

SBML Model Report

Model name: “Smallbone2013 - Yeast metabolic model with modular rate law, merged with Pritchard 2002”



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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 February 20th 2008 at 10:05 a. m. and last time modified at April 29th 2014 at 11:47 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	713
events	0	constraints	0
reactions	298	function definitions	1
global parameters	0	unit definitions	10
rules	0	initial assignments	0

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2 Unit Definitions

This is an overview of 14 unit definitions of which four are predefined by SBML and not mentioned in the model.

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_cubed`

Name mM cubed

Definition $\text{mmol}^3 \cdot \text{l}^{-3}$

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 `per_mM_cubed`

Name `per_mM_cubed`

Definition $\text{mmol}^{-3} \cdot \text{l}^3$

2.9 Unit `per_s`

Name `per_s`

Definition s^{-1}

2.10 Unit `per_mM_per_s`

Name `per_mM_per_s`

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

2.11 Unit `volume`

Notes Litre is the predefined SBML unit for `volume`.

Definition `l`

2.12 Unit `area`

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

Definition m^2

2.13 Unit `length`

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

Definition `m`

2.14 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 713 species. The boundary condition of 403 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_0002	(1->3)-beta-D-glucan	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0004	(1->6)-beta-D-glucan	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0008	(2R,3R)-2,3-dihydroxy-3-methylpentanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0009	(2R,3S)-3-isopropylmalate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0010	(2S)-2-isopropyl-3-oxosuccinate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0015	(N(omega)-L-arginino)succinic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0016	(R)-2,3-dihydroxy-3-methylbutanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0018	(R)-5-diphosphomevalonic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0019	(R)-5-phosphomevalonic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0025	(R)-lactate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0028	(R)-mevalonate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0033	(R)-S-lactoylglutathione	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0037	(S)-2,3-epoxysqualene	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0039	(S)-2-acetyl-2-hydroxybutanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0056	(S)-3-methyl-2-oxopentanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0061	(S)-dihydroorotate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0062	(S)-lactaldehyde	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0063	(S)-lactate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0066	(S)-malate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
BPG	1,3-bisphospho-D-glycerate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0076	1-(2-carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0077	1-(5-phospho-D-ribosyl)-5-[(5-phospho-D-ribosylamino)methylideneamino]imidazole-4-carboxamide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0078	1-(5-phosphoribosyl)-5'-AMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0082	1-acyl-sn-glycerol 3-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0086	1-C-(indol-3-yl)glycerol 3-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0089	1-phosphatidyl-1D-myo-inositol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0118	1-pyrroline-5-carboxylate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0120	10-formyl-THF	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0122	14-demethylsterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0126	1D-myo-inositol 1-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0141	2,5-diamino-4-hydroxy-6-(5-phosphoribosylamino)pyrimidine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0142	2,5-diamino-6-(5-phosphono)ribitylamino-4(3H)-pyrimidinone	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0145	2-acetamido-5-oxopentanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0146	2-acetyllactic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0158	2-hydroxy-3-oxobutyl phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0162	2-isopropylmalate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0165	2-isopropylmaleic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0176	2-oxoadipic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0178	2-oxobutanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0180	2-oxoglutarate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
P2G	2-phospho-D-glyceric acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0190	farnesyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0201	3'-phospho-5'-adenylyl sulfate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0204	3-(4-hydroxyphenyl)pyruvate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0207	3-(imidazol-4-yl)-2-oxopropyl dihydro- gen phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0209	3-dehydro-4-methylzymosterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0210	3-dehydroquinate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0211	3-dehydroshikimate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0218	3-hydroxy-3-methylglutaryl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0231	3-ketosphinganine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0232	3-methyl-2-oxobutanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
P3G	3-phosphoglycerate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0261	3-phosphoshikimic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0262	4,4-dimethyl-5alpha-cholesta-8,14,24- trien-3beta-ol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0291	4-methyl-2-oxopentanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0295	4-phospho-L-aspartate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0296	4alpha-methylzymosterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0297	4beta-methylzymosterol-4alpha- carboxylic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0298	5'-adenylyl sulfate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0299	5'-phosphoribosyl-4-(N- succinocarboxamide)-5-aminoimidazole	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0300	5'-phosphoribosyl-5-aminoimidazole	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0301	5'-phosphoribosyl-N-formylglycineamide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0302	5'-phosphoribosyl-N-formylglycineamidine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0304	5,10-methenyl-THF	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0306	5,10-methylenetetrahydrofolate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0312	5-[(5-phospho-1-deoxy-D-ribulos-1-ylamino)methylideneamino]-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0313	5-amino-6-(5-phosphoribitylamino)uracil	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0314	5-amino-6-(D-ribitylamino)uracil	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0322	5-methyltetrahydrofolate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0324	5-O-(1-carboxyvinyl)-3-phosphoshikimic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0325	5-phospho-ribosyl-glycineamide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0326	5-phosphoribosyl-ATP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0327	5-phosphoribosylamine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0328	6,7-dimethyl-8-(1-D-ribityl)lumazine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0335	6-O-phosphono-D-glucono-1,5-lactone	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0340	6-phospho-D-gluconate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0349	7-phospho-2-dehydro-3-deoxy-D-arabino-heptonic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
AcAld	acetaldehyde	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0360	acetaldehyde	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0362	acetate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0367	acetoacetyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0373	acetyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0380	acyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0386	adenosine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0390	adenosine 3',5'-bimonophosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0393	adenylo-succinate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
ADP	ADP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0403	AICAR	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0404	Ala-tRNA(Ala)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0409	alpha,alpha-trehalose 6-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0419	ammonium	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0420	ammonium	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
AMP	AMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0427	anthranilate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0428	Arg-tRNA(Arg)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0430	Asn-tRNA(Asn)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0432	Asp-tRNA(Asp)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
ATP	ATP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0445	bicarbonate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0454	but-1-ene-1,2,4-tricarboxylic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0455	carbamoyl phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
C02	carbon dioxide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0458	carbon dioxide	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0467	CDP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0471	CDP-diacylglycerol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0478	ceramide-1 (C26)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0505	cerotate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0515	chorismate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0516	cis-aconitate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0522	citrate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0526	CMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0529	coenzyme A	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0539	CTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0542	Cys-tRNA(Cys)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0550	D-erythro-1-(imidazol-4-yl)glycerol 3-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0551	D-erythrose 4-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
F16bP	D-fructose 1,6-bisphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
F6P	D-fructose 6-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
GLC	D-glucose	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
GLCx	D-glucose	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0567	D-glucose 1-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
G6P	D-glucose 6-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0573	D-mannose 1-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0574	D-mannose 6-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0577	D-ribulose 5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0581	D-xylulose 5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0582	dADP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0584	dAMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0586	dATP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0587	dCDP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0589	dCMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0595	decanoate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0602	decanoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0613	dGDP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0615	dGMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0619	diglyceride	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_0625	dihydrofolic acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
DHAP	dihydroxyacetone phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0633	diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0644	dolichyl D-mannosyl phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0645	dolichyl phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0649	dTMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0654	dUMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0656	dUTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0657	episterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0662	ergosta-5,7,22,24(28)-tetraen-3beta-ol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0666	ergosterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0672	ergosterol ester	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
EtOH	ethanol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0681	ethanol	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0700	fecosterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0709	ferricytochrome c	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0710	ferrocycytochrome c	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0722	formate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0725	fumarate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0739	GDP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0743	GDP-alpha-D-mannose	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0745	geranyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0747	Gln-tRNA(Gln)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0748	Glu-tRNA(Glu)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0750	glutathione	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0757	Gly-tRNA(Gly)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
GAP	glyceraldehyde 3-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
GLY	glycerol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0766	glycerol	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_0767	glycerol 3-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0773	glycogen	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0779	glyoxylate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0782	GMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0785	GTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0816	hexacosanoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0832	His-tRNA(His)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0835	homocitrate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0836	homoisocitrate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0841	hydrogen sulfide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0847	Ile-tRNA(Ile)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0849	IMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0897	inositol-P-ceramide A (C26)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0940	isocitrate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0943	isopentenyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0951	keto-phenylpyruvate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0953	L-2-aminoadipate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0955	L-alanine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0959	L-allysine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0965	L-arginine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0969	L-asparagine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0973	L-aspartate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0978	L-aspartate 4-semialdehyde	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0979	L-citrulline	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0980	L-cystathionine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
s_0981	L-cysteine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0991	L-glutamate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_0999	L-glutamine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1003	L-glycine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1006	L-histidine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1010	L-histidinol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1011	L-histidinol phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1012	L-homocysteine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1014	L-homoserine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1016	L-isoleucine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1021	L-leucine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1025	L-lysine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1029	L-methionine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1032	L-phenylalanine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1035	L-proline	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1038	L-saccharopine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1039	L-serine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1045	L-threonine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1048	L-tryptophan	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1051	L-tyrosine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1056	L-valine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1059	lanosterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1065	laurate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1073	lauroyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1077	Leu-tRNA(Leu)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1084	lignoceric acid	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1099	Lys-tRNA(Lys)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1101	malonyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1107	mannan	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1148	Met-tRNA(Met)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1151	methylglyoxal	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1153	myo-inositol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1161	myristate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1176	myristoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1182	N(2)-acetyl-L-ornithine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1187	N-(5-phospho-beta-D-ribosyl)anthranilate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1191	N-acetyl-L-gamma-glutamyl phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1192	N-acetyl-L-glutamate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1194	N-carbamoyl-L-aspartate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
NAD	NAD	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
NADH	NADH	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1207	NADP(+)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1212	NADPH	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1233	O-acetyl-L-homoserine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1238	O-phospho-L-homoserine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1255	octanoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1266	ornithine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1269	orotate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1270	orotidine 5'-(dihydrogen phosphate)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1271	oxaloacetate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1275	oxygen	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1277	oxygen	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1286	palmitate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1302	palmitoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1314	Phe-tRNA(Phe)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
PHO	phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1324	phosphate	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1331	phosphatidate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1337	phosphatidyl-L-serine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1342	phosphatidyl-N,N-dimethylethanolamine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1343	phosphatidyl-N-methylethanolamine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1346	phosphatidylcholine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1351	phosphatidylethanolamine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
PEP	phosphoenolpyruvate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1364	phosphoribosyl-carboxy-aminoimidazole	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1365	phosphoribosyl-formamido-carboxamide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1376	prenyl diphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1377	prephenate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1379	Pro-tRNA(Pro)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1386	PRPP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
PYR	pyruvate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1405	riboflavin	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1408	ribose-5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1413	S-adenosyl-L-homocysteine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1416	S-adenosyl-L-methionine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1426	sedoheptulose 1,7-bisphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1427	sedoheptulose 7-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1428	Ser-tRNA(Ser)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1429	shikimate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1445	sphinganine	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1447	squalene	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s_1449	stearate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1454	stearoyl-CoA	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1458	succinate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1459	succinate	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1467	sulphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1468	sulphate	extracellular	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
s_1469	sulphite	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1487	THF	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1491	Thr-tRNA(Thr)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1520	trehalose	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1524	triglyceride	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1527	Trp-tRNA(Trp)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1533	Tyr-tRNA(Tyr)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1535	ubiquinol-6	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1537	ubiquinone-6	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1538	UDP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1543	UDP-D-glucose	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1545	UMP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1559	UTP	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1561	Val-tRNA(Val)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1565	xanthosine-5-phosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1569	zymosterol	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1576	zymosterol intermediate 1a	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1577	zymosterol intermediate 1b	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1578	zymosterol intermediate 1c	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1579	zymosterol intermediate 2	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1582	tRNA(Ala)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
s_1583	tRNA(Arg)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1585	tRNA(Asn)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1587	tRNA(Asp)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1589	tRNA(Cys)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1590	tRNA(Gln)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1591	tRNA(Glu)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1593	tRNA(Gly)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1594	tRNA(His)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1596	tRNA(Ile)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1598	tRNA(Leu)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1600	tRNA(Lys)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1602	tRNA(Met)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1604	tRNA(Phe)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1606	tRNA(Pro)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1607	tRNA(Ser)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1608	tRNA(Thr)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1610	tRNA(Trp)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1612	tRNA(Tyr)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1614	tRNA(Val)	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1616	TRX1	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
s_1620	TRX1 disulphide	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input type="checkbox"/>
e_0001	COX1	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0002	ATP8	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0003	ATP6	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0004	COB	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0005	OLI1	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0006	COX2	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0007	COX3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0008	CYS3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0010	PMT2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0011	CDC19	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0012	GCV3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0017	ADE1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0020	SCT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0022	ACH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0025	RIB1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0026	URA7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0028	COR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0030	PRS4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0031	ILS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0033	ATP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0038	IPP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0045	CDS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0051	ATP3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0053	FAT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0054	TSC3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0057	MIS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0062	LYS2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0063	TKL2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0064	GRS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0065	TPS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0066	VMA2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0069	ADH5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0071	RIB7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0074	TYR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0079	PGI1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0084	PYC2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0087	HIS7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0088	ARO4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0089	DUT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0090	RIB5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0091	SHM1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0092	TSC10	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0100	ILV6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0101	LEU2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0103	HIS4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0106	GLK1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0107	APA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0109	CHA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0111	CIT2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0113	PGK1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0117	FEN1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0122	THR4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0124	TRX3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0127	ATP16	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0128	TSC13	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0129	GPD1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0133	SLC1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0134	PSA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0135	IDP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0136	COX9	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0137	MDH3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0141	PMT5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0142	PMT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0146	LYS21	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0151	DLD1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0152	DLD2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0154	LYS20	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0155	VMA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0160	GDH2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0165	TRP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0167	GCV1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0168	SES1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0169	ARO3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0171	KRS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0175	TPI1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0176	TGL2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0177	LCB2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0179	TPS2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0182	ARO1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0183	YCF1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0186	HOM2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0188	SDH4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0194	ADK1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0196	LYS4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0202	GLO2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0203	DPP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0204	INM2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0207	ATP5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0213	TIM11	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0214	YDR341C	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0218	TRR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0219	TRP4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0220	KEI1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0223	ATP17	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0231	ADE8	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0234	GUK1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0237	RIB3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0239	SAM2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0243	QCR7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0249	URA3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0250	RIP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0251	VMA3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0255	CYC7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0260	GLY1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0263	VMA8	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0268	DLD3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0269	PMI40	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0271	YND1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0273	FAA2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0276	PRO3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0278	CHO1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0280	SAH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0281	HOM3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0283	HIS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0288	HOR2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0289	ICL1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0290	ARG5,6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0291	RNR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0293	ALD5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0295	ILV1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0296	AIM10	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0297	TRP2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0298	MET6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0299	PRS2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0303	ADK2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0311	LPD1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0312	FRS2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0313	AGX1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0314	SEC53	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0317	GSY1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0320	HIS2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0321	MET10	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0322	QCR6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0325	HXK1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0326	ERG26	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0328	LEU1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0329	ERG4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0330	TRP5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0334	PYC1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0340	MET13	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0342	ARO2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0343	LYS5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0346	COX4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0347	COX13	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0348	ARO8	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0352	ADE5,7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0353	GUS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0355	HXK2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0356	ADH4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0362	VMA7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0364	GSC2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0365	ACB1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0367	ERG25	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0368	ADE6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0370	PDC6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0372	VAS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0376	ASN2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0379	SKN1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0380	CYS4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0381	CHO2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0382	PSD2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0385	ERG1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0387	RNR4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0389	QCR9	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0390	TYS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0392	TDH3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0396	ADE3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0398	TRX2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0401	PFK1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0404	SOL4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0405	ENO1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0407	GND2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0409	MES1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0417	LAG1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0418	PRS3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0422	QCR10	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0424	ERG11	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0425	DIA4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0426	ARG4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0427	DED81	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0428	THR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0429	VMA16	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0431	PUT2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0432	VMA10	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0434	NCP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0435	INM1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0436	COX6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0440	ERG7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0447	GRE3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0448	TRR2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0452	DCD1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0453	SOL3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0454	ENO2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0455	GND1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0456	ERG9	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0457	BAT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0458	IMD2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0462	FAA3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0465	HIS6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0466	RHR2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0467	RNR3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0470	THS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0472	LYS12	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0475	COX5B	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0476	HIS5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0489	LYS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0492	RNR2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0494	YJL045W	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0495	TDH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0496	BNA3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0499	ARG3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0506	RPE1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0508	URA2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0510	GLG2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0512	INO1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0514	QCR8	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0515	ERG20	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0525	TDH2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0528	ILV3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0531	CYC1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0536	OPI3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0540	URA8	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0541	ADO1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0542	CPA2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0544	ATP2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0545	STR2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0547	MET5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0548	HOM6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0549	PMT4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0550	BAT2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0556	MET14	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0557	AUR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0558	LAC1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0559	ATP7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0561	URA6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0565	UGP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0567	FBA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0568	YNK1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0569	VMA5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0571	MDH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0574	AAT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0576	PGM1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0578	TGL1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0579	SDH3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0581	SDH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0582	GPM1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0585	PRS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0586	FAS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0588	PXA2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0591	TRP3	cell	mmol · l ⁻¹	✓	✓
e_0594	URA1	cell	mmol · l ⁻¹	✓	✓
e_0601	SHB17	cell	mmol · l ⁻¹	✓	✓
e_0603	GLG1	cell	mmol · l ⁻¹	✓	✓
e_0607	GPT2	cell	mmol · l ⁻¹	✓	✓
e_0610	MTD1	cell	mmol · l ⁻¹	✓	✓
e_0611	TGL4	cell	mmol · l ⁻¹	✓	✓
e_0612	PCK1	cell	mmol · l ⁻¹	✓	✓
e_0613	YEH1	cell	mmol · l ⁻¹	✓	✓
e_0615	DPS1	cell	mmol · l ⁻¹	✓	✓
e_0619	SDH2	cell	mmol · l ⁻¹	✓	✓
e_0621	YBT1	cell	mmol · l ⁻¹	✓	✓
e_0629	AAT2	cell	mmol · l ⁻¹	✓	✓
e_0631	ADE16	cell	mmol · l ⁻¹	✓	✓
e_0632	COX12	cell	mmol · l ⁻¹	✓	✓
e_0633	TRX1	cell	mmol · l ⁻¹	✓	✓
e_0636	PDC1	cell	mmol · l ⁻¹	✓	✓
e_0638	SHM2	cell	mmol · l ⁻¹	✓	✓
e_0639	FRS1	cell	mmol · l ⁻¹	✓	✓
e_0642	ALT1	cell	mmol · l ⁻¹	✓	✓
e_0644	ERG27	cell	mmol · l ⁻¹	✓	✓
e_0647	PDC5	cell	mmol · l ⁻¹	✓	✓
e_0658	SAM1	cell	mmol · l ⁻¹	✓	✓
e_0667	GSY2	cell	mmol · l ⁻¹	✓	✓
e_0671	ATP14	cell	mmol · l ⁻¹	✓	✓
e_0674	MET17	cell	mmol · l ⁻¹	✓	✓
e_0675	ACO1	cell	mmol · l ⁻¹	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0682	FKS1	cell	mmol · l ⁻¹	✓	✓
e_0684	TAL1	cell	mmol · l ⁻¹	✓	✓
e_0685	ILV5	cell	mmol · l ⁻¹	✓	✓
e_0686	ADE13	cell	mmol · l ⁻¹	✓	✓
e_0687	SUR4	cell	mmol · l ⁻¹	✓	✓
e_0690	COX8	cell	mmol · l ⁻¹	✓	✓
e_0692	URA4	cell	mmol · l ⁻¹	✓	✓
e_0693	IMD3	cell	mmol · l ⁻¹	✓	✓
e_0695	VMA6	cell	mmol · l ⁻¹	✓	✓
e_0697	HMG2	cell	mmol · l ⁻¹	✓	✓
e_0698	GLO1	cell	mmol · l ⁻¹	✓	✓
e_0699	ERG6	cell	mmol · l ⁻¹	✓	✓
e_0704	CYB2	cell	mmol · l ⁻¹	✓	✓
e_0705	IMD4	cell	mmol · l ⁻¹	✓	✓
e_0708	HMG1	cell	mmol · l ⁻¹	✓	✓
e_0709	ATP18	cell	mmol · l ⁻¹	✓	✓
e_0711	TSL1	cell	mmol · l ⁻¹	✓	✓
e_0712	URA5	cell	mmol · l ⁻¹	✓	✓
e_0716	ERG13	cell	mmol · l ⁻¹	✓	✓
e_0727	STV1	cell	mmol · l ⁻¹	✓	✓
e_0729	ARG7	cell	mmol · l ⁻¹	✓	✓
e_0730	ADH3	cell	mmol · l ⁻¹	✓	✓
e_0733	PGM2	cell	mmol · l ⁻¹	✓	✓
e_0734	ILV2	cell	mmol · l ⁻¹	✓	✓
e_0736	ADE17	cell	mmol · l ⁻¹	✓	✓
e_0740	ALD2	cell	mmol · l ⁻¹	✓	✓
e_0741	GCV2	cell	mmol · l ⁻¹	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0742	ERG2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0743	PFK2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0744	HFA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0745	ERG12	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0746	GUA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0747	ERG8	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0750	FAA4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0752	COX7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0753	TPS3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0754	PPA2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0755	URA10	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0757	PGM3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0761	LCB1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0762	LIP1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0763	ADE4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0765	TGL3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0769	IDP3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0771	IDH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0774	COX5A	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0778	LEU4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0788	PSD1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0791	ADE12	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0792	ZWF1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0793	YNL247W	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0799	MET2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0800	ERG24	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0802	PHA2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0805	CIT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0808	ACC1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0812	MVD1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0813	LYS9	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0826	ARG1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0827	GPD2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0829	PRS5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0830	MET22	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0832	RIB2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0834	ADH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0836	WRS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0838	MDH2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0840	ARG8	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0841	RIB4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0842	GRE2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0846	GLO4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0848	CYT1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0850	CDC21	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0851	TGL5	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0852	RKI1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0855	LEU9	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0860	ADE2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0862	IDH2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0867	GLN4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0869	ALE1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0875	HIS3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0880	DFR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
e_0883	DGA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0884	VPH1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0888	CPA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0889	FAA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0890	PMT3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0892	VMA4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0894	ALA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0895	PYK2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0898	ALD4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0903	MET12	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0904	ERG10	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0911	ALD6	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0913	ATP4	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0915	GLR1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0922	IDI1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0924	PXA1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0926	CDC60	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0934	FAS2	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0935	VMA11	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0940	FUM1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0944	ATP15	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0947	CIT3	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0950	ATP20	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0953	HTS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0955	GLN1	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0956	VMA13	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓
e_0959	ARO7	cell	$\text{mmol} \cdot \text{l}^{-1}$	✓	✓

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
e_0962	TKL1	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0963	GRS2	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0964	PIS1	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0970	ASN1	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0973	KRE6	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0975	MET16	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0976	DPM1	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0978	QCR2	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e_0980	YER152C	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F26bP	beta-D-fructose 2,6-bisphosphate	cell	$\text{mmol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input 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 298 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	(R)-lactate:ferricytochrome-c oxidoreductase	2- s_0025 + 2 s_0709 $\xrightleftharpoons[\text{PYR}]{\text{e_0151, e_0268, e_0255, e_0531, e_0152, s_0025, s_0709, s_0710, F}}$	0000176
2	r_0004	(S)-lactate:ferricytochrome-c oxidoreductase	2- s_0063 + 2 s_0709 $\xrightleftharpoons[\text{PYR}]{\text{e_0704, e_0531, e_0255, s_0063, s_0709, s_0710, PYR}}$	0000176
3	r_0005	1,3-beta-glucan synthase	s_1543 $\xrightleftharpoons[\text{s_1538}]{\text{e_0682, e_0364, s_1543, s_0002, s_1538}}$ s_0002	0000176
4	r_0006	1,6-beta-glucan synthase	s_1543 $\xrightleftharpoons[\text{s_1538}]{\text{e_0973, e_0379, s_1543, s_0004, s_1538}}$ s_0004	0000176
5	r_0007	1-(5-phosphoribosyl)-5-[(5-phosphoribosylamino)methylideneamino]imidazole-4-carboxamide isomerase	s_0077 $\xrightleftharpoons[\text{s_0312}]{\text{e_0465, s_0077, s_0312}}$	0000176
6	r_0008	1-acyl-sn-glycerol-3-phosphate acyltransferase	s_0082 + s_0380 $\xrightleftharpoons[\text{s_1331}]{\text{e_0869, e_0133, e_0117, s_0082, s_0380, s_0529, s_1331}}$ s_0529 +	0000176
7	r_0012	1-pyrroline-5-carboxylate dehydrogenase	s_0991 + NADH $\xrightleftharpoons[\text{NAD}]{\text{e_0431, s_0991, NADH, s_0118, NAD}}$	0000176
8	r_0014	2,5-diamino-6-ribitylamino-4(3H)-pyrimidinone 5'-phosphate deaminase	s_0142 $\xrightleftharpoons[\text{s_0419}]{\text{e_0832, s_0142, s_0313, s_0419}}$ s_0313 +	0000176

Nº	Id	Name	Reaction Equation	SBO
9	r_0015	2,5-diamino-6-ribosylamino-4(3H)-pyrimidinone 5'-phosphate reductase (NADPH)	$s_{0141} + s_{1212} \xrightleftharpoons[e_{0071}, s_{0141}, s_{1212}, s_{0142}, s_{1207}]{0000176} s_{1207}$	0000176 +
10	r_0016	2-aceto-2-hydroxybutanoate synthase	$s_{0178} + \text{PYR} \xrightleftharpoons[e_{0734}, e_{0100}, s_{0178}, \text{PYR}, s_{0039}, \text{CO}_2]{0000176} \text{CO}_2$	0000176 +
11	r_0018	2-aminoadipate transaminase	$s_{0176} + s_{0991} \xrightleftharpoons[e_{0348}, e_{0496}, e_{0980}, s_{0176}, s_{0991}, s_{0180}, s_{0953}]{0000176} s_{0180} + s_{0953}$	0000176 +
12	r_0020	2-deoxy-D-arabino-heptulosonate phosphate synthetase	$s_{0551} + \text{PEP} \xrightleftharpoons[e_{0169}, e_{0088}, s_{0551}, \text{PEP}, s_{0349}, \text{PHO}]{0000176} \text{PHO}$	0000176 +
13	r_0023	2-isopropylmalate hydratase	$s_{0162} \xrightleftharpoons[e_{0328}, s_{0162}, s_{0165}]{0000176} s_{0165}$	0000176
14	r_0024	2-isopropylmalate synthase	$s_{0232} + s_{0373} \xrightleftharpoons[e_{0778}, e_{0855}, s_{0232}, s_{0373}, s_{0162}, s_{0529}]{0000176} s_{0162} + s_{0529}$	0000176 +
15	r_0027	2-methylcitrate dehydratase	$s_{0835} \xrightleftharpoons[e_{0196}, s_{0835}, s_{0454}]{0000176} s_{0454}$	0000176
16	r_0029	2-oxo-4-methyl-3-carboxypentanoate decarboxylation	$s_{0010} \xrightleftharpoons[e_{0550}, e_{0457}, s_{0010}, s_{0291}, \text{CO}_2]{0000176} s_{0291} + \text{CO}_2$	0000176
17	r_0032	3',5'-bisphosphate nucleotidase	$s_{0390} \xrightleftharpoons[e_{0830}, s_{0390}, \text{AMP}, \text{PHO}]{0000176} \text{AMP} + \text{PHO}$	0000176
18	r_0038	3,4-dihydroxy-2-butanone-4-phosphate synthase	$s_{0577} \xrightleftharpoons[e_{0237}, s_{0577}, s_{0158}, s_{0722}]{0000176} s_{0158} + s_{0722}$	0000176 +
19	r_0039	3-dehydroquinate dehydratase	$s_{0210} \xrightleftharpoons[e_{0182}, s_{0210}, s_{0211}]{0000176} s_{0211}$	0000176
20	r_0040	3-dehydroquinate synthase	$s_{0349} \xrightleftharpoons[e_{0182}, s_{0349}, s_{0210}, \text{PHO}]{0000176} s_{0210} + \text{PHO}$	0000176 +
21	r_0041	3-dehydrosphinganine reductase	$s_{0231} + s_{1212} \xrightleftharpoons[e_{0092}, s_{0231}, s_{1212}, s_{1207}, s_{1445}]{0000176} s_{1445}$	0000176 +

Nº	Id	Name	Reaction Equation	SBO
22	r_0060	3-isopropylmalate dehydratase	$s_{0165} \xrightleftharpoons{e_{0328}, s_{0165}, s_{0009}} s_{0009}$	0000176
23	r_0061	3-isopropylmalate dehydrogenase	$s_{0009} + NAD \xrightleftharpoons{e_{0101}, s_{0009}, NAD, s_{0010}, NADH} NADH$	0000176
24	r_0065	3-phosphoshikimate carboxyvinyltransferase	1- $s_{0261} + PEP \xrightleftharpoons{e_{0182}, s_{0261}, PEP, s_{0324}, PHO} s_{0324} + PHO$	0000176
25	r_0079	5'-phosphoribosylformyl glycinamide syn- thetase	$s_{0301} + ATP + s_{0999} \xrightleftharpoons{e_{0368}, s_{0301}, ATP, s_{0999}, s_{0302}, ADP, s_{0991}, PHO} s_{0302} + ADP + s_{0991} + PHO$	0000176
26	r_0080	5,10-methylenetetrahydrofolate reductase (NADPH)	$s_{0306} + s_{1212} \xrightleftharpoons{e_{0340}, e_{0903}, s_{0306}, s_{1212}, s_{0322}, s_{1207}} s_{0322} + s_{1207}$	0000176
27	r_0091	6-phosphogluconolactonase	$s_{0335} \xrightleftharpoons{e_{0453}, e_{0404}, s_{0335}, s_{0340}} s_{0340}$	0000176
28	r_0096	acetoxy acid isomeroreductase	$s_{0146} + s_{1212} \xrightleftharpoons{e_{0685}, s_{0146}, s_{1212}, s_{0016}, s_{1207}} s_{0016} + s_{1207}$	0000176
29	r_0097	acetolactate synthase	$2\text{ PYR} \xrightleftharpoons{e_{0734}, e_{0100}, \text{PYR}, s_{0146}, \text{CO}_2} s_{0146} + \text{CO}_2$	0000176
30	r_0103	acetyl-CoA C-acetyltransferase	$2\text{ s}_{0373} \xrightleftharpoons{e_{0904}, s_{0373}, s_{0367}, s_{0529}} s_{0367} + s_{0529}$	0000176
31	r_0108	acetyl-CoA carboxylase	$s_{0373} + ATP + s_{0445} \xrightleftharpoons{e_{0744}, e_{0808}, s_{0373}, ATP, s_{0445}, ADP, s_{1101}, PHO} s_{1101} + PHO$	0000176
32	r_0110	acetyl-CoA hydrolase	$s_{0362} + s_{0529} \xrightleftharpoons{e_{0022}, s_{0362}, s_{0529}, s_{0373}} s_{0373}$	0000176
33	r_0115	acetylglutamate kinase	$ATP + s_{1192} \xrightleftharpoons{e_{0290}, ATP, s_{1192}, ADP, s_{1191}} ADP + s_{1191}$	0000176
34	r_0118	acteylornithine transaminase	$s_{0145} + s_{0991} \xrightleftharpoons{e_{0840}, s_{0145}, s_{0991}, s_{0180}, s_{1182}} s_{0180} + s_{1182}$	0000176

Nº	Id	Name	Reaction Equation	SBO
35	r_0142	adenosine kinase	$s_{0386} + \text{ATP} \xrightleftharpoons{e_{0541}, s_{0386}, \text{ATP}, \text{ADP}, \text{AMP}} \text{ADP} + \text{AMP}$	0000176
36	r_0144	adenosylhomocysteinase	$s_{1413} \xrightleftharpoons{e_{0280}, s_{1413}, s_{0386}, s_{1012}} s_{0386} + s_{1012}$	0000176
37	AK	adenylate kinase	$2 \text{ADP} \xrightleftharpoons{e_{0194}, e_{0303}, \text{ADP}, \text{AMP}, \text{ATP}} \text{AMP} + \text{ATP}$	0000176
38	r_0150	adenylate kinase (GTP)	$\text{AMP} + s_{0785} \xrightleftharpoons{e_{0303}, \text{AMP}, s_{0785}, \text{ADP}, s_{0739}} \text{ADP} + s_{0739}$	0000176
39	r_0151	adenylosuccinate lyase (AICAR)	$s_{0299} \xrightleftharpoons{e_{0686}, s_{0299}, s_{0403}, s_{0725}} s_{0403} + s_{0725}$	0000176
40	r_0152	adenylosuccinate lyase	$s_{0393} \xrightleftharpoons{e_{0686}, s_{0393}, \text{AMP}, s_{0725}} \text{AMP} + s_{0725}$	0000176
41	r_0153	adenylosuccinate synthase	$s_{0785} + s_{0849} \xrightleftharpoons{e_{0791}, s_{0785}, s_{0849}, s_{0973}, s_{0393}, s_{0739}, \text{PHO}} s_{0973} + s_{0393} + \text{PHO}$	0000176
42	r_0154	adenylyl-sulfate kinase	$s_{0298} + \text{ATP} \xrightleftharpoons{e_{0556}, s_{0298}, \text{ATP}, s_{0201}, \text{ADP}} s_{0201} + \text{ADP}$	0000176
43	r_0156	alanine glyoxylate aminotransferase	$s_{0779} + s_{0955} \xrightleftharpoons{e_{0313}, s_{0779}, s_{0955}, s_{1003}, \text{PYR}} s_{1003} + \text{PYR}$	0000176
44	r_0157	alanyl-tRNA synthetase	$\text{ATP} + s_{0955} + s_{1582} \xrightleftharpoons{e_{0894}, \text{ATP}, s_{0955}, s_{1582}, s_{0404}, \text{AMP}, s_{0633}} s_{0404} + \text{AMP} + s_{0633}$	0000176
45	ADH	mitochondrial alcohol dehydrogenase	$\text{AcAld} + \text{NADH} \xrightleftharpoons{e_{0730}, e_{0356}, e_{0069}, e_{0834}, \text{AcAld}, \text{NADH}, \text{EtOH}, \text{NAD}} \text{EtOH} + \text{NAD}$	0000176

Nº	Id	Name	Reaction Equation	SBO
46	r_0173	aldehyde dehydrogenase (acetaldehyde, NADP)	$\text{AcAld} + \text{s_1207} \xrightleftharpoons[\text{s_1212}]{\text{e_0911, e_0898, e_0293, AcAld, s_1207, s_0362, s_1212}}$	$\text{s_0362} +$
47	r_0174	aldehyde dehydrogenase (acetylaldehyde, NAD)	$\text{AcAld} + \text{NAD} \xrightleftharpoons[\text{NADH}]{\text{e_0898, e_0740, AcAld, NAD, s_0362, NADH}}$	$\text{s_0362} +$
48	r_0195	alpha,alpha-trehalose-phosphate synthase (UDP-forming)	$\text{G6P} + \text{s_1543} \xrightleftharpoons[\text{s_1538}]{\text{e_0711, e_0065, e_0179, e_0753, G6P, s_1543, s_0409, s_1538}}$	$\text{s_0409} +$
49	r_0202	anthranilate phosphoribosyltransferase	$\text{s_0427} + \text{s_1386} \xrightleftharpoons[\text{s_1187}]{\text{e_0219, s_0427, s_1386, s_0633, s_1187}}$	$\text{s_0633} +$
50	r_0203	anthranilate synthase	$\text{s_0515} + \text{s_0999} \xrightleftharpoons[\text{s_0991} + \text{PYR}]{\text{e_0297, e_0591, s_0515, s_0999, s_0427, s_0991, PYR}}$	$\text{s_0427} +$
51	r_0207	argininosuccinate lyase	$\text{s_0015} \xrightleftharpoons[\text{s_0965}]{\text{e_0426, s_0015, s_0725, s_0965}} \text{s_0725} +$	0000176
52	r_0208	argininosuccinate synthase	$\text{ATP} + \text{s_0973} + \text{s_0979} \xrightleftharpoons[\text{AMP} + \text{s_0633}]{\text{e_0826, ATP, s_0973, s_0979, s_0015, AMP, s_0633}}$	$\text{s_0015} +$
53	r_0209	arginyl-tRNA synthetase	$\text{ATP} + \text{s_0965} + \text{s_1583} \xrightleftharpoons[\text{s_0428} + \text{s_0633}]{\text{e_0214, ATP, s_0965, s_1583, AMP, s_0428, s_0633}}$	$\text{AMP} +$
54	r_0211	asparagine synthase (glutamine-hydrolysing)	$\text{ATP} + \text{s_0973} + \text{s_0999} \xrightleftharpoons[\text{s_0633} + \text{s_0969} + \text{s_0991}]{\text{e_0970, e_0376, ATP, s_0973, s_0999, AMP, s_0633, s_0969}}$	
55	r_0212	Asparaginyl-tRNA synthetase	$\text{ATP} + \text{s_0969} + \text{s_1585} \xrightleftharpoons[\text{s_0430} + \text{s_0633}]{\text{e_0427, ATP, s_0969, s_1585, AMP, s_0430, s_0633}}$	$\text{AMP} +$
56	r_0214	aspartate carbamoyltransferase	$\text{s_0455} + \text{s_0973} \xrightleftharpoons[\text{PHO}]{\text{e_0508, s_0455, s_0973, s_1194, PHO}}$	$\text{s_0973} +$

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57	r_0215	aspartate kinase	$\text{ATP} + \text{s_0973} \xrightleftharpoons[\text{ADP}]{\text{e_0281, ATP, s_0973, s_0295, ADP}} \text{s_0295} + \text{ADP}$	0000176
58	r_0216	aspartate transaminase	$\text{s_0991} + \text{s_1271} \xrightleftharpoons[\text{s_0973}]{\text{e_0629, e_0574, s_0991, s_1271, s_0180, s_0973}} \text{s_0180} + \text{s_0973}$	0000176
59	r_0219	aspartate-semialdehyde dehydrogenase	$\text{s_0295} + \text{s_1212} \xrightleftharpoons[\text{s_1207} + \text{PHO}]{\text{e_0186, s_0295, s_1212, s_0978, s_1207, PHO}} \text{s_0978} + \text{s_1207} + \text{PHO}$	0000176
60	r_0220	Aspartyl-tRNA synthetase	$\text{ATP} + \text{s_0973} + \text{s_1587} \xrightleftharpoons[\text{s_0432} + \text{s_0633}]{\text{e_0615, ATP, s_0973, s_1587, AMP, s_0432, s_0633}} \text{AMP} + \text{s_0432} + \text{s_0633}$	0000176
61	r_0225	ATP phosphoribosyltransferase	$\text{ATP} + \text{s_1386} \xrightleftharpoons[\text{s_0633}]{\text{e_0283, ATP, s_1386, s_0326, s_0633}} \text{s_0326} + \text{s_0633}$	0000176
62	r_0226	ATP synthase	$\text{ADP} + \text{PHO} \xrightleftharpoons[\text{s_0973}]{\text{e_0950, e_0944, e_0005, e_0033, e_0207, e_0003, e_0671, e_0002, e_005}}$	0000176
63	ATPase	ATPase, cytosolic	$\text{ATP} \xrightleftharpoons[\text{PHO}]{\text{e_0727, e_0569, e_0432, e_0263, e_0956, e_0155, e_0892, e_0362, e_0251, e_069}}$	0000176
64	r_0231	C-14 sterol reductase	$\text{s_0262} + \text{s_1212} \xrightleftharpoons[\text{s_1207}]{\text{e_0800, s_0262, s_1212, s_0122, s_1207}} \text{s_0122} + \text{s_1207}$	0000176
65	r_0234	C-3 sterol dehydrogenase	$\text{s_1207} + \text{s_1578} \xrightleftharpoons[\text{s_1212} + \text{s_1579}]{\text{e_0326, s_1207, s_1578, CO2, s_1212, s_1579}} \text{CO2} + \text{s_1212} + \text{s_1579}$	0000176
66	r_0235	C-3 sterol dehydrogenase (4-methylzymosterol)	$\text{s_0297} + \text{NAD} \xrightleftharpoons[\text{CO2} + \text{NADH}]{\text{e_0326, s_0297, NAD, s_0209, CO2, NADH}} \text{s_0209} + \text{CO2} + \text{NADH}$	0000176
67	r_0236	C-3 sterol keto reductase (4-methylzymosterol)	$\text{s_0209} + \text{s_1212} \xrightleftharpoons[\text{s_1207}]{\text{e_0644, s_0209, s_1212, s_0296, s_1207}} \text{s_0296} + \text{s_1207}$	0000176
68	r_0237	C-3 sterol keto reductase (zymosterol)	$\text{s_1212} + \text{s_1579} \xrightleftharpoons[\text{s_1569}]{\text{e_0644, s_1212, s_1579, s_1207, s_1569}} \text{s_1207} + \text{s_1569}$	0000176

