-phospho-D-ribosyl)glycinamide

SBO:0000247 simple chemical

Notes iJO1366:M_fgam_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1212](#) and as a product in [r_0648](#) and as a modifier in [r_0648](#), [r_1212](#)).

$$\frac{d}{dt}s_{1322} = v_{164} - v_{288} \quad (1125)$$

7.325 Species s_1327

Name N6-(1,2-Dicarboxyethyl)-AMP

SBO:0000247 simple chemical

Notes iJO1366:M_dcamp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0304](#) and as a product in [r_0303](#) and as a modifier in [r_0303](#), [r_0304](#)).

$$\frac{d}{dt}s_{1327} = v_{97} - v_{98} \quad (1126)$$

7.326 Species s_1329

Name nickel

SBO:0000247 simple chemical

Notes iJO1366:M_ni2_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1968](#) and as a modifier in [r_1968](#), [r_2584](#)).

$$\frac{d}{dt}s_{1329} = v_{385} - 3.23 \cdot 10^{-4}v_{399} \quad (1127)$$

7.327 Species s_1331

Name nickel

SBO:0000247 simple chemical

Notes iJO1366:M_ni2_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1968](#) and as a modifier in [r_1968](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1331} = 0 \quad (1128)$$

7.328 Species s_1333

Name Nicotinamide adenine dinucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_nad_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 70 reactions (as a reactant in [r_0139](#), [r_0179](#), [r_0224](#), [r_0573](#), [r_0574](#), [r_0695](#), [r_0731](#), [r_0763](#), [r_0787](#), [r_0848](#), [r_0925](#), [r_1006](#), [r_1151](#), [r_1225](#), [r_1245](#), [r_1251](#), [r_1306](#), [r_2195](#), [r_2519](#), [r_2584](#) and as a product in [r_0014](#), [r_0015](#), [r_0128](#), [r_0129](#), [r_0130](#), [r_0131](#), [r_0133](#), [r_0134](#), [r_0135](#), [r_0211](#), [r_0576](#), [r_0963](#), [r_1008](#), [r_1335](#), [r_1962](#) and as a modifier in [r_0014](#), [r_0015](#), [r_0128](#), [r_0129](#), [r_0130](#), [r_0131](#), [r_0133](#), [r_0134](#), [r_0135](#), [r_0139](#), [r_0179](#), [r_0211](#), [r_0224](#), [r_0573](#), [r_0574](#), [r_0576](#), [r_0695](#), [r_0731](#), [r_0763](#), [r_0787](#), [r_0848](#), [r_0925](#), [r_0963](#), [r_1006](#), [r_1008](#), [r_1151](#), [r_1225](#), [r_1245](#), [r_1251](#), [r_1306](#), [r_1335](#), [r_1962](#), [r_2195](#), [r_2519](#), [r_2584](#)).

$$\begin{aligned} \frac{d}{dt}s_{-1333} = & v_7 + v_8 + v_{36} + v_{37} + v_{38} + v_{39} + v_{40} + v_{41} + v_{42} + v_{61} + v_{156} + v_{236} + v_{245} \\ & + v_{327} + v_{384} - v_{44} - v_{57} - v_{67} - v_{154} - v_{155} - v_{179} - v_{186} - 2v_{197} - v_{208} - v_{225} \\ & - v_{228} - v_{244} - v_{273} - v_{297} - v_{300} - v_{302} - v_{320} - v_{391} - v_{393} - 0.001831v_{399} \end{aligned} \quad (1129)$$

7.329 Species s_-1334

Name Nicotinamide adenine dinucleotide - reduced

SBO:0000247 simple chemical

Notes iJO1366:M_nadh_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 64 reactions (as a reactant in r_0014, r_0015, r_0128, r_0129, r_-0130, r_0131, r_0133, r_0134, r_0135, r_0211, r_0576, r_0963, r_1335, r_1962 and as a product in r_0139, r_0179, r_0224, r_0573, r_0574, r_0695, r_0731, r_0763, r_0787, r_-0848, r_0925, r_1151, r_1225, r_1245, r_1251, r_1306, r_2195, r_2519 and as a modifier in r_0014, r_0015, r_0128, r_0129, r_0130, r_0131, r_0133, r_0134, r_0135, r_0139, r_0179, r_0211, r_0224, r_0573, r_0574, r_0576, r_0695, r_0731, r_0763, r_0787, r_0848, r_0925, r_0963, r_1151, r_1225, r_1245, r_1251, r_1306, r_1335, r_1962, r_2195, r_2519).

$$\begin{aligned} \frac{d}{dt}s_{-1334} = & v_{44} + v_{57} + v_{67} + v_{154} + v_{155} + v_{179} + v_{186} + 2v_{197} + v_{208} + v_{225} \\ & + v_{228} + v_{273} + v_{297} + v_{300} + v_{302} + v_{320} + v_{391} + v_{393} - v_7 - v_8 - v_{36} \\ & - v_{37} - v_{38} - v_{39} - v_{40} - v_{41} - v_{42} - v_{61} - v_{156} - v_{236} - v_{327} - v_{384} \end{aligned} \quad (1130)$$

7.330 Species s_-1335

Name Nicotinamide adenine dinucleotide phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_nadp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 64 reactions (as a reactant in r_0660, r_0806, r_0957, r_1962, r_-2584 and as a product in r_0011, r_0063, r_0146, r_0149, r_0154, r_0212, r_0371, r_0502, r_0504, r_0563, r_0564, r_0675, r_0679, r_0686, r_0712, r_0769, r_0811, r_0812, r_0996, r_1006, r_1250, r_1304, r_1330, r_1346, r_1347, r_1375, r_1388 and as a modifier in r_0011, r_0063, r_0146, r_0149, r_0154, r_0212, r_0371, r_0502, r_0504, r_0563, r_0564, r_0660, r_0675, r_0679, r_0686, r_0712, r_0769, r_0806, r_0811, r_0812, r_0957, r_0996, r_1006, r_1250, r_1304, r_1330, r_1346, r_1347, r_1375, r_1388, r_1962, r_2584).

$$\begin{aligned} \frac{d}{dt}s_{-1335} = & v_4 + v_{13} + v_{47} + v_{50} + v_{52} + v_{62} + v_{111} + v_{137} + v_{139} + v_{152} + v_{153} + v_{170} \\ & + v_{173} + v_{177} + v_{183} + v_{200} + v_{219} + v_{220} + v_{242} + v_{244} + v_{301} + v_{318} + 3v_{326} \\ & + v_{332} + v_{333} + v_{343} + v_{347} - v_{167} - v_{217} - v_{235} - v_{384} - 4.47 \cdot 10^{-4}v_{399} \end{aligned} \quad (1131)$$

7.331 Species s_-1336

Name Nicotinamide adenine dinucleotide phosphate - reduced

SBO:0000247 simple chemical

Notes iJO1366:M_nadph_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 60 reactions (as a reactant in [r_0011](#), [r_0063](#), [r_0146](#), [r_0149](#), [r_0154](#), [r_0212](#), [r_0371](#), [r_0502](#), [r_0504](#), [r_0563](#), [r_0564](#), [r_0675](#), [r_0679](#), [r_0686](#), [r_0712](#), [r_0769](#), [r_0811](#), [r_0812](#), [r_0996](#), [r_1250](#), [r_1304](#), [r_1330](#), [r_1346](#), [r_1347](#), [r_1375](#), [r_1388](#) and as a product in [r_0660](#), [r_0806](#), [r_0957](#), [r_1962](#) and as a modifier in [r_0011](#), [r_0063](#), [r_0146](#), [r_0149](#), [r_0154](#), [r_0212](#), [r_0371](#), [r_0502](#), [r_0504](#), [r_0563](#), [r_0564](#), [r_0660](#), [r_0675](#), [r_0679](#), [r_0686](#), [r_0712](#), [r_0769](#), [r_0806](#), [r_0811](#), [r_0812](#), [r_0957](#), [r_0996](#), [r_1250](#), [r_1304](#), [r_1330](#), [r_1346](#), [r_1347](#), [r_1375](#), [r_1388](#), [r_1962](#)).

$$\begin{aligned} \frac{d}{dt}s_{-1336} = & v_{167} + v_{217} + v_{235} + v_{384} - v_4 - v_{13} - v_{47} - v_{50} - v_{52} - v_{62} - v_{111} \\ & - v_{137} - v_{139} - v_{152} - v_{153} - v_{170} - v_{173} - v_{177} - v_{183} - v_{200} - v_{219} \\ & - v_{220} - v_{242} - v_{301} - v_{318} - 3v_{326} - v_{332} - v_{333} - v_{343} - v_{347} \end{aligned} \quad (1132)$$

7.332 Species s_-1340

Name Nicotinate D-ribonucleotide

SBO:0000247 simple chemical

Notes iJO1366:M_nicrnt_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1019](#) and as a product in [r_1021](#) and as a modifier in [r_1019](#), [r_1021](#)).

$$\frac{d}{dt}s_{-1340} = v_{247} - v_{246} \quad (1133)$$

7.333 Species s_1358

Name O-Acetyl-L-serine

SBO:0000247 simple chemical

Notes iJO1366:M_acser_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0452](#) and as a product in [r_1301](#) and as a modifier in [r_0452](#), [r_1301](#)).

$$\frac{d}{dt}s_{1358} = v_{317} - v_{128} \quad (1134)$$

7.334 Species s_1362

Name O-Phospho-4-hydroxy-L-threonine

SBO:0000247 simple chemical

Notes iJO1366:M_phthr_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1245](#) and as a product in [r_1054](#) and as a modifier in [r_1054](#), [r_1245](#)).

$$\frac{d}{dt}s_{1362} = v_{253} - v_{300} \quad (1135)$$

7.335 Species s_1363

Name O-Phospho-L-homoserine

SBO:0000247 simple chemical

Notes iJO1366:M_phom_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1349](#) and as a product in [r_0770](#) and as a modifier in [r_0770](#), [r_1349](#)).

$$\frac{d}{dt}s_{1363} = v_{201} - v_{335} \quad (1136)$$

7.336 Species s_1364

Name O-Phospho-L-serine

SBO:0000247 simple chemical

Notes iJO1366:M_pser_DASH_L_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1134](#) and as a product in [r_1217](#) and as a modifier in [r_1134](#), [r_1217](#)).

$$\frac{d}{dt}s_{1364} = v_{291} - v_{268} \quad (1137)$$

7.337 Species s_1367

Name O-Succinyl-L-homoserine

SBO:0000247 simple chemical

Notes iJO1366:M_suchms_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1057](#) and as a product in [r_0771](#) and as a modifier in [r_0771](#), [r_1057](#)).

$$\frac{d}{dt}s_{1367} = v_{202} - v_{254} \quad (1138)$$

7.338 Species s_1372

Name O2

SBO:0000247 simple chemical

Notes iJO1366:M_o2_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in [r_0436](#), [r_0829](#), [r_1230](#), [r_1581](#), [r_1582](#) and as a product in [r_0928](#), [r_2002](#) and as a modifier in [r_0436](#), [r_0829](#), [r_0928](#), [r_1230](#), [r_1581](#), [r_1582](#), [r_2002](#)).

$$\frac{d}{dt}s_{1372} = v_{229} + v_{386} - v_{124} - v_{222} - 1.5v_{298} - 0.5v_{372} - 0.5v_{373} \quad (1139)$$

7.339 Species s_1374

Name O2

SBO:0000247 simple chemical

Notes iJO1366:M_o2_e

Initial concentration 1 mmol · l⁻¹

This species takes part in two reactions (as a reactant in [r_2002](#) and as a modifier in [r_2002](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1374} = 0 \quad (1140)$$

7.340 Species s_1390

Name Octanoyl-CoA (n-C8:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_occoa_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0235](#) and as a product in [r_0272](#) and as a modifier in [r_0235](#), [r_0272](#)).

$$\frac{d}{dt}s_{1390} = v_{91} - v_{75} \quad (1141)$$

7.341 Species s_1391

Name Ornithine

SBO:0000247 simple chemical

Notes iJO1366:M_orn_c

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_1065](#) and as a product in [r_0244](#) and as a modifier in [r_0244](#), [r_1065](#)).

$$\frac{d}{dt}s_{1391} = v_{79} - v_{257} \quad (1142)$$

7.342 Species s_1394

Name Orotate

SBO:0000247 simple chemical

Notes iJO1366:M_orot_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1067](#) and as a product in [r_0501](#), [r_0512](#) and as a modifier in [r_0501](#), [r_0512](#), [r_1067](#)).

$$\frac{d}{dt}s_{1394} = v_{136} + v_{144} - v_{258} \quad (1143)$$

7.343 Species s_1397

Name Orotidine 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_orot5p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1068](#) and as a product in [r_1067](#) and as a modifier in [r_1067](#), [r_1068](#)).

$$\frac{d}{dt}s_{1397} = v_{258} - v_{259} \quad (1144)$$

7.344 Species s_1399

Name Oxaloacetate

SBO:0000247 simple chemical

Notes iJO1366:M_oaa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0370](#), [r_0428](#), [r_0928](#) and as a product in [r_0925](#), [r_1141](#) and as a modifier in [r_0370](#), [r_0428](#), [r_0925](#), [r_0928](#), [r_1141](#)).

$$\frac{d}{dt}s_{1399} = v_{228} + v_{271} - v_{110} - v_{123} - v_{229} \quad (1145)$$

7.345 Species s_1406

Name Oxidized thioredoxin

SBO:0000247 simple chemical

Notes iJO1366:M_trdox_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1347](#) and as a product in [r_1139](#) and as a modifier in [r_1139](#), [r_1347](#)).

$$\frac{d}{dt}s_{1406} = v_{270} - v_{333} \quad (1146)$$

7.346 Species s_1407

Name p-Cresol

SBO:0000247 simple chemical

Notes iJO1366:M_4crsol_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2537](#) and as a product in [r_1375](#) and as a modifier in [r_1375](#), [r_2537](#)).

$$\frac{d}{dt}s_{1407} = v_{343} - v_{397} \quad (1147)$$

7.347 Species s_1411

Name Palmitoyl-ACP (n-C16:0ACP)

SBO:0000247 simple chemical

Notes iJO1366:M_palmACP_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0013](#), [r_0706](#) and as a product in [r_0259](#) and as a modifier in [r_0013](#), [r_0259](#), [r_0706](#)).

$$\frac{d}{dt}s_{1411} = v_{84} - v_6 - v_{181} \quad (1148)$$

7.348 Species s_1412

Name Palmitoyl-CoA (n-C16:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_pmtcoa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0580](#) and as a product in [r_0269](#) and as a modifier in [r_0269](#), [r_0580](#)).

$$\frac{d}{dt}s_{1412} = v_{89} - v_{158} \quad (1149)$$

7.349 Species s_1413

Name Pantetheine 4'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pan4p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1074](#) and as a product in [r_1201](#) and as a modifier in [r_1074](#), [r_1201](#)).

$$\frac{d}{dt}s_{1413} = v_{278} - v_{260} \quad (1150)$$

7.350 Species s_1429

Name Phenylpyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_phpyr_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1081](#) and as a product in [r_1224](#) and as a modifier in [r_1081](#), [r_1224](#)).

$$\frac{d}{dt}s_{1429} = v_{296} - v_{263} \quad (1151)$$

7.351 Species s_1430

Name Phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pi_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 105 reactions (as a reactant in r_0695, r_1521 and as a product in r_0085, r_0099, r_0100, r_0101, r_0106, r_0175, r_0237, r_0303, r_0368, r_0371, r_0425, r_0440, r_0463, r_0489, r_0505, r_0622, r_0648, r_0679, r_0683, r_0764, r_0951, r_0996, r_1047, r_1065, r_1134, r_1141, r_1206, r_1208, r_1210, r_1212, r_1214, r_1218, r_1222, r_1232, r_1245, r_1259, r_1265, r_1315, r_1329, r_1349, r_1389, r_1397, r_1399, r_1400, r_1401, r_1413, r_2011, r_2195, r_2310, r_2521, r_2584 and as a modifier in r_0085, r_0099, r_0100, r_0101, r_0106, r_0175, r_0237, r_0303, r_0368, r_0371, r_0425, r_0440, r_0463, r_0489, r_0505, r_0622, r_0648, r_0679, r_0683, r_0695, r_0764, r_0951, r_0996, r_1047, r_1065, r_1134, r_1141, r_1206, r_1208, r_1210, r_1212, r_1214, r_1218, r_1222, r_1232, r_1245, r_1259, r_1265, r_1315, r_1329, r_1349, r_1389, r_1397, r_1399, r_1400, r_1401, r_1413, r_1521, r_2011, r_2195, r_2310, r_2521).

$$\begin{aligned}\frac{d}{dt}s_{1430} = & v_{18} + v_{22} + v_{23} + v_{24} + v_{28} + v_{54} + v_{77} + v_{97} + v_{108} + v_{111} + v_{122} + v_{125} + v_{130} + v_{132} + v_{140} \\ & + v_{162} + v_{164} + v_{173} + v_{175} + v_{198} + v_{233} + v_{242} + v_{252} + v_{257} + v_{268} + v_{271} + v_{282} + v_{284} \\ & + v_{286} + v_{288} + v_{289} + v_{292} + v_{294} + v_{299} + v_{300} + v_{305} + v_{307} + v_{322} + v_{325} + v_{335} + v_{348} \\ & + v_{352} + v_{353} + v_{354} + v_{355} + v_{359} + v_{387} + 2v_{391} + v_{392} + v_{394} + 53.95v_{399} - v_{179} - v_{366}\end{aligned}\quad (1152)$$

7.352 Species s_1432

Name Phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pi_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in r_2011 and as a modifier in r_2011), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1432} = 0 \quad (1153)$$

7.353 Species s_1435

Name phosphatidylethanolamine (dihexadec-9enoyl, n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_pe161_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1124](#) and as a modifier in [r_1124](#), [r_2584](#)).

$$\frac{d}{dt}s_{1435} = v_{265} - 0.07521v_{399} \quad (1154)$$

7.354 Species s_1437

Name phosphatidylethanolamine (dihexadecanoyl, n-C16:0)

SBO:0000247 simple chemical

Notes iJO1366:M_pe160_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1123](#) and as a modifier in [r_1123](#), [r_2584](#)).

$$\frac{d}{dt}s_{1437} = v_{264} - 0.06382v_{399} \quad (1155)$$

7.355 Species s_1476

Name phosphatidylserine (dihexadec-9-enoyl, n-C16:1)

SBO:0000247 simple chemical

Notes iJO1366:M_ps161_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1124](#) and as a product in [r_1131](#) and as a modifier in [r_1124](#), [r_1131](#)).

$$\frac{d}{dt}s_{1476} = v_{267} - v_{265} \quad (1156)$$

7.356 Species s_1477

Name phosphatidylserine (dihexadecanoyl, n-C16:0)

SBO:0000247 simple chemical

Notes iJO1366:M_ps160_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1123](#) and as a product in [r_1130](#) and as a modifier in [r_1123](#), [r_1130](#)).

$$\frac{d}{dt}s_{1477} = v_{266} - v_{264} \quad (1157)$$

7.357 Species s_1484

Name Phosphoenolpyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_pep_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 16 reactions (as a reactant in [r_0100](#), [r_0101](#), [r_0175](#), [r_1141](#), [r_1389](#), [r_1622](#), [r_1714](#) and as a product in [r_0538](#) and as a modifier in [r_0100](#), [r_0101](#), [r_0175](#), [r_0538](#), [r_1141](#), [r_1389](#), [r_1622](#), [r_1714](#)).

$$\frac{d}{dt}s_{1484} = v_{151} - v_{23} - v_{24} - v_{54} - v_{271} - v_{348} - v_{375} - v_{376} \quad (1158)$$

7.358 Species s_1491

Name Pimeloyl-[acyl-carrier protein]

SBO:0000247 simple chemical

Notes iJO1366:M_pimACP_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0222](#) and as a product in [r_1220](#) and as a modifier in [r_0222](#), [r_1220](#)).

$$\frac{d}{dt}s_{1491} = v_{293} - v_{66} \quad (1159)$$

7.359 Species s_1492

Name Pimeloyl-[acyl-carrier protein] methyl ester

SBO:0000247 simple chemical

Notes iJO1366:M_pmeACP_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1220](#) and as a product in [r_0564](#) and as a modifier in [r_0564](#), [r_1220](#)).

$$\frac{d}{dt}s_{1492} = v_{153} - v_{293} \quad (1160)$$

7.360 Species s_1493

Name Porphobilinogen

SBO:0000247 simple chemical

Notes iJO1366:M_ppbng_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0777](#) and as a product in [r_1223](#) and as a modifier in [r_0777](#), [r_1223](#)).

$$\frac{d}{dt}s_{1493} = v_{295} - 4v_{204} \quad (1161)$$

7.361 Species s_1494

Name potassium

SBO:0000247 simple chemical

Notes iJO1366:M_k_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_2047](#) and as a modifier in [r_2047](#), [r_2584](#)).