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69	r_0238	C-4 methyl sterol oxidase	$\text{s_0296} + \text{s_1212} + \text{0000176}$ $\text{s_1275} \xrightleftharpoons[\text{s_1576}]{\text{e_0367, s_0296, s_1212, s_1275, s_1207, s_1576}} \text{s_1207} +$	
70	r_0239	C-4 methyl sterol oxidase	$\text{s_1212} + \text{s_1275} + \text{0000176}$ $\text{s_1576} \xrightleftharpoons[\text{s_1577}]{\text{e_0367, s_1212, s_1275, s_1576, s_1207, s_1577}} \text{s_1207} +$	
71	r_0240	C-4 methyl sterol oxidase	$\text{s_1212} + \text{s_1275} + \text{0000176}$ $\text{s_1577} \xrightleftharpoons[\text{s_1578}]{\text{e_0367, s_1212, s_1275, s_1577, s_1207, s_1578}} \text{s_1207} +$	
72	r_0241	C-4 sterol methyl oxidase (4,4-dimethylzymosterol)	$\text{s_0122} + 3 \text{s_1212} + \text{0000176}$ $3 \text{s_1275} \xrightleftharpoons[3 \text{s_1207}]{\text{e_0367, s_0122, s_1212, s_1275, s_0297, s_1207}} \text{s_0297} +$	
73	r_0243	C-8 sterol isomerase	$\text{s_0700} \xrightleftharpoons[\text{s_0657}]{\text{e_0742, s_0700, s_0657}} \text{s_0657} \quad \text{0000176}$	
74	r_0244	C-s24 sterol reductase	$\text{s_0662} + \text{s_1212} \xrightleftharpoons[\text{s_1207}]{\text{e_0329, s_0662, s_1212, s_0666, s_1207}} \text{0000176} +$	
75	r_0250	carbamoyl-phosphate synthase (glutamine-hydrolysing)	$2 \text{ATP} + \text{s_0445} + \text{0000176}$ $\text{s_0999} \xrightleftharpoons[\text{s_0455} + \text{s_0991} + \text{PHO}]{\text{e_0508, e_0542, e_0888, ATP, s_0445, s_0999, ADP, s_0455, s_0991, PHO}} 2 \text{ } \Delta$	
76	r_0257	CDP-diacylglycerol synthase	$\text{s_0539} + \text{s_1331} \xrightleftharpoons[\text{s_0633}]{\text{e_0045, s_0539, s_1331, s_0471, s_0633}} \text{0000176} +$	
77	r_0264	ceramide-1 synthase (26C)	$\text{s_0816} + \text{s_1445} \xrightleftharpoons[\text{s_0529}]{\text{e_0558, e_0417, e_0762, s_0816, s_1445, s_0478, s_0529}} \text{0000176} +$	
78	r_0278	chorismate mutase	$\text{s_0515} \xrightleftharpoons[\text{s_1377}]{\text{e_0959, s_0515, s_1377}} \text{s_1377} \quad \text{0000176}$	

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79	r_0279	chorismate synthase	$s_{0324} \xrightleftharpoons[e_{0342}, s_{0324}, s_{0515}, \text{PHO}]{\text{PHO}} s_{0515}$	+ 0000176
80	r_0280	cis-aconitate(3-) to isocitrate	$s_{0516} \xrightleftharpoons[e_{0675}, s_{0516}, s_{0940}]{s_{0940}}$	0000176
81	r_0300	citrate synthase	$s_{0373} + s_{1271} \xrightleftharpoons[e_{0947}, e_{0805}, e_{0111}, s_{0373}, s_{1271}, s_{0522}, s_{0529}]{s_{0522} + s_{0529}}$	0000176
82	r_0302	citrate to cis-aconitate(3-)	$s_{0522} \xrightleftharpoons[e_{0675}, s_{0522}, s_{0516}]{s_{0516}}$	0000176
83	r_0307	CTP synthase (NH3)	$s_{0419} + \text{ATP} + s_{1559} \xrightleftharpoons[e_{0540}, e_{0026}, s_{0419}, \text{ATP}, s_{1559}, \text{ADP}, s_{0539}, \text{PHO}]{s_{0539} + \text{PHO}}$	0000176
84	r_0309	cystathionine beta-synthase	$s_{1012} + s_{1039} \xrightleftharpoons[e_{0380}, s_{1012}, s_{1039}, s_{0980}]{s_{0980}}$	0000176
85	r_0310	cystathionine g-lyase	$s_{0980} \xrightleftharpoons[e_{0008}, s_{0980}, s_{0178}, s_{0419}, s_{0981}]{s_{0419} + s_{0981}}$	0000176
86	r_0311	cystathionine gamma-synthase	$s_{0981} + s_{1233} \xrightleftharpoons[e_{0545}, s_{0981}, s_{1233}, s_{0362}, s_{0980}]{s_{0980}}$	0000176
87	r_0313	cysteinyl-tRNA synthetase	$\text{ATP} + s_{0981} + s_{1589} \xrightleftharpoons[e_{0793}, \text{ATP}, s_{0981}, s_{1589}, \text{AMP}, s_{0542}, s_{0633}]{s_{0542} + s_{0633}}$	0000176
88	r_0317	cytochrome P450 lanosterol 14-alpha-demethylase (NADP)	$s_{1059} + 3 s_{1212} + 3 s_{1275} \xrightleftharpoons[e_{0434}, e_{0424}, s_{1059}, s_{1212}, s_{1275}, s_{0262}, s_{0722}, s_{1207}]{s_{0722} + 3 s_{1207}}$	+ 0000176
89	r_0326	dCMP deaminase	$s_{0589} \xrightleftharpoons[e_{0452}, s_{0589}, s_{0419}, s_{0654}]{s_{0419} + s_{0654}}$	0000176
90	r_0330	deoxyguanylate kinase (dGMP:ATP)	$\text{ADP} + s_{0613} \xrightleftharpoons[e_{0234}, \text{ADP}, s_{0613}, \text{ATP}, s_{0615}]{s_{0615}}$	0000176

Nº	Id	Name	Reaction Equation	SBO
91	r_0336	diacylglycerol acyltransferase	$s_{.0529} + s_{.1524} \xrightleftharpoons[e_{.0883, s_{.0529}, s_{.1524}, s_{.0380}, s_{.0619}}{s_{.0619}} 0000176 +$	
92	r_0337	diacylglycerol pyrophosphate phosphatase	$s_{.1331} \xrightleftharpoons[e_{.0203, s_{.1331}, s_{.0619}, PHO}]{PHO} s_{.0619} + 0000176$	
93	r_0344	dihydrofolate reductase	$s_{.0625} + s_{.1212} \xrightleftharpoons[e_{.0880, s_{.0625}, s_{.1212}, s_{.1207}, s_{.1487}}{s_{.1487}} 0000176 +$	
94	r_0349	dihydroorotase	$s_{.1194} \xrightleftharpoons[e_{.0692, s_{.1194}, s_{.0061}}{s_{.0061}} 0000176$	
95	r_0352	dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylbutanoate)	$s_{.0016} \xrightleftharpoons[e_{.0528, s_{.0016}, s_{.0232}}{s_{.0232}} 0000176$	
96	r_0353	dihydroxy-acid dehydratase (2,3-dihydroxy-3-methylpentanoate)	$s_{.0008} \xrightleftharpoons[e_{.0528, s_{.0008}, s_{.0056}}{s_{.0056}} 0000176$	
97	r_0355	dimethylallyltranstransferase	$s_{.0943} + s_{.1376} \xrightleftharpoons[e_{.0515, s_{.0943}, s_{.1376}, s_{.0633}, s_{.0745}}{s_{.0745}} 0000176 +$	
98	r_0361	dolichyl-phosphate D-mannosyltransferase	$s_{.0645} + s_{.0743} \xrightleftharpoons[e_{.0976, s_{.0645}, s_{.0743}, s_{.0644}, s_{.0739}}{s_{.0739}} 0000176 +$	
99	r_0362	dolichyl-phosphate-mannose-protein mannosyltransferase	$s_{.0644} \xrightleftharpoons[e_{.0141, e_{.0549}, e_{.0010}, e_{.0890}, e_{.0142}, s_{.0644}, s_{.0645}, s_{.1107}}{s_{.1107}} 0000176 + s_{.0645} +$	
100	r_0364	dUTP diphosphatase	$s_{.0656} \xrightleftharpoons[e_{.0089, s_{.0656}, s_{.0633}, s_{.0654}}{s_{.0654}} s_{.0633} + 0000176$	
101	ENO	enolase	$P2G \xrightleftharpoons[e_{.0405, e_{.0454}, P2G, PEP}]{PEP} PEP 0000176$	
102	r_0386	fatty acid synthase (n-C12:0)	$s_{.0595} + s_{.1101} + 0000176$ $2 s_{.1212} \xrightleftharpoons[e_{.0808, e_{.0365}, e_{.0586}, e_{.0934}, s_{.0595}, s_{.1101}, s_{.1212}, CO2, s_{.0529}, s_{.10}}{s_{.0529} + s_{.1065} + 2 s_{.1207}}$	

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103	r_0387	fatty acid synthase (n-C14:0)	$\text{s_1065} + \text{s_1101} + 0000176$ $2 \text{ s_1212} \xleftarrow{\text{e_0808, e_0365, e_0586, e_0934, s_1065, s_1101, s_1212, CO2, s_0529, s_1101}}$ $\text{s_0529} + \text{s_1161} + 2 \text{ s_1207}$	
104	r_0389	fatty acid synthase (n-C16:0)	$\text{s_1101} + \text{s_1161} + 0000176$ $2 \text{ s_1212} \xleftarrow{\text{e_0808, e_0365, e_0586, e_0934, s_1101, s_1161, s_1212, CO2, s_0529, s_1101}}$ $\text{s_0529} + 2 \text{ s_1207} + \text{s_1286}$	
105	r_0391	fatty acid synthase (n-C18:0)	$\text{s_1101} + 2 \text{ s_1212} + 0000176$ $\text{s_1286} \xleftarrow{\text{e_0808, e_0365, e_0586, e_0934, s_1101, s_1212, s_1286, CO2, s_0529, s_1207}}$ $\text{s_0529} + 2 \text{ s_1207} + \text{s_1449}$	
106	r_0393	fatty acid synthase (n-C24:0), lumped reaction	$3 \text{ s_1101} + 6 \text{ s_1212} + 0000176$ $\text{s_1449} \xleftarrow{\text{e_0128, e_0117, e_0687, s_1101, s_1212, s_1449, CO2, s_0529, s_1084, s_1207}}$ $3 \text{ s_0529} + \text{s_1084} + 6 \text{ s_1207}$	
107	r_0394	fatty acid synthase (n-C26:0)	$\text{s_1084} + \text{s_1101} + 0000176$ $2 \text{ s_1212} \xleftarrow{\text{e_0128, e_0117, e_0687, s_1084, s_1101, s_1212, CO2, s_0505, s_0529, s_1207}}$ $\text{s_0505} + \text{s_0529} + 2 \text{ s_1207}$	
108	r_0397	fatty acyl-CoA synthase (n-C10:0CoA)	$\text{s_1101} + 2 \text{ s_1212} + 0000176$ $\text{s_1255} \xleftarrow{\text{e_0808, e_0365, e_0586, e_0934, s_1101, s_1212, s_1255, CO2, s_0529, s_0602}}$ $\text{s_0529} + \text{s_0602} + 2 \text{ s_1207}$	
109	r_0398	fatty acyl-CoA synthase (n-C8:0CoA), lumped reaction	$\text{s_0373} + 3 \text{ s_1101} + 0000176$ $6 \text{ s_1212} \xleftarrow{\text{e_0808, e_0365, e_0586, e_0934, s_0373, s_1101, s_1212, CO2, s_0529, s_1207}}$ $3 \text{ s_0529} + 6 \text{ s_1207} + \text{s_1255}$	
110	r_0399	fatty-acid-CoA ligase (decanoate)	$\text{AMP} + \text{s_0602} + \text{s_0633} \xleftarrow{\text{e_0273, AMP, s_0602, s_0633, ATP, s_0529, s_0595}} 0000176 \text{ ATP} + \text{s_0529} + \text{s_0595}$	
111	r_0400	fatty-acid-CoA ligase (dodecanoate)	$\text{ATP} + \text{s_0529} + \text{s_1065} \xleftarrow{\text{e_0273, ATP, s_0529, s_1065, AMP, s_0633, s_1073}} 0000176 \text{ AMP} + \text{s_0633} + \text{s_1073}$	

Nº	Id	Name	Reaction Equation	SBO
112	r_0406	fatty-acid-CoA ligase (n-C26:0)	$\text{ATP} + \text{s_0505} + \text{s_0529} \xrightleftharpoons[\text{s_0633} + \text{s_0816}]{\text{e_0053, ATP, s_0505, s_0529, AMP, s_0633, s_0816}} \text{AMP} +$	0000176
113	r_0407	fatty-acid-CoA ligase (octadecanoate)	$\text{AMP} + \text{s_0633} + \text{s_1454} \xrightleftharpoons[\text{s_0529} + \text{s_1449}]{\text{e_0750, e_0889, e_0462, AMP, s_0633, s_1454, ATP, s_0529}}$	0000176
114	r_0432	fatty-acyl-CoA synthase (n-C12:0CoA)	$\text{s_0602} + \text{s_1101} + \text{0000176} \xrightleftharpoons[2 \text{ s_1212}]{\text{e_0808, e_0365, e_0586, e_0934, s_0602, s_1101, s_1212, CO2, s_0529, s_10}}$	
115	r_0433	fatty-acyl-CoA synthase (n-C14:0CoA)	$\text{s_0529} + \text{s_1073} + 2 \text{ s_1207} \xrightleftharpoons[2 \text{ s_1212}]{\text{s_1073} + \text{s_1101} + \text{0000176} \text{ e_0808, e_0365, e_0586, e_0934, s_1073, s_1101, s_1212, CO2, s_0529, s_11}}$	
116	r_0434	fatty-acyl-CoA synthase (n-C16:0CoA)	$\text{s_0529} + \text{s_1176} + 2 \text{ s_1207} \xrightleftharpoons[2 \text{ s_1212}]{\text{s_1101} + \text{s_1176} + \text{0000176} \text{ e_0808, e_0365, e_0586, e_0934, s_1101, s_1176, s_1212, CO2, s_0529, s_12}}$	
117	r_0435	fatty-acyl-CoA synthase (n-C18:0CoA)	$\text{s_0529} + 2 \text{ s_1207} + \text{s_1302} \xrightleftharpoons[\text{s_1302}]{\text{s_1101} + 2 \text{ s_1212} + \text{0000176} \text{ e_0808, e_0365, e_0586, e_0934, s_1101, s_1212, s_1302, CO2, s_0529, s_120}}$	
118	r_0438	ferrocytochrome-c:oxygen oxidoreductase	$4 \text{ s_0710} + \text{s_1275} \xrightleftharpoons[\text{0000176}]{\text{e_0632, e_0007, e_0774, e_0436, e_0136, e_0001, e_0347, e_0255, e}}$	
119	r_0439	ferrocytochrome-c:oxygen oxidoreductase	$2 \text{ s_0709} + \text{s_1535} \xrightleftharpoons[\text{s_1537}]{\text{e_0514, e_0978, e_0422, e_0250, e_0004, e_0243, e_0389, e_0255, e}}$	0000176
120	r_0446	formate-tetrahydrofolate ligase	$\text{ATP} + \text{s_0722} + \text{s_1487} \xrightleftharpoons[\text{ADP} + \text{PHO}]{\text{e_0396, e_0057, ATP, s_0722, s_1487, s_0120, ADP, PHO}}$	0000176
121	FBA	fructose-bisphosphate aldolase	$\text{F16bP} \xrightleftharpoons[\text{0000176}]{\text{e_0567, F16bP, DHAP, GAP}} \text{DHAP} + \text{GAP}$	0000176
122	r_0451	fumarase	$\text{s_0725} \xrightleftharpoons[\text{s_0066}]{\text{e_0940, s_0725, s_0066}}$	0000176

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123	r_0462	geranyltranstransferase	$s_{.0745} + s_{.0943} \xrightleftharpoons[e_{.0515, s_{.0745}, s_{.0943}, s_{.0190}, s_{.0633}}{0000176} s_{.0633}$	0000176
124	r_0466	glucose 6-phosphate dehydrogenase	$G6P + s_{.1207} \xrightleftharpoons[e_{.0792, G6P, s_{.1207}, s_{.0335}, s_{.1212}}{s_{.0633}} s_{.1212}$	0000176
125	PGI	glucose-6-phosphate isomerase	$G6P \xrightleftharpoons[e_{.0079, G6P, F6P}]{0000176} F6P$	0000176
126	r_0470	glutamate dehydrogenase (NAD)	$s_{.0180} + s_{.0419} \xrightleftharpoons[e_{.0160, s_{.0180}, s_{.0419}, NADH, s_{.0991}, NAD}]{0000176} s_{.0991} + NADH$	0000176
127	r_0476	glutamine synthetase	$s_{.0419} + ATP + s_{.0991} \xrightleftharpoons[e_{.0955, s_{.0419}, ATP, s_{.0991}, ADP, s_{.0999}, PHO}]{0000176} ADP + s_{.0999} + PHO$	0000176
128	r_0478	glutaminyl-tRNA synthetase	$ATP + s_{.0999} + s_{.1590} \xrightleftharpoons[e_{.0867, ATP, s_{.0999}, s_{.1590}, AMP, s_{.0633}, s_{.0747}}]{0000176} AMP + s_{.0633} + s_{.0747}$	0000176
129	r_0479	glutamyl-tRNA synthetase	$ATP + s_{.0991} + s_{.1591} \xrightleftharpoons[e_{.0353, ATP, s_{.0991}, s_{.1591}, AMP, s_{.0633}, s_{.0748}}]{0000176} AMP + s_{.0633} + s_{.0748}$	0000176
130	TDH	glyceraldehyde-3-phosphate dehydrogenase	$GAP + NAD + PHO \xrightleftharpoons[e_{.0392, e_{.0495}, e_{.0525}, GAP, NAD, PHO, BPG, NADH}]{0000176} BPG + NADH$	0000176
131	r_0489	glycerol-3-phosphatase	$s_{.0767} \xrightleftharpoons[e_{.0466, e_{.0288}, s_{.0767}, GLY, PHO}]{0000176} GLY + PHO$	0000176
132	r_0491	glycerol-3-phosphate dehydrogenase (NAD)	$DHAP + NADH \xrightleftharpoons[e_{.0129, e_{.0827}, DHAP, NADH, s_{.0767}, NAD}]{0000176} s_{.0767} + NAD$	0000176
133	r_0495	glycerol-3-phosphate/dihydroxyacetone phosphate acyltransferase	$s_{.0380} + s_{.0767} \xrightleftharpoons[e_{.0020, e_{.0607}, s_{.0380}, s_{.0767}, s_{.0082}, s_{.0529}}]{0000176} s_{.0082} + s_{.0529}$	0000176

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134	r_0499	glycinamide ribotide transformylase	$s_{0120} + s_{0325} \xrightleftharpoons[e_{0231}, s_{0120}, s_{0325}, s_{0301}, s_{1487}]{00000761} s_{1487}$	
135	r_0501	glycine cleavage system	$s_{1003} + \text{NAD} + s_{1487} \xrightleftharpoons[e_{0741}, e_{0012}, e_{0167}, e_{0311}, s_{1003}, \text{NAD}, s_{1487}, s_{0301}]{0000176} s_{0419} + \text{CO}_2 + \text{NADH}$	
136	r_0502	glycine hydroxymethyltransferase	$s_{0306} + s_{1003} \xrightleftharpoons[e_{0638}, e_{0091}, s_{0306}, s_{1003}, s_{1039}, s_{1487}]{0000176} s_{1039} + s_{1487}$	
137	r_0510	glycogen (starch) synthase	$s_{1543} \xrightleftharpoons[e_{0667}, e_{0510}, e_{0317}, e_{0603}, s_{1543}, s_{0773}, s_{1538}]{0000176} s_{0773} + s_{1538}$	
138	r_0512	glycyl-tRNA synthetase	$\text{ATP} + s_{1003} + s_{1593} \xrightleftharpoons[e_{0064}, e_{0963}, \text{ATP}, s_{1003}, s_{1593}, \text{AMP}, s_{0633}, s_{0757}]{0000176} s_{0633} + s_{0757}$	
139	r_0514	GMP synthase	$\text{ATP} + s_{0999} + s_{1565} \xrightleftharpoons[e_{0746}, \text{ATP}, s_{0999}, s_{1565}, \text{AMP}, s_{0633}, s_{0782}, s_{0991}]{0000176} s_{0633} + s_{0782} + s_{0991}$	
140	r_0525	GTP cyclohydrolase II	$s_{0785} \xrightleftharpoons[e_{0025}, s_{0785}, s_{0141}, s_{0633}, s_{0722}]{0000176} s_{0141} + s_{0633} + s_{0722}$	
141	r_0528	guanylate kinase	$\text{ATP} + s_{0782} \xrightleftharpoons[e_{0234}, \text{ATP}, s_{0782}, \text{ADP}, s_{0739}]{0000176} \text{ADP} + s_{0739}$	
142	r_0529	guanylate kinase (GMP:dATP)	$s_{0586} + s_{0782} \xrightleftharpoons[e_{0234}, s_{0586}, s_{0782}, s_{0582}, s_{0739}]{0000176} s_{0739} + s_{0582}$	
143	HXK	hexokinase (D-glucose:ATP)	$\text{ATP} + \text{GLC} \xrightleftharpoons[e_{0106}, e_{0325}, e_{0355}, \text{GLC}, \text{ATP}, \text{G6P}, \text{ADP}]{0000176} \text{G6P} + \text{ADP}$	
144	r_0536	histidinol dehydrogenase	$s_{1010} + 2 \text{NAD} \xrightleftharpoons[e_{0103}, s_{1010}, \text{NAD}, s_{1006}, \text{NADH}]{0000076} 2 \text{NADH}$	

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145	r_0537	histidinol-phosphatase	$s_{1011} \xrightleftharpoons[e_{0320, s_{1011}, s_{1010}, \text{PHO}}]{} s_{1010} + \text{PHO}$	0000176
146	r_0538	histidinol-phosphate transaminase	$s_{0207} + s_{0991} \xrightleftharpoons[e_{0476, s_{0207}, s_{0991}, s_{0180}, s_{1011}}]{} s_{1011} + \text{AMP}$	0000176
147	r_0539	histidyl-tRNA synthetase	$\text{ATP} + s_{1006} + s_{1594} \xrightleftharpoons[e_{0953, \text{ATP}, s_{1006}, s_{1594}, \text{AMP}, s_{0633}, s_{0832}}]{} \text{AMP} + s_{0633} + s_{0832}$	0000176
148	r_0542	homoacontinate hydratase	$s_{0454} \xrightleftharpoons[e_{0196, s_{0454}, s_{0836}}]{} s_{0836}$	0000176
149	r_0543	homocitrate synthase	$s_{0180} + s_{0373} \xrightleftharpoons[e_{0154, e_{0146}, s_{0180}, s_{0373}, s_{0529}, s_{0835}}]{} s_{0529} + s_{0835}$	0000176
150	r_0545	homoisocitrate dehydrogenase	$s_{0836} + \text{NAD} \xrightleftharpoons[e_{0472, s_{0836}, \text{NAD}, s_{0176}, \text{NADH}, \text{CO}_2}]{} \text{NADH} + \text{CO}_2$	0000176
151	r_0547	homoserine dehydrogenase (NADP)	$s_{0978} + s_{1212} \xrightleftharpoons[e_{0548, s_{0978}, s_{1212}, s_{1014}, s_{1207}}]{} s_{1207} + \text{NADP}$	0000176
152	r_0548	homoserine kinase	$\text{ATP} + s_{1014} \xrightleftharpoons[e_{0428, \text{ATP}, s_{1014}, \text{ADP}, s_{1238}}]{} \text{ADP} + s_{1238}$	0000176
153	r_0549	homoserine O-trans-acetylase	$s_{0373} + s_{1014} \xrightleftharpoons[e_{0799, s_{0373}, s_{1014}, s_{0529}, s_{1233}}]{} s_{1233} + \text{AMP}$	0000176
154	r_0553	hydroxyacylglutathione hydrolase	$s_{0033} \xrightleftharpoons[e_{0202, e_{0846}, s_{0033}, s_{0025}, s_{0750}}]{} s_{0025} + s_{0750}$	0000176
155	r_0558	hydroxymethylglutaryl CoA reductase	$s_{0218} + 2 s_{1212} \xrightleftharpoons[e_{0697, e_{0708}, s_{0218}, s_{1212}, s_{0028}, s_{0529}, s_{1207}}]{} s_{0028} + s_{0529} + 2 s_{1207}$	0000176
156	r_0559	hydroxymethylglutaryl CoA synthase	$s_{0367} + s_{0373} \xrightleftharpoons[e_{0716, s_{0367}, s_{0373}, s_{0218}, s_{0529}}]{} s_{0529} + \text{AMP}$	0000176

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157	r_0563	Imidazole-glycerol-3-phosphate synthase	$s_{.0312} + s_{.0999} \xrightleftharpoons[e_{.0087, s_{.0312}, s_{.0999}, s_{.0403}, s_{.0550}, s_{.0991}}{0000176} s_{.0403} + s_{.0550} + s_{.0991}$	
158	r_0564	imidazoleglycerol-phosphate dehydratase	$s_{.0550} \xrightleftharpoons[e_{.0875, s_{.0550}, s_{.0207}}{0000176} s_{.0207}$	
159	r_0565	IMP dehydrogenase	$s_{.0849} + \text{NAD} \xrightleftharpoons[e_{.0705, e_{.0458}, e_{.0693}, s_{.0849}, \text{NAD}, \text{NADH}, s_{.1565}}{0000176} \text{NADH} + s_{.1565}$	
160	r_0566	indole-3-glycerol-phosphate synthase	$s_{.0076} \xrightleftharpoons[e_{.0591, s_{.0076}, s_{.0086}, \text{CO}_2}]{\text{CO}_2} s_{.0086} + 0000176$	
161	r_0568	inorganic diphosphatase	$s_{.0633} \xrightleftharpoons[e_{.0038, e_{.0754}, s_{.0633}, \text{PHO}}]{0000176} 2 \text{PHO}$	
162	r_0570	inosine monophosphate cyclohydrolase	$s_{.1365} \xrightleftharpoons[e_{.0631, e_{.0736}, s_{.1365}, s_{.0849}}]{0000176} s_{.0849}$	
163	r_0591	IPC synthase	$s_{.0089} + s_{.0478} \xrightleftharpoons[e_{.0557, e_{.0220}, s_{.0089}, s_{.0478}, s_{.0619}, s_{.0897}}{0000176} s_{.0619} + s_{.0897}$	
164	r_0658	isocitrate dehydrogenase (NAD+)	$s_{.0940} + \text{NAD} \xrightleftharpoons[e_{.0862, e_{.0771}, s_{.0940}, \text{NAD}, s_{.0180}, \text{CO}_2, \text{NADH}}]{0000176} s_{.0180} + \text{CO}_2 + \text{NADH}$	
165	r_0661	isocitrate dehydrogenase (NADP+), peroxisomal	$s_{.0940} + s_{.1207} \xrightleftharpoons[e_{.0769, e_{.0135}, s_{.0940}, s_{.1207}, s_{.0180}, \text{CO}_2, s_{.1212}}]{0000176} s_{.0180} + \text{CO}_2 + s_{.1212}$	
166	r_0662	isocitrate lyase	$s_{.0940} \xrightleftharpoons[e_{.0289, s_{.0940}, s_{.0779}, s_{.1458}}]{0000176} s_{.0779} + s_{.1458}$	
167	r_0663	isoleucine transaminase	$s_{.0056} + s_{.0991} \xrightleftharpoons[e_{.0550, e_{.0457}, s_{.0056}, s_{.0991}, s_{.0180}, s_{.1016}}]{0000176} s_{.0180} + s_{.1016}$	
168	r_0665	isoleucyl-tRNA synthetase	$\text{ATP} + s_{.1016} + s_{.1596} \xrightleftharpoons[e_{.0031, \text{ATP}, s_{.1016}, s_{.1596}, \text{AMP}, s_{.0633}, s_{.0847}}]{0000176} \text{AMP} + s_{.0633} + s_{.0847}$	
169	r_0667	isopentenyl-diphosphate D-isomerase	$s_{.0943} \xrightleftharpoons[e_{.0922, s_{.0943}, s_{.1376}}]{0000176} s_{.1376}$	

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170	r_0669	ketol-acid reductoisomerase (2-aceto-2-hydroxybutanoate)	$s_{0039} + s_{1212} \xrightleftharpoons[e_{0685}, s_{0039}, s_{1212}, s_{0008}, s_{1207}]{s_{1207}} s_{1207}$	00000768 +
171	r_0674	L-alanine transaminase	$s_{0991} + \text{PYR} \xrightleftharpoons[s_{0955}]{e_{0642}, s_{0991}, \text{PYR}, s_{0180}, s_{0955}} s_{0062}$	00000176
172	r_0678	L-aminoadipate-semialdehyde dehydrogenase (NADPH)	$s_{0953} + s_{1212} \xrightleftharpoons[s_{1207}]{e_{0062}, e_{0343}, s_{0953}, s_{1212}, s_{0959}, s_{1207}} s_{0959} +$	00000176
173	r_0688	L-lactaldehyde:NADP+ 1-oxidoreductase	$s_{1151} + s_{1212} \xrightleftharpoons[s_{1207}]{e_{0842}, e_{0447}, s_{1151}, s_{1212}, s_{0062}, s_{1207}} s_{0062} +$	00000176
174	r_0692	L-threonine deaminase	$s_{1045} \xrightleftharpoons[s_{0419}]{e_{0109}, e_{0295}, s_{1045}, s_{0178}, s_{0419}} s_{0178}$	00000176
175	r_0696	lactaldehyde dehydrogenase	$s_{0062} + \text{NAD} \xrightleftharpoons[\text{NADH}]{s_{0062}, \text{NAD}, s_{0063}, \text{NADH}} s_{0063} +$	00000176
176	r_0697	lactoylglutathione lyase	$s_{0750} + s_{1151} \xrightleftharpoons[s_{0030}]{e_{0698}, s_{0750}, s_{1151}, s_{0033}} s_{0030}$	00000176
177	r_0698	lanosterol synthase	$s_{0037} \xrightleftharpoons[s_{1059}]{e_{0440}, s_{0037}, s_{1059}} s_{1059}$	00000176
178	r_0699	leucine transaminase	$s_{0291} + s_{0991} \xrightleftharpoons[s_{1021}]{e_{0550}, e_{0457}, s_{0291}, s_{0991}, s_{0180}, s_{1021}} s_{0180} +$	00000176
179	r_0701	leucyl-tRNA synthetase	$\text{ATP} + s_{1021} + s_{1598} \xrightleftharpoons[s_{0633} + s_{1077}]{e_{0926}, \text{ATP}, s_{1021}, s_{1598}, \text{AMP}, s_{0633}, s_{1077}} \text{AMP} +$	00000176
180	r_0711	lysyl-tRNA synthetase	$\text{ATP} + s_{1025} + s_{1600} \xrightleftharpoons[s_{0633} + s_{1099}]{e_{0171}, \text{ATP}, s_{1025}, s_{1600}, \text{AMP}, s_{0633}, s_{1099}} \text{AMP} +$	00000176
181	r_0713	malate dehydrogenase	$s_{0066} + \text{NAD} \xrightleftharpoons[s_{1271}]{e_{0571}, e_{0838}, e_{0137}, s_{0066}, \text{NAD}, \text{NADH}, s_{1271}} \text{NADH} +$	00000176

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182	r_0722	mannose-1-phosphate guanylyltransferase	$s_{.0573} + s_{.0785} \xrightleftharpoons[e_{.0134, s_{.0573}, s_{.0785}, s_{.0633}, s_{.0743}}{s_{.0743}} s_{.0743}$	00000743 +
183	r_0723	mannose-6-phosphate isomerase	$F6P \xrightleftharpoons[e_{.0269, F6P, s_{.0574}}{s_{.0574}} s_{.0574}$	0000176
184	r_0724	methenyltetrahydrofate cyclohydrolase	$s_{.0304} \xrightleftharpoons[e_{.0057, e_{.0396}, s_{.0304}, s_{.0120}}{s_{.0120}} s_{.0120}$	0000176
185	r_0726	methionine adenosyltransferase	$ATP + s_{.1029} \xrightleftharpoons[e_{.0239, e_{.0658}, ATP, s_{.1029}, s_{.0633}, PHO, s_{.1416}}{s_{.1416}} s_{.0633} + PHO + s_{.1416}$	0000176
186	r_0727	methionine synthase	$s_{.0322} + s_{.1012} \xrightleftharpoons[e_{.0298, s_{.0322}, s_{.1012}, s_{.1029}, s_{.1487}}{s_{.1487}} s_{.1487}$	00001029 +
187	r_0729	methionyl-tRNA synthetase	$ATP + s_{.1029} + s_{.1602} \xrightleftharpoons[e_{.0409, ATP, s_{.1029}, s_{.1602}, AMP, s_{.0633}, s_{.1148}}{s_{.0633} + s_{.1148}} AMP + s_{.0633} + s_{.1148}$	0000176
188	r_0731	methylenetetrahydrofolate dehydrogenase (NAD)	$s_{.0304} + NADH \xrightleftharpoons[e_{.0610, s_{.0304}, NADH, s_{.0306}, NAD}]{NAD} s_{.0306} + NAD$	0000106 +
189	r_0732	methylenetetrahydrofolate dehydrogenase (NADP)	$s_{.0306} + s_{.1207} \xrightleftharpoons[e_{.0396, e_{.0057}, s_{.0306}, s_{.1207}, s_{.0304}, s_{.1212}}{s_{.1212}} s_{.0304} + s_{.1212}$	0000176
190	r_0735	mevalonate kinase (atp)	$s_{.0028} + ATP \xrightleftharpoons[e_{.0745, s_{.0028}, ATP, s_{.0019}, ADP}]{ADP} s_{.0019} + ADP$	0000176
191	r_0736	mevalonate kinase (ctp)	$s_{.0028} + s_{.0539} \xrightleftharpoons[e_{.0745, s_{.0028}, s_{.0539}, s_{.0019}, s_{.0467}}{s_{.0467}} s_{.0467}$	00000769 +
192	r_0739	mevalonate pyrophosphate decarboxylase	$s_{.0018} + ATP \xrightleftharpoons[e_{.0812, s_{.0018}, ATP, ADP, CO_2, s_{.0943}, PHO}]{CO_2 + s_{.0943} + PHO} s_{.0943} + PHO$	0000176
193	r_0757	myo-inositol 1-phosphatase	$s_{.0126} \xrightleftharpoons[e_{.0204, e_{.0435}, s_{.0126}, s_{.1153}, PHO}]{s_{.1153} + PHO} s_{.1153} + PHO$	0000176

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194	r_0758	myo-inositol-1-phosphate synthase	$\text{G6P} \xrightleftharpoons[\text{s_0126}]{\text{e_0512, G6P, s_0126}}$	0000176
195	r_0759	N-acetyl-g-glutamyl-phosphate reductase	$\text{s_1191} + \text{s_1212} \xrightleftharpoons[\text{s_1207} + \text{PHO}]{\text{e_0290, s_1191, s_1212, s_0145, s_1207, PHO}}$	0000176 s_0145 +
196	r_0792	nucleoside diphosphatase	$\text{s_0467} \xrightleftharpoons[\text{PHO}]{\text{e_0271, s_0467, s_0526, PHO}} \text{s_0526} +$	0000176
197	r_0800	nucleoside diphosphate kinase	$\text{ATP} + \text{s_0739} \xrightleftharpoons[\text{s_0785}]{\text{e_0568, ATP, s_0739, ADP, s_0785}} \text{ADP}$	0000176
198	r_0811	nucleoside-diphosphate kinase (ATP:UDP)	$\text{ATP} + \text{s_1538} \xrightleftharpoons[\text{s_1559}]{\text{e_0568, ATP, s_1538, ADP, s_1559}} \text{ADP}$	0000176
199	r_0813	O-acetylhomoserine (thiol)-lyase	$\text{s_0841} + \text{s_1233} \xrightleftharpoons[\text{s_1012}]{\text{e_0674, s_0841, s_1233, s_0362, s_1012}}$	0000176 +
200	r_0816	ornithine carbamoyltransferase	$\text{s_0455} + \text{s_1266} \xrightleftharpoons[\text{PHO}]{\text{e_0499, s_0455, s_1266, s_0979, PHO}}$	0000176 +
201	r_0818	ornithine transacetylase	$\text{s_0991} + \text{s_1182} \xrightleftharpoons[\text{s_1266}]{\text{e_0729, s_0991, s_1182, s_1192, s_1266}}$	0000176 +
202	r_0820	orotate phosphoribosyltransferase	$\text{s_1269} + \text{s_1386} \xrightleftharpoons[\text{s_1270}]{\text{e_0755, e_0712, s_1269, s_1386, s_0633, s_1270}}$	0000176 s_0633 +
203	r_0821	orotidine-5'-phosphate decarboxylase	$\text{s_1270} \xrightleftharpoons[\text{s_1545}]{\text{e_0249, s_1270, CO2, s_1545}} \text{CO2} +$	0000176
204	r_0851	phenylalanine transaminase	$\text{s_0951} + \text{s_0991} \xrightleftharpoons[\text{s_1032}]{\text{e_0348, s_0951, s_0991, s_0180, s_1032}}$	0000176 +
205	r_0852	phenylalanyl-tRNA synthetase	$\text{ATP} + \text{s_1032} + \text{s_1604} \xrightleftharpoons[\text{s_0633} + \text{s_1314}]{\text{e_0639, e_0312, ATP, s_1032, s_1604, AMP, s_0633, s_1314}}$	0000176

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206	r_0855	phopshoribosylaminoimidazole synthetase	$s_{0302} + \text{ATP} \xrightleftharpoons[e_{0352}, s_{0302}, \text{ATP}, s_{0300}, \text{ADP}, \text{PHO}]{0000176} \text{ADP} + \text{PHO}$	0000176
207	r_0858	phosphatidylethanolamine methyltransferase	$s_{1351} + s_{1416} \xrightleftharpoons[e_{0536}, e_{0381}, s_{1351}, s_{1416}, s_{1343}, s_{1413}]{0000176} s_{1343} + s_{1413}$	0000176
208	r_0874	phosphatidylinositol synthase	$s_{0471} + s_{1153} \xrightleftharpoons[e_{0964}, s_{0471}, s_{1153}, s_{0089}, s_{0526}]{0000176} s_{0526}$	0000176
209	r_0877	phosphatidylserine decarboxylase	$s_{1337} \xrightleftharpoons[e_{0788}, e_{0382}, s_{1337}, \text{CO}_2, s_{1351}]{0000176} \text{CO}_2 + s_{1351}$	0000176
210	r_0880	phosphatidylserine synthase	$s_{0471} + s_{1039} \xrightleftharpoons[e_{0278}, s_{0471}, s_{1039}, s_{0526}, s_{1337}]{0000176} s_{1337}$	0000176
211	r_0883	phosphoadenylyl-sulfate reductase (thioredoxin)	$s_{0201} + s_{1616} \xrightleftharpoons[e_{0633}, e_{0975}, e_{0398}, s_{0201}, s_{1616}, s_{0390}, s_{1469}, s_{1620}]{0000176} s_{1469} + s_{1620}$	0000176
212	r_0884	phosphoenolpyruvate carboxykinase	$\text{ATP} + s_{1271} \xrightleftharpoons[e_{0612}, \text{ATP}, s_{1271}, \text{ADP}, \text{CO}_2, \text{PEP}]{0000176} \text{ADP} + \text{CO}_2 + \text{PEP}$	0000176
213	PFK	phosphofructokinase	$\text{ATP} + \text{F6P} \xrightleftharpoons[e_{0401}, e_{0743}, \text{AMP}, \text{F26bP}, \text{F6P}, \text{ATP}, \text{AMP}, \text{F26bP}, \text{F16bP}]{0000176} \text{ADP} + \text{F16bP}$	0000176
214	r_0888	phosphoglucomutase	$\text{G6P} \xrightleftharpoons[e_{0576}, e_{0757}, e_{0733}, \text{G6P}, s_{0567}]{0000176} s_{0567}$	0000176
215	r_0889	phosphogluconate dehydrogenase	$s_{0340} + s_{1207} \xrightleftharpoons[e_{0455}, e_{0407}, s_{0340}, s_{1207}, \text{CO}_2, s_{0577}, s_{1212}]{0000176} \text{CO}_2 + s_{0577} + s_{1212}$	0000176
216	PGK	phosphoglycerate kinase	$\text{BPG} + \text{ADP} \xrightleftharpoons[e_{0113}, \text{BPG}, \text{ADP}, \text{P3G}, \text{ATP}]{0000176} \text{P3G} + \text{ATP}$	0000176
217	GPM	phosphoglycerate mutase	$\text{P3G} \xrightleftharpoons[e_{0582}, \text{P3G}, \text{P2G}]{0000176} \text{P2G}$	0000176