$$\frac{d}{dt}s_{1494} = v_{388} - 0.1952v_{399} \quad (1162)$$

7.362 Species s_1496

Name potassium

SBO:0000247 simple chemical

Notes iJO1366:M_k_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_2047](#) and as a modifier in [r_2047](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1496} = 0 \quad (1163)$$

7.363 Species s_1497

Name Prephenate

SBO:0000247 simple chemical

Notes iJO1366:M_pphn_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1224](#), [r_1225](#) and as a product in [r_0423](#) and as a modifier in [r_0423](#), [r_1224](#), [r_1225](#)).

$$\frac{d}{dt}s_{1497} = v_{120} - v_{296} - v_{297} \quad (1164)$$

7.364 Species s_1508

Name Protoheme

SBO:0000247 simple chemical

Notes iJO1366:M_pheme_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0602](#) and as a modifier in [r_0602](#), [r_2584](#)).

$$\frac{d}{dt}s_{1508} = v_{160} - 2.23 \cdot 10^{-4}v_{399} \quad (1165)$$

7.365 Species s_1511

Name Protoporphyrin

SBO:0000247 simple chemical

Notes iJO1366:M_ppp9_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0602](#) and as a product in [r_1230](#) and as a modifier in [r_0602](#), [r_1230](#)).

$$\frac{d}{dt}s_{1511} = v_{298} - v_{160} \quad (1166)$$

7.366 Species s_1512

Name Protoporphyrinogen IX

SBO:0000247 simple chemical

Notes iJO1366:M_pppg9_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1230](#) and as a product in [r_0436](#) and as a modifier in [r_0436](#), [r_1230](#)).

$$\frac{d}{dt}s_{1512} = v_{124} - v_{298} \quad (1167)$$

7.367 Species s_1522

Name Pyridoxal 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pydx5p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_2519](#) and as a modifier in [r_2519](#), [r_2584](#)).

$$\frac{d}{dt}s_{1522} = v_{393} - 2.23 \cdot 10^{-4}v_{399} \quad (1168)$$

7.368 Species s_1530

Name Pyridoxine 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_pdx5p_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2519](#) and as a product in [r_1245](#) and as a modifier in [r_1245](#), [r_2519](#)).

$$\frac{d}{dt}s_{1530} = v_{300} - v_{393} \quad (1169)$$

7.369 Species s_1531

Name Pyruvate

SBO:0000247 simple chemical

Notes iJO1366:M_pyr_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 32 reactions (as a reactant in [r_0009](#), [r_0038](#), [r_0227](#), [r_0503](#), [r_0815](#), [r_1251](#), [r_1252](#), [r_1255](#), [r_1368](#) and as a product in [r_0056](#), [r_0182](#), [r_0349](#), [r_0424](#), [r_0450](#), [r_1622](#), [r_1714](#) and as a modifier in [r_0009](#), [r_0038](#), [r_0056](#), [r_0182](#), [r_0227](#), [r_0349](#), [r_0424](#), [r_0450](#), [r_0503](#), [r_0815](#), [r_1251](#), [r_1252](#), [r_1255](#), [r_1368](#), [r_1622](#), [r_1714](#)).

$$\begin{aligned} \frac{d}{dt}s_{1531} = & v_{12} + v_{59} + v_{102} + v_{121} + v_{127} + v_{375} + v_{376} - v_3 \\ & - v_9 - 2v_{69} - v_{138} - v_{221} - v_{302} - v_{303} - v_{304} - v_{342} \end{aligned} \quad (1170)$$

7.370 Species s_1537

Name Quinolinate

SBO:0000247 simple chemical

Notes iJO1366:M_quln_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1021](#) and as a product in [r_1259](#) and as a modifier in [r_1021](#), [r_1259](#)).

$$\frac{d}{dt}s_{1537} = v_{305} - v_{247} \quad (1171)$$

7.371 Species s_1544

Name Reduced thioredoxin

SBO:0000247 simple chemical

Notes iJO1366:M_trrd_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1139](#) and as a product in [r_1347](#) and as a modifier in [r_1139](#), [r_1347](#)).

$$\frac{d}{dt}s_{1544} = v_{333} - v_{270} \quad (1172)$$

7.372 Species s_1546

Name Riboflavin

SBO:0000247 simple chemical

Notes iJO1366:M_ribflv_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1264](#), [r_2584](#) and as a product in [r_1266](#) and as a modifier in [r_1264](#), [r_1266](#), [r_2584](#)).

$$\frac{d}{dt}s_{1546} = v_{308} - v_{306} - 2.23 \cdot 10^{-4}v_{399} \quad (1173)$$

7.373 Species s_1550

Name S-Adenosyl-4-methylthio-2-oxobutanoate

SBO:0000247 simple chemical

Notes iJO1366:M_amob_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2538](#) and as a product in [r_0297](#) and as a modifier in [r_0297](#), [r_2538](#)).

$$\frac{d}{dt}s_{1550} = v_{94} - v_{398} \quad (1174)$$

7.374 Species s_1551

Name S-Adenosyl-L-homocysteine

SBO:0000247 simple chemical

Notes iJO1366:M_ahcys_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1288](#) and as a product in [r_0934](#), [r_1422](#) and as a modifier in [r_0934](#), [r_1288](#), [r_1422](#)).

$$\frac{d}{dt}s_{1551} = v_{230} + 2v_{361} - v_{315} \quad (1175)$$

7.375 Species s_1552

Name S-Adenosyl-L-methionine

SBO:0000247 simple chemical

Notes iJO1366:M_amet_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in [r_0297](#), [r_0383](#), [r_0934](#), [r_1375](#), [r_1422](#), [r_2584](#) and as a product in [r_0951](#) and as a modifier in [r_0297](#), [r_0383](#), [r_0934](#), [r_0951](#), [r_1375](#), [r_1422](#), [r_2584](#)).

$$\frac{d}{dt}s_{1552} = v_{233} - v_{94} - v_{113} - v_{230} - v_{343} - 2v_{361} - 2.23 \cdot 10^{-4}v_{399} \quad (1176)$$

7.376 Species s_1558

Name S-Ribosyl-L-homocysteine

SBO:0000247 simple chemical

Notes iJO1366:M_rhcys_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1291](#) and as a product in [r_1288](#) and as a modifier in [r_1288](#), [r_1291](#)).

$$\frac{d}{dt}s_{1558} = v_{315} - v_{316} \quad (1177)$$

7.377 Species s_1561

Name Sedoheptulose 7-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_s7p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1357](#) and as a product in [r_1356](#) and as a modifier in [r_1356](#), [r_1357](#)).

$$\frac{d}{dt}s_{1561} = v_{337} - v_{338} \quad (1178)$$

7.378 Species s_1571

Name Shikimate

SBO:0000247 simple chemical

Notes iJO1366:M_skm_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1305](#) and as a product in [r_1304](#) and as a modifier in [r_1304](#), [r_1305](#)).

$$\frac{d}{dt}s_{1571} = v_{318} - v_{319} \quad (1179)$$

7.379 Species s_1574

Name Shikimate 5-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_skm5p_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0175](#) and as a product in [r_1305](#) and as a modifier in [r_0175](#), [r_1305](#)).

$$\frac{d}{dt}s_{1574} = v_{319} - v_{54} \quad (1180)$$

7.380 Species s_1577

Name Siroheme

SBO:0000247 simple chemical

Notes iJO1366:M_sheme_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1307](#) and as a modifier in [r_1307](#), [r_2584](#)).

$$\frac{d}{dt}s_{1577} = v_{321} - 2.23 \cdot 10^{-4}v_{399} \quad (1181)$$

7.381 Species s_1578

Name sirohydrochlorin

SBO:0000247 simple chemical

Notes iJO1366:M_scl_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1307](#) and as a product in [r_1306](#) and as a modifier in [r_1306](#), [r_1307](#)).

$$\frac{d}{dt}s_{1578} = v_{320} - v_{321} \quad (1182)$$

7.382 Species s_1595

Name Succinate

SBO:0000247 simple chemical

Notes iJO1366:M_succ_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1315](#) and as a product in [r_1057](#), [r_1316](#) and as a modifier in [r_1057](#), [r_1315](#), [r_1316](#)).

$$\frac{d}{dt}s_{1595} = v_{254} + v_{323} - v_{322} \quad (1183)$$

7.383 Species s_1599

Name Succinyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_succoa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0771](#), [r_1338](#) and as a product in [r_1315](#) and as a modifier in [r_0771](#), [r_1315](#), [r_1338](#)).

$$\frac{d}{dt}s_{1599} = v_{322} - v_{202} - v_{329} \quad (1184)$$

7.384 Species s_1609

Name Sulfate

SBO:0000247 simple chemical

Notes iJO1366:M_so4_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1329](#), [r_2584](#) and as a product in [r_2108](#) and as a modifier in [r_1329](#), [r_2108](#), [r_2584](#)).

$$\frac{d}{dt}s_{1609} = v_{389} - v_{325} - 0.004338v_{399} \quad (1185)$$

7.385 Species s_1611

Name Sulfate

SBO:0000247 simple chemical

Notes iJO1366:M_so4_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_2108](#) and as a modifier in [r_2108](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1611} = 0 \quad (1186)$$

7.386 Species s_1612

Name Sulfite

SBO:0000247 simple chemical

Notes iJO1366:M_so3_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1330](#) and as a product in [r_1139](#) and as a modifier in [r_1139](#), [r_1330](#)).

$$\frac{d}{dt}s_{1612} = v_{270} - v_{326} \quad (1187)$$

7.387 Species s_1632

Name Tetradecanoyl-CoA (n-C14:0CoA)

SBO:0000247 simple chemical

Notes iJO1366:M_tdcoa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0236](#) and as a product in [r_0273](#) and as a modifier in [r_0236](#), [r_0273](#)).

$$\frac{d}{dt}s_{1632} = v_{92} - v_{76} \quad (1188)$$

7.388 Species s_1643

Name Thiamin monophosphate

SBO:0000247 simple chemical

Notes iJO1366:M_thmmp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1345](#) and as a product in [r_1344](#) and as a modifier in [r_1344](#), [r_1345](#)).

$$\frac{d}{dt}s_{1643} = v_{330} - v_{331} \quad (1189)$$

7.389 Species s_1644

Name Thiamine diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_thmpp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_1345](#) and as a modifier in [r_1345](#), [r_2584](#)).

$$\frac{d}{dt}s_{1644} = v_{331} - 2.23 \cdot 10^{-4}v_{399} \quad (1190)$$

7.390 Species s_1668

Name trans-Dec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_dc2coa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0267](#) and as a product in [r_0121](#) and as a modifier in [r_0121](#), [r_0267](#)).

$$\frac{d}{dt}s_{1668} = v_{30} - v_{87} \quad (1191)$$

7.391 Species s_1670

Name trans-Dodec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_dd2coa_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0268](#) and as a product in [r_0122](#) and as a modifier in [r_0122](#), [r_0268](#)).

$$\frac{d}{dt}s_{1670} = v_{31} - v_{88} \quad (1192)$$

7.392 Species s_1672

Name trans-Hex-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_hx2coa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0270](#) and as a product in [r_0124](#) and as a modifier in [r_0124](#), [r_0270](#)).

$$\frac{d}{dt}s_{1672} = v_{33} - v_{90} \quad (1193)$$

7.393 Species s_1674

Name trans-Hexadec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_hdd2coa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0096](#), [r_0269](#) and as a product in [r_0123](#) and as a modifier in [r_0096](#), [r_0123](#), [r_0269](#)).

$$\frac{d}{dt}s_{1674} = v_{32} - v_{20} - v_{89} \quad (1194)$$

7.394 Species s_1676

Name trans-Oct-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_oc2coa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0272](#) and as a product in [r_0126](#) and as a modifier in [r_0126](#), [r_0272](#)).

$$\frac{d}{dt}s_{1676} = v_{34} - v_{91} \quad (1195)$$

7.395 Species s_1680

Name trans-Tetradec-2-enoyl-CoA

SBO:0000247 simple chemical

Notes iJO1366:M_td2coa_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0273](#) and as a product in [r_0127](#) and as a modifier in [r_0127](#), [r_0273](#)).

$$\frac{d}{dt}s_{1680} = v_{35} - v_{92} \quad (1196)$$

7.396 Species s_1690

Name tRNA (Glu)

SBO:0000247 simple chemical

Notes iJO1366:M_trnaglu_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0687](#) and as a product in [r_0686](#) and as a modifier in [r_0686](#), [r_0687](#)).

$$\frac{d}{dt}s_{1690} = v_{177} - v_{178} \quad (1197)$$

7.397 Species s_1719

Name two disacharide linked murein units, pentapeptide crosslinked tetrapeptide (A2pm->D-alanine) (middle of chain)

SBO:0000247 simple chemical

Notes iJO1366:M_murein5px4p_p

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_0970](#) and as a modifier in [r_0970](#), [r_2584](#)).

$$\frac{d}{dt}s_{1719} = v_{241} - 0.01389v_{399} \quad (1198)$$

7.398 Species s_1725

Name two linked disacharide pentapeptide murein units (uncrosslinked, middle of chain)

SBO:0000247 simple chemical

Notes iJO1366:M_murein5p5p_p

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0970](#) and as a product in [r_1944](#) and as a modifier in [r_0970](#), [r_1944](#)).

$$\frac{d}{dt}s_{1725} = v_{383} - v_{241} \quad (1199)$$

7.399 Species s_1731

Name Ubiquinol-8

SBO:0000247 simple chemical

Notes iJO1366:M_q8h2_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_1582](#) and as a product in [r_0501](#), [r_0734](#) and as a modifier in [r_0501](#), [r_0734](#), [r_1582](#)).

$$\frac{d}{dt}s_{1731} = v_{136} + v_{187} - v_{373} \quad (1200)$$

7.400 Species s_1732

Name Ubiquinone-8

SBO:0000247 simple chemical

Notes iJO1366:M_q8_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0501](#), [r_0734](#) and as a product in [r_1582](#) and as a modifier in [r_0501](#), [r_0734](#), [r_1582](#)).

$$\frac{d}{dt}s_{1732} = v_{373} - v_{136} - v_{187} \quad (1201)$$

7.401 Species s_1733

Name UDP

SBO:0000247 simple chemical

Notes iJO1366:M_udp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_1046](#) and as a product in [r_0857](#), [r_1393](#), [r_1409](#) and as a modifier in [r_0857](#), [r_1046](#), [r_1393](#), [r_1409](#)).

$$\frac{d}{dt}s_{1733} = v_{227} + v_{351} + v_{357} - v_{251} \quad (1202)$$

7.402 Species s_1734

Name UDP-2,3-bis(3-hydroxytetradecanoyl)glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_u23ga_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0857](#), [r_1402](#) and as a product in [r_1378](#) and as a modifier in [r_0857](#), [r_1378](#), [r_1402](#)).

$$\frac{d}{dt}s_{1734} = v_{345} - v_{227} - v_{356} \quad (1203)$$

7.403 Species s_1735

Name UDP-3-O-(3-hydroxytetradecanoyl)-D-glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_u3hga_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1378](#) and as a product in [r_1379](#) and as a modifier in [r_1378](#), [r_1379](#)).

$$\frac{d}{dt}s_{1735} = v_{346} - v_{345} \quad (1204)$$

7.404 Species s_1736

Name UDP-3-O-(3-hydroxytetradecanoyl)-N-acetylglucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_u3aga_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1379](#) and as a product in [r_1391](#) and as a modifier in [r_1379](#), [r_1391](#)).

$$\frac{d}{dt}s_{1736} = v_{349} - v_{346} \quad (1205)$$

7.405 Species s_1742

Name UDP-N-acetyl-3-O-(1-carboxyvinyl)-D-glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_uacccg_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1388](#) and as a product in [r_1389](#) and as a modifier in [r_1388](#), [r_1389](#)).

$$\frac{d}{dt}s_{1742} = v_{348} - v_{347} \quad (1206)$$

7.406 Species s_1745

Name UDP-N-acetyl-D-glucosamine

SBO:0000247 simple chemical

Notes iJO1366:M_uacgam_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_1389](#), [r_1391](#), [r_1393](#) and as a product in [r_1392](#) and as a modifier in [r_1389](#), [r_1391](#), [r_1392](#), [r_1393](#)).

$$\frac{d}{dt}s_{1745} = v_{350} - v_{348} - v_{349} - v_{351} \quad (1207)$$

7.407 Species s_1750

Name UDP-N-acetylmuramate

SBO:0000247 simple chemical

Notes iJO1366:M_uamr_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1397](#) and as a product in [r_1388](#) and as a modifier in [r_1388](#), [r_1397](#)).

$$\frac{d}{dt}s_{1750} = v_{347} - v_{352} \quad (1208)$$

7.408 Species s_1751

Name UDP-N-acetylmuramoyl-L-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_uama_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1399](#) and as a product in [r_1397](#) and as a modifier in [r_1397](#), [r_1399](#)).

$$\frac{d}{dt}s_{1751} = v_{352} - v_{353} \quad (1209)$$

7.409 Species s_1752

Name UDP-N-acetylmuramoyl-L-alanyl-D-gamma-glutamyl-meso-2,6-diaminopimelate

SBO:0000247 simple chemical

Notes iJO1366:M_ugmd_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1401](#) and as a product in [r_1400](#) and as a modifier in [r_1400](#), [r_1401](#)).

$$\frac{d}{dt}s_{1752} = v_{354} - v_{355} \quad (1210)$$

7.410 Species s_1754

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamate

SBO:0000247 simple chemical

Notes iJO1366:M_uamag_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1400](#) and as a product in [r_1399](#) and as a modifier in [r_1399](#), [r_1400](#)).

$$\frac{d}{dt}s_{1754} = v_{353} - v_{354} \quad (1211)$$

7.411 Species s_1755

Name UDP-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_ugmda_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1137](#) and as a product in [r_1401](#) and as a modifier in [r_1137](#), [r_1401](#)).

$$\frac{d}{dt}s_{1755} = v_{355} - v_{269} \quad (1212)$$

7.412 Species s_1762

Name UMP

SBO:0000247 simple chemical

Notes iJO1366:M_ump_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_1409](#) and as a product in [r_1068](#), [r_1137](#), [r_1402](#) and as a modifier in [r_1068](#), [r_1137](#), [r_1402](#), [r_1409](#)).

$$\frac{d}{dt}s_{1762} = v_{259} + v_{269} + v_{356} - v_{357} \quad (1213)$$

7.413 Species s_1765

Name Undecaprenyl diphosphate

SBO:0000247 simple chemical

Notes iJO1366:M_udcpdp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_1413](#), [r_2584](#) and as a product in [r_1410](#), [r_1944](#) and as a modifier in [r_1410](#), [r_1413](#), [r_1944](#), [r_2584](#)).

$$\frac{d}{dt}s_{1765} = v_{358} + 2v_{383} - v_{359} - 5.5 \cdot 10^{-5}v_{399} \quad (1214)$$

7.414 Species s_1768

Name Undecaprenyl phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_udcpp_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1137](#) and as a product in [r_1413](#) and as a modifier in [r_1137](#), [r_1413](#)).

$$\frac{d}{dt}s_{1768} = v_{359} - v_{269} \quad (1215)$$

7.415 Species s_1776

Name Undecaprenyl-diphospho-N-acetylmuramoyl-(N-acetylglucosamine)-L-alanine-D-glutamate-meso-2,6-diaminopimeloyl-D-alanine-D-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_uaagmda_c

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_1944](#) and as a product in [r_1393](#) and as a modifier in [r_1393](#), [r_1944](#)).

$$\frac{d}{dt}s_{1776} = v_{351} - 2v_{383} \quad (1216)$$

7.416 Species s_1777

Name Undecaprenyl-diphospho-N-acetylmuramoyl-L-alanyl-D-glutamyl-meso-2,6-diaminopimeloyl-D-alanyl-D-alanine

SBO:0000247 simple chemical

Notes iJO1366:M_uagmda_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1393](#) and as a product in [r_1137](#) and as a modifier in [r_1137](#), [r_1393](#)).

$$\frac{d}{dt}s_{1777} = v_{269} - v_{351} \quad (1217)$$

7.417 Species s_1791

Name Uroporphyrinogen III

SBO:0000247 simple chemical

Notes iJO1366:M_uppg3_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1421](#), [r_1422](#) and as a product in [r_1423](#) and as a modifier in [r_1421](#), [r_1422](#), [r_1423](#)).

$$\frac{d}{dt}s_{1791} = v_{362} - v_{360} - v_{361} \quad (1218)$$

7.418 Species s_1792

Name UTP

SBO:0000247 simple chemical

Notes iJO1366:M_utp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0440](#), [r_1279](#), [r_1392](#), [r_2584](#) and as a product in [r_1046](#) and as a modifier in [r_0440](#), [r_1046](#), [r_1279](#), [r_1392](#), [r_2584](#)).