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218	r_0900	phospholipid methyltransferase	$s_{1342} + s_{1416} \xrightleftharpoons[e_{0536}, s_{1342}, s_{1416}, s_{1346}, s_{1413}]{000176} s_{1413}$	000176
219	r_0901	phospholipid methyltransferase	$s_{1343} + s_{1416} \xrightleftharpoons[e_{0536}, s_{1343}, s_{1416}, s_{1342}, s_{1413}]{000176} s_{1413}$	000176
220	r_0902	phosphomannomutase	$s_{0574} \xrightleftharpoons[e_{0314}, s_{0574}, s_{0573}]{s_{0573}}$	0000176
221	r_0904	phosphomevalonate kinase	$s_{0019} + ATP \xrightleftharpoons[e_{0747}, s_{0019}, ATP, s_{0018}, ADP]{s_{0018} + ADP} s_{0019}$	0000176
222	r_0908	phosphoribosyl amino imidazolesuccinocarbozamide synthetase	$ATP + s_{0973} + s_{1364} \xrightleftharpoons[e_{0017}, ATP, s_{0973}, s_{1364}, s_{0299}, ADP, PHO]{000176} s_{0299} + ADP + PHO$	0000176
223	r_0909	phosphoribosyl-AMP cyclohydrolase	$s_{0078} \xrightleftharpoons[e_{0103}, s_{0078}, s_{0077}]{s_{0077}}$	0000176
224	r_0910	phosphoribosyl-ATP pyrophosphatase	$s_{0326} \xrightleftharpoons[e_{0103}, s_{0326}, s_{0078}, s_{0633}]{s_{0078} + s_{0633}}$	0000176
225	r_0911	phosphoribosylaminoimidazole-carboxylase	$s_{0300} + CO_2 + ATP \xrightleftharpoons[e_{0860}, s_{0300}, CO_2, ATP, s_{1364}, ADP, PHO]{000176} s_{1364} + ADP + PHO$	0000176
226	r_0912	phosphoribosylaminoimidazolecarboxamide formyltransferase	$s_{0120} + s_{0403} \xrightleftharpoons[e_{0631}, e_{0736}, s_{0120}, s_{0403}, s_{1365}, s_{1487}]{000176} s_{1365} + s_{1487}$	0000176
227	r_0913	phosphoribosylanthranilate isomerase	$s_{1187} \xrightleftharpoons[e_{0165}, s_{1187}, s_{0076}]{s_{0076}}$	0000176
228	r_0914	phosphoribosylglycinamidine synthetase	$s_{0327} + ATP + s_{1003} \xrightleftharpoons[e_{0352}, s_{0327}, ATP, s_{1003}, s_{0325}, ADP, PHO]{000176} s_{0325} + ADP + PHO$	0000176
229	r_0915	phosphoribosylpyrophosphate amidotransferase	$s_{0999} + s_{1386} \xrightleftharpoons[e_{0763}, s_{0999}, s_{1386}, s_{0327}, s_{0633}, s_{0991}]{000176} s_{0327} + s_{0633} + s_{0991}$	0000176
230	r_0916	phosphoribosylpyrophosphate synthetase	$ATP + s_{1408} \xrightleftharpoons[e_{0030}, e_{0299}, e_{0418}, e_{0585}, e_{0829}, ATP, s_{1408}, AMP, s_{1386}]{000176} s_{1386}$	0000176

Nº	Id	Name	Reaction Equation	SBO
231	r_0938	prephenate dehydratase	$s_{1377} \xrightleftharpoons[e_{0802}, s_{1377}, CO_2, s_{0951}]{s_{0951}} CO_2 +$	0000176
232	r_0939	prephenate dehydrogenase (NADP)	$s_{1207} + s_{1377} \xrightleftharpoons[e_{0074}, s_{1207}, s_{1377}, s_{0204}, CO_2, s_{1212}]{s_{0204} + CO_2 + s_{1212}}$	0000176
233	r_0941	prolyl-tRNA synthetase	$ATP + s_{1035} + s_{1606} \xrightleftharpoons[e_{0296}, ATP, s_{1035}, s_{1606}, AMP, s_{0633}, s_{1379}]{s_{0633} + s_{1379}} AMP +$	0000176
234	r_0957	pyrroline-5-carboxylate reductase	$s_{0118} + s_{1212} \xrightleftharpoons[e_{0276}, s_{0118}, s_{1212}, s_{1035}, s_{1207}]{s_{1207}}$	0000176
235	r_0958	pyruvate carboxylase	$ATP + s_{0445} + PYR \xrightleftharpoons[e_{0334}, e_{0084}, ATP, s_{0445}, PYR, ADP, s_{1271}, PHO]{s_{1271} + PHO} ADP +$	0000176
236	PDC	pyruvate decarboxylase	$PYR \xrightleftharpoons[e_{0370}, e_{0636}, e_{0647}, PYR]{AcAld + CO_2}$	0000176
237	PYK	pyruvate kinase	$ADP + PEP \xrightleftharpoons[e_{0011}, e_{0895}, PEP, ADP, PYR, ATP]{PYR} ATP +$	0000176
238	r_0967	riboflavin synthase	$s_{0158} + s_{0314} \xrightleftharpoons[e_{0841}, s_{0158}, s_{0314}, s_{0328}, PHO]{PHO}$	0000176
239	r_0968	riboflavin synthase	$2 s_{0328} \xrightleftharpoons[e_{0090}, s_{0328}, s_{0314}, s_{1405}]{s_{0314} +}$	0000176
240	r_0970	ribonucleoside-triphosphate reductase (ATP)	$ATP + s_{1616} \xrightleftharpoons[e_{0398}, ATP, s_{1616}, s_{0586}, s_{1620}]{s_{1620}}$	0000176
241	r_0973	ribonucleoside-triphosphate reductase (UTP)	$s_{1559} + s_{1616} \xrightleftharpoons[e_{0398}, s_{1559}, s_{1616}, s_{0656}, s_{1620}]{s_{1620}}$	0000176
242	r_0974	ribonucleotide reductase	$ADP + s_{1616} \xrightleftharpoons[e_{0467}, e_{0492}, e_{0387}, e_{0291}, ADP, s_{1616}, s_{0582}, s_{1620}]{s_{1620}}$	0000176

Nº	Id	Name	Reaction Equation	SBO
243	r_0976	ribonucleotide reductase	$s_{0467} + s_{1616} \xrightleftharpoons[e_{0467}, e_{0492}, e_{0387}, e_{0291}, s_{0467}, s_{1616}, s_{0587}, s_{1620}]{0000176} s_{1620}$	s_0
244	r_0978	ribonucleotide reductase	$s_{0739} + s_{1616} \xrightleftharpoons[e_{0467}, e_{0492}, e_{0387}, e_{0291}, s_{0739}, s_{1616}, s_{0613}, s_{1620}]{0000176} s_{1620}$	s_0
245	r_0982	ribose-5-phosphate isomerase	$s_{0577} \xrightleftharpoons[e_{0852}, s_{0577}, s_{1408}]{s_{1408}} s_{1408}$	0000176
246	r_0984	ribulose 5-phosphate 3-epimerase	$s_{0577} \xrightleftharpoons[e_{0506}, s_{0577}, s_{0581}]{s_{0581}} s_{0581}$	0000176
247	r_0986	S-adenosyl-methionine delta-24-sterol-c-methyltransferase	$s_{1416} + s_{1569} \xrightleftharpoons[e_{0699}, s_{1416}, s_{1569}, s_{0700}, s_{1413}]{0000176} s_{1413}$	0000176 +
248	r_0988	saccharopine dehydrogenase (NAD, L-lysine forming)	$s_{1038} + \text{NAD} \xrightleftharpoons[e_{0489}, s_{1038}, \text{NAD}, s_{0180}, s_{1025}, \text{NADH}]{0000176} s_{1025} + \text{NADH}$	s_0180 +
249	r_0989	saccharopine dehydrogenase (NADP, L-glutamate forming)	$s_{0959} + s_{0991} \xrightleftharpoons[e_{0813}, s_{0959}, s_{0991}, s_{1212}, s_{1038}, s_{1207}]{0000176} s_{1212} \xrightleftharpoons{s_{1212}} s_{1038} + s_{1207}$	0000176
250	r_0990	sedoheptulose 1,7-bisphosphate D-glyceraldehyde-3-phosphate-lyase	$s_{0551} + \text{DHAP} \xrightleftharpoons[e_{0567}, s_{0551}, \text{DHAP}, s_{1426}]{s_{1426}} s_{1426}$	0000176
251	r_0993	serine palmitotransferase	$s_{1039} + s_{1302} \xrightleftharpoons[e_{0054}, e_{0177}, e_{0761}, s_{1039}, s_{1302}, s_{0231}, \text{CO}_2, s_{0529}]{0000176} s_{0231} + \text{CO}_2 + s_{0529}$	s_0231
252	r_0995	seryl-tRNA synthetase	$\text{ATP} + s_{1039} + s_{1607} \xrightleftharpoons[e_{0168}, e_{0425}, \text{ATP}, s_{1039}, s_{1607}, \text{AMP}, s_{0633}, s_{1428}]{0000176} s_{0633} + s_{1428}$	0000176
253	r_0996	shikimate dehydrogenase	$s_{0211} + s_{1212} \xrightleftharpoons[e_{0182}, s_{0211}, s_{1212}, s_{1207}, s_{1429}]{0000176} s_{1207} + s_{1429}$	0000176 +
254	r_0997	shikimate kinase	$\text{ATP} + s_{1429} \xrightleftharpoons[e_{0182}, \text{ATP}, s_{1429}, s_{0261}, \text{ADP}]{s_{0261}} s_{0261} + \text{ADP}$	0000176

Nº	Id	Name	Reaction Equation	SBO
255	r_1010	squalene epoxidase (NAD)	$\text{NADH} + \text{s}_{1275} + 0000176 \xrightleftharpoons[\text{NAD}]{\text{e}_{0385}, \text{NADH}, \text{s}_{1275}, \text{s}_{1447}, \text{s}_{0037}, \text{NAD}} \text{s}_{0037} + \text{NAD}$	
256	r_1012	squalene synthase	$2 \text{s}_{0190} + \text{s}_{1212} \xrightleftharpoons[\text{s}_{1207} + \text{s}_{1447}]{\text{e}_{0456}, \text{s}_{0190}, \text{s}_{1212}, \text{s}_{0633}, \text{s}_{1207}, \text{s}_{1447}} 2 \text{s}_{0633} + \text{s}_{1207}$	
257	r_1014	steryl ester hydrolase	$\text{s}_{0666} + 1 \cdot 8 \text{s}_{0595} \xrightleftharpoons[\text{s}_{0672}]{\text{e}_{0578}, \text{e}_{0613}, \text{s}_{0666}, \text{s}_{0595}, \text{s}_{0672}} \text{s}_{0672}$	
258	r_1021	succinate dehydrogenase (ubiquinone-6)	$\text{s}_{1458} + \text{s}_{1537} \xrightleftharpoons[\text{s}_{1535}]{\text{e}_{0579}, \text{e}_{0188}, \text{e}_{0494}, \text{e}_{0619}, \text{e}_{0581}, \text{s}_{1458}, \text{s}_{1537}, \text{s}_{0725}, \text{s}_{1535}} \text{s}_{1535}$	
259	r_1026	sulfate adenylyltransferase (ADP)	$\text{ADP} + \text{s}_{1467} \xrightleftharpoons[\text{PHO}]{\text{e}_{0107}, \text{ADP}, \text{s}_{1467}, \text{s}_{0298}, \text{PHO}} \text{s}_{0298} + \text{PHO}$	
260	r_1027	sulfite reductase (NADPH ₂)	$3 \text{s}_{1212} + \text{s}_{1469} \xrightleftharpoons[\text{s}_{1207}]{\text{e}_{0547}, \text{e}_{0321}, \text{s}_{1212}, \text{s}_{1469}, \text{s}_{0841}, \text{s}_{1207}} \text{s}_{0841} + \text{s}_{1207}$	
261	r_1038	thioredoxin reductase (NADPH)	$\text{s}_{1212} + \text{s}_{1620} \xrightleftharpoons[\text{s}_{1616}]{\text{e}_{0633}, \text{e}_{0218}, \text{e}_{0398}, \text{e}_{0448}, \text{e}_{0915}, \text{e}_{0124}, \text{s}_{1212}, \text{s}_{1620}, \text{s}_{1616}} \text{s}_{1616}$	
262	r_1040	threonine aldolase	$\text{s}_{1045} \xrightleftharpoons[\text{s}_{1003}]{\text{e}_{0260}, \text{s}_{1045}, \text{AcAld}, \text{s}_{1003}} \text{AcAld} + 0000176$	
263	r_1041	threonine synthase	$\text{s}_{1238} \xrightleftharpoons[\text{PHO}]{\text{e}_{0122}, \text{s}_{1238}, \text{s}_{1045}, \text{PHO}} \text{s}_{1045} + 0000176$	
264	r_1042	threonyl-tRNA synthetase	$\text{ATP} + \text{s}_{1045} + \text{s}_{1608} \xrightleftharpoons[\text{s}_{0633} + \text{s}_{1491}]{\text{e}_{0470}, \text{ATP}, \text{s}_{1045}, \text{s}_{1608}, \text{AMP}, \text{s}_{0633}, \text{s}_{1491}} \text{AMP} + \text{s}_{0633}$	
265	r_1045	thymidylate synthase	$\text{s}_{0306} + \text{s}_{0654} \xrightleftharpoons[\text{s}_{0649}]{\text{e}_{0850}, \text{s}_{0306}, \text{s}_{0654}, \text{s}_{0625}, \text{s}_{0649}} \text{s}_{0625} + \text{s}_{0649}$	

Nº	Id	Name	Reaction Equation	SBO
266	r_1048	transaldolase	$\text{GAP} + \text{s_1427} \xrightleftharpoons{\text{e_0684, GAP, s_1427, s_0551, F6P}} \text{s_0551} + \text{F6P}$	0000176
267	r_1049	transketolase 1	$\text{s_0581} + \text{s_1408} \xrightleftharpoons{\text{e_0063, e_0962, s_0581, s_1408, GAP, s_1427}} \text{s_1427} + \text{GAP}$	0000176
268	r_1050	transketolase 2	$\text{s_0551} + \text{s_0581} \xrightleftharpoons{\text{e_0063, e_0962, s_0551, s_0581, F6P, GAP}} \text{F6P} + \text{GAP}$	0000176
269	r_1051	trehalose-phosphatase	$\text{s_0409} \xrightleftharpoons{\text{e_0711, e_0065, e_0179, e_0753, s_0409, PHO, s_1520}} \text{s_1520} + \text{PHO}$	0000176
270	r_1052	triacylglycerol lipase	$\text{s_0619} + 2 \cdot \text{s_0595} \xrightleftharpoons{\text{e_0176, e_0611, e_0765, e_0851, s_0619, s_0595, s_1524}} \text{s_1524}$	0000176
271	TPI	triose-phosphate isomerase	$\text{DHAP} \xrightleftharpoons{\text{e_0175, DHAP, GAP}} \text{GAP}$	0000176
272	r_1055	tryptophan synthase (indoleglycerol phosphate)	$\text{s_0086} + \text{s_1039} \xrightleftharpoons{\text{e_0330, s_0086, s_1039, GAP, s_1048}} \text{s_1048}$	0000176
273	r_1057	tryptophanyl-tRNA synthetase	$\text{ATP} + \text{s_1048} + \text{s_1610} \xrightleftharpoons{\text{e_0836, ATP, s_1048, s_1610, AMP, s_0633, s_1527}} \text{s_0633} + \text{s_1527} + \text{AMP}$	0000176
274	r_1063	tyrosine transaminase	$\text{s_0204} + \text{s_0991} \xrightleftharpoons{\text{e_0348, e_0629, s_0204, s_0991, s_0180, s_1051}} \text{s_0180} + \text{s_1051}$	0000176
275	r_1066	tyrosyl-tRNA synthetase	$\text{ATP} + \text{s_1051} + \text{s_1612} \xrightleftharpoons{\text{e_0390, ATP, s_1051, s_1612, AMP, s_0633, s_1533}} \text{s_0633} + \text{s_1533} + \text{AMP}$	0000176
276	r_1072	UMP kinase	$\text{ATP} + \text{s_1545} \xrightleftharpoons{\text{e_0561, ATP, s_1545, ADP, s_1538}} \text{s_1538} + \text{ADP}$	0000176
277	r_1084	UTP-glucose-1-phosphate uridylyltransferase	$\text{s_0567} + \text{s_1559} \xrightleftharpoons{\text{e_0565, s_0567, s_1559, s_0633, s_1543}} \text{s_1543} + \text{s_0633}$	0000176

Nº	Id	Name	Reaction Equation	SBO
278	r_1087	valine transaminase	$s_{.0232} + s_{.0991} \xrightleftharpoons[e_{.0550, e_{.0457}, s_{.0232}, s_{.0991}, s_{.0180}, s_{.1056}}{0000176} s_{.0180} + s_{.1056}$	
279	r_1089	valyl-tRNA synthetase	$ATP + s_{.1056} + s_{.1614} \xrightleftharpoons[e_{.0372, ATP, s_{.1056}, s_{.1614}, AMP, s_{.0633}, s_{.1561}}{0000176} AMP + s_{.0633} + s_{.1561}$	
280	r_1115	ammonia transport	$s_{.0420} \xrightleftharpoons[s_{.0419}]{s_{.0420}, s_{.0419}} s_{.0419}$	0000185
281	HXT	glucose transport	$GLC_x \xrightleftharpoons{GLC_x, GLC} GLC$	0000185
282	r_1172	glycerol transport via channel	$GLY \xrightarrow{GLY} s_{.0766}$	0000185
283	r_1244	phosphate transport	$s_{.1324} \xrightleftharpoons{s_{.1324}, PHO} PHO$	0000185
284	r_1266	sulfate uniport	$s_{.1468} \xrightleftharpoons[s_{.1467}]{s_{.1468}, s_{.1467}} s_{.1467}$	0000185
285	r_1633	acetaldehyde transport	$AcAld \xrightarrow{AcAld} s_{.0360}$	0000185
286	r_1664	bicarbonate formation	$CO_2 \xrightleftharpoons[CO_2, s_{.0445}]{s_{.0445}} s_{.0445}$	0000176
287	r_1682	cholestenol delta-isomerase, lumped reaction	$s_{.1275} + s_{.1416} + s_{.1569} \xrightleftharpoons[s_{.1413}]{s_{.1275}, s_{.1416}, s_{.1569}, s_{.0662}, s_{.1413}} s_{.0662} + s_{.1413}$	0000176
288	r_1697	CO2 transport	$CO_2 \xrightarrow{CO_2} s_{.0458}$	0000185
289	r_1704	cytidylate kinase (dCMP)	$ADP + s_{.0587} \xrightleftharpoons[ADP, s_{.0587}, ATP, s_{.0589}]{s_{.0589}} ATP + s_{.0589}$	0000176
290	r_1729	deoxyadenylate kinase	$ADP + s_{.0582} \xrightleftharpoons[ADP, s_{.0582}, ATP, s_{.0584}]{s_{.0584}} ATP + s_{.0584}$	0000176
291	r_1762	ethanol transport	$EtOH \xrightarrow{EtOH} s_{.0681}$	0000185
292	r_1936	methylglyoxal synthase	$DHAP \xrightleftharpoons[s_{.1151} + PHO]{DHAP, s_{.1151}, PHO} s_{.1151} + PHO$	0000176
293	r_1979	O2 transport	$s_{.1277} \xrightleftharpoons[s_{.1275}]{s_{.1277}, s_{.1275}} s_{.1275}$	0000185

Nº	Id	Name	Reaction Equation	SBO
294	r_2030	pyrimidine phosphatase	$s_{0313} \xrightleftharpoons{s_{0313}, s_{0314}, \text{PHO}} s_{0314} + \text{PHO}$	0000176
295	r_2057	succinate transport	$s_{1458} \xrightarrow{s_{1458}} s_{1459}$	0000185

Nº	Id	Name	Reaction Equation	SBO
296	r_2111	growth	$ \begin{aligned} &1 \cdot 1348 \text{ s_0002} + 0 \cdot 046 \text{ AMP} + 59 \cdot 276 \text{ ATP} + \\ &0 \cdot 0447 \text{ s_0526} + 0 \cdot 0036 \text{ s_0584} + \\ &0 \cdot 0024 \text{ s_0589} + 0 \cdot 0024 \text{ s_0615} + \\ &0 \cdot 0036 \text{ s_0649} + 0 \cdot 5185 \text{ s_0773} + 0 \cdot 046 \text{ s_0782} + \\ &0 \cdot 8079 \text{ s_1107} + 9.9 \cdot 10^{-4} \text{ s_1405} + \\ &0 \cdot 02 \text{ s_1467} + 0 \cdot 0234 \text{ s_1520} + 0 \cdot 0599 \text{ s_1545} + \\ &1 \cdot 1348 \text{ s_0004} + 0 \cdot 4588 \text{ s_0404} + \\ &0 \cdot 1607 \text{ s_0428} + 0 \cdot 1017 \text{ s_0430} + \\ &0 \cdot 2975 \text{ s_0432} + 0 \cdot 0066 \text{ s_0542} + \\ &0 \cdot 1054 \text{ s_0747} + 0 \cdot 3018 \text{ s_0748} + \\ &0 \cdot 2904 \text{ s_0757} + 0 \cdot 0663 \text{ s_0832} + \\ &0 \cdot 1927 \text{ s_0847} + 0 \cdot 2964 \text{ s_1077} + \\ &0 \cdot 2862 \text{ s_1099} + 0 \cdot 0507 \text{ s_1148} + \\ &0 \cdot 1339 \text{ s_1314} + 0 \cdot 1647 \text{ s_1379} + \\ &3.9 \cdot 10^{-4} \text{ s_1337} + 0 \cdot 001583 \text{ s_0089} + \\ &0 \cdot 1854 \text{ s_1428} + 0 \cdot 1914 \text{ s_1491} + \\ &0 \cdot 0284 \text{ s_1527} + 0 \cdot 102 \text{ s_1533} + 0 \cdot 2646 \text{ s_1561} + \\ &5.6 \cdot 10^{-5} \text{ s_0122} + 5.1708 \cdot 10^{-4} \text{ s_0897} + \\ &9.6 \cdot 10^{-5} \text{ s_0657} + 1.25 \cdot 10^{-4} \text{ s_0662} + \\ &0 \cdot 0056 \text{ s_0666} + 8.12 \cdot 10^{-4} \text{ s_0672} + \\ &5.355999999999999 \cdot 10^{-4} \text{ s_0595} + \\ &1.14 \cdot 10^{-4} \text{ s_0700} + 3.2 \cdot 10^{-5} \text{ s_1059} + \\ &0 \cdot 00288 \text{ s_1346} + 6.97 \cdot 10^{-4} \text{ s_1351} + \\ &7.81 \cdot 10^{-4} \text{ s_1524} + \\ &1.5 \cdot 10^{-5} \text{ s_1569} \text{ s_0002, AMP, ATP, s_0526, s_0584, s_0589, s_0615, s_0649, s_0773,} \\ &58 \cdot 70001 \text{ PHO} + 0 \cdot 4588 \text{ s_1582} + \\ &0 \cdot 1607 \text{ s_1583} + 0 \cdot 1017 \text{ s_1585} + \\ &0 \cdot 2975 \text{ s_1587} + 0 \cdot 0066 \text{ s_1589} + \\ &0 \cdot 1054 \text{ s_1590} + 0 \cdot 3018 \text{ s_1591} + \\ &0 \cdot 2904 \text{ s_1593} + 0 \cdot 0663 \text{ s_1594} + \\ &0 \cdot 1927 \text{ s_1596} + 0 \cdot 2964 \text{ s_1598} + \\ &0 \cdot 2862 \text{ s_1600} + 0 \cdot 0507 \text{ s_1602} + \\ &0 \cdot 1339 \text{ s_1604} + 0 \cdot 1647 \text{ s_1606} + \\ &0 \cdot 1854 \text{ s_1607} + 0 \cdot 1914 \text{ s_1608} + \\ &0 \cdot 0284 \text{ s_1610} + 0 \cdot 102 \text{ s_1612} + 0 \cdot 2646 \text{ s_1614} \end{aligned} $	0000176

Nº	Id	Name	Reaction Equation	SBO
297	r_2126	sedoheptulose biphosphatase	$s_{1426} \xrightleftharpoons[e_{0601}, s_{1426}, s_{1427}, \text{PHO}]{\text{PHO}} s_{1427} +$	0000176
298	r_2127	dihydroorotate dehydrogenase	$s_{0061} + \text{NAD} \xrightleftharpoons[e_{0594}, s_{0061}, \text{NAD}, s_{1269}, \text{NADH}]{\text{NADH}} s_{1269}$	0000176

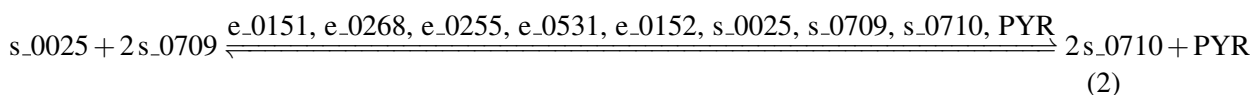
6.1 Reaction r_0001

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

Name (R)-lactate:ferricytochrome-c 2-oxidoreductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 5: Properties of each reactant.

Id	Name	SBO
s_0025	(R)-lactate	
s_0709	ferricytochrome c	

Modifiers

Table 6: Properties of each modifier.

Id	Name	SBO
e_0151	DLD1	0000460
e_0268	DLD3	0000460
e_0255	CYC7	0000460
e_0531	CYC1	0000460
e_0152	DLD2	0000460
s_0025	(R)-lactate	
s_0709	ferricytochrome c	
s_0710	ferrocytochrome c	
PYR	pyruvate	

Products

Table 7: Properties of each product.

Id	Name	SBO
s_0710	ferrocytochrome c	

Id	Name	SBO
PYR	pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_1 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0025] \cdot [s_0709]^2 - \frac{[s_0710]^2 \cdot [\text{PYR}]}{K_{\text{eq}}}}{K_{\text{m0025}} \cdot K_{\text{m0709}}^2} \right)}{\left(1 + \frac{[s_0025]}{K_{\text{m0025}}} \right) \cdot \left(1 + \frac{[s_0709]}{K_{\text{m0709}}} \right)^2 + \left(1 + \frac{[s_0710]}{K_{\text{m0710}}} \right)^2 \cdot \left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right) - 1} \quad (3)$$

Table 8: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.165	dimensionless	✓
Vmax		0000324	4.940	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	36.306	dimensionless	✓
Km0025		0000322	0.100	mmol · l ⁻¹	✓
Km0709		0000322	0.100	mmol · l ⁻¹	✓
Km0710		0000323	0.100	mmol · l ⁻¹	✓
KmPYR		0000323	1.815	mmol · l ⁻¹	✓

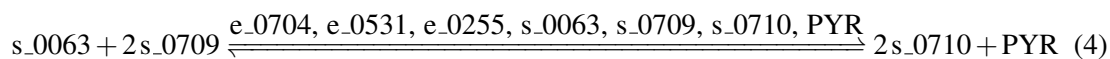
6.2 Reaction r_0004

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

Name (S)-lactate:ferricytochrome-c 2-oxidoreductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 9: Properties of each reactant.

Id	Name	SBO
s_0063	(S)-lactate	
s_0709	ferricytochrome c	

Modifiers

Table 10: Properties of each modifier.

Id	Name	SBO
e_0704	CYB2	0000460
e_0531	CYC1	0000460
e_0255	CYC7	0000460
s_0063	(S)-lactate	
s_0709	ferricytochrome c	
s_0710	ferrocycytochrome c	
PYR	pyruvate	

Products

Table 11: Properties of each product.

Id	Name	SBO
s_0710	ferrocycytochrome c	
PYR	pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_2 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0063}] \cdot [s_{0709}]^2 - \frac{[s_{0710}]^2 \cdot [\text{PYR}]}{K_{\text{eq}}}}{K_{\text{m0063}} \cdot K_{\text{m0709}}^2} \right)}{\left(1 + \frac{[s_{0063}]}{K_{\text{m0063}}} \right) \cdot \left(1 + \frac{[s_{0709}]}{K_{\text{m0709}}} \right)^2 + \left(1 + \frac{[s_{0710}]}{K_{\text{m0710}}} \right)^2 \cdot \left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right) - 1} \quad (5)$$

Table 12: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	✓
Vmax		0000324	1.532	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	36.306	dimensionless	✓
Km0063		0000322	0.100	mmol · l ⁻¹	✓
Km0709		0000322	0.100	mmol · l ⁻¹	✓
Km0710		0000323	0.100	mmol · l ⁻¹	✓
KmPYR		0000323	1.815	mmol · l ⁻¹	✓

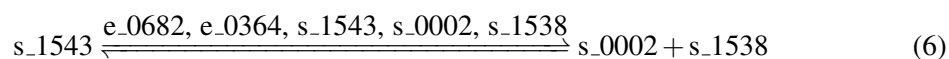
6.3 Reaction r_0005

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

Name 1,3-beta-glucan synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 13: Properties of each reactant.

Id	Name	SBO
s_1543	UDP-D-glucose	

Modifiers

Table 14: Properties of each modifier.

Id	Name	SBO
e_0682	FKS1	0000460
e_0364	GSC2	0000460
s_1543	UDP-D-glucose	
s_0002	(1->3)-beta-D-glucan	
s_1538	UDP	

Products

Table 15: Properties of each product.

Id	Name	SBO
s_0002	(1->3)-beta-D-glucan	
s_1538	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_3 = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_1543] - \frac{[s_0002] \cdot [s_1538]}{K_{\text{eq}}}}{K_{m1543}} \right)}{1 + \frac{[s_1543]}{K_{m1543}} + \left(1 + \frac{[s_0002]}{K_{m0002}} \right) \cdot \left(1 + \frac{[s_1538]}{K_{m1538}} \right) - 1} \quad (7)$$

Table 16: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.488	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1543		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0002		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1538		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

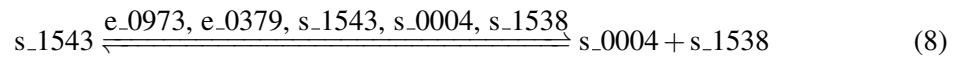
6.4 Reaction r_0006

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

Name 1,6-beta-glucan synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 17: Properties of each reactant.

Id	Name	SBO
s_1543	UDP-D-glucose	

Modifiers

Table 18: Properties of each modifier.

Id	Name	SBO
e_0973	KRE6	0000460
e_0379	SKN1	0000460
s_1543	UDP-D-glucose	

Id	Name	SBO
s_0004	(1->6)-beta-D-glucan	
s_1538	UDP	

Products

Table 19: Properties of each product.

Id	Name	SBO
s_0004	(1->6)-beta-D-glucan	
s_1538	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_4 = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{1543}] - \frac{[\text{s}_{0004}] \cdot [\text{s}_{1538}]}{K_{\text{eq}}}}{K_{\text{m1543}}} \right)}{1 + \frac{[\text{s}_{1543}]}{K_{\text{m1543}}} + \left(1 + \frac{[\text{s}_{0004}]}{K_{\text{m0004}}} \right) \cdot \left(1 + \frac{[\text{s}_{1538}]}{K_{\text{m1538}}} \right) - 1} \quad (9)$$

Table 20: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.049	dimensionless	✓
Vmax		0000324	0.488	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km1543		0000322	0.100	mmol · l ⁻¹	✓
Km0004		0000323	0.100	mmol · l ⁻¹	✓
Km1538		0000323	0.100	mmol · l ⁻¹	✓

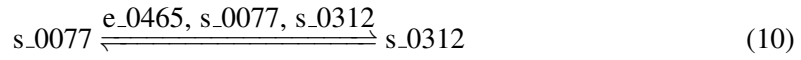
6.5 Reaction r_0007

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 21: Properties of each reactant.

Id	Name
s_0077	1-(5-phospho-D-ribosyl)-5-[(5-phospho-D-ribosylamino)methylideneamino]imidazole-4-carboxamide

Modifiers

Table 22: Properties of each modifier.

Id	Name
e_0465	HIS6
s_0077	1-(5-phospho-D-ribosyl)-5-[(5-phospho-D-ribosylamino)methylideneamino]imidazole-4-carboxamide
s_0312	5-[(5-phospho-1-deoxy-D-ribulos-1-ylamino)methylideneamino]-1-(5-phospho-D-ribosyl)imidazole-4-c

Product

Table 23: Properties of each product.

Id	Name
s_0312	5-[(5-phospho-1-deoxy-D-ribulos-1-ylamino)methylideneamino]-1-(5-phospho-D-ribosyl)imidazole-4-c

Kinetic Law

Derived unit contains undeclared units

$$v_5 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0077] - \frac{[s_0312]}{K_{\text{eq}}} \right)}{K_{m0077} + 1 + \frac{[s_0077]}{K_{m0077}} + 1 + \frac{[s_0312]}{K_{m0312}} - 1} \quad (11)$$

Table 24: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.017	mmol · l ⁻¹ · s ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0077		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0312		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

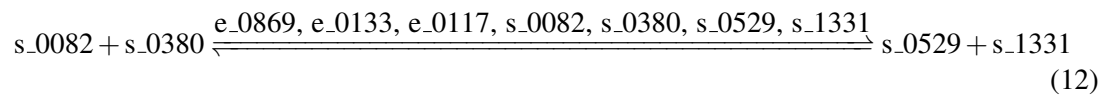
6.6 Reaction r_0008

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

Name 1-acyl-sn-glycerol-3-phosphate acyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 25: Properties of each reactant.

Id	Name	SBO
s_0082	1-acyl-sn-glycerol 3-phosphate	
s_0380	acyl-CoA	

Modifiers

Table 26: Properties of each modifier.

Id	Name	SBO
e_0869	ALE1	0000460
e_0133	SLC1	0000460
e_0117	FEN1	0000460
s_0082	1-acyl-sn-glycerol 3-phosphate	
s_0380	acyl-CoA	
s_0529	coenzyme A	
s_1331	phosphatidate	

Products

Table 27: Properties of each product.

Id	Name	SBO
s_0529	coenzyme A	
s_1331	phosphatidate	

Kinetic Law

Derived unit contains undeclared units

$$v_6 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0082}] \cdot [s_{0380}] - \frac{[s_{0529}] \cdot [s_{1331}]}{K_{eq}}}{K_{m0082} \cdot K_{m0380}} \right)}{\left(1 + \frac{[s_{0082}]}{K_{m0082}} \right) \cdot \left(1 + \frac{[s_{0380}]}{K_{m0380}} \right) + \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) \cdot \left(1 + \frac{[s_{1331}]}{K_{m1331}} \right) - 1} \quad (13)$$

Table 28: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.72166486160745 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0082		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0380		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1331		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

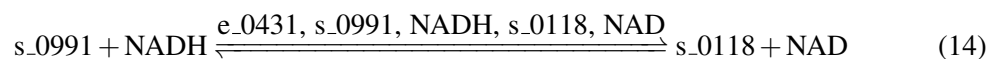
6.7 Reaction r_0012

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

Name 1-pyrroline-5-carboxylate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 29: Properties of each reactant.

Id	Name	SBO
s_0991	L-glutamate	
NADH	NADH	

Modifiers

Table 30: Properties of each modifier.

Id	Name	SBO
e_0431	PUT2	0000460
s_0991	L-glutamate	
NADH	NADH	
s_0118	1-pyrroline-5-carboxylate	
NAD	NAD	

Products

Table 31: Properties of each product.

Id	Name	SBO
s_0118	1-pyrroline-5-carboxylate	
NAD	NAD	

Kinetic Law

Derived unit contains undeclared units

$$v_7 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0991}] \cdot [NADH] - \frac{[s_{0118}] \cdot [NAD]}{K_{eq}} \right)}{K_{m0991} \cdot K_{mNADH} \cdot \left(\left(1 + \frac{[s_{0991}]}{K_{m0991}} \right) \cdot \left(1 + \frac{[NADH]}{K_{mNADH}} \right) + \left(1 + \frac{[s_{0118}]}{K_{m0118}} \right) \cdot \left(1 + \frac{[NAD]}{K_{mNAD}} \right) - 1 \right)} \quad (15)$$

Table 32: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.099	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	34.674	dimensionless	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
KmNADH		0000322	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmO118		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000323	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>

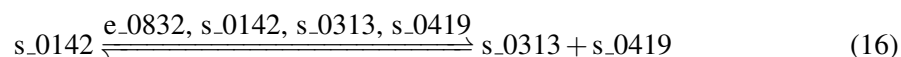
6.8 Reaction r_0014

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

Name 2,5-diamino-6-ribitylamino-4(3H)-pyrimidinone 5'-phosphate deaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 33: Properties of each reactant.

Id	Name	SBO
s_0142	2,5-diamino-6-(5-phosphono)ribitylamino-4(3H)-pyrimidinone	

Modifiers

Table 34: Properties of each modifier.

Id	Name	SBO
e_0832	RIB2	0000460
s_0142	2,5-diamino-6-(5-phosphono)ribitylamino-4(3H)-pyrimidinone	
s_0313	5-amino-6-(5-phosphoribitylamino)uracil	
s_0419	ammonium	

Products

Table 35: Properties of each product.

Id	Name	SBO
s_0313	5-amino-6-(5-phosphoribitylamino)uracil	
s_0419	ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_8 = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0142] - \frac{[s_0313] \cdot [s_0419]}{K_{\text{eq}}}}{K_{\text{m0142}}} \right)}{1 + \frac{[s_0142]}{K_{\text{m0142}}} + \left(1 + \frac{[s_0313]}{K_{\text{m0313}}} \right) \cdot \left(1 + \frac{[s_0419]}{K_{\text{m0419}}} \right) - 1} \quad (17)$$

Table 36: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.25595995293758 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$4.25595995293516 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0142		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0313		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0419		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

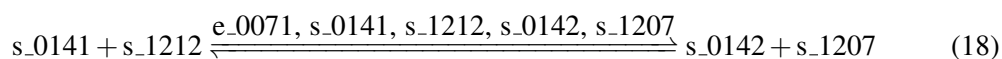
6.9 Reaction r_0015

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

Name 2,5-diamino-6-ribosylamino-4(3H)-pyrimidinone 5'-phosphate reductase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 37: Properties of each reactant.

Id	Name	SBO
s_0141	2,5-diamino-4-hydroxy-6-(5-phosphoribosylamino)pyrimidine	
s_1212	NADPH	

Modifiers

Table 38: Properties of each modifier.

Id	Name	SBO
e_0071	RIB7	0000460
s_0141	2,5-diamino-4-hydroxy-6-(5-phosphoribosylamino)pyrimidine	
s_1212	NADPH	
s_0142	2,5-diamino-6-(5-phosphono)ribitylamino-4(3H)-pyrimidinone	
s_1207	NADP(+)	

Products

Table 39: Properties of each product.

Id	Name	SBO
s_0142	2,5-diamino-6-(5-phosphono)ribitylamino-4(3H)-pyrimidinone	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_9 = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0141}] \cdot [s_{1212}] - \frac{[s_{0142}] \cdot [s_{1207}]}{K_{eq}}}{K_{m0141} \cdot K_{m1212}} \right)}{\left(1 + \frac{[s_{0141}]}{K_{m0141}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) + \left(1 + \frac{[s_{0142}]}{K_{m0142}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) - 1} \quad (19)$$

Table 40: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.25595995293758 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$5.95834393411522 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0141		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0142		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

6.10 Reaction r_0016

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

Name 2-aceto-2-hydroxybutanoate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 41: Properties of each reactant.

Id	Name	SBO
s_0178	2-oxobutanoate	
PYR	pyruvate	

Modifiers

Table 42: Properties of each modifier.

Id	Name	SBO
e_0734	ILV2	0000460
e_0100	ILV6	0000460
s_0178	2-oxobutanoate	
PYR	pyruvate	
s_0039	(S)-2-acetyl-2-hydroxybutanoate	
CO2	carbon dioxide	

Products

Table 43: Properties of each product.

Id	Name	SBO
s_0039	(S)-2-acetyl-2-hydroxybutanoate	
CO2	carbon dioxide	

Kinetic Law

Derived unit contains undeclared units

$$v_{10} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0178] \cdot [\text{PYR}] - \frac{[s_0039] \cdot [\text{CO}_2]}{K_{\text{eq}}}}{K_{\text{m0178}} \cdot K_{\text{mPYR}}} \right)}{\left(1 + \frac{[s_0178]}{K_{\text{m0178}}} \right) \cdot \left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right) + \left(1 + \frac{[s_0039]}{K_{\text{m0039}}} \right) \cdot \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) - 1} \quad (21)$$

Table 44: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.116	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	1.102	dimensionless	<input checked="" type="checkbox"/>
Km0178		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPYR		0000322	1.815	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0039		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>

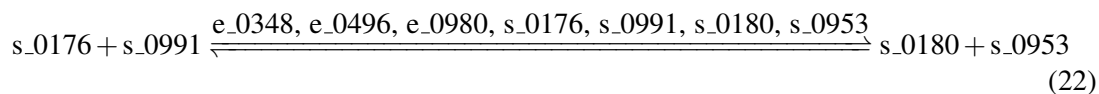
6.11 Reaction r_0018

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

Name 2-aminoadipate transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 45: Properties of each reactant.

Id	Name	SBO
s_0176	2-oxoadipic acid	
s_0991	L-glutamate	

Modifiers

Table 46: Properties of each modifier.

Id	Name	SBO
e_0348	ARO8	0000460
e_0496	BNA3	0000460
e_0980	YER152C	0000460
s_0176	2-oxoadipic acid	
s_0991	L-glutamate	

Id	Name	SBO
s_0180	2-oxoglutarate	
s_0953	L-2-aminoadipate	

Products

Table 47: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_0953	L-2-aminoadipate	

Kinetic Law

Derived unit contains undeclared units

$$v_{11} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0176] \cdot [\text{s}_0991] - \frac{[\text{s}_0180] \cdot [\text{s}_0953]}{K_{\text{eq}}}}{K_{\text{m0176}} \cdot K_{\text{m0991}}} \right)}{\left(1 + \frac{[\text{s}_0176]}{K_{\text{m0176}}} \right) \cdot \left(1 + \frac{[\text{s}_0991]}{K_{\text{m0991}}} \right) + \left(1 + \frac{[\text{s}_0180]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[\text{s}_0953]}{K_{\text{m0953}}} \right) - 1} \quad (23)$$

Table 48: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	✓
Vmax		0000324	0.172	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0176		0000322	0.100	mmol · l ⁻¹	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓
Km0180		0000323	0.100	mmol · l ⁻¹	✓
Km0953		0000323	0.100	mmol · l ⁻¹	✓

6.12 Reaction r_0020

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

Name 2-deoxy-D-arabino-heptulosonate 7-phosphate synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 49: Properties of each reactant.

Id	Name	SBO
s_0551	D-erythrose 4-phosphate	
PEP	phosphoenolpyruvate	

Modifiers

Table 50: Properties of each modifier.

Id	Name	SBO
e_0169	ARO3	0000460
e_0088	ARO4	0000460
s_0551	D-erythrose 4-phosphate	
PEP	phosphoenolpyruvate	
s_0349	7-phospho-2-dehydro-3-deoxy-D-arabino-heptonic acid	
PHO	phosphate	

Products

Table 51: Properties of each product.

Id	Name	SBO
s_0349	7-phospho-2-dehydro-3-deoxy-D-arabino-heptonic acid	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{12} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0551] \cdot [\text{PEP}] - \frac{[s_0349] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0551}} \cdot K_{\text{mPEP}}} \right)}{\left(1 + \frac{[s_0551]}{K_{\text{m0551}}} \right) \cdot \left(1 + \frac{[\text{PEP}]}{K_{\text{mPEP}}} \right) + \left(1 + \frac{[s_0349]}{K_{\text{m0349}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (25)$$

Table 52: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.159	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	3.163	dimensionless	<input checked="" type="checkbox"/>
Km0551		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPEP		0000322	0.063	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0349		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

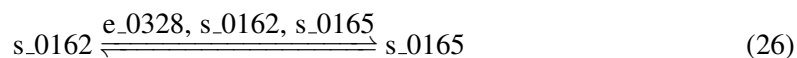
6.13 Reaction r_0023

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

Name 2-isopropylmalate hydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 53: Properties of each reactant.

Id	Name	SBO
s_0162	2-isopropylmalate	

Modifiers

Table 54: Properties of each modifier.

Id	Name	SBO
e_0328	LEU1	0000460
s_0162	2-isopropylmalate	
s_0165	2-isopropylmaleic acid	

Product

Table 55: Properties of each product.

Id	Name	SBO
s_0165	2-isopropylmaleic acid	

Kinetic Law

Derived unit contains undeclared units

$$v_{13} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0162}] - \frac{[s_{0165}]}{K_{\text{eq}}}}{K_{m0162}} \right)}{1 + \frac{[s_{0162}]}{K_{m0162}} + 1 + \frac{[s_{0165}]}{K_{m0165}} - 1} \quad (27)$$

Table 56: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.076	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0162		0000322	0.100	mmol · l ⁻¹	✓
Km0165		0000323	0.100	mmol · l ⁻¹	✓

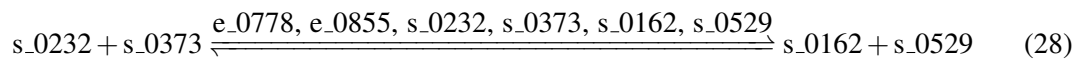
6.14 Reaction r_0024

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

Name 2-isopropylmalate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 57: Properties of each reactant.

Id	Name	SBO
s_0232	3-methyl-2-oxobutanoate	
s_0373	acetyl-CoA	

Modifiers

Table 58: Properties of each modifier.

Id	Name	SBO
e_0778	LEU4	0000460
e_0855	LEU9	0000460
s_0232	3-methyl-2-oxobutanoate	
s_0373	acetyl-CoA	
s_0162	2-isopropylmalate	
s_0529	coenzyme A	

Products

Table 59: Properties of each product.

Id	Name	SBO
s_0162	2-isopropylmalate	
s_0529	coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{14} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0232}] \cdot [s_{0373}] - \frac{[s_{0162}] \cdot [s_{0529}]}{K_{\text{eq}}}}{K_{\text{m0232}} \cdot K_{\text{m0373}}} \right)}{\left(1 + \frac{[s_{0232}]}{K_{\text{m0232}}} \right) \cdot \left(1 + \frac{[s_{0373}]}{K_{\text{m0373}}} \right) + \left(1 + \frac{[s_{0162}]}{K_{\text{m0162}}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{\text{m0529}}} \right) - 1} \quad (29)$$

Table 60: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.178	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0232		0000322	0.100	mmol · l ⁻¹	✓
Km0373		0000322	0.100	mmol · l ⁻¹	✓
Km0162		0000323	0.100	mmol · l ⁻¹	✓
Km0529		0000323	0.100	mmol · l ⁻¹	✓

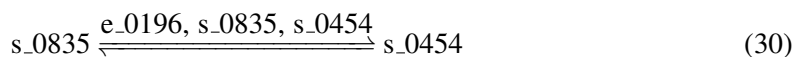
6.15 Reaction r_0027

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

Name 2-methylcitrate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 61: Properties of each reactant.

Id	Name	SBO
s_0835	homocitrate	

Modifiers

Table 62: Properties of each modifier.

Id	Name	SBO
e_0196	LYS4	0000460
s_0835	homocitrate	
s_0454	but-1-ene-1,2,4-tricarboxylic acid	

Product

Table 63: Properties of each product.

Id	Name	SBO
s_0454	but-1-ene-1,2,4-tricarboxylic acid	

Kinetic Law

Derived unit contains undeclared units

$$v_{15} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0835] - \frac{[s_0454]}{K_{\text{eq}}}}{K_{m0835}} \right)}{1 + \frac{[s_0835]}{K_{m0835}} + 1 + \frac{[s_0454]}{K_{m0454}} - 1} \quad (31)$$

Table 64: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.074	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0835		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0454		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

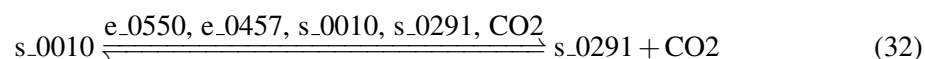
6.16 Reaction r_0029

This is a reversible reaction of one reactant forming two products influenced by five 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_0010	(2S)-2-isopropyl-3-oxosuccinate	

Modifiers

Table 66: Properties of each modifier.

Id	Name	SBO
e_0550	BAT2	0000460
e_0457	BAT1	0000460
s_0010	(2S)-2-isopropyl-3-oxosuccinate	
s_0291	4-methyl-2-oxopentanoate	
CO2	carbon dioxide	

Products

Table 67: Properties of each product.

Id	Name	SBO
s_0291	4-methyl-2-oxopentanoate	
CO2	carbon dioxide	

Kinetic Law

Derived unit contains undeclared units

$$v_{16} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0010] - \frac{[s_0291] \cdot [\text{CO}_2]}{K_{\text{eq}}}}{K_{\text{m0010}}} \right)}{1 + \frac{[s_0010]}{K_{\text{m0010}}} + \left(1 + \frac{[s_0291]}{K_{\text{m0291}}} \right) \cdot \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) - 1} \quad (33)$$

Table 68: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.127	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0010		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0291		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>

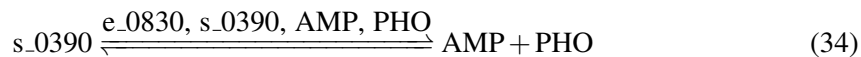
6.17 Reaction r_0032

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 69: Properties of each reactant.

Id	Name	SBO
s_0390	adenosine 3',5'-bismonophosphate	

Id	Name	SBO
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Modifiers

Table 70: Properties of each modifier.

Id	Name	SBO
e_0830	MET22	0000460
s_0390	adenosine 3',5'-bimonophosphate	
AMP	AMP	
PHO	phosphate	

Products

Table 71: Properties of each product.

Id	Name	SBO
AMP	AMP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{17} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{0390}] - \frac{[\text{AMP}] \cdot [\text{PHO}]}{K_{\text{eq}}} \right)}{K_{\text{m0390}} + \left(1 + \frac{[s_{0390}]}{K_{\text{m0390}}} + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1 \right)} \quad (35)$$

Table 72: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.025	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.586	mmol · l ⁻¹	✓
Km0390		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

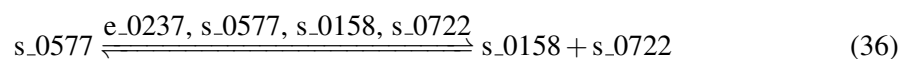
6.18 Reaction r_0038

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 73: Properties of each reactant.

Id	Name	SBO
s_0577	D-ribulose 5-phosphate	

Modifiers

Table 74: Properties of each modifier.

Id	Name	SBO
e_0237	RIB3	0000460
s_0577	D-ribulose 5-phosphate	
s_0158	2-hydroxy-3-oxobutyl phosphate	
s_0722	formate	

Products

Table 75: Properties of each product.

Id	Name	SBO
s_0158	2-hydroxy-3-oxobutyl phosphate	
s_0722	formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{18} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0577}] - \frac{[s_{0158}] \cdot [s_{0722}]}{K_{\text{eq}}}}{K_{\text{m0577}}} \right)}{1 + \frac{[s_{0577}]}{K_{\text{m0577}}} + \left(1 + \frac{[s_{0158}]}{K_{\text{m0158}}} \right) \cdot \left(1 + \frac{[s_{0722}]}{K_{\text{m0722}}} \right) - 1} \quad (37)$$

Table 76: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$8.51191990587516 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$8.51191990587032 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0577		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0158		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0722		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

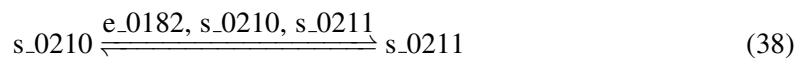
6.19 Reaction r_0039

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

Name 3-dehydroquinate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 77: Properties of each reactant.

Id	Name	SBO
s_0210	3-dehydroquinate	

Modifiers

Table 78: Properties of each modifier.

Id	Name	SBO
e_0182	ARO1	0000460
s_0210	3-dehydroquinate	
s_0211	3-dehydroshikimate	

Product

Table 79: Properties of each product.

Id	Name	SBO
s_0211	3-dehydroshikimate	

Kinetic Law

Derived unit contains undeclared units

$$v_{19} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0210}] - \frac{[s_{0211}]}{K_{\text{eq}}}}{K_{m0210}} \right)}{1 + \frac{[s_{0210}]}{K_{m0210}} + 1 + \frac{[s_{0211}]}{K_{m0211}} - 1} \quad (39)$$

Table 80: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.068	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0210		0000322	0.100	mmol · l ⁻¹	✓
Km0211		0000323	0.100	mmol · l ⁻¹	✓

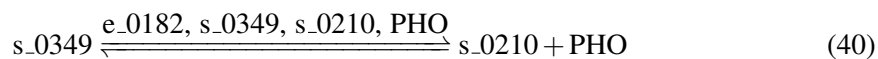
6.20 Reaction r_0040

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

Name 3-dehydroquinase synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 81: Properties of each reactant.

Id	Name	SBO
s_0349	7-phospho-2-dehydro-3-deoxy-D-arabino-heptonic acid	

Modifiers

Table 82: Properties of each modifier.

Id	Name	SBO
e_0182	ARO1	0000460
s_0349	7-phospho-2-dehydro-3-deoxy-D-arabino-heptonic acid	
s_0210	3-dehydroquinone	
PHO	phosphate	

Products

Table 83: Properties of each product.

Id	Name	SBO
s_0210	3-dehydroquinone	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{20} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0349]}{K_{m0349}} - \frac{[s_0210] \cdot [\text{PHO}]}{K_{\text{eq}}} \right)}{1 + \frac{[s_0349]}{K_{m0349}} + \left(1 + \frac{[s_0210]}{K_{m0210}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}} \right) - 1} \quad (41)$$

Table 84: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.114	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0349		0000322	0.100	mmol · l ⁻¹	✓
Km0210		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

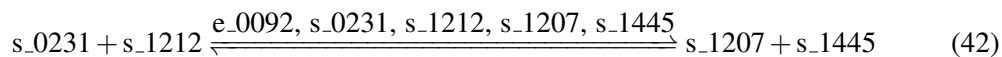
6.21 Reaction r_0041

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

Name 3-dehydrosphinganine reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 85: Properties of each reactant.

Id	Name	SBO
s_0231	3-ketosphinganine	
s_1212	NADPH	

Modifiers

Table 86: Properties of each modifier.

Id	Name	SBO
e_0092	TSC10	0000460
s_0231	3-ketosphinganine	
s_1212	NADPH	
s_1207	NADP(+)	
s_1445	sphinganine	

Products

Table 87: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1445	sphinganine	

Kinetic Law

Derived unit contains undeclared units

$$v_{21} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0231] \cdot [s_1212] - \frac{[s_1207] \cdot [s_1445]}{K_{\text{eq}}}}{K_{\text{m0231}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_0231]}{K_{\text{m0231}}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_1207]}{K_{\text{m1207}}} \right) \cdot \left(1 + \frac{[s_1445]}{K_{\text{m1445}}} \right) - 1} \quad (43)$$

Table 88: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.22290041668838 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.11206058336746 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0231		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1445		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

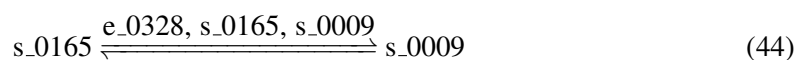
6.22 Reaction r_0060

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

Name 3-isopropylmalate dehydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 89: Properties of each reactant.

Id	Name	SBO
s_0165	2-isopropylmaleic acid	

Modifiers

Table 90: Properties of each modifier.

Id	Name	SBO
e_0328	LEU1	0000460
s_0165	2-isopropylmaleic acid	
s_0009	(2R,3S)-3-isopropylmalate	

Product

Table 91: Properties of each product.

Id	Name	SBO
s_0009	(2R,3S)-3-isopropylmalate	

Kinetic Law

Derived unit contains undeclared units

$$v_{22} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0165}] - \frac{[s_{0009}]}{K_{\text{eq}}}}{K_{m0165}} \right)}{1 + \frac{[s_{0165}]}{K_{m0165}} + 1 + \frac{[s_{0009}]}{K_{m0009}} - 1} \quad (45)$$

Table 92: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.076	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0165		0000322	0.100	mmol · l ⁻¹	✓
Km0009		0000323	0.100	mmol · l ⁻¹	✓

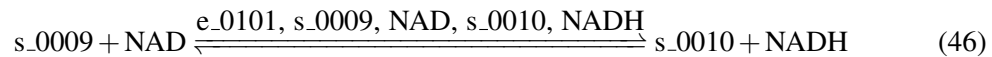
6.23 Reaction r_0061

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 93: Properties of each reactant.

Id	Name	SBO
s_0009	(2R,3S)-3-isopropylmalate	
NAD	NAD	

Modifiers

Table 94: Properties of each modifier.

Id	Name	SBO
e_0101	LEU2	0000460
s_0009	(2R,3S)-3-isopropylmalate	
NAD	NAD	
s_0010	(2S)-2-isopropyl-3-oxosuccinate	
NADH	NADH	

Products

Table 95: Properties of each product.

Id	Name	SBO
s_0010	(2S)-2-isopropyl-3-oxosuccinate	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{23} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0009] \cdot [NAD] - \frac{[s_0010] \cdot [NADH]}{K_{eq}}}{K_{m0009} \cdot K_{mNAD}} \right)}{\left(1 + \frac{[s_0009]}{K_{m0009}} \right) \cdot \left(1 + \frac{[NAD]}{K_{mNAD}} \right) + \left(1 + \frac{[s_0010]}{K_{m0010}} \right) \cdot \left(1 + \frac{[NADH]}{K_{mNADH}} \right) - 1} \quad (47)$$

Table 96: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.178	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.115	dimensionless	✓
Km0009		0000322	0.100	mmol · l ⁻¹	✓
KmNAD		0000322	1.503	mmol · l ⁻¹	✓
Km0010		0000323	0.100	mmol · l ⁻¹	✓
KmNADH		0000323	0.087	mmol · l ⁻¹	✓

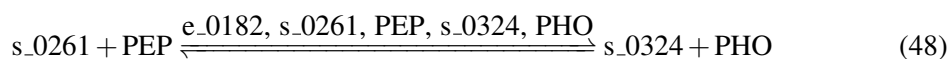
6.24 Reaction r_0065

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 97: Properties of each reactant.

Id	Name	SBO
s_0261	3-phosphoshikimic acid	
PEP	phosphoenolpyruvate	

Modifiers

Table 98: Properties of each modifier.

Id	Name	SBO
e_0182	ARO1	0000460
s_0261	3-phosphoshikimic acid	
PEP	phosphoenolpyruvate	
s_0324	5-O-(1-carboxyvinyl)-3-phosphoshikimic acid	
PHO	phosphate	

Products

Table 99: Properties of each product.

Id	Name	SBO
s_0324	5-O-(1-carboxyvinyl)-3-phosphoshikimic acid	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{24} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0261] \cdot [\text{PEP}] - \frac{[\text{s}_0324] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0261}} \cdot K_{\text{mPEP}}} \right)}{\left(1 + \frac{[\text{s}_0261]}{K_{\text{m0261}}} \right) \cdot \left(1 + \frac{[\text{PEP}]}{K_{\text{mPEP}}} \right) + \left(1 + \frac{[\text{s}_0324]}{K_{\text{m0324}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (49)$$

Table 100: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.159	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	3.163	dimensionless	✓
Km0261		0000322	0.100	mmol · l ⁻¹	✓
KmPEP		0000322	0.063	mmol · l ⁻¹	✓
Km0324		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

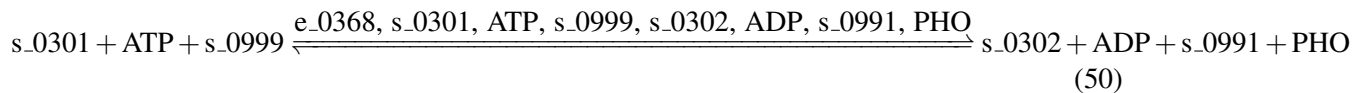
6.25 Reaction r_0079

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

Name 5'-phosphoribosylformyl glycinamidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 101: Properties of each reactant.

Id	Name	SBO
s_0301	5'-phosphoribosyl-N-formylglycineamide	
ATP	ATP	
s_0999	L-glutamine	

Modifiers

Table 102: Properties of each modifier.

Id	Name	SBO
e_0368	ADE6	0000460
s_0301	5'-phosphoribosyl-N-formylglycineamide	
ATP	ATP	
s_0999	L-glutamine	
s_0302	5'-phosphoribosyl-N-formylglycineamidine	
ADP	ADP	
s_0991	L-glutamate	
PHO	phosphate	

Products

Table 103: Properties of each product.

Id	Name	SBO
s_0302	5'-phosphoribosyl-N-formylglycineamidine	
ADP	ADP	
s_0991	L-glutamate	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{25} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0301}] \cdot [ATP] \cdot [s_{0999}] - \frac{[s_{0302}] \cdot [ADP] \cdot [s_{0991}] \cdot [PHO]}{K_{eq}}}{K_{m0301} \cdot K_{mATP} \cdot K_{m0999}} \right)}{\left(1 + \frac{[s_{0301}]}{K_{m0301}} \right) \cdot \left(1 + \frac{[ATP]}{K_{mATP}} \right) \cdot \left(1 + \frac{[s_{0999}]}{K_{m0999}} \right) + \left(1 + \frac{[s_{0302}]}{K_{m0302}} \right) \cdot \left(1 + \frac{[ADP]}{K_{mADP}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{m0991}} \right) \cdot \left(1 + \frac{[PHO]}{K_{mPHO}} \right)}$$
(51)

Table 104: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.196	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.102	mmol · l ⁻¹	✓
Km0301		0000322	0.100	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0999		0000322	0.100	mmol · l ⁻¹	✓
Km0302		0000323	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0991		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

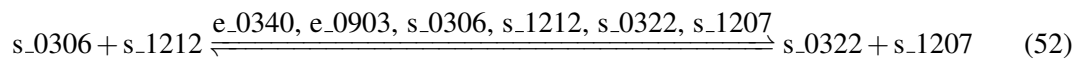
6.26 Reaction r_0080

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

Name 5,10-methylenetetrahydrofolate reductase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 105: Properties of each reactant.

Id	Name	SBO
s_0306	5,10-methylenetetrahydrofolate	
s_1212	NADPH	

Modifiers

Table 106: Properties of each modifier.

Id	Name	SBO
e_0340	MET13	0000460
e_0903	MET12	0000460
s_0306	5,10-methylenetetrahydrofolate	
s_1212	NADPH	
s_0322	5-methyltetrahydrofolate	
s_1207	NADP(+)	

Products

Table 107: Properties of each product.

Id	Name	SBO
s_0322	5-methyltetrahydrofolate	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{26} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0306}] \cdot [s_{1212}] - \frac{[s_{0322}] \cdot [s_{1207}]}{K_{\text{eq}}}}{K_{\text{m0306}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_{0306}]}{K_{\text{m0306}}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_{0322}]}{K_{\text{m0322}}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right) - 1} \quad (53)$$

Table 108: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.040	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0306		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0322		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

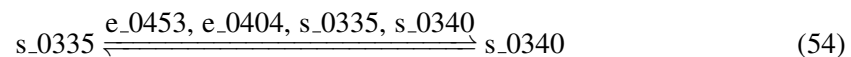
6.27 Reaction r_0091

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

Name 6-phosphogluconolactonase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 109: Properties of each reactant.

Id	Name	SBO
s_0335	6-O-phosphono-D-glucono-1,5-lactone	

Modifiers

Table 110: Properties of each modifier.

Id	Name	SBO
e_0453	SOL3	0000460
e_0404	SOL4	0000460
s_0335	6-O-phosphono-D-glucono-1,5-lactone	
s_0340	6-phospho-D-gluconate	

Product

Table 111: Properties of each product.

Id	Name	SBO
s_0340	6-phospho-D-gluconate	

Kinetic Law

Derived unit contains undeclared units

$$v_{27} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0335}] - \frac{[s_{0340}]}{K_{\text{eq}}} \right)}{K_{\text{m0335}}} \quad (55)$$

$$1 + \frac{[s_{0335}]}{K_{\text{m0335}}} + 1 + \frac{[s_{0340}]}{K_{\text{m0340}}} - 1$$

Table 112: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.058	dimensionless	✓
Vmax		0000324	0.348	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0335		0000322	0.100	mmol · l ⁻¹	✓
Km0340		0000323	0.100	mmol · l ⁻¹	✓

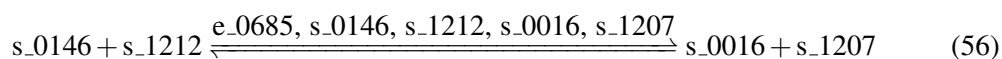
6.28 Reaction r_0096

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

Name acetohydroxy acid isomeroeductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 113: Properties of each reactant.

Id	Name	SBO
s_0146	2-acetylactic acid	
s_1212	NADPH	

Modifiers

Table 114: Properties of each modifier.

Id	Name	SBO
e_0685	ILV5	0000460
s_0146	2-acetylactic acid	
s_1212	NADPH	
s_0016	(R)-2,3-dihydroxy-3-methylbutanoate	
s_1207	NADP(+)	

Products

Table 115: Properties of each product.

Id	Name	SBO
s_0016	(R)-2,3-dihydroxy-3-methylbutanoate	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{28} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{.0146}] \cdot [s_{.1212}] - \frac{[s_{.0016}] \cdot [s_{.1207}]}{K_{\text{eq}}}}{K_{\text{m0146}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_{.0146}]}{K_{\text{m0146}}} \right) \cdot \left(1 + \frac{[s_{.1212}]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_{.0016}]}{K_{\text{m0016}}} \right) \cdot \left(1 + \frac{[s_{.1207}]}{K_{\text{m1207}}} \right) - 1} \quad (57)$$

Table 116: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.024	dimensionless	✓
Vmax		0000324	0.338	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0146		0000322	0.100	mmol · l ⁻¹	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km0016		0000323	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓

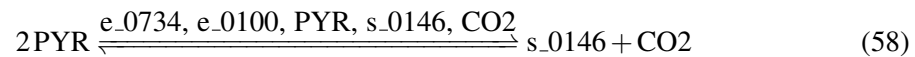
6.29 Reaction r_0097

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

Name acetolactate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 117: Properties of each reactant.

Id	Name	SBO
PYR	pyruvate	

Modifiers

Table 118: Properties of each modifier.

Id	Name	SBO
e_0734	ILV2	0000460
e_0100	ILV6	0000460

Id	Name	SBO
PYR	pyruvate	
s_0146	2-acetylactic acid	
CO2	carbon dioxide	

Products

Table 119: Properties of each product.

Id	Name	SBO
s_0146	2-acetylactic acid	
CO2	carbon dioxide	

Kinetic Law

Derived unit contains undeclared units

$$v_{29} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([\text{PYR}]^2 - \frac{[\text{s}_0146] \cdot [\text{CO}_2]}{K_{\text{eq}}} \right)}{K_{\text{mPYR}}^2} \quad (59)$$

$$\left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right)^2 + \left(1 + \frac{[\text{s}_0146]}{K_{\text{m0146}}} \right) \cdot \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) - 1$$

Table 120: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.024	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.338	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.061	dimensionless	<input checked="" type="checkbox"/>
KmPYR		0000322	1.815	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0146		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>

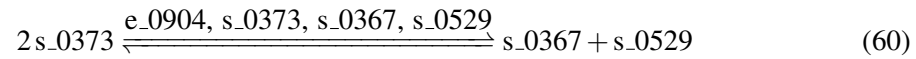
6.30 Reaction r_0103

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

Name acetyl-CoA C-acetyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 121: Properties of each reactant.

Id	Name	SBO
s_0373	acetyl-CoA	

Modifiers

Table 122: Properties of each modifier.

Id	Name	SBO
e_0904	ERG10	0000460
s_0373	acetyl-CoA	
s_0367	acetoacetyl-CoA	
s_0529	coenzyme A	

Products

Table 123: Properties of each product.

Id	Name	SBO
s_0367	acetoacetyl-CoA	
s_0529	coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{30} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0373}]^2 - \frac{[s_{0367}] \cdot [s_{0529}]}{K_{eq}}}{K_{m0373}^2} \right)}{\left(1 + \frac{[s_{0373}]}{K_{m0373}} \right)^2 + \left(1 + \frac{[s_{0367}]}{K_{m0367}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) - 1} \quad (61)$$

Table 124: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.025	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0373		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0367		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

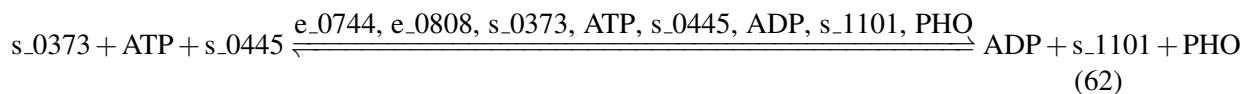
6.31 Reaction r_0108

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

Name acetyl-CoA carboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 125: Properties of each reactant.

Id	Name	SBO
s_0373	acetyl-CoA	
ATP	ATP	
s_0445	bicarbonate	

Modifiers

Table 126: Properties of each modifier.

Id	Name	SBO
e_0744	HFA1	0000460
e_0808	ACC1	0000460
s_0373	acetyl-CoA	
ATP	ATP	

Id	Name	SBO
s_0445	bicarbonate	
ADP	ADP	
s_1101	malonyl-CoA	
PHO	phosphate	

Products

Table 127: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_1101	malonyl-CoA	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{31} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0373}] \cdot [ATP] \cdot [s_{0445}] - \frac{[ADP] \cdot [s_{1101}] \cdot [PHO]}{K_{eq}}}{K_{m0373} \cdot K_{mATP} \cdot K_{m0445}} \right)}{\left(1 + \frac{[s_{0373}]}{K_{m0373}} \right) \cdot \left(1 + \frac{[ATP]}{K_{mATP}} \right) \cdot \left(1 + \frac{[s_{0445}]}{K_{m0445}} \right) + \left(1 + \frac{[ADP]}{K_{mADP}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[PHO]}{K_{mPHO}} \right) - 1} \quad (63)$$

Table 128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.203	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
Km0373		0000322	0.100	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0445		0000322	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓
Km1101		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

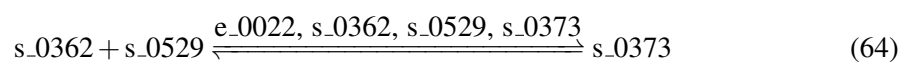
6.32 Reaction r_0110

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

Name acetyl-CoA hydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 129: Properties of each reactant.

Id	Name	SBO
s_0362	acetate	
s_0529	coenzyme A	

Modifiers

Table 130: Properties of each modifier.

Id	Name	SBO
e_0022	ACH1	0000460
s_0362	acetate	
s_0529	coenzyme A	
s_0373	acetyl-CoA	

Product

Table 131: Properties of each product.

Id	Name	SBO
s_0373	acetyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{32} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0362] \cdot [s_0529] - \frac{[s_0373]}{K_{\text{eq}}} \right)}{\left(1 + \frac{[s_0362]}{K_{m0362}} \right) \cdot \left(1 + \frac{[s_0529]}{K_{m0529}} \right) + 1 + \frac{[s_0373]}{K_{m0373}}} - 1 \quad (65)$$

Table 132: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.122	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.218	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	20.000	mmol ⁻¹ · l	<input checked="" type="checkbox"/>
Km0362		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0529		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0373		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.33 Reaction r_0115

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 133: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1192	N-acetyl-L-glutamate	

Modifiers

Table 134: Properties of each modifier.

Id	Name	SBO
e_0290	ARG5,6	0000460
ATP	ATP	
s_1192	N-acetyl-L-glutamate	
ADP	ADP	
s_1191	N-acetyl-L-gamma-glutamyl phosphate	

Products

Table 135: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_1191	N-acetyl-L-gamma-glutamyl phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{33} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1192}] - \frac{[\text{ADP}] \cdot [\text{s}_{1191}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1192}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1192}]}{K_{\text{m1192}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1191}]}{K_{\text{m1191}}} \right) - 1} \quad (67)$$

Table 136: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.097	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1192		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1191		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

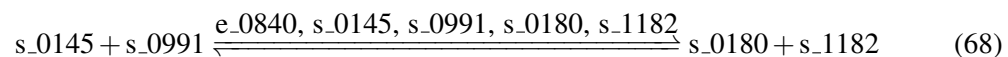
6.34 Reaction r_0118

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

Name acteylornithine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 137: Properties of each reactant.

Id	Name	SBO
s_0145	2-acetamido-5-oxopentanoate	
s_0991	L-glutamate	

Modifiers

Table 138: Properties of each modifier.

Id	Name	SBO
e_0840	ARG8	0000460
s_0145	2-acetamido-5-oxopentanoate	
s_0991	L-glutamate	
s_0180	2-oxoglutarate	
s_1182	N(2)-acetyl-L-ornithine	

Products

Table 139: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1182	N(2)-acetyl-L-ornithine	

Kinetic Law

Derived unit contains undeclared units

$$v_{34} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0145}] \cdot [s_{0991}] - \frac{[s_{0180}] \cdot [s_{1182}]}{K_{\text{eq}}}}{K_{\text{m0145}} \cdot K_{\text{m0991}}} \right)}{\left(1 + \frac{[s_{0145}]}{K_{\text{m0145}}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{\text{m0991}}} \right) + \left(1 + \frac{[s_{0180}]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_{1182}]}{K_{\text{m1182}}} \right) - 1} \quad (69)$$

Table 140: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.097	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0145		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km0991		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1182		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.35 Reaction r_0142

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 141: Properties of each reactant.

Id	Name	SBO
s_0386	adenosine	
ATP	ATP	

Modifiers

Table 142: Properties of each modifier.

Id	Name	SBO
e_0541	ADO1	0000460
s_0386	adenosine	
ATP	ATP	
ADP	ADP	
AMP	AMP	

Products

Table 143: Properties of each product.

Id	Name	SBO
ADP	ADP	
AMP	AMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{35} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_0386] \cdot [ATP] - \frac{[ADP] \cdot [AMP]}{K_{\text{eq}}} \right)}{K_{\text{m0386}} \cdot K_{\text{mATP}} \cdot \left(\left(1 + \frac{[s_0386]}{K_{\text{m0386}}} \right) \cdot \left(1 + \frac{[ATP]}{K_{\text{mATP}}} \right) + \left(1 + \frac{[ADP]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[AMP]}{K_{\text{mAMP}}} \right) - 1 \right)} \quad (71)$$

Table 144: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.61479376058174 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.009	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.974	dimensionless	<input checked="" type="checkbox"/>
Km0386		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmAMP		0000323	0.293	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

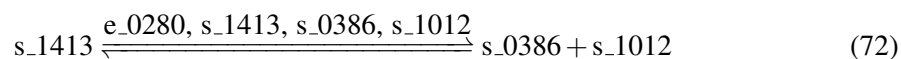
6.36 Reaction r_0144

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

Name adenosylhomocysteinase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 145: Properties of each reactant.

Id	Name	SBO
s_1413	S-adenosyl-L-homocysteine	

Modifiers

Table 146: Properties of each modifier.

Id	Name	SBO
e_0280	SAH1	0000460
s_1413	S-adenosyl-L-homocysteine	
s_0386	adenosine	
s_1012	L-homocysteine	

Products

Table 147: Properties of each product.

Id	Name	SBO
s_0386	adenosine	
s_1012	L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{36} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1413}] - \frac{[s_{0386}] \cdot [s_{1012}]}{K_{eq}}}{K_{m1413}} \right)}{1 + \frac{[s_{1413}]}{K_{m1413}} + \left(1 + \frac{[s_{0386}]}{K_{m0386}} \right) \cdot \left(1 + \frac{[s_{1012}]}{K_{m1012}} \right) - 1} \quad (73)$$

Table 148: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.6147934932568 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.007	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1413		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0386		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1012		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

6.37 Reaction AK

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

Name adenylate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 149: Properties of each reactant.

Id	Name	SBO
ADP	ADP	

Modifiers

Table 150: Properties of each modifier.

Id	Name	SBO
e_0194	ADK1	0000460
e_0303	ADK2	0000460
ADP	ADP	
AMP	AMP	
ATP	ATP	

Products

Table 151: Properties of each product.

Id	Name	SBO
AMP	AMP	
ATP	ATP	

Kinetic Law

Derived unit $0.0010 \text{ mol} \cdot \text{s}^{-1}$

$$v_{37} = \text{vol}(\text{cell}) \cdot k \cdot \left([\text{ADP}] \cdot [\text{ADP}] - \frac{[\text{AMP}] \cdot [\text{ATP}]}{K_{\text{eq}}} \right) \quad (75)$$

Table 152: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k			0.750	$\text{mmol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}			0.450	dimensionless	<input checked="" type="checkbox"/>
FLUX_VALUE			$7.17842452147011 \cdot 10^{-12}$	dimensionless	<input checked="" type="checkbox"/>

6.38 Reaction r_0150

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

Name adenylate kinase (GTP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 153: Properties of each reactant.

Id	Name	SBO
AMP	AMP	
s_0785	GTP	

Modifiers

Table 154: Properties of each modifier.

Id	Name	SBO
e_0303	ADK2	0000460
AMP	AMP	
s_0785	GTP	
ADP	ADP	
s_0739	GDP	

Products

Table 155: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_0739	GDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{38} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{AMP}] \cdot [\text{s}_0785] - \frac{[\text{ADP}] \cdot [\text{s}_0739]}{K_{\text{eq}}}}{K_{\text{mAMP}} \cdot K_{\text{m0785}}} \right)}{\left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0785]}{K_{\text{m0785}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_0739]}{K_{\text{m0739}}} \right) - 1} \quad (77)$$

Table 156: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.189	dimensionless	✓
Vmax		0000324	2.653	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	8.754	dimensionless	✓
KmAMP		0000322	0.293	mmol · l ⁻¹	✓
Km0785		0000322	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓
Km0739		0000323	0.100	mmol · l ⁻¹	✓

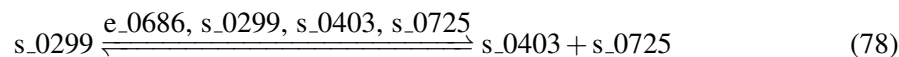
6.39 Reaction r_0151

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

Name adenylosuccinate lyase (AICAR)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 157: Properties of each reactant.

Id	Name	SBO
s_0299	5'-phosphoribosyl-4-(N-succinocarboxamide)-5-aminoimidazole	

Modifiers

Table 158: Properties of each modifier.

Id	Name	SBO
e_0686	ADE13	0000460
s_0299	5'-phosphoribosyl-4-(N-succinocarboxamide)-5-aminoimidazole	
s_0403	AICAR	
s_0725	fumarate	

Products

Table 159: Properties of each product.

Id	Name	SBO
s_0403	AICAR	
s_0725	fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{39} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0299}] - \frac{[\text{s}_{0403}] \cdot [\text{s}_{0725}]}{K_{\text{eq}}}}{K_{\text{m0299}}} \right)}{1 + \frac{[\text{s}_{0299}]}{K_{\text{m0299}}} + \left(1 + \frac{[\text{s}_{0403}]}{K_{\text{m0403}}} \right) \cdot \left(1 + \frac{[\text{s}_{0725}]}{K_{\text{m0725}}} \right) - 1} \quad (79)$$

Table 160: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.043	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0299		0000322	0.100	mmol · l ⁻¹	✓
Km0403		0000323	0.100	mmol · l ⁻¹	✓
Km0725		0000323	0.100	mmol · l ⁻¹	✓

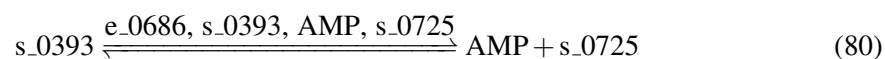
6.40 Reaction r_0152

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 161: Properties of each reactant.

Id	Name	SBO
s_0393	adenylo-succinate	

Modifiers

Table 162: Properties of each modifier.

Id	Name	SBO
e_0686	ADE13	0000460
s_0393	adenylo-succinate	
AMP	AMP	
s_0725	fumarate	

Products

Table 163: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0725	fumarate	

Kinetic Law

Derived unit contains undeclared units

$$v_{40} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0393]}{\text{Km0393}} - \frac{[\text{AMP}] \cdot [\text{s}_0725]}{\text{Keq}} \right)}{1 + \frac{[\text{s}_0393]}{\text{Km0393}} + \left(1 + \frac{[\text{AMP}]}{\text{KmAMP}} \right) \cdot \left(1 + \frac{[\text{s}_0725]}{\text{Km0725}} \right) - 1} \quad (81)$$

Table 164: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.050	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.586	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0393		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmAMP		0000323	0.293	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0725		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

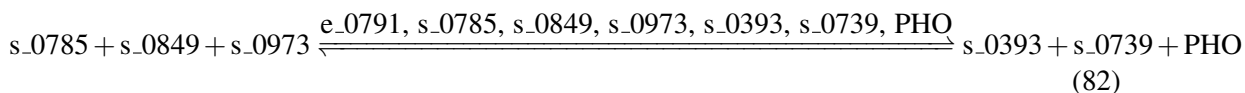
6.41 Reaction r_0153

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 165: Properties of each reactant.

Id	Name	SBO
s_0785	GTP	
s_0849	IMP	
s_0973	L-aspartate	

Modifiers

Table 166: Properties of each modifier.

Id	Name	SBO
e_0791	ADE12	0000460
s_0785	GTP	
s_0849	IMP	
s_0973	L-aspartate	
s_0393	adenylo-succinate	
s_0739	GDP	
PHO	phosphate	

Products

Table 167: Properties of each product.