$$\frac{d}{dt}s_{1792} = v_{251} - v_{125} - v_{312} - v_{350} - 0.1441v_{399} \quad (1219)$$

7.419 Species s_1799

Name Xanthosine 5'-phosphate

SBO:0000247 simple chemical

Notes iJO1366:M_xmp_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0741](#) and as a product in [r_0787](#) and as a modifier in [r_0741](#), [r_0787](#)).

$$\frac{d}{dt}s_{1799} = v_{208} - v_{190} \quad (1220)$$

7.420 Species s_1804

Name Zinc

SBO:0000247 simple chemical

Notes iJO1366:M_zn2_c

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2584](#) and as a product in [r_2167](#) and as a modifier in [r_2167](#), [r_2584](#)).

$$\frac{d}{dt}s_{1804} = v_{390} - 3.41 \cdot 10^{-4}v_{399} \quad (1221)$$

7.421 Species s_1806

Name Zinc

SBO:0000247 simple chemical

Notes iJO1366:M_zn2_e

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_2167](#) and as a modifier in [r_2167](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1806} = 0 \quad (1222)$$

7.422 Species s_1807

Name (2R,4S)-2-methyl-2,3,3,4-tetrahydroxytetrahydrofuran

SBO:0000247 simple chemical

Initial concentration 0 mmol · l⁻¹

This species takes part in one reaction (as a product in [r_2533](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1807} = 0 \quad (1223)$$

7.423 Species s_1835

Name 5'-deoxyribose

SBO:0000247 simple chemical

Initial concentration 0 mmol · l⁻¹

This species takes part in one reaction (as a product in [r_2534](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1835} = 0 \quad (1224)$$

7.424 Species s_2072

Name p-Cresol

SBO:0000247 simple chemical

Initial concentration 0 mmol · l⁻¹

This species takes part in one reaction (as a product in [r_2537](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{2072} = 0 \quad (1225)$$

7.425 Species s_2093

Name S-Adenosyl-4-methylthio-2-oxobutanoate

SBO:0000247 simple chemical

Initial concentration 0 mmol · l⁻¹

This species takes part in one reaction (as a product in [r_2538](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{2093} = 0 \quad (1226)$$

7.426 Species e_0001

Name thrA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0369](#), [r_0769](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0001} = 0 \quad (1227)$$

7.427 Species e_0002

Name thrB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0770](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0002} = 0 \quad (1228)$$

7.428 Species e_0003

Name thrC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1349](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0003} = 0 \quad (1229)$$

7.429 Species e_0005

Name talB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1356](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0005} = 0 \quad (1230)$$

7.430 Species e_0006

Name mog

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0965](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0006} = 0 \quad (1231)$$

7.431 Species e_0008

Name ribF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0611](#), [r_1264](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0008} = 0 \quad (1232)$$

7.432 Species e_0010

Name ispH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0014](#), [r_0015](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0010} = 0 \quad (1233)$$

7.433 Species e_0012

Name dapB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0502](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0012} = 0 \quad (1234)$$

7.434 Species e_0020

Name folA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0504](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0020} = 0 \quad (1235)$$

7.435 Species e_0022

Name pdxA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1245](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0022} = 0 \quad (1236)$$

7.436 Species e_0030

Name leuD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0066](#), [r_0138](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0030} = 0 \quad (1237)$$

7.437 Species e_0031

Name leuC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0066](#), [r_0138](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0031} = 0 \quad (1238)$$

7.438 Species e_0032

Name leuB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0139](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0032} = 0 \quad (1239)$$

7.439 Species e_0033

Name leuA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0067](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0033} = 0 \quad (1240)$$

7.440 Species e_0034

Name ilvI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0038](#), [r_0227](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0034} = 0 \quad (1241)$$

7.441 Species e_0035

Name ilvH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0038](#), [r_0227](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0035} = 0 \quad (1242)$$

7.442 Species e_0036

Name ftsI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0970](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0036} = 0 \quad (1243)$$

7.443 Species e_0037

Name murE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1400](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0037} = 0 \quad (1244)$$

7.444 Species e_0038

Name murF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1401](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0038} = 0 \quad (1245)$$

7.445 Species e_0039

Name mraY

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1137](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0039} = 0 \quad (1246)$$

7.446 Species e_0040

Name murD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1399](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0040} = 0 \quad (1247)$$

7.447 Species e_0041

Name murG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1393](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0041} = 0 \quad (1248)$$

7.448 Species e_0042

Name murC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1397](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0042} = 0 \quad (1249)$$

7.449 Species e_0043

Name ddIB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0463](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0043} = 0 \quad (1250)$$

7.450 Species e_0044

Name lpxC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1379](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0044} = 0 \quad (1251)$$

7.451 Species e_0045

Name mutT

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0510](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0045} = 0 \quad (1252)$$

7.452 Species e_0046

Name coaE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0488](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0046} = 0 \quad (1253)$$

7.453 Species e_0048

Name nadC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1021](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0048} = 0 \quad (1254)$$

7.454 Species e_0051

Name aceE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1251](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0051} = 0 \quad (1255)$$

7.455 Species e_0052

Name aceF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1251](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0052} = 0 \quad (1256)$$

7.456 Species e_0053

Name lpdA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1251](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0053} = 0 \quad (1257)$$

7.457 Species e_0054

Name acnB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0246](#), [r_0247](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0054} = 0 \quad (1258)$$

7.458 Species e_0060

Name can

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0755](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0060} = 0 \quad (1259)$$

7.459 Species e_0061

Name panD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0367](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0061} = 0 \quad (1260)$$

7.460 Species e_0062

Name panC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1076](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0062} = 0 \quad (1261)$$

7.461 Species e_0063

Name panB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0143](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0063} = 0 \quad (1262)$$

7.462 Species e_0064

Name folK

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0216](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0064} = 0 \quad (1263)$$

7.463 Species e_0065

Name mrcB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0970](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0065} = 0 \quad (1264)$$

7.464 Species e_0071

Name hemL

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0678](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0071} = 0 \quad (1265)$$

7.465 Species e_0074

Name mtmN

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0186](#), [r_1288](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0074} = 0 \quad (1266)$$

7.466 Species e_0076

Name dapD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1338](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0076} = 0 \quad (1267)$$

7.467 Species e_0077

Name pyrH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1409](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0077} = 0 \quad (1268)$$

7.468 Species e_0078

Name dxr

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0011](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0078} = 0 \quad (1269)$$

7.469 Species e_0079

Name uppS

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1410](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0079} = 0 \quad (1270)$$

7.470 Species e_0080

Name cdsA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0418](#), [r_0419](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0080} = 0 \quad (1271)$$

7.471 Species e_0081

Name lpxD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1378](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0081} = 0 \quad (1272)$$

7.472 Species e_0082

Name fabZ

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0145](#), [r_0148](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0082} = 0 \quad (1273)$$

7.473 Species e_0083

Name lpxA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1391](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0083} = 0 \quad (1274)$$

7.474 Species e_0084

Name lpxB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0857](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0084} = 0 \quad (1275)$$

7.475 Species e_0085

Name accA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0237](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0085} = 0 \quad (1276)$$

7.476 Species e_0094

Name fadE

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in seven reactions (as a modifier in [r_0266](#), [r_0267](#), [r_0268](#), [r_0269](#), [r_0270](#), [r_0272](#), [r_0273](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0094} = 0 \quad (1277)$$

7.477 Species e_0099

Name proB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0673](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0099} = 0 \quad (1278)$$

7.478 Species e_0100

Name proA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0679](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0100} = 0 \quad (1279)$$

7.479 Species e_0103

Name argF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1065](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0103} = 0 \quad (1280)$$

7.480 Species e_0110

Name yahI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0388](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0110} = 0 \quad (1281)$$

7.481 Species e_0116

Name cynT

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0755](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0116} = 0 \quad (1282)$$

7.482 Species e_0125

Name mhpF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0224](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0125} = 0 \quad (1283)$$

7.483 Species e_0134

Name hemB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1223](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0134} = 0 \quad (1284)$$

7.484 Species e_0135

Name ddLA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0463](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0135} = 0 \quad (1285)$$

7.485 Species e_0137

Name proC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1250](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0137} = 0 \quad (1286)$$

7.486 Species e_0138

Name aroL

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1305](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0138} = 0 \quad (1287)$$

7.487 Species e_0139

Name mak

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0761](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0139} = 0 \quad (1288)$$

7.488 Species e_0144

Name ribD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0212](#), [r_0498](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0144} = 0 \quad (1289)$$

7.489 Species e_0145

Name ribH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1266](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0145} = 0 \quad (1290)$$

7.490 Species e_0146

Name thiL

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1345](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0146} = 0 \quad (1291)$$

7.491 Species e_0149

Name dxs

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0009](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0149} = 0 \quad (1292)$$

7.492 Species e_0150

Name ispA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0522](#), [r_0655](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0150} = 0 \quad (1293)$$

7.493 Species e_0151

Name thiI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1346](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0151} = 0 \quad (1294)$$

7.494 Species e_0152

Name panE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0063](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0152} = 0 \quad (1295)$$

7.495 Species e_0162

Name tesB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a modifier in [r_0579](#), [r_0580](#), [r_0581](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0162} = 0 \quad (1296)$$

7.496 Species e_0167

Name adk

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a modifier in [r_0292](#), [r_0301](#), [r_1039](#), [r_1043](#), [r_1045](#), [r_1046](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0167} = 0 \quad (1297)$$

7.497 Species [e_0168](#)

Name hemH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0602](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0168} = 0 \quad (1298)$$

7.498 Species [e_0175](#)

Name gcl

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0739](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0175} = 0 \quad (1299)$$

7.499 Species [e_0177](#)

Name glxR

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1335](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0177} = 0 \quad (1300)$$

7.500 Species e_0183

Name arcC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0388](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0183} = 0 \quad (1301)$$

7.501 Species e_0184

Name purK

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1206](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0184} = 0 \quad (1302)$$

7.502 Species e_0185

Name purE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1207](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0185} = 0 \quad (1303)$$

7.503 Species e_0186

Name lpxH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1402](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0186} = 0 \quad (1304)$$

7.504 Species e_0188

Name folD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0950](#), [r_0957](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0188} = 0 \quad (1305)$$

7.505 Species e_0221

Name mrdA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0970](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0221} = 0 \quad (1306)$$

7.506 Species e_0223

Name nadD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1019](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0223} = 0 \quad (1307)$$

7.507 Species e_0225

Name hscC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1047](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0225} = 0 \quad (1308)$$

7.508 Species e_0238

Name fldA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in six reactions (as a modifier in [r_0084](#), [r_1255](#), [r_1276](#), [r_1277](#), [r_1278](#), [r_1279](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0238} = 0 \quad (1309)$$