Id	Name	SBO
s_0393	adenylo-succinate	
s_0739	GDP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{41} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0785}] \cdot [s_{0849}] \cdot [s_{0973}] - \frac{[s_{0393}] \cdot [s_{0739}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0785}} \cdot K_{\text{m0849}} \cdot K_{\text{m0973}}} \right)}{\left(1 + \frac{[s_{0785}]}{K_{\text{m0785}}} \right) \cdot \left(1 + \frac{[s_{0849}]}{K_{\text{m0849}}} \right) \cdot \left(1 + \frac{[s_{0973}]}{K_{\text{m0973}}} \right) + \left(1 + \frac{[s_{0393}]}{K_{\text{m0393}}} \right) \cdot \left(1 + \frac{[s_{0739}]}{K_{\text{m0739}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (83)$$

Table 168: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	✓
Vmax		0000324	0.149	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0785		0000322	0.100	mmol · l ⁻¹	✓
Km0849		0000322	0.100	mmol · l ⁻¹	✓
Km0973		0000322	0.100	mmol · l ⁻¹	✓
Km0393		0000323	0.100	mmol · l ⁻¹	✓
Km0739		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

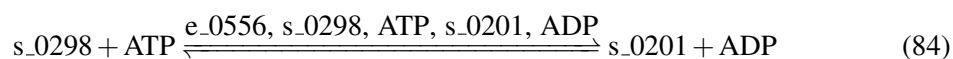
6.42 Reaction r_0154

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 169: Properties of each reactant.

Id	Name	SBO
s_0298	5'-adenylyl sulfate	
ATP	ATP	

Modifiers

Table 170: Properties of each modifier.

Id	Name	SBO
e_0556	MET14	0000460
s_0298	5'-adenylyl sulfate	
ATP	ATP	
s_0201	3'-phospho-5'-adenylyl sulfate	
ADP	ADP	

Products

Table 171: Properties of each product.

Id	Name	SBO
s_0201	3'-phospho-5'-adenylyl sulfate	
ADP	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{42} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0298}] \cdot [\text{ATP}] - \frac{[\text{s}_{0201}] \cdot [\text{ADP}]}{K_{\text{eq}}}}{K_{\text{m0298}} \cdot K_{\text{mATP}}} \right)}{\left(1 + \frac{[\text{s}_{0298}]}{K_{\text{m0298}}} \right) \cdot \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) + \left(1 + \frac{[\text{s}_{0201}]}{K_{\text{m0201}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) - 1} \quad (85)$$

Table 172: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.034	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
Km0298		0000322	0.100	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0201		0000323	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓

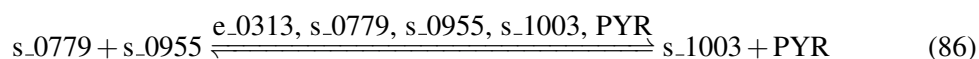
6.43 Reaction r_0156

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

Name alanine glyoxylate aminotransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 173: Properties of each reactant.

Id	Name	SBO
s_0779	glyoxylate	
s_0955	L-alanine	

Modifiers

Table 174: Properties of each modifier.

Id	Name	SBO
e_0313	AGX1	0000460

Id	Name	SBO
s_0779	glyoxylate	
s_0955	L-alanine	
s_1003	L-glycine	
PYR	pyruvate	

Products

Table 175: Properties of each product.

Id	Name	SBO
s_1003	L-glycine	
PYR	pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{43} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0779}] \cdot [\text{s}_{0955}] - \frac{[\text{s}_{1003}] \cdot [\text{PYR}]}{K_{\text{eq}}}}{K_{\text{m0779}} \cdot K_{\text{m0955}}} \right)}{\left(1 + \frac{[\text{s}_{0779}]}{K_{\text{m0779}}} \right) \cdot \left(1 + \frac{[\text{s}_{0955}]}{K_{\text{m0955}}} \right) + \left(1 + \frac{[\text{s}_{1003}]}{K_{\text{m1003}}} \right) \cdot \left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right) - 1} \quad (87)$$

Table 176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.033	dimensionless	✓
Vmax		0000324	0.459	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	36.306	dimensionless	✓
Km0779		0000322	0.100	mmol · l ⁻¹	✓
Km0955		0000322	0.100	mmol · l ⁻¹	✓
Km1003		0000323	0.100	mmol · l ⁻¹	✓
KmPYR		0000323	1.815	mmol · l ⁻¹	✓

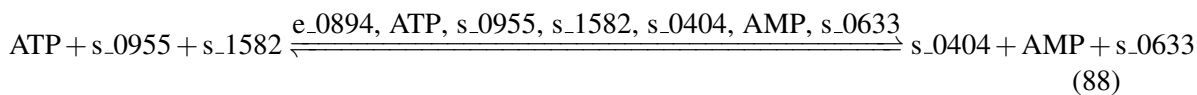
6.44 Reaction r_0157

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

Name alanyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 177: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0955	L-alanine	
s_1582	tRNA(Ala)	

Modifiers

Table 178: Properties of each modifier.

Id	Name	SBO
e_0894	ALA1	0000460
ATP	ATP	
s_0955	L-alanine	
s_1582	tRNA(Ala)	
s_0404	Ala-tRNA(Ala)	
AMP	AMP	
s_0633	diphosphate	

Products

Table 179: Properties of each product.

Id	Name	SBO
s_0404	Ala-tRNA(Ala)	
AMP	AMP	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{0955}] \cdot [\text{s}_{1582}] - \frac{[\text{s}_{0404}] \cdot [\text{AMP}] \cdot [\text{s}_{0633}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0955}} \cdot K_{\text{m1582}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0955}]}{K_{\text{m0955}}} \right) \cdot \left(1 + \frac{[\text{s}_{1582}]}{K_{\text{m1582}}} \right) + \left(1 + \frac{[\text{s}_{0404}]}{K_{\text{m0404}}} \right) \cdot \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) - 1}$$

Table 180: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.020	dimensionless	✓
Vmax		0000324	0.592	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0955		0000322	0.100	mmol · l ⁻¹	✓
Km1582		0000322	0.100	mmol · l ⁻¹	✓
Km0404		0000323	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓

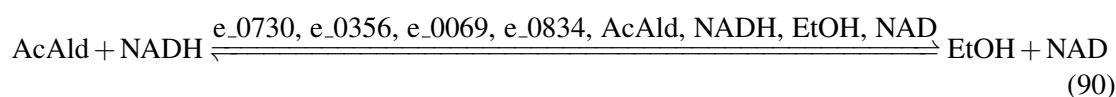
6.45 Reaction ADH

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

Name mitochondrial alcohol dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 181: Properties of each reactant.

Id	Name	SBO
AcAld	acetaldehyde	
NADH	NADH	

Modifiers

Table 182: Properties of each modifier.

Id	Name	SBO
e_0730	ADH3	0000460
e_0356	ADH4	0000460
e_0069	ADH5	0000460
e_0834	ADH1	0000460
AcAld	acetaldehyde	
NADH	NADH	
EtOH	ethanol	
NAD	NAD	

Products

Table 183: Properties of each product.

Id	Name	SBO
EtOH	ethanol	
NAD	NAD	

Kinetic Law

Derived unit contains undeclared units

$$v_{45} = \text{vol}(\text{cell})$$

$$V_{\max} \cdot \left(\frac{[\text{AcAld}] \cdot [\text{NADH}]}{\text{Kacald} \cdot \text{Kinadh}} - \frac{[\text{EtOH}] \cdot [\text{NAD}]}{\text{Kacald} \cdot \text{Kinadh} \cdot \text{Keq}} \right) \cdot \frac{1}{1 + \frac{[\text{NADH}]}{\text{Kinadh}} + \frac{[\text{AcAld}] \cdot \text{Knadh}}{\text{Kinadh} \cdot \text{Kacald}} + \frac{[\text{EtOH}] \cdot \text{Knad}}{\text{Kinad} \cdot \text{Ketoh}} + \frac{[\text{NAD}]}{\text{Kinad}} + \frac{[\text{AcAld}] \cdot [\text{NADH}]}{\text{Kinadh} \cdot \text{Kacald}} + \frac{[\text{NADH}] \cdot [\text{EtOH}] \cdot \text{Knad}}{\text{Kinadh} \cdot \text{Kinad} \cdot \text{Ketoh}} + \frac{[\text{AcAld}] \cdot [\text{NAD}] \cdot \text{Knadh}}{\text{Kinadh} \cdot \text{Kinad} \cdot \text{Kacald}} + \frac{[\text{EtOH}]}{\text{Ketoh}}}$$

Table 184: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			111.335	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Ketoh			17.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Kinad			0.920	$\text{mmol} \cdot \text{l}^{-1}$	✓
Keq			14492.754	dimensionless	✓
Knad			0.170	$\text{mmol} \cdot \text{l}^{-1}$	✓
Knadh			0.110	$\text{mmol} \cdot \text{l}^{-1}$	✓
Kinadh			0.031	$\text{mmol} \cdot \text{l}^{-1}$	✓
Kacald			1.110	$\text{mmol} \cdot \text{l}^{-1}$	✓
Kiacald			1.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

Id	Name	SBO	Value	Unit	Constant
Kietoh			90.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
FLUX_VALUE			2.173	dimensionless	<input checked="" type="checkbox"/>

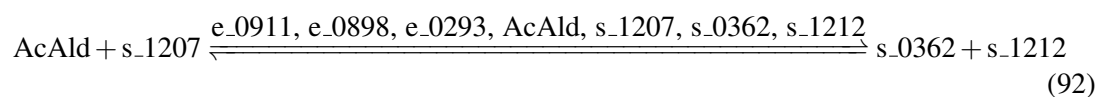
6.46 Reaction r_0173

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

Name aldehyde dehydrogenase (acetaldehyde, NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 185: Properties of each reactant.

Id	Name	SBO
AcAld	acetaldehyde	
s_1207	NADP(+)	

Modifiers

Table 186: Properties of each modifier.

Id	Name	SBO
e_0911	ALD6	0000460
e_0898	ALD4	0000460
e_0293	ALD5	0000460
AcAld	acetaldehyde	
s_1207	NADP(+)	
s_0362	acetate	
s_1212	NADPH	

Products

Table 187: Properties of each product.

Id	Name	SBO
s_0362	acetate	
s_1212	NADPH	

Kinetic Law

Derived unit contains undeclared units

$$v_{46} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([\text{AcAld}] \cdot [\text{s}_1207] - \frac{[\text{s}_0362] \cdot [\text{s}_1212]}{K_{\text{eq}}} \right)}{K_{\text{mAcAld}} \cdot K_{\text{m1207}} \cdot \left(\left(1 + \frac{[\text{AcAld}]}{K_{\text{mAcAld}}} \right) \cdot \left(1 + \frac{[\text{s}_1207]}{K_{\text{m1207}}} \right) + \left(1 + \frac{[\text{s}_0362]}{K_{\text{m0362}}} \right) \cdot \left(1 + \frac{[\text{s}_1212]}{K_{\text{m1212}}} \right) - 1 \right)} \quad (93)$$

Table 188: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.086	dimensionless	✓
Vmax		0000324	1.207	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.123	dimensionless	✓
KmAcAld		0000322	0.178	mmol · l ⁻¹	✓
Km1207		0000322	0.100	mmol · l ⁻¹	✓
Km0362		0000323	0.100	mmol · l ⁻¹	✓
Km1212		0000323	0.100	mmol · l ⁻¹	✓

6.47 Reaction r_0174

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

Name aldehyde dehydrogenase (acetaldehyde, NAD)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 189: Properties of each reactant.

Id	Name	SBO
AcAld	acetaldehyde	
NAD	NAD	

Modifiers

Table 190: Properties of each modifier.

Id	Name	SBO
e_0898	ALD4	0000460
e_0740	ALD2	0000460
AcAld	acetaldehyde	
NAD	NAD	
s_0362	acetate	
NADH	NADH	

Products

Table 191: Properties of each product.

Id	Name	SBO
s_0362	acetate	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{47} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{AcAld}] \cdot [\text{NAD}] - \frac{[\text{s}_0362] \cdot [\text{NADH}]}{K_{\text{eq}}}}{K_{\text{mAcAld}} \cdot K_{\text{mNAD}}} \right)}{\left(1 + \frac{[\text{AcAld}]}{K_{\text{mAcAld}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right) + \left(1 + \frac{[\text{s}_0362]}{K_{\text{m0362}}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right) - 1} \quad (95)$$

Table 192: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.029	dimensionless	✓
Vmax		0000324	0.408	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.065	dimensionless	✓

Id	Name	SBO	Value	Unit	Constant
KmAcAld		0000322	0.178	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000322	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmO362		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNADH		0000323	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>

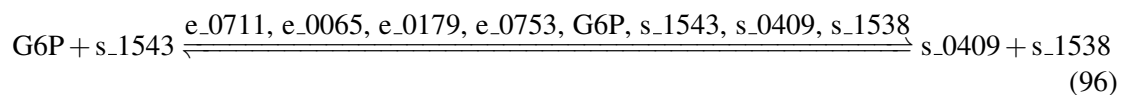
6.48 Reaction r_0195

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

Name alpha,alpha-trehalose-phosphate synthase (UDP-forming)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 193: Properties of each reactant.

Id	Name	SBO
G6P	D-glucose 6-phosphate	
s_1543	UDP-D-glucose	

Modifiers

Table 194: Properties of each modifier.

Id	Name	SBO
e_0711	TSL1	0000460
e_0065	TPS1	0000460
e_0179	TPS2	0000460
e_0753	TPS3	0000460
G6P	D-glucose 6-phosphate	
s_1543	UDP-D-glucose	
s_0409	alpha,alpha-trehalose 6-phosphate	
s_1538	UDP	

Products

Table 195: Properties of each product.

Id	Name	SBO
s_0409	alpha,alpha-trehalose 6-phosphate	
s_1538	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{48} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{G6P}] \cdot [\text{s}_{1543}] - \frac{[\text{s}_{0409}] \cdot [\text{s}_{1538}]}{K_{\text{eq}}}}{K_{\text{mG6P}} \cdot K_{\text{m1543}}} \right)}{\left(1 + \frac{[\text{G6P}]}{K_{\text{mG6P}}} \right) \cdot \left(1 + \frac{[\text{s}_{1543}]}{K_{\text{m1543}}} \right) + \left(1 + \frac{[\text{s}_{0409}]}{K_{\text{m0409}}} \right) \cdot \left(1 + \frac{[\text{s}_{1538}]}{K_{\text{m1538}}} \right) - 1} \quad (97)$$

Table 196: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	✓
Vmax		0000324	0.014	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.075	dimensionless	✓
KmG6P		0000322	2.675	mmol · l ⁻¹	✓
Km1543		0000322	0.100	mmol · l ⁻¹	✓
Km0409		0000323	0.100	mmol · l ⁻¹	✓
Km1538		0000323	0.100	mmol · l ⁻¹	✓

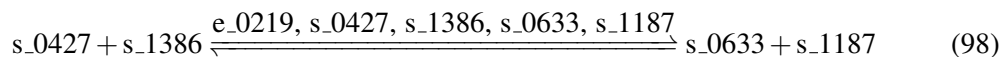
6.49 Reaction r_0202

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 197: Properties of each reactant.

Id	Name	SBO
s_0427	anthranilate	
s_1386	PRPP	

Modifiers

Table 198: Properties of each modifier.

Id	Name	SBO
e_0219	TRP4	0000460
s_0427	anthranilate	
s_1386	PRPP	
s_0633	diphosphate	
s_1187	N-(5-phospho-beta-D-ribosyl)anthranilate	

Products

Table 199: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
s_1187	N-(5-phospho-beta-D-ribosyl)anthranilate	

Kinetic Law

Derived unit contains undeclared units

$$v_{49} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0427}] \cdot [s_{1386}] - \frac{[s_{0633}] \cdot [s_{1187}]}{K_{\text{eq}}}}{K_{\text{m0427}} \cdot K_{\text{m1386}}} \right)}{\left(1 + \frac{[s_{0427}]}{K_{\text{m0427}}} \right) \cdot \left(1 + \frac{[s_{1386}]}{K_{\text{m1386}}} \right) + \left(1 + \frac{[s_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[s_{1187}]}{K_{\text{m1187}}} \right) - 1} \quad (99)$$

Table 200: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	✓
Vmax		0000324	0.017	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0427		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km1386		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1187		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

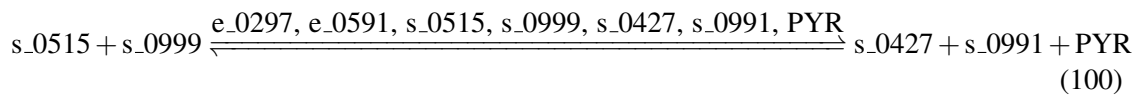
6.50 Reaction r_0203

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 201: Properties of each reactant.

Id	Name	SBO
s_0515	chorismate	
s_0999	L-glutamine	

Modifiers

Table 202: Properties of each modifier.

Id	Name	SBO
e_0297	TRP2	0000460
e_0591	TRP3	0000460
s_0515	chorismate	
s_0999	L-glutamine	
s_0427	anthranilate	
s_0991	L-glutamate	
PYR	pyruvate	

Products

Table 203: Properties of each product.

Id	Name	SBO
s_0427	anthranilate	
s_0991	L-glutamate	
PYR	pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{50} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0515}] \cdot [s_{0999}] - \frac{[s_{0427}] \cdot [s_{0991}] \cdot [\text{PYR}]}{K_{\text{eq}}}}{K_{\text{m0515}} \cdot K_{\text{m0999}}} \right)}{\left(1 + \frac{[s_{0515}]}{K_{\text{m0515}}} \right) \cdot \left(1 + \frac{[s_{0999}]}{K_{\text{m0999}}} \right) + \left(1 + \frac{[s_{0427}]}{K_{\text{m0427}}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{\text{m0991}}} \right) \cdot \left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right) - 1} \quad (101)$$

Table 204: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	✓
Vmax		0000324	0.027	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	3.631	mmol · l ⁻¹	✓
Km0515		0000322	0.100	mmol · l ⁻¹	✓
Km0999		0000322	0.100	mmol · l ⁻¹	✓
Km0427		0000323	0.100	mmol · l ⁻¹	✓
Km0991		0000323	0.100	mmol · l ⁻¹	✓
KmPYR		0000323	1.815	mmol · l ⁻¹	✓

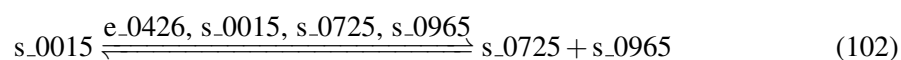
6.51 Reaction r_0207

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 205: Properties of each reactant.

Id	Name	SBO
s_0015	(N(omega)-L-arginino)succinic acid	

Modifiers

Table 206: Properties of each modifier.

Id	Name	SBO
e_0426	ARG4	0000460
s_0015	(N(omega)-L-arginino)succinic acid	
s_0725	fumarate	
s_0965	L-arginine	

Products

Table 207: Properties of each product.

Id	Name	SBO
s_0725	fumarate	
s_0965	L-arginine	

Kinetic Law

Derived unit contains undeclared units

$$v_{51} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0015}] - \frac{[s_{0725}] \cdot [s_{0965}]}{K_{\text{eq}}}}{K_{m0015}} \right)}{1 + \frac{[s_{0015}]}{K_{m0015}} + \left(1 + \frac{[s_{0725}]}{K_{m0725}} \right) \cdot \left(1 + \frac{[s_{0965}]}{K_{m0965}} \right) - 1} \quad (103)$$

Table 208: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.069	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0015		0000322	0.100	mmol · l ⁻¹	✓
Km0725		0000323	0.100	mmol · l ⁻¹	✓
Km0965		0000323	0.100	mmol · l ⁻¹	✓

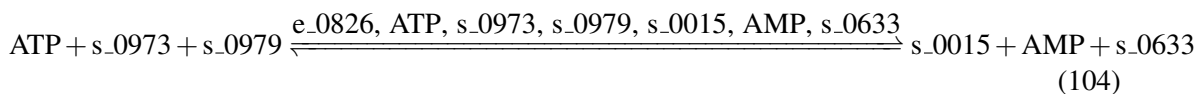
6.52 Reaction r_0208

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 209: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0973	L-aspartate	
s_0979	L-citrulline	

Modifiers

Table 210: Properties of each modifier.

Id	Name	SBO
e_0826	ARG1	0000460
ATP	ATP	
s_0973	L-aspartate	
s_0979	L-citrulline	
s_0015	(N(omega)-L-arginino)succinic acid	
AMP	AMP	
s_0633	diphosphate	

Products

Table 211: Properties of each product.

Id	Name	SBO
s_0015	(N(omega)-L-arginino)succinic acid	

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{52} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [s_{0973}] \cdot [s_{0979}] - \frac{[s_{0015}] \cdot [\text{AMP}] \cdot [s_{0633}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0973}} \cdot K_{\text{m0979}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[s_{0973}]}{K_{\text{m0973}}} \right) \cdot \left(1 + \frac{[s_{0979}]}{K_{\text{m0979}}} \right) + \left(1 + \frac{[s_{0015}]}{K_{\text{m0015}}} \right) \cdot \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[s_{0633}]}{K_{\text{m0633}}} \right) - 1} \quad (105)$$

Table 212: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.207	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0973		0000322	0.100	mmol · l ⁻¹	✓
Km0979		0000322	0.100	mmol · l ⁻¹	✓
Km0015		0000323	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓

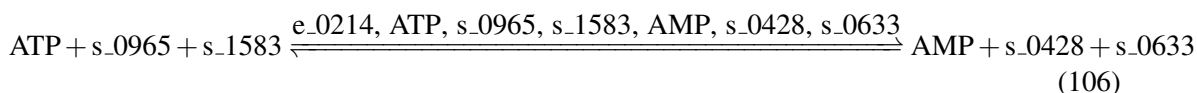
6.53 Reaction r_0209

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

Name arginyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 213: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0965	L-arginine	
s_1583	tRNA(Arg)	

Modifiers

Table 214: Properties of each modifier.

Id	Name	SBO
e_0214	YDR341C	0000460
ATP	ATP	
s_0965	L-arginine	
s_1583	tRNA(Arg)	
AMP	AMP	
s_0428	Arg-tRNA(Arg)	
s_0633	diphosphate	

Products

Table 215: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0428	Arg-tRNA(Arg)	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{53} & \quad (107) \\
 &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0965] \cdot [\text{s}_1583] - \frac{[\text{AMP}] \cdot [\text{s}_0428] \cdot [\text{s}_0633]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0965}} \cdot K_{\text{m1583}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0965]}{K_{\text{m0965}}} \right) \cdot \left(1 + \frac{[\text{s}_1583]}{K_{\text{m1583}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0428]}{K_{\text{m0428}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) - 1}
 \end{aligned}$$

Table 216: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.207	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0965		0000322	0.100	mmol · l ⁻¹	✓
Km1583		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0428		0000323	0.100	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓

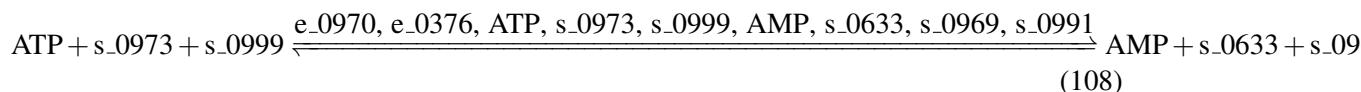
6.54 Reaction r_0211

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

Name asparagine synthase (glutamine-hydrolysing)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 217: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0973	L-aspartate	
s_0999	L-glutamine	

Modifiers

Table 218: Properties of each modifier.

Id	Name	SBO
e_0970	ASN1	0000460

Id	Name	SBO
e_0376	ASN2	0000460
ATP	ATP	
s_0973	L-aspartate	
s_0999	L-glutamine	
AMP	AMP	
s_0633	diphosphate	
s_0969	L-asparagine	
s_0991	L-glutamate	

Products

Table 219: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_0969	L-asparagine	
s_0991	L-glutamate	

Kinetic Law

Derived unit contains undeclared units

v_{54}

(109)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0973] \cdot [\text{s}_0999]}{\text{Keq}} - \frac{[\text{AMP}] \cdot [\text{s}_0633] \cdot [\text{s}_0969] \cdot [\text{s}_0991]}{\text{Keq}} \right)}{\text{KmATP} \cdot \text{Km0973} \cdot \text{Km0999} \cdot \left(1 + \frac{[\text{ATP}]}{\text{KmATP}} \right) \cdot \left(1 + \frac{[\text{s}_0973]}{\text{Km0973}} \right) \cdot \left(1 + \frac{[\text{s}_0999]}{\text{Km0999}} \right) + \left(1 + \frac{[\text{AMP}]}{\text{KmAMP}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{\text{Km0633}} \right) \cdot \left(1 + \frac{[\text{s}_0969]}{\text{Km0969}} \right) \cdot \left(1 + \frac{[\text{s}_0991]}{\text{Km0991}} \right)}$$

Table 220: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.201	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.023	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0973		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0999		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmAMP		0000323	0.293	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0969		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0991		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

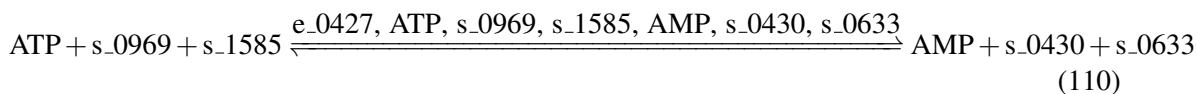
6.55 Reaction r_0212

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

Name Asparaginyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 221: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0969	L-asparagine	
s_1585	tRNA(Asn)	

Modifiers

Table 222: Properties of each modifier.

Id	Name	SBO
e_0427	DED81	0000460
ATP	ATP	
s_0969	L-asparagine	
s_1585	tRNA(Asn)	
AMP	AMP	
s_0430	Asn-tRNA(Asn)	
s_0633	diphosphate	

Products

Table 223: Properties of each product.

Id	Name	SBO
AMP	AMP	

Id	Name	SBO
s_0430	Asn-tRNA(Asn)	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{55} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0969] \cdot [\text{s}_1585] - \frac{[\text{AMP}] \cdot [\text{s}_0430] \cdot [\text{s}_0633]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0969}} \cdot K_{\text{m1585}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0969]}{K_{\text{m0969}}} \right) \cdot \left(1 + \frac{[\text{s}_1585]}{K_{\text{m1585}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0430]}{K_{\text{m0430}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) - 1} \quad (111)$$

Table 224: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.131	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0969		0000322	0.100	mmol · l ⁻¹	✓
Km1585		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0430		0000323	0.100	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓

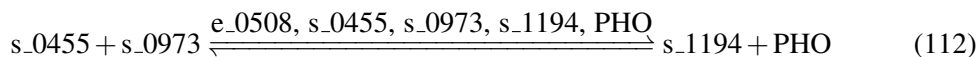
6.56 Reaction r_0214

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

Name aspartate carbamoyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 225: Properties of each reactant.

Id	Name	SBO
s_0455	carbamoyl phosphate	
s_0973	L-aspartate	

Modifiers

Table 226: Properties of each modifier.

Id	Name	SBO
e_0508	URA2	0000460
s_0455	carbamoyl phosphate	
s_0973	L-aspartate	
s_1194	N-carbamoyl-L-aspartate	
PHO	phosphate	

Products

Table 227: Properties of each product.

Id	Name	SBO
s_1194	N-carbamoyl-L-aspartate	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{56} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0455}] \cdot [s_{0973}] - \frac{[s_{1194}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0455}} \cdot K_{\text{m0973}}} \right)}{\left(1 + \frac{[s_{0455}]}{K_{\text{m0455}}} \right) \cdot \left(1 + \frac{[s_{0973}]}{K_{\text{m0973}}} \right) + \left(1 + \frac{[s_{1194}]}{K_{\text{m1194}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (113)$$

Table 228: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	✓
Vmax		0000324	0.067	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0455		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km0973		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1194		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

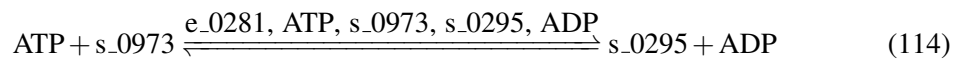
6.57 Reaction r_0215

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

Name aspartate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 229: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0973	L-aspartate	

Modifiers

Table 230: Properties of each modifier.

Id	Name	SBO
e_0281	HOM3	0000460
ATP	ATP	
s_0973	L-aspartate	
s_0295	4-phospho-L-aspartate	
ADP	ADP	

Products

Table 231: Properties of each product.

Id	Name	SBO
s_0295	4-phospho-L-aspartate	
ADP	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{57} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{0973}] - \frac{[\text{s}_{0295}] \cdot [\text{ADP}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0973}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0973}]}{K_{\text{m0973}}} \right) + \left(1 + \frac{[\text{s}_{0295}]}{K_{\text{m0295}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) - 1} \quad (115)$$

Table 232: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.036	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.502	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0973		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0295		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>

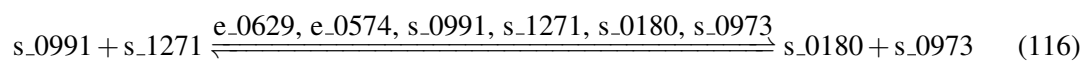
6.58 Reaction r_0216

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

Name aspartate transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 233: Properties of each reactant.

Id	Name	SBO
s_0991	L-glutamate	
s_1271	oxaloacetate	

Modifiers

Table 234: Properties of each modifier.

Id	Name	SBO
e_0629	AAT2	0000460
e_0574	AAT1	0000460
s_0991	L-glutamate	
s_1271	oxaloacetate	
s_0180	2-oxoglutarate	
s_0973	L-aspartate	

Products

Table 235: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_0973	L-aspartate	

Kinetic Law

Derived unit contains undeclared units

$$v_{58} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0991}] \cdot [s_{1271}] - \frac{[s_{0180}] \cdot [s_{0973}]}{K_{eq}}}{K_{m0991} \cdot K_{m1271}} \right)}{\left(1 + \frac{[s_{0991}]}{K_{m0991}} \right) \cdot \left(1 + \frac{[s_{1271}]}{K_{m1271}} \right) + \left(1 + \frac{[s_{0180}]}{K_{m0180}} \right) \cdot \left(1 + \frac{[s_{0973}]}{K_{m0973}} \right) - 1} \quad (117)$$

Table 236: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.074	dimensionless	✓
Vmax		0000324	1.035	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓

Id	Name	SBO	Value	Unit	Constant
Km0991		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1271		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0973		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

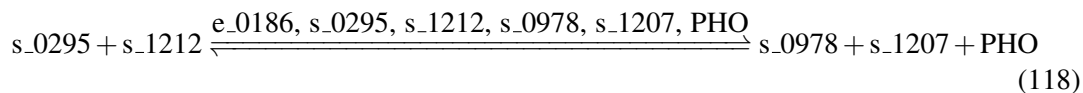
6.59 Reaction r_0219

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 237: Properties of each reactant.

Id	Name	SBO
s_0295	4-phospho-L-aspartate	
s_1212	NADPH	

Modifiers

Table 238: Properties of each modifier.

Id	Name	SBO
e_0186	HOM2	0000460
s_0295	4-phospho-L-aspartate	
s_1212	NADPH	
s_0978	L-aspartate 4-semialdehyde	
s_1207	NADP(+)	
PHO	phosphate	

Products

Table 239: Properties of each product.

Id	Name	SBO
s_0978	L-aspartate 4-semialdehyde	
s_1207	NADP(+)	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{59} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0295}] \cdot [s_{1212}] - \frac{[s_{0978}] \cdot [s_{1207}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0295}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_{0295}]}{K_{\text{m0295}}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_{0978}]}{K_{\text{m0978}}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (119)$$

Table 240: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.036	dimensionless	✓
Vmax		0000324	0.790	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0295		0000322	0.100	mmol · l ⁻¹	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km0978		0000323	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

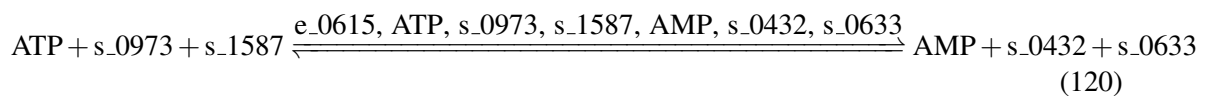
6.60 Reaction r_0220

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

Name Aspartyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 241: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0973	L-aspartate	
s_1587	tRNA(Asp)	

Modifiers

Table 242: Properties of each modifier.

Id	Name	SBO
e_0615	DPS1	0000460
ATP	ATP	
s_0973	L-aspartate	
s_1587	tRNA(Asp)	
AMP	AMP	
s_0432	Asp-tRNA(Asp)	
s_0633	diphosphate	

Products

Table 243: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0432	Asp-tRNA(Asp)	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{60} &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0973] \cdot [\text{s}_1587] - \frac{[\text{AMP}] \cdot [\text{s}_0432] \cdot [\text{s}_0633]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0973}} \cdot K_{\text{m1587}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0973]}{K_{\text{m0973}}} \right) \cdot \left(1 + \frac{[\text{s}_1587]}{K_{\text{m1587}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0432]}{K_{\text{m0432}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) - 1}
 \end{aligned} \tag{121}$$

Table 244: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.384	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.232	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0973		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1587		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmAMP		0000323	0.293	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0432		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

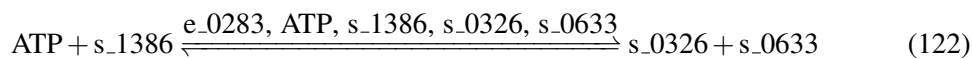
6.61 Reaction r_0225

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 245: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1386	PRPP	

Modifiers

Table 246: Properties of each modifier.

Id	Name	SBO
e_0283	HIS1	0000460
ATP	ATP	
s_1386	PRPP	
s_0326	5-phosphoribosyl-ATP	

Id	Name	SBO
s_0633	diphosphate	

Products

Table 247: Properties of each product.

Id	Name	SBO
s_0326	5-phosphoribosyl-ATP	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{61} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1386] - \frac{[\text{s}_0326] \cdot [\text{s}_0633]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1386}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1386]}{K_{\text{m1386}}} \right) + \left(1 + \frac{[\text{s}_0326]}{K_{\text{m0326}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) - 1} \quad (123)$$

Table 248: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.040	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.079	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1386		0000322	0.100	mmol · l ⁻¹	✓
Km0326		0000323	0.100	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓

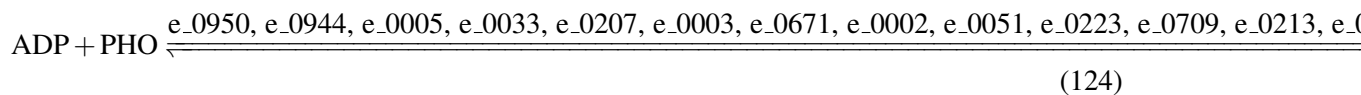
6.62 Reaction r_0226

This is a reversible reaction of two reactants forming one product influenced by 19 modifiers.

Name ATP synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 249: Properties of each reactant.

Id	Name	SBO
ADP	ADP	
PHO	phosphate	

Modifiers

Table 250: Properties of each modifier.

Id	Name	SBO
e_0950	ATP20	0000460
e_0944	ATP15	0000460
e_0005	OLI1	0000460
e_0033	ATP1	0000460
e_0207	ATP5	0000460
e_0003	ATP6	0000460
e_0671	ATP14	0000460
e_0002	ATP8	0000460
e_0051	ATP3	0000460
e_0223	ATP17	0000460
e_0709	ATP18	0000460
e_0213	TIM11	0000460
e_0544	ATP2	0000460
e_0559	ATP7	0000460
e_0127	ATP16	0000460
e_0913	ATP4	0000460
ADP	ADP	
PHO	phosphate	
ATP	ATP	

Product

Table 251: Properties of each product.

Id	Name	SBO
ATP	ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{62} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([\text{ADP}] \cdot [\text{PHO}] - \frac{[\text{ATP}]}{K_{\text{eq}}} \right)}{\left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) + 1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} - 1} \quad (125)$$

Table 252: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			3.292	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	32.921	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{eq}		0000281	39.394	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
K _m ADP		0000322	1.282	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _m PHO		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _m ATP		0000323	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.63 Reaction ATPase

This is a reversible reaction of one reactant forming two products influenced by 31 modifiers.

Name ATPase, cytosolic

SBO:0000176 biochemical reaction

Reaction equation

$$\text{ATP} \xrightarrow{\text{e}_{-0727}, \text{e}_{-0569}, \text{e}_{-0432}, \text{e}_{-0263}, \text{e}_{-0956}, \text{e}_{-0155}, \text{e}_{-0892}, \text{e}_{-0362}, \text{e}_{-0251}, \text{e}_{-0695}, \text{e}_{-0935}, \text{e}_{-0066}, \text{e}_{-0429}, \text{e}_{-0127}, \text{e}_{-0540}, \text{e}_{-0399}, \text{e}_{-0709}, \text{e}_{-0210}, \text{e}_{-0640}, \text{e}_{-0478}, \text{e}_{-0800}, \text{e}_{-0100}, \text{e}_{-0510}, \text{e}_{-0330}, \text{e}_{-0750}, \text{e}_{-0230}, \text{e}_{-0620}, \text{e}_{-0410}, \text{e}_{-0830}, \text{e}_{-0140}, \text{e}_{-0530}, \text{e}_{-0320}, \text{e}_{-0740}, \text{e}_{-0220}, \text{e}_{-0610}, \text{e}_{-0400}, \text{e}_{-0820}, \text{e}_{-0130}, \text{e}_{-0520}, \text{e}_{-0310}, \text{e}_{-0730}, \text{e}_{-0210}, \text{e}_{-0600}, \text{e}_{-0390}, \text{e}_{-0710}, \text{e}_{-0200}, \text{e}_{-0590}, \text{e}_{-0380}, \text{e}_{-0700}, \text{e}_{-0190}, \text{e}_{-0580}, \text{e}_{-0370}, \text{e}_{-0690}, \text{e}_{-0180}, \text{e}_{-0570}, \text{e}_{-0360}, \text{e}_{-0680}, \text{e}_{-0170}, \text{e}_{-0560}, \text{e}_{-0350}, \text{e}_{-0670}, \text{e}_{-0160}, \text{e}_{-0550}, \text{e}_{-0340}, \text{e}_{-0660}, \text{e}_{-0150}, \text{e}_{-0540}, \text{e}_{-0330}, \text{e}_{-0650}, \text{e}_{-0140}, \text{e}_{-0530}, \text{e}_{-0320}, \text{e}_{-0640}, \text{e}_{-0130}, \text{e}_{-0520}, \text{e}_{-0310}, \text{e}_{-0630}, \text{e}_{-0120}, \text{e}_{-0510}, \text{e}_{-0300}, \text{e}_{-0620}, \text{e}_{-0110}, \text{e}_{-0500}, \text{e}_{-0290}, \text{e}_{-0610}, \text{e}_{-0100}, \text{e}_{-0490}, \text{e}_{-0280}, \text{e}_{-0600}, \text{e}_{-0090}, \text{e}_{-0480}, \text{e}_{-0270}, \text{e}_{-0590}, \text{e}_{-0080}, \text{e}_{-0470}, \text{e}_{-0260}, \text{e}_{-0580}, \text{e}_{-0070}, \text{e}_{-0460}, \text{e}_{-0250}, \text{e}_{-0570}, \text{e}_{-0060}, \text{e}_{-0450}, \text{e}_{-0240}, \text{e}_{-0560}, \text{e}_{-0050}, \text{e}_{-0440}, \text{e}_{-0230}, \text{e}_{-0550}, \text{e}_{-0040}, \text{e}_{-0430}, \text{e}_{-0220}, \text{e}_{-0540}, \text{e}_{-0030}, \text{e}_{-0420}, \text{e}_{-0210}, \text{e}_{-0530}, \text{e}_{-0020}, \text{e}_{-0410}, \text{e}_{-0200}, \text{e}_{-0520}, \text{e}_{-0010}, \text{e}_{-0400}, \text{e}_{-0190}, \text{e}_{-0510}, \text{e}_{-0000}} \quad (126)$$

Reactant

Table 253: Properties of each reactant.

Id	Name	SBO
ATP	ATP	

Modifiers

Table 254: Properties of each modifier.

Id	Name	SBO
e_0727	STV1	0000460
e_0569	VMA5	0000460
e_0432	VMA10	0000460
e_0263	VMA8	0000460
e_0956	VMA13	0000460
e_0155	VMA1	0000460
e_0892	VMA4	0000460
e_0362	VMA7	0000460
e_0251	VMA3	0000460
e_0695	VMA6	0000460
e_0935	VMA11	0000460
e_0066	VMA2	0000460
e_0429	VMA16	0000460
e_0183	YCF1	0000460
e_0621	YBT1	0000460
e_0569	VMA5	0000460
e_0432	VMA10	0000460
e_0263	VMA8	0000460
e_0956	VMA13	0000460
e_0155	VMA1	0000460
e_0892	VMA4	0000460
e_0362	VMA7	0000460
e_0251	VMA3	0000460
e_0695	VMA6	0000460
e_0884	VPH1	0000460
e_0935	VMA11	0000460
e_0066	VMA2	0000460
e_0429	VMA16	0000460
e_0588	PXA2	0000460
e_0924	PXA1	0000460
ATP	ATP	

Products

Table 255: Properties of each product.

Id	Name	SBO
ADP	ADP	
PHO	phosphate	

Kinetic Law

Derived unit $\text{s}^{-1} \cdot \text{mmol}$

$$v_{63} = \text{vol}(\text{cell}) \cdot k \cdot [\text{ATP}] \quad (127)$$

Table 256: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k			0.658	s^{-1}	<input checked="" type="checkbox"/>
FLUX_VALUE			1.662	dimensionless	<input checked="" type="checkbox"/>

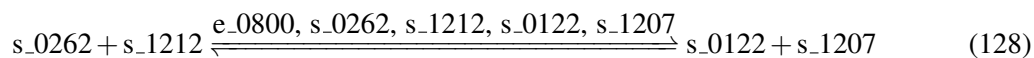
6.64 Reaction r_0231

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

Name C-14 sterol reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 257: Properties of each reactant.

Id	Name	SBO
s_0262	4,4-dimethyl-5alpha-cholesta-8,14,24-trien-3beta-ol	
s_1212	NADPH	

Modifiers

Table 258: Properties of each modifier.

Id	Name	SBO
e_0800	ERG24	0000460
s_0262	4,4-dimethyl-5alpha-cholesta-8,14,24-trien-3beta-ol	
s_1212	NADPH	
s_0122	14-demethyllanosterol	
s_1207	NADP(+)	

Products

Table 259: Properties of each product.

Id	Name	SBO
s_0122	14-demethyllanosterol	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{64} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0262}] \cdot [s_{1212}] - \frac{[s_{0122}] \cdot [s_{1207}]}{K_{eq}}}{K_{m0262} \cdot K_{m1212}} \right)}{\left(1 + \frac{[s_{0262}]}{K_{m0262}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) + \left(1 + \frac{[s_{0122}]}{K_{m0122}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) - 1} \quad (129)$$

Table 260: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.93102373430305 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0262		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0122		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

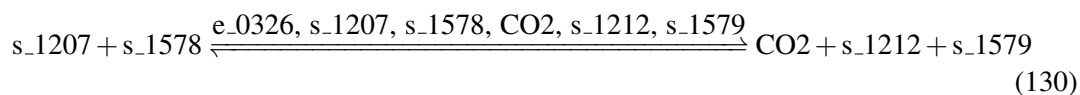
6.65 Reaction r_0234

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

Name C-3 sterol dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 261: Properties of each reactant.

Id	Name	SBO
s_1207	NADP(+)	
s_1578	zymosterol intermediate 1c	

Modifiers

Table 262: Properties of each modifier.

Id	Name	SBO
e_0326	ERG26	0000460
s_1207	NADP(+)	
s_1578	zymosterol intermediate 1c	
C02	carbon dioxide	
s_1212	NADPH	
s_1579	zymosterol intermediate 2	

Products

Table 263: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_1212	NADPH	
s_1579	zymosterol intermediate 2	

Kinetic Law

Derived unit contains undeclared units

$$v_{65} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{1207}] \cdot [\text{s}_{1578}] - \frac{[\text{CO}_2] \cdot [\text{s}_{1212}] \cdot [\text{s}_{1579}]}{\text{K}_{\text{eq}}}}{\text{K}_{\text{m1207}} \cdot \text{K}_{\text{m1578}}} \right)}{\left(1 + \frac{[\text{s}_{1207}]}{\text{K}_{\text{m1207}}} \right) \cdot \left(1 + \frac{[\text{s}_{1578}]}{\text{K}_{\text{m1578}}} \right) + \left(1 + \frac{[\text{CO}_2]}{\text{K}_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[\text{s}_{1212}]}{\text{K}_{\text{m1212}}} \right) \cdot \left(1 + \frac{[\text{s}_{1579}]}{\text{K}_{\text{m1579}}} \right) - 1} \quad (131)$$

Table 264: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1578		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmCO2		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1579		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

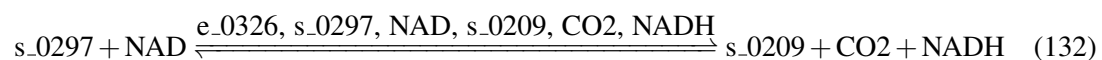
6.66 Reaction r_0235

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

Name C-3 sterol dehydrogenase (4-methylzymosterol)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 265: Properties of each reactant.

Id	Name	SBO
s_0297	4beta-methylzymosterol-4alpha-carboxylic acid	
NAD	NAD	

Modifiers

Table 266: Properties of each modifier.

Id	Name	SBO
e_0326	ERG26	0000460
s_0297	4beta-methylzymosterol-4alpha-carboxylic acid	
NAD	NAD	
s_0209	3-dehydro-4-methylzymosterol	
CO2	carbon dioxide	
NADH	NADH	

Products

Table 267: Properties of each product.

Id	Name	SBO
s_0209	3-dehydro-4-methylzymosterol	
CO2	carbon dioxide	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{66} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0297}] \cdot [NAD]}{K_{\text{m}0297} \cdot K_{\text{m}NAD}} - \frac{[s_{0209}] \cdot [CO_2] \cdot [NADH]}{K_{\text{eq}}} \right)}{\left(1 + \frac{[s_{0297}]}{K_{\text{m}0297}} \right) \cdot \left(1 + \frac{[NAD]}{K_{\text{m}NAD}} \right) + \left(1 + \frac{[s_{0209}]}{K_{\text{m}0209}} \right) \cdot \left(1 + \frac{[CO_2]}{K_{\text{m}CO_2}} \right) \cdot \left(1 + \frac{[NADH]}{K_{\text{m}NADH}} \right) - 1} \quad (133)$$

Table 268: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.115	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0297		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmNAD		0000322	1.503	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0209		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmCO2		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmNADH		0000323	0.087	$\text{mmol} \cdot \text{l}^{-1}$	✓

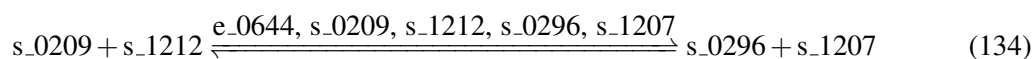
6.67 Reaction r_0236

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

Name C-3 sterol keto reductase (4-methylzymosterol)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 269: Properties of each reactant.

Id	Name	SBO
s_0209	3-dehydro-4-methylzymosterol	
s_1212	NADPH	

Modifiers

Table 270: Properties of each modifier.

Id	Name	SBO
e_0644	ERG27	0000460
s_0209	3-dehydro-4-methylzymosterol	
s_1212	NADPH	
s_0296	4alpha-methylzymosterol	
s_1207	NADP(+)	

Products

Table 271: Properties of each product.

Id	Name	SBO
s_0296	4alpha-methylzymosterol	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{67} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0209}] \cdot [\text{s}_{1212}] - \frac{[\text{s}_{0296}] \cdot [\text{s}_{1207}]}{K_{\text{eq}}}}{K_{\text{m0209}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[\text{s}_{0209}]}{K_{\text{m0209}}} \right) \cdot \left(1 + \frac{[\text{s}_{1212}]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[\text{s}_{0296}]}{K_{\text{m0296}}} \right) \cdot \left(1 + \frac{[\text{s}_{1207}]}{K_{\text{m1207}}} \right) - 1} \quad (135)$$

Table 272: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	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"/>
Km0209		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0296		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

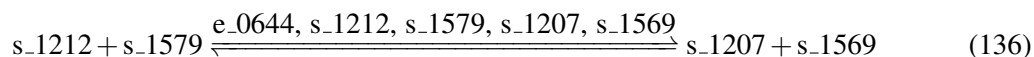
6.68 Reaction r_0237

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

Name C-3 sterol keto reductase (zymosterol)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 273: Properties of each reactant.

Id	Name	SBO
s_1212	NADPH	
s_1579	zymosterol intermediate 2	

Modifiers

Table 274: Properties of each modifier.

Id	Name	SBO
e_0644	ERG27	0000460

Id	Name	SBO
s_1212	NADPH	
s_1579	zymosterol intermediate 2	
s_1207	NADP(+)	
s_1569	zymosterol	

Products

Table 275: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1569	zymosterol	

Kinetic Law

Derived unit contains undeclared units

$$v_{68} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1212}] \cdot [s_{1579}] - \frac{[s_{1207}] \cdot [s_{1569}]}{K_{eq}}}{K_{m1212} \cdot K_{m1579}} \right)}{\left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) \cdot \left(1 + \frac{[s_{1579}]}{K_{m1579}} \right) + \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) \cdot \left(1 + \frac{[s_{1569}]}{K_{m1569}} \right) - 1} \quad (137)$$

Table 276: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1579		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1569		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

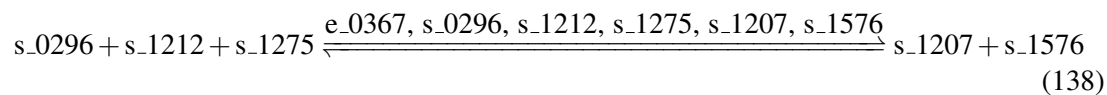
6.69 Reaction r_0238

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

Name C-4 methyl sterol oxidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 277: Properties of each reactant.

Id	Name	SBO
s_0296	4alpha-methylzymosterol	
s_1212	NADPH	
s_1275	oxygen	

Modifiers

Table 278: Properties of each modifier.

Id	Name	SBO
e_0367	ERG25	0000460
s_0296	4alpha-methylzymosterol	
s_1212	NADPH	
s_1275	oxygen	
s_1207	NADP(+)	
s_1576	zymosterol intermediate 1a	

Products

Table 279: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1576	zymosterol intermediate 1a	

Kinetic Law

Derived unit contains undeclared units

$$v_{69} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0296}] \cdot [\text{s}_{1212}] \cdot [\text{s}_{1275}] - \frac{[\text{s}_{1207}] \cdot [\text{s}_{1576}]}{K_{\text{eq}}}}{K_{\text{m0296}} \cdot K_{\text{m1212}} \cdot K_{\text{m1275}}} \right)}{\left(1 + \frac{[\text{s}_{0296}]}{K_{\text{m0296}}} \right) \cdot \left(1 + \frac{[\text{s}_{1212}]}{K_{\text{m1212}}} \right) \cdot \left(1 + \frac{[\text{s}_{1275}]}{K_{\text{m1275}}} \right) + \left(1 + \frac{[\text{s}_{1207}]}{K_{\text{m1207}}} \right) \cdot \left(1 + \frac{[\text{s}_{1576}]}{K_{\text{m1576}}} \right) - 1} \quad (139)$$

Table 280: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	✓
Km0296		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1275		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1576		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

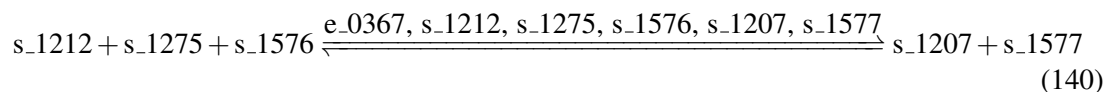
6.70 Reaction r_0239

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

Name C-4 methyl sterol oxidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 281: Properties of each reactant.

Id	Name	SBO
s_1212	NADPH	
s_1275	oxygen	
s_1576	zymosterol intermediate 1a	

Modifiers

Table 282: Properties of each modifier.

Id	Name	SBO
e_0367	ERG25	0000460
s_1212	NADPH	
s_1275	oxygen	
s_1576	zymosterol intermediate 1a	
s_1207	NADP(+)	
s_1577	zymosterol intermediate 1b	

Products

Table 283: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1577	zymosterol intermediate 1b	

Kinetic Law

Derived unit contains undeclared units

$$v_{70} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1212}] \cdot [s_{1275}] \cdot [s_{1576}] - \frac{[s_{1207}] \cdot [s_{1577}]}{K_{\text{eq}}}}{K_{\text{m1212}} \cdot K_{\text{m1275}} \cdot K_{\text{m1576}}} \right)}{\left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right) \cdot \left(1 + \frac{[s_{1275}]}{K_{\text{m1275}}} \right) \cdot \left(1 + \frac{[s_{1576}]}{K_{\text{m1576}}} \right) + \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right) \cdot \left(1 + \frac{[s_{1577}]}{K_{\text{m1577}}} \right) - 1} \quad (141)$$

Table 284: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1275		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1576		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1577		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

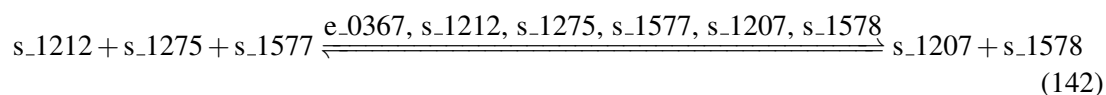
6.71 Reaction r_0240

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

Name C-4 methyl sterol oxidase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 285: Properties of each reactant.

Id	Name	SBO
s_1212	NADPH	
s_1275	oxygen	
s_1577	zymosterol intermediate 1b	

Modifiers

Table 286: Properties of each modifier.

Id	Name	SBO
e_0367	ERG25	0000460
s_1212	NADPH	
s_1275	oxygen	
s_1577	zymosterol intermediate 1b	
s_1207	NADP(+)	
s_1578	zymosterol intermediate 1c	

Products

Table 287: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1578	zymosterol intermediate 1c	

Kinetic Law

Derived unit contains undeclared units

$$v_{71} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{1212}] \cdot [\text{s}_{1275}] \cdot [\text{s}_{1577}] - \frac{[\text{s}_{1207}] \cdot [\text{s}_{1578}]}{K_{\text{eq}}}}{K_{\text{m1212}} \cdot K_{\text{m1275}} \cdot K_{\text{m1577}}} \right)}{\left(1 + \frac{[\text{s}_{1212}]}{K_{\text{m1212}}} \right) \cdot \left(1 + \frac{[\text{s}_{1275}]}{K_{\text{m1275}}} \right) \cdot \left(1 + \frac{[\text{s}_{1577}]}{K_{\text{m1577}}} \right) + \left(1 + \frac{[\text{s}_{1207}]}{K_{\text{m1207}}} \right) \cdot \left(1 + \frac{[\text{s}_{1578}]}{K_{\text{m1578}}} \right) - 1} \quad (143)$$

Table 288: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1275		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1577		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1578		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

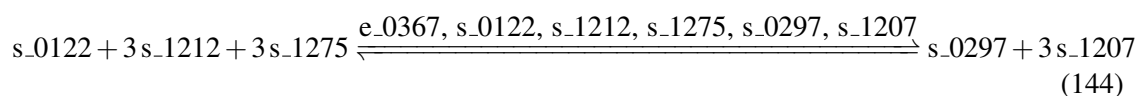
6.72 Reaction r_0241

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

Name C-4 sterol methyl oxidase (4,4-dimethylzymosterol)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 289: Properties of each reactant.

Id	Name	SBO
s_0122	14-demethylzanosterol	
s_1212	NADPH	
s_1275	oxygen	

Modifiers

Table 290: Properties of each modifier.

Id	Name	SBO
e_0367	ERG25	0000460
s_0122	14-demethylanosterol	
s_1212	NADPH	
s_1275	oxygen	
s_0297	4beta-methylzymosterol-4alpha-carboxylic acid	
s_1207	NADP(+)	

Products

Table 291: Properties of each product.

Id	Name	SBO
s_0297	4beta-methylzymosterol-4alpha-carboxylic acid	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{72} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0122}] \cdot [s_{1212}]^3 \cdot [s_{1275}]^3 - \frac{[s_{0297}] \cdot [s_{1207}]^3}{K_{\text{eq}}}}{K_{m0122} \cdot K_{m1212}^3 \cdot K_{m1275}^3} \right)}{\left(1 + \frac{[s_{0122}]}{K_{m0122}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^3 \cdot \left(1 + \frac{[s_{1275}]}{K_{m1275}} \right)^3 + \left(1 + \frac{[s_{0297}]}{K_{m0297}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)^3} - 1 \quad (145)$$

Table 292: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.90694961726454 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.083	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2000.000	$\text{mmol}^{-3} \cdot \text{l}^3$	✓
Km0122		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1275		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0297		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

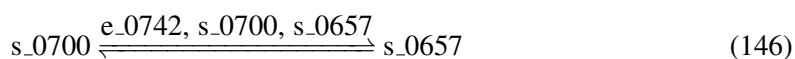
6.73 Reaction r_0243

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

Name C-8 sterol isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 293: Properties of each reactant.

Id	Name	SBO
s_0700	fecosterol	

Modifiers

Table 294: Properties of each modifier.

Id	Name	SBO
e_0742	ERG2	0000460
s_0700	fecosterol	
s_0657	episterol	

Product

Table 295: Properties of each product.

Id	Name	SBO
s_0657	episterol	

Kinetic Law

Derived unit contains undeclared units

$$v_{73} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_0700] - \frac{[s_0657]}{K_{\text{eq}}} \right)}{K_{m0700} \left(1 + \frac{[s_0700]}{K_{m0700}} + 1 + \frac{[s_0657]}{K_{m0657}} \right) - 1} \quad (147)$$

Table 296: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.12702283642471 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$2.47621370185965 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0700		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0657		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

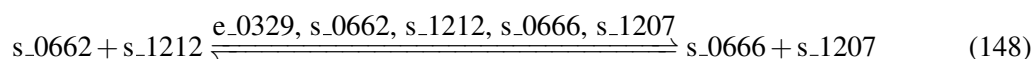
6.74 Reaction r_0244

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

Name C-s24 sterol reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 297: Properties of each reactant.

Id	Name	SBO
s_0662	ergosta-5,7,22,24(28)-tetraen-3beta-ol	
s_1212	NADPH	

Modifiers

Table 298: Properties of each modifier.

Id	Name	SBO
e_0329	ERG4	0000460
s_0662	ergosta-5,7,22,24(28)-tetraen-3beta-ol	
s_1212	NADPH	
s_0666	ergosterol	
s_1207	NADP(+)	

Products

Table 299: Properties of each product.

Id	Name	SBO
s_0666	ergosterol	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{74} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{s}_0662] \cdot [\text{s}_1212] - \frac{[\text{s}_0666] \cdot [\text{s}_1207]}{K_{\text{eq}}}}{K_{\text{m0662}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[\text{s}_0662]}{K_{\text{m0662}}} \right) \cdot \left(1 + \frac{[\text{s}_1212]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[\text{s}_0666]}{K_{\text{m0666}}} \right) \cdot \left(1 + \frac{[\text{s}_1207]}{K_{\text{m1207}}} \right) - 1} \quad (149)$$

Table 300: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.7564863865831 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0662		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0666		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

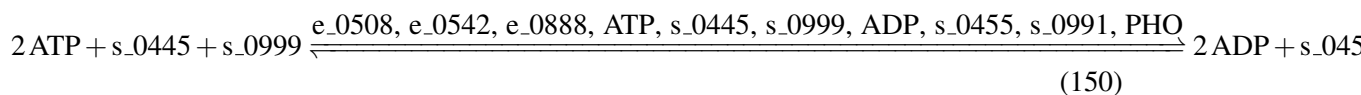
6.75 Reaction r_0250

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

Name carbamoyl-phosphate synthase (glutamine-hydrolysing)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 301: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0445	bicarbonate	
s_0999	L-glutamine	

Modifiers

Table 302: Properties of each modifier.

Id	Name	SBO
e_0508	URA2	0000460
e_0542	CPA2	0000460
e_0888	CPA1	0000460
ATP	ATP	
s_0445	bicarbonate	
s_0999	L-glutamine	
ADP	ADP	
s_0455	carbamoyl phosphate	
s_0991	L-glutamate	
PHO	phosphate	

Products

Table 303: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_0455	carbamoyl phosphate	
s_0991	L-glutamate	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

v_{75}

(151)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([\text{ATP}]^2 \cdot [\text{s}_0445] \cdot [\text{s}_0999] - \frac{[\text{ADP}]^2 \cdot [\text{s}_0455] \cdot [\text{s}_0991] \cdot [\text{PHO}]}{K_{\text{eq}}} \right)}{K_{\text{mATP}}^2 \cdot K_{\text{m0445}} \cdot K_{\text{m0999}} + \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right)^2 \cdot \left(1 + \frac{[\text{s}_0445]}{K_{\text{m0445}}} \right) \cdot \left(1 + \frac{[\text{s}_0999]}{K_{\text{m0999}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right)^2 \cdot \left(1 + \frac{[\text{s}_0455]}{K_{\text{m0455}}} \right) \cdot \left(1 + \frac{[\text{s}_0991]}{K_{\text{m0991}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right)}$$

Table 304: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.096	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.052	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0445		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0999		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0455		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0991		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

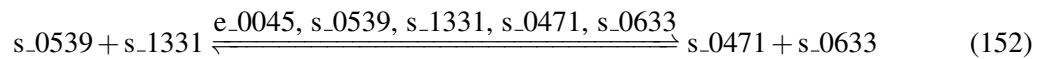
6.76 Reaction r_0257

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

Name CDP-diacylglycerol synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 305: Properties of each reactant.

Id	Name	SBO
s_0539	CTP	
s_1331	phosphatidate	

Modifiers

Table 306: Properties of each modifier.

Id	Name	SBO
e_0045	CDS1	0000460
s_0539	CTP	
s_1331	phosphatidate	

Id	Name	SBO
s_0471	CDP-diacylglycerol	
s_0633	diphosphate	

Products

Table 307: Properties of each product.

Id	Name	SBO
s_0471	CDP-diacylglycerol	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{76} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0539}] \cdot [\text{s}_{1331}] - \frac{[\text{s}_{0471}] \cdot [\text{s}_{0633}]}{K_{\text{eq}}}}{K_{\text{m0539}} \cdot K_{\text{m1331}}} \right)}{\left(1 + \frac{[\text{s}_{0539}]}{K_{\text{m0539}}} \right) \cdot \left(1 + \frac{[\text{s}_{1331}]}{K_{\text{m1331}}} \right) + \left(1 + \frac{[\text{s}_{0471}]}{K_{\text{m0471}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) - 1} \quad (153)$$

Table 308: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.60820701144352 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0539		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1331		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0471		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

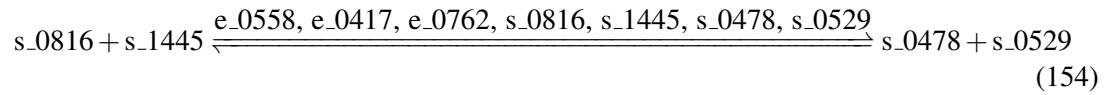
6.77 Reaction r_0264

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

Name ceramide-1 synthase (26C)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 309: Properties of each reactant.

Id	Name	SBO
s_0816	hexacosanoyl-CoA	
s_1445	sphinganine	

Modifiers

Table 310: Properties of each modifier.

Id	Name	SBO
e_0558	LAC1	0000460
e_0417	LAG1	0000460
e_0762	LIP1	0000460
s_0816	hexacosanoyl-CoA	
s_1445	sphinganine	
s_0478	ceramide-1 (C26)	
s_0529	coenzyme A	

Products

Table 311: Properties of each product.

Id	Name	SBO
s_0478	ceramide-1 (C26)	
s_0529	coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{77} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0816] \cdot [s_1445]}{K_{\text{eq}}} - \frac{[s_0478] \cdot [s_0529]}{K_{\text{eq}}} \right)}{\left(1 + \frac{[s_0816]}{K_{m0816}} \right) \cdot \left(1 + \frac{[s_1445]}{K_{m1445}} \right) + \left(1 + \frac{[s_0478]}{K_{m0478}} \right) \cdot \left(1 + \frac{[s_0529]}{K_{m0529}} \right) - 1} \quad (155)$$

Table 312: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.22290012145366 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.11206017003025 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0816		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1445		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0478		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

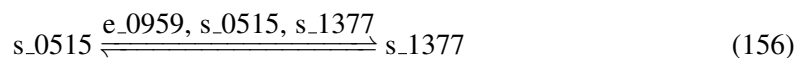
6.78 Reaction r_0278

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

Name chorismate mutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 313: Properties of each reactant.

Id	Name	SBO
s_0515	chorismate	

Modifiers

Table 314: Properties of each modifier.

Id	Name	SBO
e_0959	ARO7	0000460
s_0515	chorismate	
s_1377	prephenate	

Product

Table 315: Properties of each product.

Id	Name	SBO
s_1377	prephenate	

Kinetic Law

Derived unit contains undeclared units

$$v_{78} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0515}] - \frac{[s_{1377}]}{K_{\text{eq}}}}{K_{m0515}} \right)}{1 + \frac{[s_{0515}]}{K_{m0515}} + 1 + \frac{[s_{1377}]}{K_{m1377}} - 1} \quad (157)$$

Table 316: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	✓
Vmax		0000324	0.061	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0515		0000322	0.100	mmol · l ⁻¹	✓
Km1377		0000323	0.100	mmol · l ⁻¹	✓

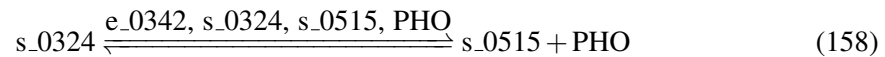
6.79 Reaction r_0279

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 317: Properties of each reactant.

Id	Name	SBO
s_0324	5-O-(1-carboxyvinyl)-3-phosphoshikimic acid	

Modifiers

Table 318: Properties of each modifier.

Id	Name	SBO
e_0342	ARO2	0000460
s_0324	5-O-(1-carboxyvinyl)-3-phosphoshikimic acid	
s_0515	chorismate	
PHO	phosphate	

Products

Table 319: Properties of each product.

Id	Name	SBO
s_0515	chorismate	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{79} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0324}] - \frac{[s_{0515}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0324}}} \right)}{1 + \frac{[s_{0324}]}{K_{\text{m0324}}} + \left(1 + \frac{[s_{0515}]}{K_{\text{m0515}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (159)$$

Table 320: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.114	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0324		0000322	0.100	mmol · l ⁻¹	✓
Km0515		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

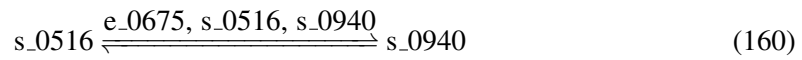
6.80 Reaction r_0280

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

Name cis-aconitate(3-) to isocitrate

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 321: Properties of each reactant.

Id	Name	SBO
s_0516	cis-aconitate	

Modifiers

Table 322: Properties of each modifier.

Id	Name	SBO
e_0675	ACO1	0000460
s_0516	cis-aconitate	
s_0940	isocitrate	

Product

Table 323: Properties of each product.

Id	Name	SBO
s_0940	isocitrate	

Kinetic Law

Derived unit contains undeclared units

$$v_{80} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_0516] - \frac{[s_0940]}{K_{\text{eq}}} \right)}{K_{m0516}} \quad (161)$$

$$1 + \frac{[s_0516]}{K_{m0516}} + 1 + \frac{[s_0940]}{K_{m0940}} - 1$$

Table 324: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.077	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.460	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0516		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0940		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

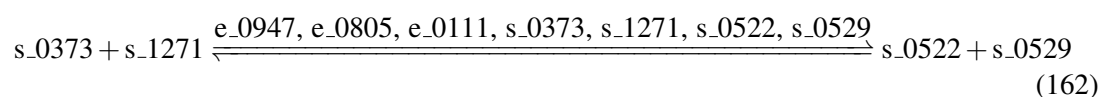
6.81 Reaction r_0300

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

Name citrate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 325: Properties of each reactant.

Id	Name	SBO
s_0373	acetyl-CoA	
s_1271	oxaloacetate	

Modifiers

Table 326: Properties of each modifier.

Id	Name	SBO
e_0947	CIT3	0000460
e_0805	CIT1	0000460
e_0111	CIT2	0000460
s_0373	acetyl-CoA	
s_1271	oxaloacetate	
s_0522	citrate	
s_0529	coenzyme A	

Products

Table 327: Properties of each product.

Id	Name	SBO
s_0522	citrate	
s_0529	coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{81} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0373}] \cdot [s_{1271}] - \frac{[s_{0522}] \cdot [s_{0529}]}{K_{eq}}}{K_{m0373} \cdot K_{m1271}} \right)}{\left(1 + \frac{[s_{0373}]}{K_{m0373}} \right) \cdot \left(1 + \frac{[s_{1271}]}{K_{m1271}} \right) + \left(1 + \frac{[s_{0522}]}{K_{m0522}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) - 1} \quad (163)$$

Table 328: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.077	dimensionless	✓
Vmax		0000324	1.073	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0373		0000322	0.100	mmol · l ⁻¹	✓
Km1271		0000322	0.100	mmol · l ⁻¹	✓
Km0522		0000323	0.100	mmol · l ⁻¹	✓
Km0529		0000323	0.100	mmol · l ⁻¹	✓

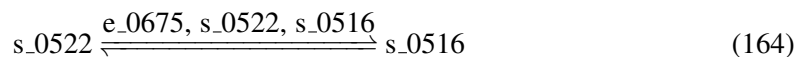
6.82 Reaction r_0302

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

Name citrate to cis-aconitate(3-)

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 329: Properties of each reactant.

Id	Name	SBO
s_0522	citrate	

Modifiers

Table 330: Properties of each modifier.

Id	Name	SBO
e_0675	ACO1	0000460
s_0522	citrate	
s_0516	cis-aconitate	

Product

Table 331: Properties of each product.

Id	Name	SBO
s_0516	cis-aconitate	

Kinetic Law

Derived unit contains undeclared units

$$v_{82} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0522}] - \frac{[s_{0516}]}{K_{\text{eq}}}}{K_{m0522}} \right)}{1 + \frac{[s_{0522}]}{K_{m0522}} + 1 + \frac{[s_{0516}]}{K_{m0516}} - 1} \quad (165)$$

Table 332: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.077	dimensionless	✓
Vmax		0000324	0.460	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0522		0000322	0.100	mmol · l ⁻¹	✓
Km0516		0000323	0.100	mmol · l ⁻¹	✓

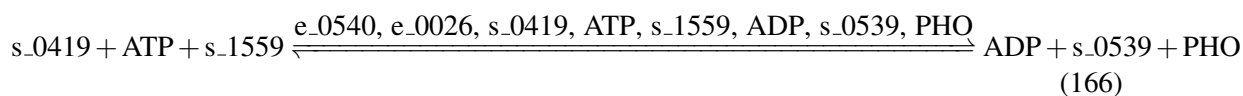
6.83 Reaction r_0307

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

Name CTP synthase (NH3)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 333: Properties of each reactant.

Id	Name	SBO
s_0419	ammonium	
ATP	ATP	
s_1559	UTP	

Modifiers

Table 334: Properties of each modifier.

Id	Name	SBO
e_0540	URA8	0000460
e_0026	URA7	0000460
s_0419	ammonium	
ATP	ATP	
s_1559	UTP	
ADP	ADP	
s_0539	CTP	
PHO	phosphate	

Products

Table 335: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_0539	CTP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

v_{83}

(167)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0419}] \cdot [ATP] \cdot [s_{1559}] - \frac{[ADP] \cdot [s_{0539}] \cdot [PHO]}{K_{eq}}}{K_{m0419} \cdot K_{mATP} \cdot K_{m1559}} \right)}{\left(1 + \frac{[s_{0419}]}{K_{m0419}} \right) \cdot \left(1 + \frac{[ATP]}{K_{mATP}} \right) \cdot \left(1 + \frac{[s_{1559}]}{K_{m1559}} \right) + \left(1 + \frac{[ADP]}{K_{mADP}} \right) \cdot \left(1 + \frac{[s_{0539}]}{K_{m0539}} \right) \cdot \left(1 + \frac{[PHO]}{K_{mPHO}} \right) - 1}$$

Table 336: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.061	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
Km0419		0000322	0.100	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1559		0000322	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓
Km0539		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

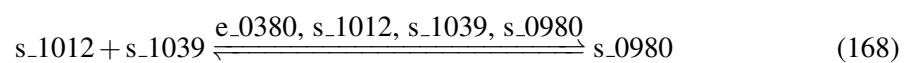
6.84 Reaction r_0309

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

Name cystathionine beta-synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 337: Properties of each reactant.

Id	Name	SBO
s_1012	L-homocysteine	
s_1039	L-serine	

Modifiers

Table 338: Properties of each modifier.

Id	Name	SBO
e_0380	CYS4	0000460
s_1012	L-homocysteine	
s_1039	L-serine	
s_0980	L-cystathionine	

Product

Table 339: Properties of each product.

Id	Name	SBO
s_0980	L-cystathionine	

Kinetic Law

Derived unit contains undeclared units

$$v_{84} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1012}] \cdot [s_{1039}] - \frac{[s_{0980}]}{K_{\text{eq}}} \right)}{\left(1 + \frac{[s_{1012}]}{K_{m1012}} \right) \cdot \left(1 + \frac{[s_{1039}]}{K_{m1039}} \right) + 1 + \frac{[s_{0980}]}{K_{m0980}} - 1} \quad (169)$$

Table 340: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.83730618430864 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	✓
Km1012		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1039		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0980		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

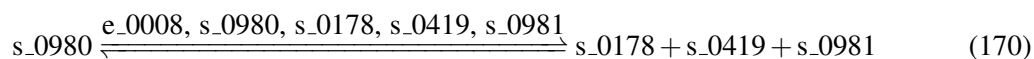
6.85 Reaction r_0310

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

Name cystathionine g-lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 341: Properties of each reactant.

Id	Name	SBO
s_0980	L-cystathionine	

Modifiers

Table 342: Properties of each modifier.

Id	Name	SBO
e_0008	CYS3	0000460
s_0980	L-cystathionine	
s_0178	2-oxobutanoate	
s_0419	ammonium	
s_0981	L-cysteine	

Products

Table 343: Properties of each product.

Id	Name	SBO
s_0178	2-oxobutanoate	
s_0419	ammonium	
s_0981	L-cysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{85} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0980}] - \frac{[s_{0178}] \cdot [s_{0419}] \cdot [s_{0981}]}{K_{eq}}}{K_{m0980}} \right)}{1 + \frac{[s_{0980}]}{K_{m0980}} + \left(1 + \frac{[s_{0178}]}{K_{m0178}} \right) \cdot \left(1 + \frac{[s_{0419}]}{K_{m0419}} \right) \cdot \left(1 + \frac{[s_{0981}]}{K_{m0981}} \right) - 1} \quad (171)$$

Table 344: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.077	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.020	mmol ² · l ⁻²	✓
Km0980		0000322	0.100	mmol · l ⁻¹	✓
Km0178		0000323	0.100	mmol · l ⁻¹	✓
Km0419		0000323	0.100	mmol · l ⁻¹	✓
Km0981		0000323	0.100	mmol · l ⁻¹	✓

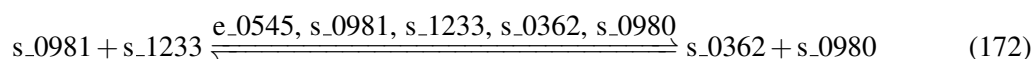
6.86 Reaction r_0311

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

Name cystathionine gamma-synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 345: Properties of each reactant.

Id	Name	SBO
s_0981	L-cysteine	
s_1233	O-acetyl-L-homoserine	

Modifiers

Table 346: Properties of each modifier.

Id	Name	SBO
e_0545	STR2	0000460

Id	Name	SBO
s_0981	L-cysteine	
s_1233	O-acetyl-L-homoserine	
s_0362	acetate	
s_0980	L-cystathionine	

Products

Table 347: Properties of each product.

Id	Name	SBO
s_0362	acetate	
s_0980	L-cystathionine	

Kinetic Law

Derived unit contains undeclared units

$$v_{86} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0981}] \cdot [s_{1233}] - \frac{[s_{0362}] \cdot [s_{0980}]}{K_{\text{eq}}}}{K_{\text{m0981}} \cdot K_{\text{m1233}}} \right)}{\left(1 + \frac{[s_{0981}]}{K_{\text{m0981}}} \right) \cdot \left(1 + \frac{[s_{1233}]}{K_{\text{m1233}}} \right) + \left(1 + \frac{[s_{0362}]}{K_{\text{m0362}}} \right) \cdot \left(1 + \frac{[s_{0980}]}{K_{\text{m0980}}} \right) - 1} \quad (173)$$

Table 348: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.056	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0981		0000322	0.100	mmol · l ⁻¹	✓
Km1233		0000322	0.100	mmol · l ⁻¹	✓
Km0362		0000323	0.100	mmol · l ⁻¹	✓
Km0980		0000323	0.100	mmol · l ⁻¹	✓

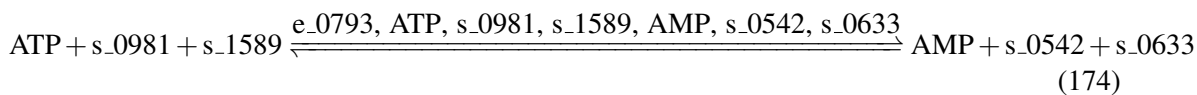
6.87 Reaction r_0313

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

Name cysteinyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 349: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0981	L-cysteine	
s_1589	tRNA(Cys)	

Modifiers

Table 350: Properties of each modifier.

Id	Name	SBO
e_0793	YNL247W	0000460
ATP	ATP	
s_0981	L-cysteine	
s_1589	tRNA(Cys)	
AMP	AMP	
s_0542	Cys-tRNA(Cys)	
s_0633	diphosphate	

Products

Table 351: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0542	Cys-tRNA(Cys)	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

v_{87}

(175)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{0981}] \cdot [\text{s}_{1589}] - \frac{[\text{AMP}] \cdot [\text{s}_{0542}] \cdot [\text{s}_{0633}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0981}} \cdot K_{\text{m1589}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0981}]}{K_{\text{m0981}}} \right) \cdot \left(1 + \frac{[\text{s}_{1589}]}{K_{\text{m1589}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0542}]}{K_{\text{m0542}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) - 1}$$

Table 352: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.83730663529172 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.009	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.232	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0981		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1589		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmAMP		0000323	0.293	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0542		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

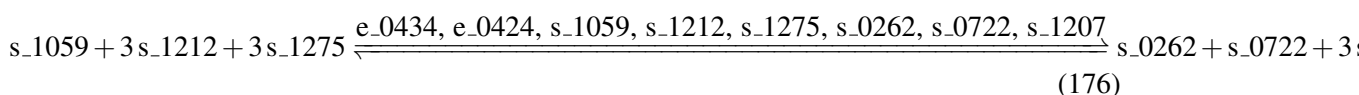
6.88 Reaction r_0317

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

Name cytochrome P450 lanosterol 14-alpha-demethylase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 353: Properties of each reactant.

Id	Name	SBO
s_1059	lanosterol	
s_1212	NADPH	
s_1275	oxygen	

Modifiers

Table 354: Properties of each modifier.

Id	Name	SBO
e_0434	NCP1	0000460
e_0424	ERG11	0000460
s_1059	lanosterol	
s_1212	NADPH	
s_1275	oxygen	
s_0262	4,4-dimethyl-5alpha-cholesta-8,14,24-trien-3beta-ol	
s_0722	formate	
s_1207	NADP(+)	

Products

Table 355: Properties of each product.

Id	Name	SBO
s_0262	4,4-dimethyl-5alpha-cholesta-8,14,24-trien-3beta-ol	
s_0722	formate	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{88} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1059}] \cdot [s_{1212}]^3 \cdot [s_{1275}]^3 - \frac{[s_{0262}] \cdot [s_{0722}] \cdot [s_{1207}]^3}{K_{eq}}}{K_{m1059} \cdot K_{m1212}^3 \cdot K_{m1275}^3} \right)}{\left(1 + \frac{[s_{1059}]}{K_{m1059}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^3 \cdot \left(1 + \frac{[s_{1275}]}{K_{m1275}} \right)^3 + \left(1 + \frac{[s_{0262}]}{K_{m0262}} \right) \cdot \left(1 + \frac{[s_{0722}]}{K_{m0722}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)^3 - 1} \quad (177)$$

Table 356: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.93102373430305 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.093	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	200.000	$\text{mmol}^{-2} \cdot \text{l}^2$	✓
Km1059		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

Id	Name	SBO	Value	Unit	Constant
Km1275		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0262		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0722		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

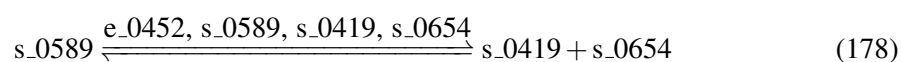
6.89 Reaction r_0326

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

Name dCMP deaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 357: Properties of each reactant.

Id	Name	SBO
s_0589	dCMP	

Modifiers

Table 358: Properties of each modifier.