7.509 Species e_0246

Name gltA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0428](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0246} = 0 \quad (1310)$$

7.510 Species e_0253

Name sucC

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1315](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0253} = 0 \quad (1311)$$

7.511 Species e_0254

Name sucD

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1315](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0254} = 0 \quad (1312)$$

7.512 Species e_0260

Name nadA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1259](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0260} = 0 \quad (1313)$$

7.513 Species e_0263

Name aroG

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0101](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0263} = 0 \quad (1314)$$

7.514 Species e_0264

Name gpmA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1153](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0264} = 0 \quad (1315)$$

7.515 Species e_0273

Name pgl

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0218](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0273} = 0 \quad (1316)$$

7.516 Species e_0274

Name bioA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0297](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0274} = 0 \quad (1317)$$

7.517 Species e_0275

Name bioB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0383](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0275} = 0 \quad (1318)$$

7.518 Species e_0276

Name bioF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0222](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0276} = 0 \quad (1319)$$

7.519 Species e_0277

Name bioC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0934](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0277} = 0 \quad (1320)$$

7.520 Species e_0278

Name bioD1

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0489](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0278} = 0 \quad (1321)$$

7.521 Species e_0279

Name moaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0445](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0279} = 0 \quad (1322)$$

7.522 Species e_0280

Name moaC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0445](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0280} = 0 \quad (1323)$$

7.523 Species e_0281

Name moaD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0963](#), [r_0968](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0281} = 0 \quad (1324)$$

7.524 Species e_0282

Name moaE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0968](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0282} = 0 \quad (1325)$$

7.525 Species e_0291

Name moeB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0969](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0291} = 0 \quad (1326)$$

7.526 Species e_0292

Name moeA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0384](#), [r_0964](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0292} = 0 \quad (1327)$$

7.527 Species e_0300

Name ybjG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1413](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0300} = 0 \quad (1328)$$

7.528 Species e_0313

Name ltaE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1348](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0313} = 0 \quad (1329)$$

7.529 Species e_0318

Name trxB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1347](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0318} = 0 \quad (1330)$$

7.530 Species e_0323

Name pflA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1252](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0323} = 0 \quad (1331)$$

7.531 Species e_0324

Name pflB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1252](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0324} = 0 \quad (1332)$$

7.532 Species e_0326

Name serC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1054](#), [r_1217](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0326} = 0 \quad (1333)$$

7.533 Species e_0327

Name aroA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0175](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0327} = 0 \quad (1334)$$

7.534 Species e_0328

Name cmk

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0457](#), [r_1409](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0328} = 0 \quad (1335)$$

7.535 Species e_0330

Name lpxK

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1337](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0330} = 0 \quad (1336)$$

7.536 Species e_0331

Name kdsB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0105](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0331} = 0 \quad (1337)$$

7.537 Species e_0332

Name aspC

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in three reactions (as a modifier in [r_0370](#), [r_1081](#), [r_1376](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0332} = 0 \quad (1338)$$

7.538 Species e_0342

Name pyrD

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in two reactions (as a modifier in [r_0501](#), [r_0512](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0342} = 0 \quad (1339)$$

7.539 Species e_0368

Name pyrC

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0511](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0368} = 0 \quad (1340)$$

7.540 Species e_0372

Name fabH

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0147](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0372} = 0 \quad (1341)$$

7.541 Species e_0373

Name fabD

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0935](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0373} = 0 \quad (1342)$$

7.542 Species e_0374

Name fabG

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in three reactions (as a modifier in [r_0146](#), [r_0149](#), [r_0154](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0374} = 0 \quad (1343)$$

7.543 Species e_0375

Name acpP

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in seven reactions (as a modifier in [r_0257](#), [r_0259](#), [r_0260](#), [r_0706](#), [r_0707](#), [r_0935](#), [r_1391](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0375} = 0 \quad (1344)$$

7.544 Species e_0376

Name fabF

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0166](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0376} = 0 \quad (1345)$$

7.545 Species e_0377

Name pabC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0182](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0377} = 0 \quad (1346)$$

7.546 Species e_0378

Name tmk

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0532](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0378} = 0 \quad (1347)$$

7.547 Species e_0389

Name purB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0302](#), [r_0304](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0389} = 0 \quad (1348)$$

7.548 Species e_0391

Name icd

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0806](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0391} = 0 \quad (1349)$$

7.549 Species e_0395

Name dadX

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0310](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0395} = 0 \quad (1350)$$

7.550 Species e_0403

Name prs

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1215](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0403} = 0 \quad (1351)$$

7.551 Species e_0404

Name ispE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0178](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0404} = 0 \quad (1352)$$

7.552 Species e_0405

Name hemA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0686](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0405} = 0 \quad (1353)$$

7.553 Species e_0406

Name kdsA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0100](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0406} = 0 \quad (1354)$$

7.554 Species e_0416

Name adhE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0224](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0416} = 0 \quad (1355)$$

7.555 Species e_0425

Name trpA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1367](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0425} = 0 \quad (1356)$$

7.556 Species e_0426

Name trpB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1367](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0426} = 0 \quad (1357)$$

7.557 Species e_0427

Name trpC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0788](#), [r_1211](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0427} = 0 \quad (1358)$$

7.558 Species e_0428

Name trpD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0348](#), [r_0349](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0428} = 0 \quad (1359)$$

7.559 Species e_0429

Name trpE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0349](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0429} = 0 \quad (1360)$$

7.560 Species e_0431

Name acnA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0246](#), [r_0247](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0431} = 0 \quad (1361)$$

7.561 Species e_0432

Name ribA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0745](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0432} = 0 \quad (1362)$$

7.562 Species e_0433

Name pgpB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1413](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0433} = 0 \quad (1363)$$

7.563 Species e_0435

Name pyrF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1068](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0435} = 0 \quad (1364)$$

7.564 Species e_0436

Name fabI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0563](#), [r_0564](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0436} = 0 \quad (1365)$$

7.565 Species e_0439

Name puuA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0683](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0439} = 0 \quad (1366)$$

7.566 Species e_0451

Name ydbK

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1255](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0451} = 0 \quad (1367)$$

7.567 Species e_0466

Name aldA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0731](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0466} = 0 \quad (1368)$$

7.568 Species e_0514

Name folM

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0504](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0514} = 0 \quad (1369)$$

7.569 Species e_0515

Name fumC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0632](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0515} = 0 \quad (1370)$$

7.570 Species e_0516

Name fumA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0632](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0516} = 0 \quad (1371)$$

7.571 Species e_0519

Name malY

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0450](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0519} = 0 \quad (1372)$$

7.572 Species e_0531

Name ribE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1265](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0531} = 0 \quad (1373)$$

7.573 Species e_0540

Name ydiB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1304](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0540} = 0 \quad (1374)$$

7.574 Species e_0541

Name aroD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0098](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0541} = 0 \quad (1375)$$

7.575 Species e_0544

Name aroH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0101](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0544} = 0 \quad (1376)$$

7.576 Species e_0554

Name nadE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1008](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0554} = 0 \quad (1377)$$

7.577 Species e_0559

Name astC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0245](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0559} = 0 \quad (1378)$$

7.578 Species e_0561

Name gdhA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0675](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0561} = 0 \quad (1379)$$

7.579 Species e_0567

Name gapA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0574](#), [r_0695](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0567} = 0 \quad (1380)$$

7.580 Species e_0572

Name pabB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0181](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0572} = 0 \quad (1381)$$

7.581 Species e_0577

Name purT

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0225](#), [r_0648](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0577} = 0 \quad (1382)$$

7.582 Species e_0578

Name eda

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0056](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0578} = 0 \quad (1383)$$

7.583 Species e_0579

Name edd

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0217](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0579} = 0 \quad (1384)$$

7.584 Species e_0580

Name zwf

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0660](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0580} = 0 \quad (1385)$$

7.585 Species e_0586

Name nudB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0510](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0586} = 0 \quad (1386)$$

7.586 Species e_0605

Name hisG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0374](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0605} = 0 \quad (1387)$$

7.587 Species e_0606

Name hisD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0763](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0606} = 0 \quad (1388)$$

7.588 Species e_0607

Name hisC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0765](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0607} = 0 \quad (1389)$$

7.589 Species e_0608

Name hisB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0764](#), [r_0785](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0608} = 0 \quad (1390)$$

7.590 Species e_0609

Name hisH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0784](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0609} = 0 \quad (1391)$$

7.591 Species e_0610

Name hisA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0008](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0610} = 0 \quad (1392)$$

7.592 Species e_0611

Name hisF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0784](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0611} = 0 \quad (1393)$$

7.593 Species e_0612

Name hisI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1204](#), [r_1205](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0612} = 0 \quad (1394)$$

7.594 Species e_0641

Name thiD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1198](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0641} = 0 \quad (1395)$$

7.595 Species e_0657

Name folE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0744](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0657} = 0 \quad (1396)$$

7.596 Species e_0682

Name atoB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0230](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0682} = 0 \quad (1397)$$

7.597 Species e_0691

Name nudI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0533](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0691} = 0 \quad (1398)$$

7.598 Species e_0717

Name yfbQ

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0815](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0717} = 0 \quad (1399)$$

7.599 Species e_0719

Name ackA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0225](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0719} = 0 \quad (1400)$$

7.600 Species e_0720

Name pta

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1218](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0720} = 0 \quad (1401)$$

7.601 Species e_0727

Name ubiX

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1064](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0727} = 0 \quad (1402)$$

7.602 Species e_0728

Name purF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0682](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0728} = 0 \quad (1403)$$

7.603 Species e_0729

Name folC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0505](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0729} = 0 \quad (1404)$$

7.604 Species e_0730

Name accD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0237](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0730} = 0 \quad (1405)$$

7.605 Species e_0731

Name pdxB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0573](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0731} = 0 \quad (1406)$$

7.606 Species e_0732

Name fabB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in two reactions (as a modifier in [r_0150](#), [r_0166](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0732} = 0 \quad (1407)$$

7.607 Species e_0734

Name aroC

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0425](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0734} = 0 \quad (1408)$$

7.608 Species e_0735

Name fadJ

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in 14 reactions (as a modifier in [r_0120](#), [r_0121](#), [r_0122](#), [r_0123](#), [r_0124](#), [r_0126](#), [r_0127](#), [r_0128](#), [r_0129](#), [r_0130](#), [r_0131](#), [r_0133](#), [r_0134](#), [r_0135](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0735} = 0 \quad (1409)$$

[7.609 Species e_0736](#)

Name fadI

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in seven reactions (as a modifier in [r_0230](#), [r_0231](#), [r_0232](#), [r_0233](#), [r_0234](#), [r_0235](#), [r_0236](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0736} = 0 \quad (1410)$$

[7.610 Species e_0742](#)

Name yfdZ

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0815](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0742} = 0 \quad (1411)$$

[7.611 Species e_0743](#)

Name glk

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0762](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0743} = 0 \quad (1412)$$

7.612 Species e_0746

Name gltX

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0687](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0746} = 0 \quad (1413)$$

7.613 Species e_0750

Name cysK

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0452](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0750} = 0 \quad (1414)$$

7.614 Species e_0757

Name cysM

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0452](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0757} = 0 \quad (1415)$$

7.615 Species e_0765

Name hemF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0436](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0765} = 0 \quad (1416)$$

7.616 Species e_0768

Name eutD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1218](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0768} = 0 \quad (1417)$$

7.617 Species e_0770

Name talA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1356](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0770} = 0 \quad (1418)$$

7.618 Species e_0771

Name tktB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1357](#), [r_1358](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0771} = 0 \quad (1419)$$

7.619 Species e_0774

Name dapE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1316](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0774} = 0 \quad (1420)$$

7.620 Species e_0775

Name purC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1210](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0775} = 0 \quad (1421)$$

7.621 Species e_0776

Name dapA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0503](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0776} = 0 \quad (1422)$$

7.622 Species e_0791

Name purM

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1208](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0791} = 0 \quad (1423)$$

7.623 Species e_0793

Name ppk

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1222](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0793} = 0 \quad (1424)$$

7.624 Species e_0795

Name guaA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0741](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0795} = 0 \quad (1425)$$

7.625 Species e_0796

Name guaB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0787](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0796} = 0 \quad (1426)$$

7.626 Species e_0798

Name ispG

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0084](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0798} = 0 \quad (1427)$$

7.627 Species e_0799

Name ndk

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in four reactions (as a modifier in [r_1039](#), [r_1043](#), [r_1045](#), [r_1046](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0799} = 0 \quad (1428)$$

[7.628 Species e_0803](#)

Name iscA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in two reactions (as a modifier in [r_0799](#), [r_0801](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0803} = 0 \quad (1429)$$

[7.629 Species e_0804](#)

Name nifU

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in six reactions (as a modifier in [r_0796](#), [r_0797](#), [r_0798](#), [r_0799](#), [r_0800](#), [r_0801](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0804} = 0 \quad (1430)$$

[7.630 Species e_0805](#)

Name iscS

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in six reactions (as a modifier in [r_0796](#), [r_0797](#), [r_0798](#), [r_0802](#), [r_0963](#), [r_1346](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-0805} = 0 \quad (1431)$$

7.631 Species e_0813

Name glyA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0726](#), [r_1348](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0813} = 0 \quad (1432)$$

7.632 Species e_0815

Name purL

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1212](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0815} = 0 \quad (1433)$$

7.633 Species e_0818

Name pdxJ

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1245](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0818} = 0 \quad (1434)$$

7.634 Species e_0819

Name nadB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0829](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0819} = 0 \quad (1435)$$

7.635 Species e_0821

Name grcA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1252](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0821} = 0 \quad (1436)$$

7.636 Species e_0822

Name trxC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1139](#), [r_1347](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0822} = 0 \quad (1437)$$

7.637 Species e_0823

Name pssA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1130](#), [r_1131](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0823} = 0 \quad (1438)$$

7.638 Species e_0825

Name pheA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0423](#), [r_1224](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0825} = 0 \quad (1439)$$

7.639 Species e_0826

Name tyrA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0423](#), [r_1225](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0826} = 0 \quad (1440)$$

7.640 Species e_0827

Name aroF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0101](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0827} = 0 \quad (1441)$$

7.641 Species e_0828

Name ppnK

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1006](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0828} = 0 \quad (1442)$$

7.642 Species e_0839

Name luxS

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1291](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0839} = 0 \quad (1443)$$

7.643 Species e_0848

Name gutQ

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0355](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0848} = 0 \quad (1444)$$

7.644 Species e_0866

Name ispF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0053](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0866} = 0 \quad (1445)$$

7.645 Species e_0867

Name ispD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0054](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0867} = 0 \quad (1446)$$

7.646 Species e_0868

Name cysC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0305](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0868} = 0 \quad (1447)$$

7.647 Species e_0869

Name cysN

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1329](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0869} = 0 \quad (1448)$$

7.648 Species e_0870

Name cysD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1329](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0870} = 0 \quad (1449)$$

7.649 Species e_0871

Name cysH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1139](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0871} = 0 \quad (1450)$$

7.650 Species e_0872

Name cysI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1330](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0872} = 0 \quad (1451)$$

7.651 Species e_0873

Name cysJ

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1330](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0873} = 0 \quad (1452)$$

7.652 Species e_0875

Name eno

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0538](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0875} = 0 \quad (1453)$$

7.653 Species e_0876

Name pyrG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0440](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0876} = 0 \quad (1454)$$

7.654 Species e_0893

Name argA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0999](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0893} = 0 \quad (1455)$$

7.655 Species e_0894

Name thyA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1353](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0894} = 0 \quad (1456)$$

7.656 Species e_0896

Name aas

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a modifier in [r_0257](#), [r_0259](#), [r_0260](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0896} = 0 \quad (1457)$$

7.657 Species e_0897

Name lysA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0499](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0897} = 0 \quad (1458)$$

7.658 Species e_0903

Name yqeA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0388](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0903} = 0 \quad (1459)$$

[7.659 Species e_0911](#)

Name fldB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in six reactions (as a modifier in [r_0084](#), [r_1255](#), [r_1276](#), [r_1277](#), [r_1278](#), [r_1279](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0911} = 0 \quad (1460)$$

[7.660 Species e_0918](#)

Name serA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1151](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0918} = 0 \quad (1461)$$

[7.661 Species e_0919](#)

Name rpiA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1284](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-0919} = 0 \quad (1462)$$

7.662 Species e_0925

Name pgk

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1152](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0925} = 0 \quad (1463)$$

7.663 Species e_0926

Name epd

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0574](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0926} = 0 \quad (1464)$$

7.664 Species e_0928

Name tktA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1357](#), [r_1358](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0928} = 0 \quad (1465)$$

7.665 Species e_0931

Name metK

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0951](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0931} = 0 \quad (1466)$$

7.666 Species e_0941

Name glcD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0734](#), [r_0735](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0941} = 0 \quad (1467)$$

7.667 Species e_0951

Name metC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0450](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0951} = 0 \quad (1468)$$

7.668 Species e_0953

Name plsC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0012](#), [r_0013](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0953} = 0 \quad (1469)$$

7.669 Species e_0960

Name ribB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0092](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0960} = 0 \quad (1470)$$

7.670 Species e_0962

Name uppP

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1413](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0962} = 0 \quad (1471)$$

7.671 Species e_0964

Name folB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0507](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0964} = 0 \quad (1472)$$

7.672 Species e_0974

Name tdcE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1252](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0974} = 0 \quad (1473)$$

7.673 Species e_0975

Name tdcD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0225](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0975} = 0 \quad (1474)$$

7.674 Species e_0977

Name tdcB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0847](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0977} = 0 \quad (1475)$$

7.675 Species e_0978

Name garK

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0697](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0978} = 0 \quad (1476)$$

7.676 Species e_0979

Name garR

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1335](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0979} = 0 \quad (1477)$$

7.677 Species e_0986

Name argG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0361](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0986} = 0 \quad (1478)$$

7.678 Species e_0987

Name glmM

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1150](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0987} = 0 \quad (1479)$$

7.679 Species e_0988

Name folP

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0515](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0988} = 0 \quad (1480)$$

7.680 Species e_0990

Name ispB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1063](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0990} = 0 \quad (1481)$$

7.681 Species e_0991

Name murA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1389](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{0991} = 0 \quad (1482)$$

7.682 Species e_0993

Name kdsD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0355](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0993} = 0 \quad (1483)$$

7.683 Species e_0994

Name kdsC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0106](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0994} = 0 \quad (1484)$$

7.684 Species e_1004

Name mdh

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0925](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1004} = 0 \quad (1485)$$

7.685 Species e_1005

Name accB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0237](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1005} = 0 \quad (1486)$$

7.686 Species e_1006

Name accC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0237](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1006} = 0 \quad (1487)$$

7.687 Species e_1010

Name aroE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1304](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1010} = 0 \quad (1488)$$

7.688 Species e_1014

Name argD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0245](#), [r_1318](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1014} = 0 \quad (1489)$$

7.689 Species e_1015

Name pabA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0181](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1015} = 0 \quad (1490)$$

7.690 Species e_1019

Name cysG

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in three reactions (as a modifier in [r_1306](#), [r_1307](#), [r_1422](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1019} = 0 \quad (1491)$$

7.691 Species e_1023

Name yhfW

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1202](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1023} = 0 \quad (1492)$$

7.692 Species e_1026

Name rpe

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1285](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1026} = 0 \quad (1493)$$

7.693 Species e_1027

Name aroB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0099](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1027} = 0 \quad (1494)$$

[7.694 Species e_1028](#)

Name aroK

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1305](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1028} = 0 \quad (1495)$$

[7.695 Species e_1029](#)

Name mrcA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0970](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1029} = 0 \quad (1496)$$

[7.696 Species e_1034](#)

Name bioH

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1220](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1034} = 0 \quad (1497)$$

7.697 Species e_1045

Name asd

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0371](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1045} = 0 \quad (1498)$$

7.698 Species e_1086

Name xylA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1432](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1086} = 0 \quad (1499)$$

7.699 Species e_1105

Name cysE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1301](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1105} = 0 \quad (1500)$$

7.700 Species e_1106

Name gpsA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0712](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1106} = 0 \quad (1501)$$

7.701 Species e_1108

Name gpmI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1153](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1108} = 0 \quad (1502)$$

7.702 Species e_1109

Name tdh

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0848](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1109} = 0 \quad (1503)$$

7.703 Species e_1110

Name kbl

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0724](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1110} = 0 \quad (1504)$$

7.704 Species e_1125

Name waaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0102](#), [r_0103](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1125} = 0 \quad (1505)$$

7.705 Species e_1126

Name coaD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1074](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1126} = 0 \quad (1506)$$

7.706 Species e_1127

Name coaBC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1200](#), [r_1201](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1127} = 0 \quad (1507)$$

7.707 Species e_1128

Name dut

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0533](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1128} = 0 \quad (1508)$$