Id	Name	SBO
e_0452	DCD1	0000460
s_0589	dCMP	
s_0419	ammonium	
s_0654	dUMP	

Products

Table 359: Properties of each product.

Id	Name	SBO
s_0419	ammonium	

Id	Name	SBO
s_0654	dUMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{89} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0589}] - \frac{[s_{0419}] \cdot [s_{0654}]}{K_{\text{eq}}}}{K_{\text{m0589}}} \right)}{1 + \frac{[s_{0589}]}{K_{\text{m0589}}} + \left(1 + \frac{[s_{0419}]}{K_{\text{m0419}}} \right) \cdot \left(1 + \frac{[s_{0654}]}{K_{\text{m0654}}} \right) - 1} \quad (179)$$

Table 360: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.44213152998562 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$1.44213152998124 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0589		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0419		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0654		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.90 Reaction r_0330

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

Name deoxyguanylate kinase (dGMP:ATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 361: Properties of each reactant.

Id	Name	SBO
ADP	ADP	
s_0613	dGDP	

Modifiers

Table 362: Properties of each modifier.

Id	Name	SBO
e_0234	GUK1	0000460
ADP	ADP	
s_0613	dGDP	
ATP	ATP	
s_0615	dGMP	

Products

Table 363: Properties of each product.

Id	Name	SBO
ATP	ATP	
s_0615	dGMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{90} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([\text{ADP}] \cdot [\text{s}_0613] - \frac{[\text{ATP}] \cdot [\text{s}_0615]}{K_{\text{eq}}} \right)}{K_{\text{mADP}} \cdot K_{\text{m0613}} \cdot \left(\left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_0613]}{K_{\text{m0613}}} \right) + \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0615]}{K_{\text{m0615}}} \right) - 1 \right)} \quad (181)$$

Table 364: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.03174788678278 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	3.939	dimensionless	✓
KmADP		0000322	1.282	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0613		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmATP		0000323	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0615		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

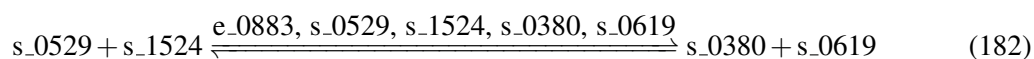
6.91 Reaction r_0336

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

Name diacylglycerol acyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 365: Properties of each reactant.

Id	Name	SBO
s_0529	coenzyme A	
s_1524	triglyceride	

Modifiers

Table 366: Properties of each modifier.

Id	Name	SBO
e_0883	DGA1	0000460
s_0529	coenzyme A	
s_1524	triglyceride	
s_0380	acyl-CoA	
s_0619	diglyceride	

Products

Table 367: Properties of each product.

Id	Name	SBO
s_0380	acyl-CoA	
s_0619	diglyceride	

Kinetic Law

Derived unit contains undeclared units

$$v_{91} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0529}] \cdot [\text{s}_{1524}] - \frac{[\text{s}_{0380}] \cdot [\text{s}_{0619}]}{\text{K}_{\text{eq}}}}{\text{K}_{\text{m0529}} \cdot \text{K}_{\text{m1524}}} \right)}{\left(1 + \frac{[\text{s}_{0529}]}{\text{K}_{\text{m0529}}} \right) \cdot \left(1 + \frac{[\text{s}_{1524}]}{\text{K}_{\text{m1524}}} \right) + \left(1 + \frac{[\text{s}_{0380}]}{\text{K}_{\text{m0380}}} \right) \cdot \left(1 + \frac{[\text{s}_{0619}]}{\text{K}_{\text{m0619}}} \right) - 1} \quad (183)$$

Table 368: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$5.44332973675324 \cdot 10^{-4}$	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"/>
Km0529		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1524		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0380		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0619		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

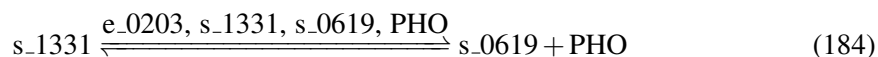
6.92 Reaction r_0337

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

Name diacylglycerol pyrophosphate phosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 369: Properties of each reactant.

Id	Name	SBO
s_1331	phosphatidate	

Modifiers

Table 370: Properties of each modifier.

Id	Name	SBO
e_0203	DPP1	0000460
s_1331	phosphatidate	

Id	Name	SBO
s_0619	diglyceride	
PHO	phosphate	

Products

Table 371: Properties of each product.

Id	Name	SBO
s_0619	diglyceride	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{92} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1331}] - \frac{[s_{0619}] \cdot [\text{PHO}]}{K_{\text{eq}}} \right)}{K_{m1331} + \left(1 + \frac{[s_{1331}]}{K_{m1331}} + \left(1 + \frac{[s_{0619}]}{K_{m0619}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}} \right) - 1 \right)} \quad (185)$$

Table 372: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.13457877977285 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$1.1345787797757 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1331		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0619		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmPHO		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

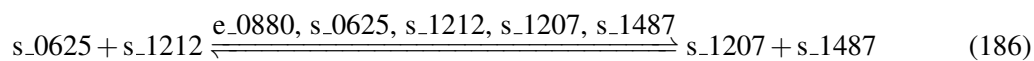
6.93 Reaction r_0344

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

Name dihydrofolate reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 373: Properties of each reactant.

Id	Name	SBO
s_0625	dihydrofolic acid	
s_1212	NADPH	

Modifiers

Table 374: Properties of each modifier.

Id	Name	SBO
e_0880	DFR1	0000460
s_0625	dihydrofolic acid	
s_1212	NADPH	
s_1207	NADP(+)	
s_1487	THF	

Products

Table 375: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1487	THF	

Kinetic Law

Derived unit contains undeclared units

$$v_{93} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0625}] \cdot [s_{1212}] - \frac{[s_{1207}] \cdot [s_{1487}]}{K_{eq}}}{K_{m0625} \cdot K_{m1212}} \right)}{\left(1 + \frac{[s_{0625}]}{K_{m0625}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) + \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) \cdot \left(1 + \frac{[s_{1487}]}{K_{m1487}} \right) - 1} \quad (187)$$

Table 376: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.54762180106816 · 10 ⁻⁴	dimensionless	✓
Vmax		0000324	0.002	mmol · l ⁻¹ · s ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0625		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1487		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

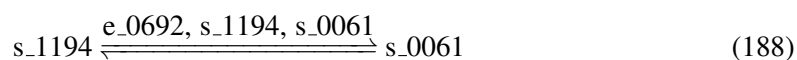
6.94 Reaction r_0349

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 377: Properties of each reactant.

Id	Name	SBO
s_1194	N-carbamoyl-L-aspartate	

Modifiers

Table 378: Properties of each modifier.

Id	Name	SBO
e_0692	URA4	0000460
s_1194	N-carbamoyl-L-aspartate	
s_0061	(S)-dihydroorotate	

Product

Table 379: Properties of each product.

Id	Name	SBO
s_0061	(S)-dihydroorotate	

Kinetic Law

Derived unit contains undeclared units

$$v_{94} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1194}] - \frac{[s_{0061}]}{K_{\text{eq}}}}{K_{m1194}} \right)}{1 + \frac{[s_{1194}]}{K_{m1194}} + 1 + \frac{[s_{0061}]}{K_{m0061}} - 1} \quad (189)$$

Table 380: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	✓
Vmax		0000324	0.029	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km1194		0000322	0.100	mmol · l ⁻¹	✓
Km0061		0000323	0.100	mmol · l ⁻¹	✓

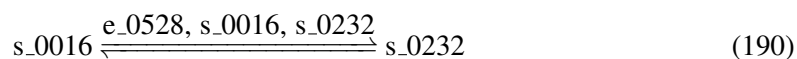
6.95 Reaction r_0352

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 381: Properties of each reactant.

Id	Name	SBO
s_0016	(R)-2,3-dihydroxy-3-methylbutanoate	

Modifiers

Table 382: Properties of each modifier.

Id	Name	SBO
e_0528	ILV3	0000460

Id	Name	SBO
s_0016	(R)-2,3-dihydroxy-3-methylbutanoate	
s_0232	3-methyl-2-oxobutanoate	

Product

Table 383: Properties of each product.

Id	Name	SBO
s_0232	3-methyl-2-oxobutanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{95} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0016] - \frac{[s_0232]}{K_{\text{eq}}} \right)}{K_{m0016} \left(1 + \frac{[s_0016]}{K_{m0016}} + 1 + \frac{[s_0232]}{K_{m0232}} - 1 \right)} \quad (191)$$

Table 384: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.024	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.145	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0016		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0232		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

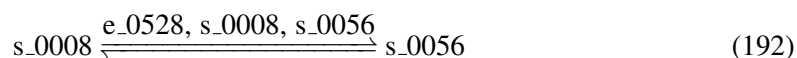
6.96 Reaction r_0353

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 385: Properties of each reactant.

Id	Name	SBO
s_0008	(2R,3R)-2,3-dihydroxy-3-methylpentanoate	

Modifiers

Table 386: Properties of each modifier.

Id	Name	SBO
e_0528	ILV3	0000460
s_0008	(2R,3R)-2,3-dihydroxy-3-methylpentanoate	
s_0056	(S)-3-methyl-2-oxopentanoate	

Product

Table 387: Properties of each product.

Id	Name	SBO
s_0056	(S)-3-methyl-2-oxopentanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{96} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0008] - \frac{[s_0056]}{K_{\text{eq}}}}{K_{\text{m0008}}} \right)}{1 + \frac{[s_0008]}{K_{\text{m0008}}} + 1 + \frac{[s_0056]}{K_{\text{m0056}}} - 1} \quad (193)$$

Table 388: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.050	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0008		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0056		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

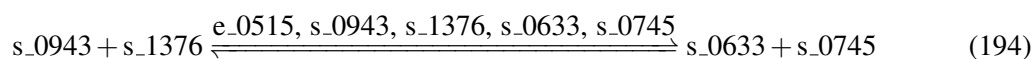
6.97 Reaction r_0355

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 389: Properties of each reactant.

Id	Name	SBO
s_0943	isopentenyl diphosphate	
s_1376	prenyl diphosphate	

Modifiers

Table 390: Properties of each modifier.

Id	Name	SBO
e_0515	ERG20	0000460
s_0943	isopentenyl diphosphate	
s_1376	prenyl diphosphate	
s_0633	diphosphate	
s_0745	geranyl diphosphate	

Products

Table 391: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
s_0745	geranyl diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{97} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0943}] \cdot [\text{s}_{1376}] - \frac{[\text{s}_{0633}] \cdot [\text{s}_{0745}]}{K_{\text{eq}}}}{K_{\text{m0943}} \cdot K_{\text{m1376}}} \right)}{\left(1 + \frac{[\text{s}_{0943}]}{K_{\text{m0943}}} \right) \cdot \left(1 + \frac{[\text{s}_{1376}]}{K_{\text{m1376}}} \right) + \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{0745}]}{K_{\text{m0745}}} \right) - 1} \quad (195)$$

Table 392: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$5.88956076077212 \cdot 10^{-4}$	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"/>
Km0943		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1376		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0745		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

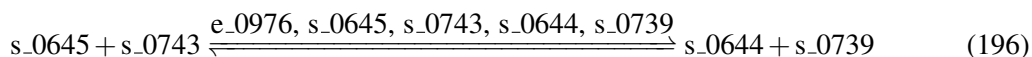
6.98 Reaction r_0361

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

Name dolichyl-phosphate D-mannosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 393: Properties of each reactant.

Id	Name	SBO
s_0645	dolichyl phosphate	
s_0743	GDP-alpha-D-mannose	

Modifiers

Table 394: Properties of each modifier.

Id	Name	SBO
e_0976	DPM1	0000460

Id	Name	SBO
s_0645	dolichyl phosphate	
s_0743	GDP-alpha-D-mannose	
s_0644	dolichyl D-mannosyl phosphate	
s_0739	GDP	

Products

Table 395: Properties of each product.

Id	Name	SBO
s_0644	dolichyl D-mannosyl phosphate	
s_0739	GDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{98} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0645}] \cdot [s_{0743}] - \frac{[s_{0644}] \cdot [s_{0739}]}{K_{\text{eq}}}}{K_{\text{m0645}} \cdot K_{\text{m0743}}} \right)}{\left(1 + \frac{[s_{0645}]}{K_{\text{m0645}}} \right) \cdot \left(1 + \frac{[s_{0743}]}{K_{\text{m0743}}} \right) + \left(1 + \frac{[s_{0644}]}{K_{\text{m0644}}} \right) \cdot \left(1 + \frac{[s_{0739}]}{K_{\text{m0739}}} \right) - 1} \quad (197)$$

Table 396: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	✓
Vmax		0000324	0.486	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0645		0000322	0.100	mmol · l ⁻¹	✓
Km0743		0000322	0.100	mmol · l ⁻¹	✓
Km0644		0000323	0.100	mmol · l ⁻¹	✓
Km0739		0000323	0.100	mmol · l ⁻¹	✓

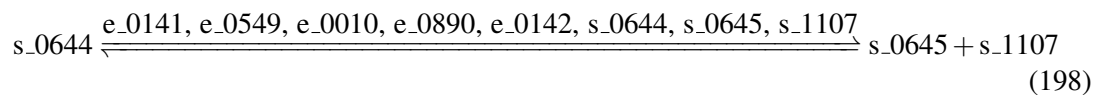
6.99 Reaction r_0362

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

Name dolichyl-phosphate-mannose–protein mannosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 397: Properties of each reactant.

Id	Name	SBO
s_0644	dolichyl D-mannosyl phosphate	

Modifiers

Table 398: Properties of each modifier.

Id	Name	SBO
e_0141	PMT5	0000460
e_0549	PMT4	0000460
e_0010	PMT2	0000460
e_0890	PMT3	0000460
e_0142	PMT1	0000460
s_0644	dolichyl D-mannosyl phosphate	
s_0645	dolichyl phosphate	
s_1107	mannan	

Products

Table 399: Properties of each product.

Id	Name	SBO
s_0645	dolichyl phosphate	
s_1107	mannan	

Kinetic Law

Derived unit contains undeclared units

$$v_{99} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0644]}{K_{m0644}} - \frac{[s_0645] \cdot [s_1107]}{K_{eq}} \right)}{1 + \frac{[s_0644]}{K_{m0644}} + \left(1 + \frac{[s_0645]}{K_{m0645}} \right) \cdot \left(1 + \frac{[s_1107]}{K_{m1107}} \right) - 1} \quad (199)$$

Table 400: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.347	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0644		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0645		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1107		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

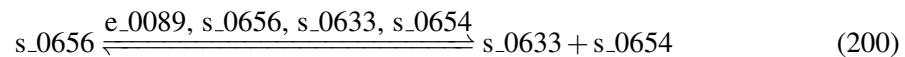
6.100 Reaction r_0364

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

Name dUTP diphosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 401: Properties of each reactant.

Id	Name	SBO
s_0656	dUTP	

Modifiers

Table 402: Properties of each modifier.

Id	Name	SBO
e_0089	DUT1	0000460
s_0656	dUTP	
s_0633	diphosphate	
s_0654	dUMP	

Products

Table 403: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
s_0654	dUMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{100} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{s}_0656]}{\text{Km0656}} - \frac{[\text{s}_0633] \cdot [\text{s}_0654]}{\text{Keq}} \right)}{1 + \frac{[\text{s}_0656]}{\text{Km0656}} + \left(1 + \frac{[\text{s}_0633]}{\text{Km0633}} \right) \cdot \left(1 + \frac{[\text{s}_0654]}{\text{Km0654}} \right) - 1} \quad (201)$$

Table 404: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.53320048576619 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0656		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0654		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.101 Reaction ENO

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

Name enolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 405: Properties of each reactant.

Id	Name	SBO
P2G	2-phospho-D-glyceric acid	

Id	Name	SBO
----	------	-----

Modifiers

Table 406: Properties of each modifier.

Id	Name	SBO
e_0405	ENO1	0000460
e_0454	ENO2	0000460
P2G	2-phospho-D-glyceric acid	
PEP	phosphoenolpyruvate	

Product

Table 407: Properties of each product.

Id	Name	SBO
PEP	phosphoenolpyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{101} = \text{vol}(\text{cell}) \cdot \frac{V_{\max} \cdot \left(\frac{[\text{P2G}]}{K_{p2g}} - \frac{[\text{PEP}]}{K_{p2g} \cdot K_{eq}} \right)}{1 + \frac{[\text{P2G}]}{K_{p2g}} + \frac{[\text{PEP}]}{K_{pep}}} \quad (203)$$

Table 408: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			3.360	mmol · l ⁻¹ · s ⁻¹	✓
Kp2g			0.040	mmol · l ⁻¹	✓
Keq			6.700	dimensionless	✓
Kpep			0.500	mmol · l ⁻¹	✓
FLUX_VALUE			2.300	dimensionless	✓

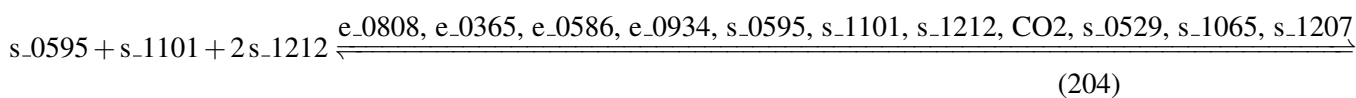
6.102 Reaction r_0386

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

Name fatty acid synthase (n-C12:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 409: Properties of each reactant.

Id	Name	SBO
s_0595	decanoate	
s_1101	malonyl-CoA	
s_1212	NADPH	

Modifiers

Table 410: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_0595	decanoate	
s_1101	malonyl-CoA	
s_1212	NADPH	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1065	laurate	
s_1207	NADP(+)	

Products

Table 411: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	

Id	Name	SBO
s_0529	coenzyme A	
s_1065	laurate	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{102} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0595}] \cdot [s_{1101}] \cdot [s_{1212}]^2 - \frac{[\text{CO}_2] \cdot [s_{0529}] \cdot [s_{1065}] \cdot [s_{1207}]^2}{K_{\text{eq}}}}{K_{\text{m0595}} \cdot K_{\text{m1101}} \cdot K_{\text{m1212}}^2} \right)}{\left(1 + \frac{[s_{0595}]}{K_{\text{m0595}}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{\text{m1101}}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right)^2 + \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[s_{1065}]}{K_{\text{m1065}}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right)^2} \quad (205)$$

Table 412: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX.VALUE			$1.11145361985654 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0595		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmCO2		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1065		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

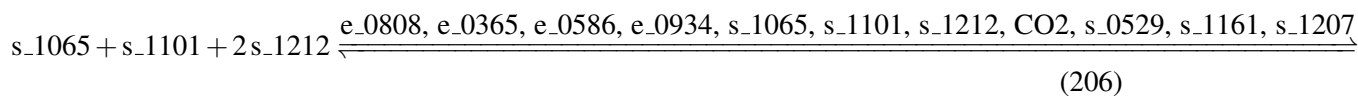
6.103 Reaction r_0387

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

Name fatty acid synthase (n-C14:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 413: Properties of each reactant.

Id	Name	SBO
s_1065	laurate	
s_1101	malonyl-CoA	
s_1212	NADPH	

Modifiers

Table 414: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_1065	laurate	
s_1101	malonyl-CoA	
s_1212	NADPH	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1161	myristate	
s_1207	NADP(+)	

Products

Table 415: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1161	myristate	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{103} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_1065] \cdot [s_1101] \cdot [s_1212]^2 - \frac{[\text{CO2}] \cdot [s_0529] \cdot [s_1161] \cdot [s_1207]^2}{K_{\text{eq}}}}{K_{\text{m1065}} \cdot K_{\text{m1101}} \cdot K_{\text{m1212}}^2} \right)}{\left(1 + \frac{[s_1065]}{K_{\text{m1065}}} \right) \cdot \left(1 + \frac{[s_1101]}{K_{\text{m1101}}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{\text{m1212}}} \right)^2 + \left(1 + \frac{[\text{CO2}]}{K_{\text{mCO2}}} \right) \cdot \left(1 + \frac{[s_0529]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[s_1161]}{K_{\text{m1161}}} \right) \cdot \left(1 + \frac{[s_1207]}{K_{\text{m1207}}} \right)^2}$$

(207)

Table 416: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.11144810306745 · 10 ^{−5}	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.001	mmol · l ^{−1} · s ^{−1}	<input checked="" type="checkbox"/>
Keq		0000281	2.000	mmol · l ^{−1}	<input checked="" type="checkbox"/>
Km1065		0000322	0.100	mmol · l ^{−1}	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	mmol · l ^{−1}	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	mmol · l ^{−1}	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	mmol · l ^{−1}	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	mmol · l ^{−1}	<input checked="" type="checkbox"/>
Km1161		0000323	0.100	mmol · l ^{−1}	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ^{−1}	<input checked="" type="checkbox"/>

6.104 Reaction r_0389

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

Name fatty acid synthase (n-C16:0)

SBO:0000176 biochemical reaction

Reaction equation

$$s_1101 + s_1161 + 2s_1212 \rightleftharpoons \frac{e_0808, e_0365, e_0586, e_0934, s_1101, s_1161, s_1212, \text{CO2}, s_0529, s_1207, s_1286}{\phantom{e_0808, e_0365, e_0586, e_0934, s_1101, s_1161, s_1212, \text{CO2}, s_0529, s_1207, s_1286}}$$

(208)

Reactants

Table 417: Properties of each reactant.

Id	Name	SBO
s_1101	malonyl-CoA	
s_1161	myristate	
s_1212	NADPH	

Modifiers

Table 418: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_1101	malonyl-CoA	
s_1161	myristate	
s_1212	NADPH	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1286	palmitate	

Products

Table 419: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1286	palmitate	

Kinetic Law

Derived unit contains undeclared units

$$v_{104} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1101}] \cdot [s_{1161}] \cdot [s_{1212}]^2 - \frac{[C02] \cdot [s_{0529}] \cdot [s_{1207}]^2 \cdot [s_{1286}]}{K_{\text{eq}}}}{K_{m1101} \cdot K_{m1161} \cdot K_{m1212}^2} \right)}{\left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{1161}]}{K_{m1161}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^2 + \left(1 + \frac{[C02]}{K_{mC02}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)^2 \cdot \left(1 + \frac{[s_{1286}]}{K_{m1286}} \right)}$$

(209)

Table 420: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.11144810306745 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1161		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1286		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

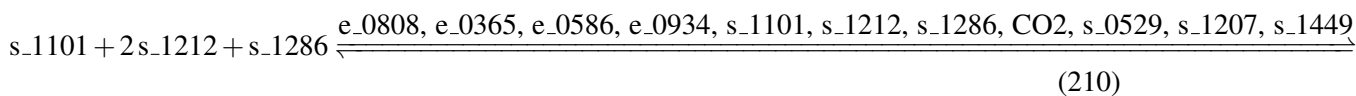
6.105 Reaction r_0391

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

Name fatty acid synthase (n-C18:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 421: Properties of each reactant.

Id	Name	SBO
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1286	palmitate	

Modifiers

Table 422: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460

Id	Name	SBO
e_0934	FAS2	0000460
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1286	palmitate	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1449	stearate	

Products

Table 423: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1449	stearate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{105} &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1101}] \cdot [s_{1212}]^2 \cdot [s_{1286}] - \frac{[C02] \cdot [s_{0529}] \cdot [s_{1207}]^2 \cdot [s_{1449}]}{K_{eq}}}{K_{m1101} \cdot K_{m1212}^2 \cdot K_{m1286}} \right)}{\left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^2 \cdot \left(1 + \frac{[s_{1286}]}{K_{m1286}} \right) + \left(1 + \frac{[C02]}{K_{mC02}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)^2 \cdot \left(1 + \frac{[s_{1449}]}{K_{m1449}} \right)} \quad (211)
 \end{aligned}$$

Table 424: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.11144810306745 \cdot 10^{-5}$	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	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1286		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1449		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

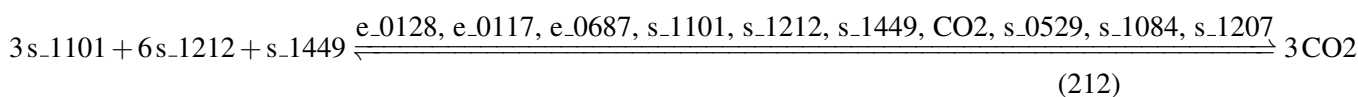
6.106 Reaction r_0393

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

Name fatty acid synthase (n-C24:0), lumped reaction

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 425: Properties of each reactant.

Id	Name	SBO
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1449	stearate	

Modifiers

Table 426: Properties of each modifier.

Id	Name	SBO
e_0128	TSC13	0000460
e_0117	FEN1	0000460
e_0687	SUR4	0000460
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1449	stearate	
CO2	carbon dioxide	
s_0529	coenzyme A	
s_1084	lignoceric acid	
s_1207	NADP(+)	

Products

Table 427: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1084	lignoceric acid	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{106} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1101}]^3 \cdot [s_{1212}]^6 \cdot [s_{1449}] - \frac{[CO_2]^3 \cdot [s_{0529}]^3 \cdot [s_{1084}] \cdot [s_{1207}]^6}{K_{eq}}}{K_{m1101}^3 \cdot K_{m1212}^6 \cdot K_{m1449}} \right)}{\left(1 + \frac{[s_{1101}]}{K_{m1101}} \right)^3 \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^6 \cdot \left(1 + \frac{[s_{1449}]}{K_{m1449}} \right) + \left(1 + \frac{[CO_2]}{K_{mCO_2}} \right)^3 \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right)^3 \cdot \left(1 + \frac{[s_{1084}]}{K_{m1084}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)} \quad (213)$$

Table 428: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.22290048783841 \cdot 10^{-5}$	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	2.000	$\text{mmol}^3 \cdot \text{l}^{-3}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1449		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1084		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

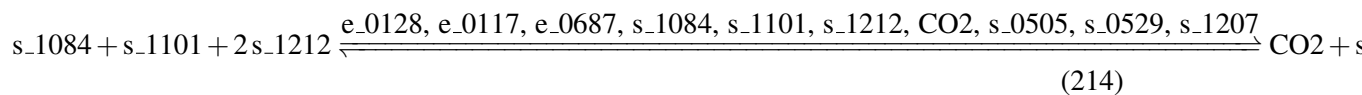
6.107 Reaction r_0394

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

Name fatty acid synthase (n-C26:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 429: Properties of each reactant.

Id	Name	SBO
s_1084	lignoceric acid	
s_1101	malonyl-CoA	
s_1212	NADPH	

Modifiers

Table 430: Properties of each modifier.

Id	Name	SBO
e_0128	TSC13	0000460
e_0117	FEN1	0000460
e_0687	SUR4	0000460
s_1084	lignoceric acid	
s_1101	malonyl-CoA	
s_1212	NADPH	
C02	carbon dioxide	
s_0505	cerotate	
s_0529	coenzyme A	
s_1207	NADP(+)	

Products

Table 431: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0505	cerotate	
s_0529	coenzyme A	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{107} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1084}] \cdot [s_{1101}] \cdot [s_{1212}]^2 - \frac{[\text{CO}_2] \cdot [s_{0505}] \cdot [s_{0529}] \cdot [s_{1207}]^2}{K_{\text{eq}}}}{K_{\text{m1084}} \cdot K_{\text{m1101}} \cdot K_{\text{m1212}}^2} \right)}{\left(1 + \frac{[s_{1084}]}{K_{\text{m1084}}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{\text{m1101}}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right)^2 + \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[s_{0505}]}{K_{\text{m0505}}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right)^2} \quad (215)$$

Table 432: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.22290070597961 \cdot 10^{-5}$	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	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1084		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0505		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

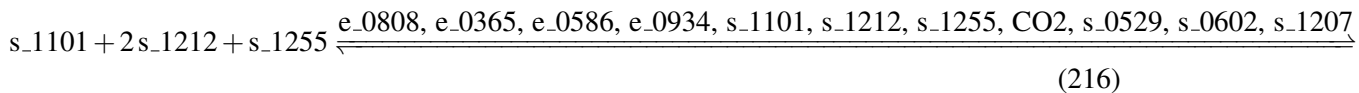
6.108 Reaction r_0397

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

Name fatty acyl-CoA synthase (n-C10:0CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 433: Properties of each reactant.

Id	Name	SBO
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1255	octanoyl-CoA	

Modifiers

Table 434: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1255	octanoyl-CoA	
C02	carbon dioxide	
s_0529	coenzyme A	
s_0602	decanoyl-CoA	
s_1207	NADP(+)	

Products

Table 435: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_0602	decanoyl-CoA	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

v_{108}

(217)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_1101] \cdot [s_1212]^2 \cdot [s_1255] - \frac{[\text{CO}_2] \cdot [s_0529] \cdot [s_0602] \cdot [s_1207]^2}{K_{\text{eq}}}}{K_{m1101} \cdot K_{m1212}^2 \cdot K_{m1255}} \right)}{\left(1 + \frac{[s_1101]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{m1212}} \right)^2 \cdot \left(1 + \frac{[s_1255]}{K_{m1255}} \right) + \left(1 + \frac{[\text{CO}_2]}{K_{m\text{CO}_2}} \right) \cdot \left(1 + \frac{[s_0529]}{K_{m0529}} \right) \cdot \left(1 + \frac{[s_0602]}{K_{m0602}} \right) \cdot \left(1 + \frac{[s_1207]}{K_{m1207}} \right)^2}$$

Table 436: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
V_{\max}		0000324	0.153	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K_{eq}		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K_{m1101}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K_{m1212}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K_{m1255}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
$K_{m\text{CO}_2}$		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K_{m0529}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K_{m0602}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K_{m1207}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.109 Reaction r_{0398}

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

Name fatty acyl-CoA synthase (n-C8:0CoA), lumped reaction

SBO:0000176 biochemical reaction

Reaction equation

$$s_0373 + 3s_1101 + 6s_1212 \xrightleftharpoons[e_0808, e_0365, e_0586, e_0934, s_0373, s_1101, s_1212, \text{CO}_2, s_0529, s_1207, s_1255]{} \quad (218)$$

Reactants

Table 437: Properties of each reactant.

Id	Name	SBO
s_0373	acetyl-CoA	
s_1101	malonyl-CoA	
s_1212	NADPH	

Modifiers

Table 438: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_0373	acetyl-CoA	
s_1101	malonyl-CoA	
s_1212	NADPH	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1255	octanoyl-CoA	

Products

Table 439: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1255	octanoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{109} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0373}] \cdot [s_{1101}]^3 \cdot [s_{1212}]^6 - \frac{[CO2]^3 \cdot [s_{0529}]^3 \cdot [s_{1207}]^6 \cdot [s_{1255}]}{K_{eq}}}{K_{m0373} \cdot K_{m1101}^3 \cdot K_{m1212}^6} \right)}{\left(1 + \frac{[s_{0373}]}{K_{m0373}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right)^3 \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^6 + \left(1 + \frac{[CO2]}{K_{mCO2}} \right)^3 \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right)^3 \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)^6 \cdot \left(1 + \frac{[s_{1255}]}{K_{m1255}} \right)^6}$$

(219)

Table 440: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	30.094	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	$\text{mmol}^3 \cdot \text{l}^{-3}$	<input checked="" type="checkbox"/>
Km0373		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1255		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

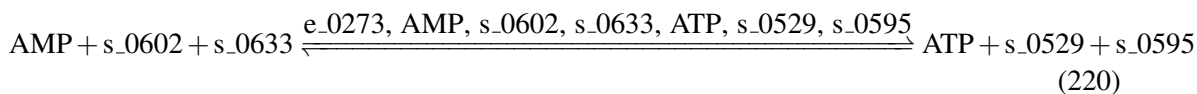
6.110 Reaction r_0399

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

Name fatty-acid-CoA ligase (decanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 441: Properties of each reactant.

Id	Name	SBO
AMP	AMP	
s_0602	decanoyl-CoA	
s_0633	diphosphate	

Modifiers

Table 442: Properties of each modifier.

Id	Name	SBO
e_0273	FAA2	0000460
AMP	AMP	
s_0602	decanoyl-CoA	

Id	Name	SBO
s_0633	diphosphate	
ATP	ATP	
s_0529	coenzyme A	
s_0595	decanoate	

Products

Table 443: Properties of each product.

Id	Name	SBO
ATP	ATP	
s_0529	coenzyme A	
s_0595	decanoate	

Kinetic Law

Derived unit contains undeclared units

$$v_{110} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{AMP}] \cdot [\text{s}_0602] \cdot [\text{s}_0633] - \frac{[\text{ATP}] \cdot [\text{s}_0529] \cdot [\text{s}_0595]}{K_{\text{eq}}}}{K_{\text{mAMP}} \cdot K_{\text{m0602}} \cdot K_{\text{m0633}}} \right)}{\left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0602]}{K_{\text{m0602}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) + \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0529]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[\text{s}_0595]}{K_{\text{m0595}}} \right) - 1} \quad (221)$$

Table 444: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.048	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	17.243	dimensionless	<input checked="" type="checkbox"/>
KmAMP		0000322	0.293	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0602		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmATP		0000323	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0595		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

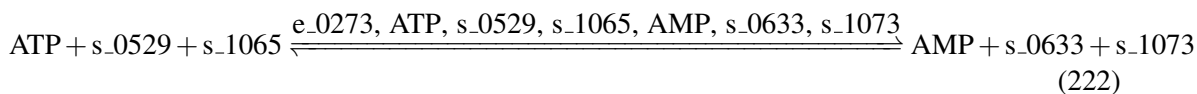
6.111 Reaction r_0400

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

Name fatty-acid-CoA ligase (dodecanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 445: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0529	coenzyme A	
s_1065	laurate	

Modifiers

Table 446: Properties of each modifier.

Id	Name	SBO
e_0273	FAA2	0000460
ATP	ATP	
s_0529	coenzyme A	
s_1065	laurate	
AMP	AMP	
s_0633	diphosphate	
s_1073	lauroyl-CoA	

Products

Table 447: Properties of each product.

Id	Name	SBO
AMP	AMP	

Id	Name	SBO
s_0633	diphosphate	
s_1073	lauroyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{111} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{0529}] \cdot [\text{s}_{1065}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{1073}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0529}} \cdot K_{\text{m1065}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0529}]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[\text{s}_{1065}]}{K_{\text{m1065}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{1073}]}{K_{\text{m1073}}} \right) - 1} \quad (223)$$

Table 448: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.40095790139533 \cdot 10^{-11}$	dimensionless	✓
Vmax		0000324	$1.02028737041523 \cdot 10^{-9}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1065		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmAMP		0000323	0.293	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1073		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

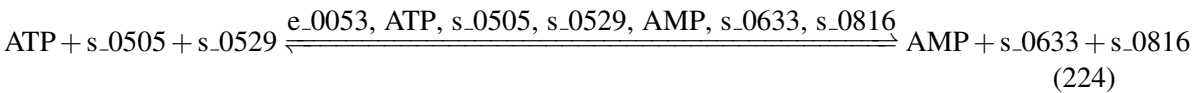
6.112 Reaction r_0406

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

Name fatty-acid-CoA ligase (n-C26:0)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 449: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0505	cerotate	
s_0529	coenzyme A	

Modifiers

Table 450: Properties of each modifier.

Id	Name	SBO
e_0053	FAT1	0000460
ATP	ATP	
s_0505	cerotate	
s_0529	coenzyme A	
AMP	AMP	
s_0633	diphosphate	
s_0816	hexacosanoyl-CoA	

Products

Table 451: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_0816	hexacosanoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{112} &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0505] \cdot [\text{s}_0529] - \frac{[\text{AMP}] \cdot [\text{s}_0633] \cdot [\text{s}_0816]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0505}} \cdot K_{\text{m0529}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0505]}{K_{\text{m0505}}} \right) \cdot \left(1 + \frac{[\text{s}_0529]}{K_{\text{m0529}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_0816]}{K_{\text{m0816}}} \right) - 1}
 \end{aligned} \tag{225}$$

Table 452: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.22290070597961 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$6.66870211793481 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0505		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmAMP		0000323	0.293	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0816		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

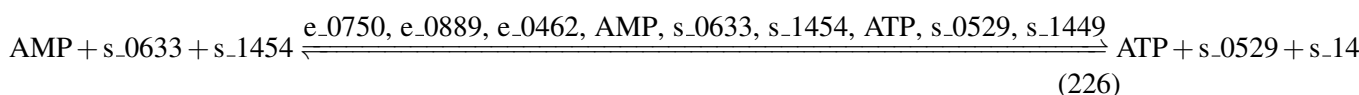
6.113 Reaction r_0407

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

Name fatty-acid–CoA ligase (octadecanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 453: Properties of each reactant.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1454	stearoyl-CoA	

Modifiers

Table 454: Properties of each modifier.

Id	Name	SBO
e_0750	FAA4	0000460

Id	Name	SBO
e_0889	FAA1	0000460
e_0462	FAA3	0000460
AMP	AMP	
s_0633	diphosphate	
s_1454	stearoyl-CoA	
ATP	ATP	
s_0529	coenzyme A	
s_1449	stearate	

Products

Table 455: Properties of each product.

Id	Name	SBO
ATP	ATP	
s_0529	coenzyme A	
s_1449	stearate	

Kinetic Law

Derived unit contains undeclared units

$$v_{113} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{AMP}] \cdot [\text{s}_0633] \cdot [\text{s}_1454] - \frac{[\text{ATP}] \cdot [\text{s}_0529] \cdot [\text{s}_1449]}{\text{K}_{\text{eq}}}}{\text{K}_{\text{mAMP}} \cdot \text{K}_{\text{m0633}} \cdot \text{K}_{\text{m1454}}} \right)}{\left(1 + \frac{[\text{AMP}]}{\text{K}_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{\text{K}_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_1454]}{\text{K}_{\text{m1454}}} \right) + \left(1 + \frac{[\text{ATP}]}{\text{K}_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0529]}{\text{K}_{\text{m0529}}} \right) \cdot \left(1 + \frac{[\text{s}_1449]}{\text{K}_{\text{m1449}}} \right) - 1} \quad (227)$$

Table 456: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.11145238477096 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$3.33435715430091 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	17.243	dimensionless	✓
KmAMP		0000322	0.293	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0633		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1454		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmATP		0000323	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1449		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

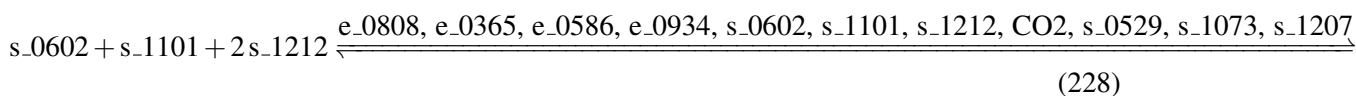
6.114 Reaction r_0432

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

Name fatty-acyl-CoA synthase (n-C12:0CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 457: Properties of each reactant.

Id	Name	SBO
s_0602	decanoyl-CoA	
s_1101	malonyl-CoA	
s_1212	NADPH	

Modifiers

Table 458: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_0602	decanoyl-CoA	
s_1101	malonyl-CoA	
s_1212	NADPH	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1073	lauroyl-CoA	
s_1207	NADP(+)	

Products

Table 459: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1073	lauroyl-CoA	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

v_{114}

(229)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0602}] \cdot [s_{1101}] \cdot [s_{1212}]^2 - \frac{[CO2] \cdot [s_{0529}] \cdot [s_{1073}] \cdot [s_{1207}]^2}{K_{eq}}}{K_{m0602} \cdot K_{m1101} \cdot K_{m1212}^2} \right)}{\left(1 + \frac{[s_{0602}]}{K_{m0602}} \right) \cdot \left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^2 + \left(1 + \frac{[CO2]}{K_{mCO2}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) \cdot \left(1 + \frac{[s_{1073}]}{K_{m1073}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)^2}$$

Table 460: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.33434646922878 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	0.003	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0602		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1073		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

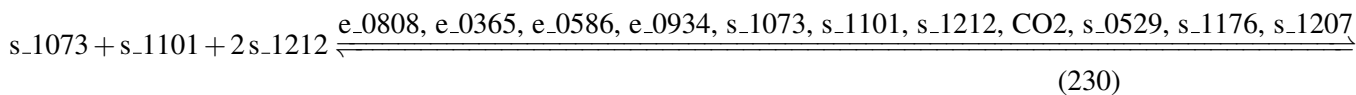
6.115 Reaction r_0433

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

Name fatty-acyl-CoA synthase (n-C14:0CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 461: Properties of each reactant.