7.708 Species e_1129

Name pyrE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1067](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1129} = 0 \quad (1509)$$

7.709 Species e_1130

Name gmk

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0754](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1130} = 0 \quad (1510)$$

7.710 Species e_1136

Name ilvN

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0038](#), [r_0227](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1136} = 0 \quad (1511)$$

7.711 Species e_1137

Name ilvB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0038](#), [r_0227](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1137} = 0 \quad (1512)$$

7.712 Species e_1141

Name tnaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1368](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1141} = 0 \quad (1513)$$

7.713 Species e_1149

Name glmS

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0684](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-1149} = 0 \quad (1514)$$

7.714 Species e_1150

Name glmU

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in two reactions (as a modifier in [r_0658](#), [r_1392](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-1150} = 0 \quad (1515)$$

7.715 Species e_1160

Name asnA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0365](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{-1160} = 0 \quad (1516)$$

7.716 Species e_1167

Name ilvE

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in four reactions (as a modifier in [r_0808](#), [r_0854](#), [r_1081](#), [r_1425](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1167} = 0 \quad (1517)$$

7.717 Species e_{-1168}

Name ilvD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0517](#), [r_0518](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1168} = 0 \quad (1518)$$

7.718 Species e_{-1169}

Name ilvA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0847](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1169} = 0 \quad (1519)$$

7.719 Species e_{-1170}

Name ilvC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a modifier in [r_0063](#), [r_0811](#), [r_0812](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1170} = 0 \quad (1520)$$

7.720 Species e_1172

Name trxA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_1139](#), [r_1347](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1172} = 0 \quad (1521)$$

7.721 Species e_1184

Name hemX

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1422](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1184} = 0 \quad (1522)$$

7.722 Species e_1185

Name hemD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1423](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1185} = 0 \quad (1523)$$

7.723 Species e_1186

Name hemC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0777](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1186} = 0 \quad (1524)$$

7.724 Species e_1188

Name cyaY

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0797](#), [r_0798](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1188} = 0 \quad (1525)$$

7.725 Species e_1189

Name dapF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0500](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1189} = 0 \quad (1526)$$

7.726 Species e_1196

Name metE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0954](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1196} = 0 \quad (1527)$$

7.727 Species e_1200

Name ubiD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1064](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1200} = 0 \quad (1528)$$

7.728 Species e_1201

Name fre

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0576](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1201} = 0 \quad (1529)$$

7.729 Species e_1202

Name fadA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in seven reactions (as a modifier in [r_0230](#), [r_0231](#), [r_0232](#), [r_0233](#), [r_0234](#), [r_0235](#), [r_0236](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1202} = 0 \quad (1530)$$

7.730 Species e_1203

Name fadB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in 15 reactions (as a modifier in [r_0096](#), [r_0120](#), [r_0121](#), [r_0122](#), [r_0123](#), [r_0124](#), [r_0126](#), [r_0127](#), [r_0128](#), [r_0129](#), [r_0130](#), [r_0131](#), [r_0133](#), [r_0134](#), [r_0135](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1203} = 0 \quad (1531)$$

7.731 Species e_1205

Name hemG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1230](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1205} = 0 \quad (1532)$$

7.732 Species e_1206

Name mobB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0385](#), [r_0386](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1206} = 0 \quad (1533)$$

7.733 Species e_1207

Name mobA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0385](#), [r_0386](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1207} = 0 \quad (1534)$$

7.734 Species e_1210

Name glnA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0683](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1210} = 0 \quad (1535)$$

7.735 Species e_1226

Name tpiA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1363](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1226} = 0 \quad (1536)$$

7.736 Species e_1227

Name fpr

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a modifier in [r_1276](#), [r_1277](#), [r_1278](#), [r_1279](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1227} = 0 \quad (1537)$$

7.737 Species e_1232

Name metB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1057](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1232} = 0 \quad (1538)$$

7.738 Species e_1233

Name metL

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0369](#), [r_0769](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1233} = 0 \quad (1539)$$

7.739 Species e_1234

Name metF

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0211](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1234} = 0 \quad (1540)$$

7.740 Species e_1238

Name pflD

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1252](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1238} = 0 \quad (1541)$$

7.741 Species e_1239

Name pflC

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1252](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1239} = 0 \quad (1542)$$

7.742 Species e_1240

Name ppc

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1141](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1240} = 0 \quad (1543)$$

7.743 Species e_1241

Name argE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0244](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1241} = 0 \quad (1544)$$

7.744 Species e_1242

Name argC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0996](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1242} = 0 \quad (1545)$$

7.745 Species e_1243

Name argB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0243](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1243} = 0 \quad (1546)$$

7.746 Species e_1244

Name argH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0360](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1244} = 0 \quad (1547)$$

7.747 Species e_1247

Name murI

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0676](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1247} = 0 \quad (1548)$$

7.748 Species e_1248

Name murB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1388](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1248} = 0 \quad (1549)$$

7.749 Species e_1249

Name coaA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1075](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1249} = 0 \quad (1550)$$

7.750 Species e_1250

Name thiH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1346](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1250} = 0 \quad (1551)$$

7.751 Species e_1251

Name thiG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1375](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1251} = 0 \quad (1552)$$

7.752 Species e_1252

Name thiF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1346](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1252} = 0 \quad (1553)$$

7.753 Species e_1253

Name thiE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1344](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1253} = 0 \quad (1554)$$

7.754 Species e_1254

Name thiC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0179](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1254} = 0 \quad (1555)$$

7.755 Species e_1256

Name hemE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1421](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1256} = 0 \quad (1556)$$

7.756 Species e_1257

Name purD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1214](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1257} = 0 \quad (1557)$$

7.757 Species e_1258

Name purH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0786](#), [r_1209](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1258} = 0 \quad (1558)$$

7.758 Species e_1259

Name metA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0771](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1259} = 0 \quad (1559)$$

7.759 Species e_1262

Name metH

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0954](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1262} = 0 \quad (1560)$$

7.760 Species e_1263

Name lysC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0369](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1263} = 0 \quad (1561)$$

7.761 Species e_1264

Name pgi

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0664](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1264} = 0 \quad (1562)$$

7.762 Species e_1271

Name ubiC

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0424](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1271} = 0 \quad (1563)$$

7.763 Species e_1272

Name ubiA

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0775](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1272} = 0 \quad (1564)$$

7.764 Species e_1273

Name plsB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0706](#), [r_0707](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1273} = 0 \quad (1565)$$

7.765 Species e_1275

Name alr

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0310](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1275} = 0 \quad (1566)$$

7.766 Species e_1276

Name tyrB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in three reactions (as a modifier in [r_0854](#), [r_1081](#), [r_1376](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1276} = 0 \quad (1567)$$

7.767 Species e_1277

Name aphA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1134](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1277} = 0 \quad (1568)$$

7.768 Species e_1291

Name rpiB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1284](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1291} = 0 \quad (1569)$$

7.769 Species e_1298

Name fumB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0632](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1298} = 0 \quad (1570)$$

[7.770 Species e_1312](#)

Name psd

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in two reactions (as a modifier in [r_1123](#), [r_1124](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1312} = 0 \quad (1571)$$

[7.771 Species e_1313](#)

Name rsgA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1047](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1313} = 0 \quad (1572)$$

[7.772 Species e_1315](#)

Name purA

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0303](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1315} = 0 \quad (1573)$$

7.773 Species e_1326

Name cysQ

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0085](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1326} = 0 \quad (1574)$$

7.774 Species e_1334

Name nrdG

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a modifier in [r_1276](#), [r_1277](#), [r_1278](#), [r_1279](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1334} = 0 \quad (1575)$$

7.775 Species e_1335

Name nrdD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a modifier in [r_1276](#), [r_1277](#), [r_1278](#), [r_1279](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1335} = 0 \quad (1576)$$

7.776 Species e_1339

Name pyrl

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_0368](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1339} = 0 \quad (1577)$$

[7.777 Species e_1340](#)

Name pyrB

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_0368](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1340} = 0 \quad (1578)$$

[7.778 Species e_1341](#)

Name argI

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1065](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1341} = 0 \quad (1579)$$

[7.779 Species e_1355](#)

Name sgcE

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol·l⁻¹

This species takes part in one reaction (as a modifier in [r_1285](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{-1355} = 0 \quad (1580)$$

7.780 Species e_1366

Name deoB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1202](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1366} = 0 \quad (1581)$$

7.781 Species e_1367

Name deoD

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1232](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1367} = 0 \quad (1582)$$

7.782 Species e_1369

Name serB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1134](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1369} = 0 \quad (1583)$$

7.783 Species e_1373

Name gpmB

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1153](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} e_{1373} = 0 \quad (1584)$$

7.784 Species e_1374

Name thiS

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a modifier in [r_1346](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1374} = 0 \quad (1585)$$

7.785 Species e_1376

Name glcF

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0734](#), [r_0735](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1376} = 0 \quad (1586)$$

7.786 Species e_1377

Name glcE

SBO:0000252 polypeptide chain

Initial concentration $0.0010 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [r_0734](#), [r_0735](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{1377} = 0 \quad (1587)$$

A Glossary of Systems Biology Ontology Terms

SBO:0000176 biochemical reaction: An event involving one or more chemical entities that modifies the electrochemical structure of at least one of the participants.

SBO:0000185 transport reaction: Movement of a physical entity without modification of the structure of the entity

SBO:0000247 simple chemical: Simple, non-repetitive chemical entity

SBO:0000252 polypeptide chain: Naturally occurring macromolecule formed by the repetition of amino-acid residues linked by peptidic bonds. A polypeptide chain is synthesized by the ribosome. CHEBI:1654

SBO:0000281 equilibrium constant: Quantity characterizing a chemical equilibrium in a chemical reaction, which is a useful tool to determine the concentration of various reactants or products in a system where chemical equilibrium occurs

SBO:0000290 physical compartment: Specific location of space, that can be bounded or not. A physical compartment can have 1, 2 or 3 dimensions

SBO:0000322 Michaelis constant for substrate: Substrate concentration at which the velocity of product production by the forward activity of a reversible enzyme is half its maximum.

SBO:0000323 Michaelis constant for product: Product concentration at which the velocity of substrate production by the reverse activity of a reversible enzyme is half its maximum.

SBO:0000324 forward maximal velocity: Limiting maximal velocity of the forward reaction of a reversible enzyme, reached when the substrate is in large excess and all the enzyme is complexed.

SBO:0000460 enzymatic catalyst: A substance that accelerates the velocity of a chemical reaction without itself being consumed or transformed, by lowering the free energy of the transition state. The substance acting as a catalyst is an enzyme

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