Id	Name	SBO
s_1073	lauroyl-CoA	
s_1101	malonyl-CoA	
s_1212	NADPH	

Modifiers

Table 462: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_1073	lauroyl-CoA	
s_1101	malonyl-CoA	
s_1212	NADPH	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1176	myristoyl-CoA	
s_1207	NADP(+)	

Products

Table 463: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1176	myristoyl-CoA	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{115} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_1073] \cdot [s_1101] \cdot [s_1212]^2 - \frac{[\text{CO}_2] \cdot [s_0529] \cdot [s_1176] \cdot [s_1207]^2}{K_{\text{eq}}}}{K_{\text{m}1073} \cdot K_{\text{m}1101} \cdot K_{\text{m}1212}^2} \right)}{\left(1 + \frac{[s_1073]}{K_{\text{m}1073}} \right) \cdot \left(1 + \frac{[s_1101]}{K_{\text{m}1101}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{\text{m}1212}} \right)^2 + \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[s_0529]}{K_{\text{m}0529}} \right) \cdot \left(1 + \frac{[s_1176]}{K_{\text{m}1176}} \right) \cdot \left(1 + \frac{[s_1207]}{K_{\text{m}1207}} \right)^2} \quad (231)$$

Table 464: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.33435576399053 \cdot 10^{-5}$	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	2.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1073		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1176		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

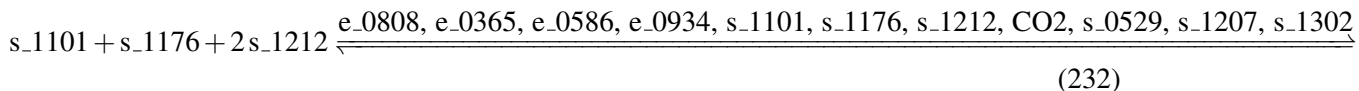
6.116 Reaction r_0434

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

Name fatty-acyl-CoA synthase (n-C16:0CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 465: Properties of each reactant.

Id	Name	SBO
s_1101	malonyl-CoA	
s_1176	myristoyl-CoA	
s_1212	NADPH	

Modifiers

Table 466: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_1101	malonyl-CoA	
s_1176	myristoyl-CoA	
s_1212	NADPH	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1302	palmitoyl-CoA	

Products

Table 467: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1302	palmitoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{116} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_1101] \cdot [s_1176] \cdot [s_1212]^2 - \frac{[\text{CO}_2] \cdot [s_0529] \cdot [s_1207]^2 \cdot [s_1302]}{K_{\text{eq}}}}{K_{\text{m1101}} \cdot K_{\text{m1176}} \cdot K_{\text{m1212}}^2} \right)}{\left(1 + \frac{[s_1101]}{K_{\text{m1101}}} \right) \cdot \left(1 + \frac{[s_1176]}{K_{\text{m1176}}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{\text{m1212}}} \right)^2 + \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[s_0529]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[s_1207]}{K_{\text{m1207}}} \right)^2 \cdot \left(1 + \frac{[s_1302]}{K_{\text{m1302}}} \right)}$$
(233)

Table 468: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.33435576399053 \cdot 10^{-5}$	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	2.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1176		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1302		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

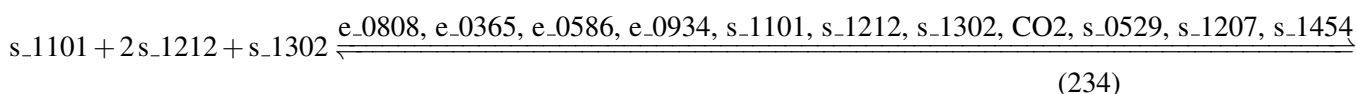
6.117 Reaction r_0435

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

Name fatty-acyl-CoA synthase (n-C18:0CoA)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 469: Properties of each reactant.

Id	Name	SBO
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1302	palmitoyl-CoA	

Modifiers

Table 470: Properties of each modifier.

Id	Name	SBO
e_0808	ACC1	0000460
e_0365	ACB1	0000460
e_0586	FAS1	0000460
e_0934	FAS2	0000460
s_1101	malonyl-CoA	
s_1212	NADPH	
s_1302	palmitoyl-CoA	
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1454	stearoyl-CoA	

Products

Table 471: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0529	coenzyme A	
s_1207	NADP(+)	
s_1454	stearoyl-CoA	

Kinetic Law

Derived unit contains undeclared units

$$v_{117} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1101}] \cdot [s_{1212}]^2 \cdot [s_{1302}] - \frac{[CO2] \cdot [s_{0529}] \cdot [s_{1207}]^2 \cdot [s_{1454}]}{K_{eq}}}{K_{m1101} \cdot K_{m1212}^2 \cdot K_{m1302}} \right)}{\left(1 + \frac{[s_{1101}]}{K_{m1101}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right)^2 \cdot \left(1 + \frac{[s_{1302}]}{K_{m1302}} \right) + \left(1 + \frac{[CO2]}{K_{mCO2}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right)^2 \cdot \left(1 + \frac{[s_{1454}]}{K_{m1454}} \right)}$$

(235)

Table 472: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			1.11145238477096 · 10 ⁻⁵	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1101		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1302		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1454		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

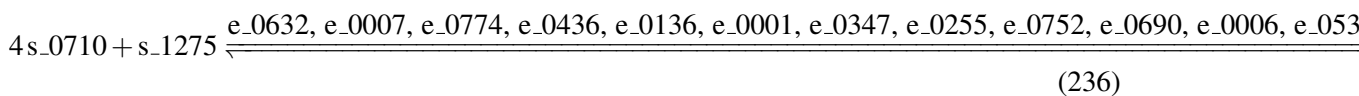
6.118 Reaction r_0438

This is a reversible reaction of two reactants forming one product influenced by 17 modifiers.

Name ferrocytochrome-c:oxygen oxidoreductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 473: Properties of each reactant.

Id	Name	SBO
s_0710	ferrocytochrome c	
s_1275	oxygen	

Modifiers

Table 474: Properties of each modifier.

Id	Name	SBO
e_0632	COX12	0000460
e_0007	COX3	0000460
e_0774	COX5A	0000460
e_0436	COX6	0000460
e_0136	COX9	0000460

Id	Name	SBO
e_0001	COX1	0000460
e_0347	COX13	0000460
e_0255	CYC7	0000460
e_0752	COX7	0000460
e_0690	COX8	0000460
e_0006	COX2	0000460
e_0531	CYC1	0000460
e_0346	COX4	0000460
e_0475	COX5B	0000460
s_0710	ferrocytochrome c	
s_1275	oxygen	
s_0709	ferricytochrome c	

Product

Table 475: Properties of each product.

Id	Name	SBO
s_0709	ferricytochrome c	

Kinetic Law

Derived unit contains undeclared units

$$v_{118} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0710}]^4 \cdot [s_{1275}] - \frac{[s_{0709}]^4}{K_{\text{eq}}} \right)}{K_{\text{m}0710}^4 \cdot K_{\text{m}1275}} \quad (237)$$

$$\left(1 + \frac{[s_{0710}]}{K_{\text{m}0710}} \right)^4 \cdot \left(1 + \frac{[s_{1275}]}{K_{\text{m}1275}} \right) + \left(1 + \frac{[s_{0709}]}{K_{\text{m}0709}} \right)^4 - 1$$

Table 476: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.116	dimensionless	✓
Vmax		0000324	10.912	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	20.000	mmol ⁻¹ · l	✓
Km0710		0000322	0.100	mmol · l ⁻¹	✓
Km1275		0000322	0.100	mmol · l ⁻¹	✓
Km0709		0000323	0.100	mmol · l ⁻¹	✓

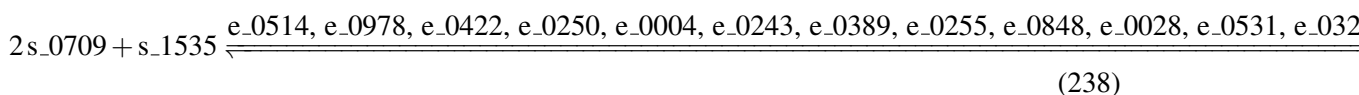
6.119 Reaction r_0439

This is a reversible reaction of two reactants forming two products influenced by 16 modifiers.

Name ferrocytochrome-c:oxygen oxidoreductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 477: Properties of each reactant.

Id	Name	SBO
s_0709	ferricytochrome c	
s_1535	ubiquinol-6	

Modifiers

Table 478: Properties of each modifier.

Id	Name	SBO
e_0514	QCR8	0000460
e_0978	QCR2	0000460
e_0422	QCR10	0000460
e_0250	RIP1	0000460
e_0004	COB	0000460
e_0243	QCR7	0000460
e_0389	QCR9	0000460
e_0255	CYC7	0000460
e_0848	CYT1	0000460
e_0028	COR1	0000460
e_0531	CYC1	0000460
e_0322	QCR6	0000460
s_0709	ferricytochrome c	
s_1535	ubiquinol-6	
s_0710	ferrocytochrome c	
s_1537	ubiquinone-6	

Products

Table 479: Properties of each product.

Id	Name	SBO
s_0710	ferrocytochrome c	
s_1537	ubiquinone-6	

Kinetic Law

Derived unit contains undeclared units

$$v_{119} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{s}_0709]^2 \cdot [\text{s}_1535] - \frac{[\text{s}_0710]^2 \cdot [\text{s}_1537]}{K_{\text{eq}}}}{K_{\text{m}0709} \cdot K_{\text{m}1535}} \right)}{\left(1 + \frac{[\text{s}_0709]}{K_{\text{m}0709}} \right)^2 \cdot \left(1 + \frac{[\text{s}_1535]}{K_{\text{m}1535}} \right) + \left(1 + \frac{[\text{s}_0710]}{K_{\text{m}0710}} \right)^2 \cdot \left(1 + \frac{[\text{s}_1537]}{K_{\text{m}1537}} \right) - 1} \quad (239)$$

Table 480: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.016	dimensionless	✓
Vmax		0000324	0.492	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0709		0000322	0.100	mmol · l ⁻¹	✓
Km1535		0000322	0.100	mmol · l ⁻¹	✓
Km0710		0000323	0.100	mmol · l ⁻¹	✓
Km1537		0000323	0.100	mmol · l ⁻¹	✓

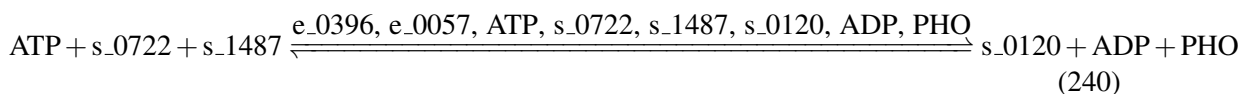
6.120 Reaction r_0446

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

Name formate-tetrahydrofolate ligase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 481: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0722	formate	
s_1487	THF	

Modifiers

Table 482: Properties of each modifier.

Id	Name	SBO
e_0396	ADE3	0000460
e_0057	MIS1	0000460
ATP	ATP	
s_0722	formate	
s_1487	THF	
s_0120	10-formyl-THF	
ADP	ADP	
PHO	phosphate	

Products

Table 483: Properties of each product.

Id	Name	SBO
s_0120	10-formyl-THF	
ADP	ADP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{120} &= \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0722] \cdot [\text{s}_1487] - \frac{[\text{s}_0120] \cdot [\text{ADP}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0722}} \cdot K_{\text{m1487}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0722]}{K_{\text{m0722}}} \right) \cdot \left(1 + \frac{[\text{s}_1487]}{K_{\text{m1487}}} \right) + \left(1 + \frac{[\text{s}_0120]}{K_{\text{m0120}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (241)
 \end{aligned}$$

Table 484: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.20781143195575 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.013	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0722		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1487		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0120		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.121 Reaction FBA

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

Name fructose-bisphosphate aldolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 485: Properties of each reactant.

Id	Name	SBO
F16bP	D-fructose 1,6-bisphosphate	

Modifiers

Table 486: Properties of each modifier.

Id	Name	SBO
e_0567	FBA1	0000460
F16bP	D-fructose 1,6-bisphosphate	
DHAP	dihydroxyacetone phosphate	
GAP	glyceraldehyde 3-phosphate	

Products

Table 487: Properties of each product.

Id	Name	SBO
DHAP	dihydroxyacetone phosphate	
GAP	glyceraldehyde 3-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{121} = \text{vol}(\text{cell}) \cdot \frac{V_{\max} \cdot \left(\frac{[\text{F16bP}]}{K_{\text{f16bp}}} - \frac{[\text{DHAP}] \cdot [\text{GAP}]}{K_{\text{f16bp}} \cdot K_{\text{eq}}} \right)}{1 + \frac{[\text{F16bP}]}{K_{\text{f16bp}}} + \frac{[\text{DHAP}]}{K_{\text{dhap}}} + \frac{[\text{GAP}]}{K_{\text{gap}}} + \frac{[\text{F16bP}] \cdot [\text{GAP}]}{K_{\text{f16bp}} \cdot K_{\text{igap}}} + \frac{[\text{DHAP}] \cdot [\text{GAP}]}{K_{\text{dhap}} \cdot K_{\text{gap}}}} \quad (243)$$

Table 488: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			1.578	mmol · l ⁻¹ · s ⁻¹	✓
Kf16bp			0.300	mmol · l ⁻¹	✓
Keq			0.069	mmol · l ⁻¹	✓
Kdhap			2.000	mmol · l ⁻¹	✓
Kgap			2.400	mmol · l ⁻¹	✓
Kigap			10.000	mmol · l ⁻¹	✓
FLUX_VALUE			1.309	dimensionless	✓

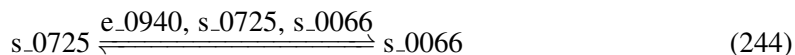
6.122 Reaction r_0451

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

Name fumarase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 489: Properties of each reactant.

Id	Name	SBO
s_0725	fumarate	

Modifiers

Table 490: Properties of each modifier.

Id	Name	SBO
e_0940	FUM1	0000460
s_0725	fumarate	
s_0066	(S)-malate	

Product

Table 491: Properties of each product.

Id	Name	SBO
s_0066	(S)-malate	

Kinetic Law

Derived unit contains undeclared units

$$v_{122} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0725] - \frac{[s_0066]}{K_{\text{eq}}}}{K_{\text{m0725}}} \right)}{1 + \frac{[s_0725]}{K_{\text{m0725}}} + 1 + \frac{[s_0066]}{K_{\text{m0066}}} - 1} \quad (245)$$

Table 492: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.033	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.195	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0725		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0066		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

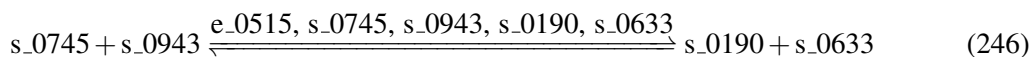
6.123 Reaction r_0462

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 493: Properties of each reactant.

Id	Name	SBO
s_0745	geranyl diphosphate	
s_0943	isopentenyl diphosphate	

Modifiers

Table 494: Properties of each modifier.

Id	Name	SBO
e_0515	ERG20	0000460
s_0745	geranyl diphosphate	
s_0943	isopentenyl diphosphate	
s_0190	farnesyl diphosphate	
s_0633	diphosphate	

Products

Table 495: Properties of each product.

Id	Name	SBO
s_0190	farnesyl diphosphate	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{123} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0745}] \cdot [s_{0943}] - \frac{[s_{0190}] \cdot [s_{0633}]}{K_{\text{eq}}}}{K_{\text{m0745}} \cdot K_{\text{m0943}}} \right)}{\left(1 + \frac{[s_{0745}]}{K_{\text{m0745}}} \right) \cdot \left(1 + \frac{[s_{0943}]}{K_{\text{m0943}}} \right) + \left(1 + \frac{[s_{0190}]}{K_{\text{m0190}}} \right) \cdot \left(1 + \frac{[s_{0633}]}{K_{\text{m0633}}} \right) - 1} \quad (247)$$

Table 496: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$5.88956076077212 \cdot 10^{-4}$	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"/>
Km0745		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0943		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0190		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

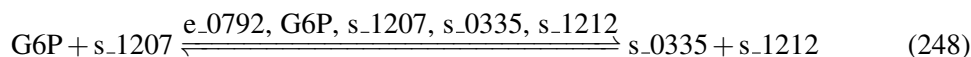
6.124 Reaction r_0466

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 497: Properties of each reactant.

Id	Name	SBO
G6P	D-glucose 6-phosphate	
s_1207	NADP(+)	

Modifiers

Table 498: Properties of each modifier.

Id	Name	SBO
e_0792	ZWF1	0000460

Id	Name	SBO
G6P	D-glucose 6-phosphate	
s_1207	NADP(+)	
s_0335	6-O-phosphono-D-glucono-1,5-lactone	
s_1212	NADPH	

Products

Table 499: Properties of each product.

Id	Name	SBO
s_0335	6-O-phosphono-D-glucono-1,5-lactone	
s_1212	NADPH	

Kinetic Law

Derived unit contains undeclared units

$$v_{124} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([\text{G6P}] \cdot [\text{s}_1207] - \frac{[\text{s}_0335] \cdot [\text{s}_1212]}{K_{\text{eq}}} \right)}{K_{\text{mG6P}} \cdot K_{\text{m1207}} + \left(1 + \frac{[\text{G6P}]}{K_{\text{mG6P}}} \right) \cdot \left(1 + \frac{[\text{s}_1207]}{K_{\text{m1207}}} \right) + \left(1 + \frac{[\text{s}_0335]}{K_{\text{m0335}}} \right) \cdot \left(1 + \frac{[\text{s}_1212]}{K_{\text{m1212}}} \right) - 1} \quad (249)$$

Table 500: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.058	dimensionless	✓
Vmax		0000324	0.813	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.075	dimensionless	✓
KmG6P		0000322	2.675	mmol · l ⁻¹	✓
Km1207		0000322	0.100	mmol · l ⁻¹	✓
Km0335		0000323	0.100	mmol · l ⁻¹	✓
Km1212		0000323	0.100	mmol · l ⁻¹	✓

6.125 Reaction PGI

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 501: Properties of each reactant.

Id	Name	SBO
G6P	D-glucose 6-phosphate	

Modifiers

Table 502: Properties of each modifier.

Id	Name	SBO
e_0079	PGI1	0000460
G6P	D-glucose 6-phosphate	
F6P	D-fructose 6-phosphate	

Product

Table 503: Properties of each product.

Id	Name	SBO
F6P	D-fructose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{125} = \text{vol}(\text{cell}) \cdot \frac{V_{\text{max}} \cdot \left(\frac{[\text{G6P}]}{K_{\text{g6p}}} - \frac{[\text{F6P}]}{K_{\text{g6p}} \cdot K_{\text{eq}}} \right)}{1 + \frac{[\text{G6P}]}{K_{\text{g6p}}} + \frac{[\text{F6P}]}{K_{\text{f6p}}}}$$

(251)

Table 504: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			17.600	mmol · l ⁻¹ · s ⁻¹	✓
Kg6p			1.400	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Keq			0.290	dimensionless	<input checked="" type="checkbox"/>
Kf6p			0.300	mmol · l ⁻¹	<input checked="" type="checkbox"/>
FLUX_VALUE			1.309	dimensionless	<input checked="" type="checkbox"/>

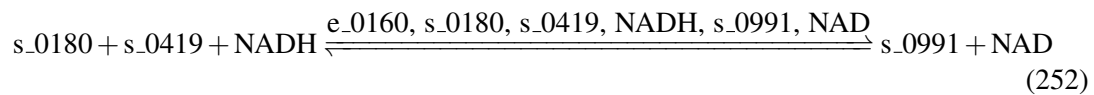
6.126 Reaction r_0470

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

Name glutamate dehydrogenase (NAD)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 505: Properties of each reactant.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_0419	ammonium	
NADH	NADH	

Modifiers

Table 506: Properties of each modifier.

Id	Name	SBO
e_0160	GDH2	0000460
s_0180	2-oxoglutarate	
s_0419	ammonium	
NADH	NADH	
s_0991	L-glutamate	
NAD	NAD	

Products

Table 507: Properties of each product.

Id	Name	SBO
s_0991	L-glutamate	
NAD	NAD	

Kinetic Law

Derived unit contains undeclared units

$$v_{126} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0180}] \cdot [s_{0419}] \cdot [\text{NADH}] - \frac{[s_{0991}] \cdot [\text{NAD}]}{K_{\text{eq}}}}{K_{\text{m0180}} \cdot K_{\text{m0419}} \cdot K_{\text{mNADH}}} \right)}{\left(1 + \frac{[s_{0180}]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_{0419}]}{K_{\text{m0419}}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right) + \left(1 + \frac{[s_{0991}]}{K_{\text{m0991}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right) - 1} \quad (253)$$

Table 508: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.235	dimensionless	✓
Vmax		0000324	5.168	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	346.741	mmol ⁻¹ · l	✓
Km0180		0000322	0.100	mmol · l ⁻¹	✓
Km0419		0000322	0.100	mmol · l ⁻¹	✓
KmNADH		0000322	0.087	mmol · l ⁻¹	✓
Km0991		0000323	0.100	mmol · l ⁻¹	✓
KmNAD		0000323	1.503	mmol · l ⁻¹	✓

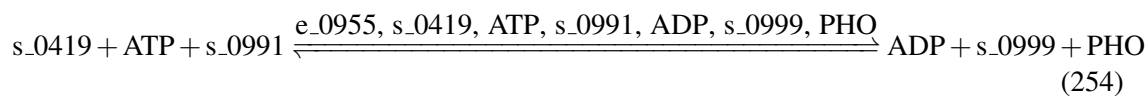
6.127 Reaction r_0476

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

Name glutamine synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 509: Properties of each reactant.

Id	Name	SBO
s_0419	ammonium	
ATP	ATP	
s_0991	L-glutamate	

Modifiers

Table 510: Properties of each modifier.

Id	Name	SBO
e_0955	GLN1	0000460
s_0419	ammonium	
ATP	ATP	
s_0991	L-glutamate	
ADP	ADP	
s_0999	L-glutamine	
PHO	phosphate	

Products

Table 511: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_0999	L-glutamine	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{127} & \quad (255) \\
 &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0419}] \cdot [ATP] \cdot [s_{0991}] - \frac{[ADP] \cdot [s_{0999}] \cdot [PHO]}{K_{eq}}}{K_{m0419} \cdot K_{mATP} \cdot K_{m0991}} \right)}{\left(1 + \frac{[s_{0419}]}{K_{m0419}} \right) \cdot \left(1 + \frac{[ATP]}{K_{mATP}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{m0991}} \right) + \left(1 + \frac{[ADP]}{K_{mADP}} \right) \cdot \left(1 + \frac{[s_{0999}]}{K_{m0999}} \right) \cdot \left(1 + \frac{[PHO]}{K_{mPHO}} \right) - 1}
 \end{aligned}$$

Table 512: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	✓
Vmax		0000324	1.058	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
Km0419		0000322	0.100	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓
Km0999		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

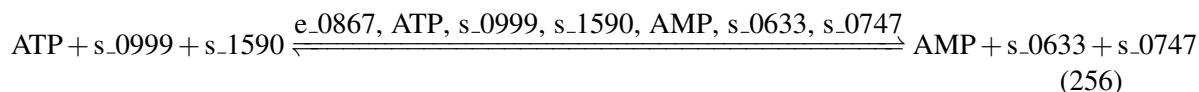
6.128 Reaction r_0478

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

Name glutaminyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 513: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0999	L-glutamine	
s_1590	tRNA(Gln)	

Modifiers

Table 514: Properties of each modifier.

Id	Name	SBO
e_0867	GLN4	0000460

Id	Name	SBO
ATP	ATP	
s_0999	L-glutamine	
s_1590	tRNA(Gln)	
AMP	AMP	
s_0633	diphosphate	
s_0747	Gln-tRNA(Gln)	

Products

Table 515: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_0747	Gln-tRNA(Gln)	

Kinetic Law

Derived unit contains undeclared units

$$v_{128} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0999] \cdot [\text{s}_{1590}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{0747}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0999}} \cdot K_{\text{m1590}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0999}]}{K_{\text{m0999}}} \right) \cdot \left(1 + \frac{[\text{s}_{1590}]}{K_{\text{m1590}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{0747}]}{K_{\text{m0747}}} \right) - 1} \quad (257)$$

Table 516: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	✓
Vmax		0000324	0.136	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0999		0000322	0.100	mmol · l ⁻¹	✓
Km1590		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km0747		0000323	0.100	mmol · l ⁻¹	✓

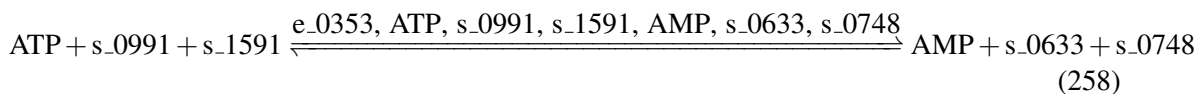
6.129 Reaction r_0479

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 517: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0991	L-glutamate	
s_1591	tRNA(Glu)	

Modifiers

Table 518: Properties of each modifier.

Id	Name	SBO
e_0353	GUS1	0000460
ATP	ATP	
s_0991	L-glutamate	
s_1591	tRNA(Glu)	
AMP	AMP	
s_0633	diphosphate	
s_0748	Glu-tRNA(Glu)	

Products

Table 519: Properties of each product.

Id	Name	SBO
AMP	AMP	

Id	Name	SBO
s_0633	diphosphate	
s_0748	Glu-tRNA(Glu)	

Kinetic Law

Derived unit contains undeclared units

$$v_{129} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{0991}] \cdot [\text{s}_{1591}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{0748}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0991}} \cdot K_{\text{m1591}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0991}]}{K_{\text{m0991}}} \right) \cdot \left(1 + \frac{[\text{s}_{1591}]}{K_{\text{m1591}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{0748}]}{K_{\text{m0748}}} \right) - 1} \quad (259)$$

Table 520: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.389	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓
Km1591		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km0748		0000323	0.100	mmol · l ⁻¹	✓

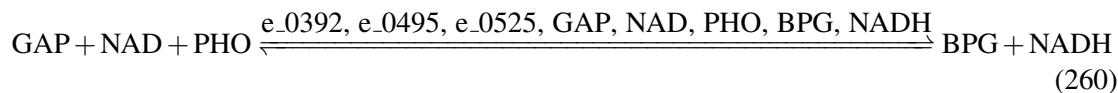
6.130 Reaction TDH

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

Name glyceraldehyde-3-phosphate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 521: Properties of each reactant.

Id	Name	SBO
GAP	glyceraldehyde 3-phosphate	
NAD	NAD	
PHO	phosphate	

Modifiers

Table 522: Properties of each modifier.

Id	Name	SBO
e_0392	TDH3	0000460
e_0495	TDH1	0000460
e_0525	TDH2	0000460
GAP	glyceraldehyde 3-phosphate	
NAD	NAD	
PHO	phosphate	
BPG	1,3-bisphospho-D-glycerate	
NADH	NADH	

Products

Table 523: Properties of each product.

Id	Name	SBO
BPG	1,3-bisphospho-D-glycerate	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{130} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\max}}{K_{\text{gap}} \cdot K_{\text{nad}} \cdot K_{\text{pho}}} \cdot \left([\text{GAP}] \cdot [\text{NAD}] \cdot [\text{PHO}] - \frac{[\text{BPG}] \cdot [\text{NADH}]}{K_{\text{eq}}} \right)}{\left(1 + \frac{[\text{PHO}]}{K_{\text{pho}}} \right) \cdot \left(1 + \frac{[\text{GAP}]}{K_{\text{gap}}} + \frac{[\text{BPG}]}{K_{\text{bpg}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{nad}}} + \frac{[\text{NADH}]}{K_{\text{nadh}}} \right)} \quad (261)$$

Table 524: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			19.219	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Kgap			0.210	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Knad			0.090	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Kbpg			0.010	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Knadh			0.060	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Keq			0.053	dimensionless	<input checked="" type="checkbox"/>
Kpho			10^{-4}	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
FLUX_VALUE			2.300	dimensionless	<input checked="" type="checkbox"/>

6.131 Reaction r_0489

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

Name glycerol-3-phosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 525: Properties of each reactant.

Id	Name	SBO
s_0767	glycerol 3-phosphate	

Modifiers

Table 526: Properties of each modifier.

Id	Name	SBO
e_0466	RHR2	0000460
e_0288	HOR2	0000460
s_0767	glycerol 3-phosphate	
GLY	glycerol	
PHO	phosphate	

Products

Table 527: Properties of each product.

Id	Name	SBO
GLY	glycerol	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{131} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0767}] - \frac{[\text{GLY}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0767}}} \right)}{1 + \frac{[s_{0767}]}{K_{\text{m0767}}} + \left(1 + \frac{[\text{GLY}]}{K_{\text{mGLY}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (263)$$

Table 528: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.093	dimensionless	✓
Vmax		0000324	0.931	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.300	mmol · l ⁻¹	✓
Km0767		0000322	0.100	mmol · l ⁻¹	✓
KmGLY		0000323	0.150	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

6.132 Reaction r_0491

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

Name glycerol-3-phosphate dehydrogenase (NAD)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 529: Properties of each reactant.

Id	Name	SBO
DHAP	dihydroxyacetone phosphate	
NADH	NADH	

Modifiers

Table 530: Properties of each modifier.

Id	Name	SBO
e_0129	GPD1	0000460
e_0827	GPD2	0000460
DHAP	dihydroxyacetone phosphate	
NADH	NADH	
s_0767	glycerol 3-phosphate	
NAD	NAD	

Products

Table 531: Properties of each product.

Id	Name	SBO
s_0767	glycerol 3-phosphate	
NAD	NAD	

Kinetic Law

Derived unit contains undeclared units

$$v_{132} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{DHAP}] \cdot [\text{NADH}] - \frac{[\text{s}_0767] \cdot [\text{NAD}]}{K_{\text{eq}}}}{K_{\text{mDHAP}} \cdot K_{\text{mNADH}}} \right)}{\left(1 + \frac{[\text{DHAP}]}{K_{\text{mDHAP}}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right) + \left(1 + \frac{[\text{s}_0767]}{K_{\text{m0767}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right) - 1} \quad (265)$$

Table 532: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.093	dimensionless	✓
Vmax		0000324	1.307	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	3.453	dimensionless	✓

Id	Name	SBO	Value	Unit	Constant
KmDHAP		0000322	1.004	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNADH		0000322	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0767		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000323	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>

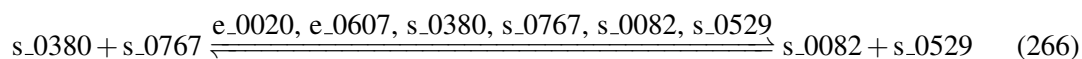
6.133 Reaction r_0495

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

Name glycerol-3-phosphate/dihydroxyacetone phosphate acyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 533: Properties of each reactant.

Id	Name	SBO
s_0380	acyl-CoA	
s_0767	glycerol 3-phosphate	

Modifiers

Table 534: Properties of each modifier.

Id	Name	SBO
e_0020	SCT1	0000460
e_0607	GPT2	0000460
s_0380	acyl-CoA	
s_0767	glycerol 3-phosphate	
s_0082	1-acyl-sn-glycerol 3-phosphate	
s_0529	coenzyme A	

Products

Table 535: Properties of each product.

Id	Name	SBO
s_0082	1-acyl-sn-glycerol 3-phosphate	
s_0529	coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{133} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0380] \cdot [s_0767] - \frac{[s_0082] \cdot [s_0529]}{K_{\text{eq}}}}{K_{\text{m0380}} \cdot K_{\text{m0767}}} \right)}{\left(1 + \frac{[s_0380]}{K_{\text{m0380}}} \right) \cdot \left(1 + \frac{[s_0767]}{K_{\text{m0767}}} \right) + \left(1 + \frac{[s_0082]}{K_{\text{m0082}}} \right) \cdot \left(1 + \frac{[s_0529]}{K_{\text{m0529}}} \right) - 1} \quad (267)$$

Table 536: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.72166486160745 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0380		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0767		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0082		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

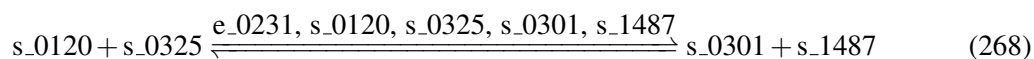
6.134 Reaction r_0499

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

Name glycinamide ribotide transformylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 537: Properties of each reactant.

Id	Name	SBO
s_0120	10-formyl-THF	
s_0325	5-phospho-ribosyl-glycineamide	

Modifiers

Table 538: Properties of each modifier.

Id	Name	SBO
e_0231	ADE8	0000460
s_0120	10-formyl-THF	
s_0325	5-phospho-ribosyl-glycineamide	
s_0301	5'-phosphoribosyl-N-formylglycineamide	
s_1487	THF	

Products

Table 539: Properties of each product.

Id	Name	SBO
s_0301	5'-phosphoribosyl-N-formylglycineamide	
s_1487	THF	

Kinetic Law

Derived unit contains undeclared units

$$v_{134} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0120}] \cdot [s_{0325}] - \frac{[s_{0301}] \cdot [s_{1487}]}{K_{\text{eq}}}}{K_{\text{m0120}} \cdot K_{\text{m0325}}} \right)}{\left(1 + \frac{[s_{0120}]}{K_{\text{m0120}}} \right) \cdot \left(1 + \frac{[s_{0325}]}{K_{\text{m0325}}} \right) + \left(1 + \frac{[s_{0301}]}{K_{\text{m0301}}} \right) \cdot \left(1 + \frac{[s_{1487}]}{K_{\text{m1487}}} \right) - 1} \quad (269)$$

Table 540: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.060	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0120		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km0325		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0301		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1487		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

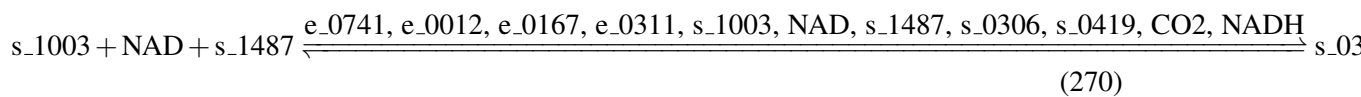
6.135 Reaction r_0501

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

Name glycine cleavage system

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 541: Properties of each reactant.

Id	Name	SBO
s_1003	L-glycine	
NAD	NAD	
s_1487	THF	

Modifiers

Table 542: Properties of each modifier.

Id	Name	SBO
e_0741	GCV2	0000460
e_0012	GCV3	0000460
e_0167	GCV1	0000460
e_0311	LPD1	0000460
s_1003	L-glycine	
NAD	NAD	
s_1487	THF	
s_0306	5,10-methylenetetrahydrofolate	
s_0419	ammonium	

Id	Name	SBO
C02	carbon dioxide	
NADH	NADH	

Products

Table 543: Properties of each product.

Id	Name	SBO
s_0306	5,10-methylenetetrahydrofolate	
s_0419	ammonium	
C02	carbon dioxide	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{135} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1003}] \cdot [NAD] \cdot [s_{1487}] - \frac{[s_{0306}] \cdot [s_{0419}] \cdot [CO_2] \cdot [NADH]}{K_{eq}}}{K_{m1003} \cdot K_{mNAD} \cdot K_{m1487}} \right)}{\left(1 + \frac{[s_{1003}]}{K_{m1003}} \right) \cdot \left(1 + \frac{[NAD]}{K_{mNAD}} \right) \cdot \left(1 + \frac{[s_{1487}]}{K_{m1487}} \right) + \left(1 + \frac{[s_{0306}]}{K_{m0306}} \right) \cdot \left(1 + \frac{[s_{0419}]}{K_{m0419}} \right) \cdot \left(1 + \frac{[CO_2]}{K_{mCO_2}} \right) \cdot \left(1 + \frac{[NADH]}{K_{mNADH}} \right)}$$

Table 544: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.024	dimensionless	✓
Vmax		0000324	1.086	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.115	mmol · l ⁻¹	✓
Km1003		0000322	0.100	mmol · l ⁻¹	✓
KmNAD		0000322	1.503	mmol · l ⁻¹	✓
Km1487		0000322	0.100	mmol · l ⁻¹	✓
Km0306		0000323	0.100	mmol · l ⁻¹	✓
Km0419		0000323	0.100	mmol · l ⁻¹	✓
KmCO2		0000323	1.000	mmol · l ⁻¹	✓
KmNADH		0000323	0.087	mmol · l ⁻¹	✓

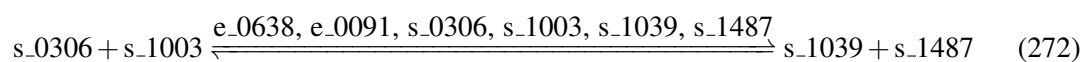
6.136 Reaction r_0502

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

Name glycine hydroxymethyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 545: Properties of each reactant.

Id	Name	SBO
s_0306	5,10-methylenetetrahydrofolate	
s_1003	L-glycine	

Modifiers

Table 546: Properties of each modifier.

Id	Name	SBO
e_0638	SHM2	0000460
e_0091	SHM1	0000460
s_0306	5,10-methylenetetrahydrofolate	
s_1003	L-glycine	
s_1039	L-serine	
s_1487	THF	

Products

Table 547: Properties of each product.

Id	Name	SBO
s_1039	L-serine	
s_1487	THF	

Kinetic Law

Derived unit contains undeclared units

$$v_{136} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0306] \cdot [s_1003] - \frac{[s_1039] \cdot [s_1487]}{K_{\text{eq}}}}{K_{\text{m0306}} \cdot K_{\text{m1003}}} \right)}{\left(1 + \frac{[s_0306]}{K_{\text{m0306}}} \right) \cdot \left(1 + \frac{[s_1003]}{K_{\text{m1003}}} \right) + \left(1 + \frac{[s_1039]}{K_{\text{m1039}}} \right) \cdot \left(1 + \frac{[s_1487]}{K_{\text{m1487}}} \right) - 1} \quad (273)$$

Table 548: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.010	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.135	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0306		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1003		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1039		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1487		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

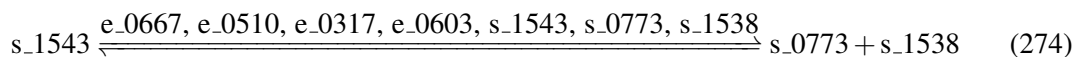
6.137 Reaction r_0510

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

Name glycogen (starch) synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 549: Properties of each reactant.

Id	Name	SBO
s_1543	UDP-D-glucose	

Modifiers

Table 550: Properties of each modifier.

Id	Name	SBO
e_0667	GSY2	0000460
e_0510	GLG2	0000460

Id	Name	SBO
e_0317	GSY1	0000460
e_0603	GLG1	0000460
s_1543	UDP-D-glucose	
s_0773	glycogen	
s_1538	UDP	

Products

Table 551: Properties of each product.

Id	Name	SBO
s_0773	glycogen	
s_1538	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{137} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1543}] - \frac{[s_{0773}] \cdot [s_{1538}]}{K_{\text{eq}}}}{K_{m1543}} \right)}{1 + \frac{[s_{1543}]}{K_{m1543}} + \left(1 + \frac{[s_{0773}]}{K_{m0773}} \right) \cdot \left(1 + \frac{[s_{1538}]}{K_{m1538}} \right) - 1} \quad (275)$$

Table 552: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.022	dimensionless	✓
Vmax		0000324	0.223	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km1543		0000322	0.100	mmol · l ⁻¹	✓
Km0773		0000323	0.100	mmol · l ⁻¹	✓
Km1538		0000323	0.100	mmol · l ⁻¹	✓

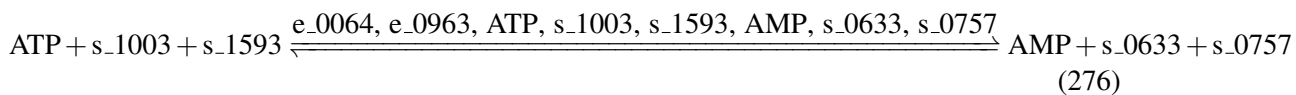
6.138 Reaction r_0512

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

Name glycyI-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 553: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1003	L-glycine	
s_1593	tRNA(Gly)	

Modifiers

Table 554: Properties of each modifier.

Id	Name	SBO
e_0064	GRS1	0000460
e_0963	GRS2	0000460
ATP	ATP	
s_1003	L-glycine	
s_1593	tRNA(Gly)	
AMP	AMP	
s_0633	diphosphate	
s_0757	Gly-tRNA(Gly)	

Products

Table 555: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_0757	Gly-tRNA(Gly)	

Kinetic Law

Derived unit contains undeclared units

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1003}] \cdot [\text{s}_{1593}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{0757}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1003}} \cdot K_{\text{m1593}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1003}]}{K_{\text{m1003}}} \right) \cdot \left(1 + \frac{[\text{s}_{1593}]}{K_{\text{m1593}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{0757}]}{K_{\text{m0757}}} \right) - 1}$$

Table 556: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	✓
V _{max}		0000324	0.375	mmol · l ⁻¹ · s ⁻¹	✓
K _{eq}		0000281	0.232	dimensionless	✓
K _{mATP}		0000322	2.525	mmol · l ⁻¹	✓
K _{m1003}		0000322	0.100	mmol · l ⁻¹	✓
K _{m1593}		0000322	0.100	mmol · l ⁻¹	✓
K _{mAMP}		0000323	0.293	mmol · l ⁻¹	✓
K _{m0633}		0000323	0.100	mmol · l ⁻¹	✓
K _{m0757}		0000323	0.100	mmol · l ⁻¹	✓

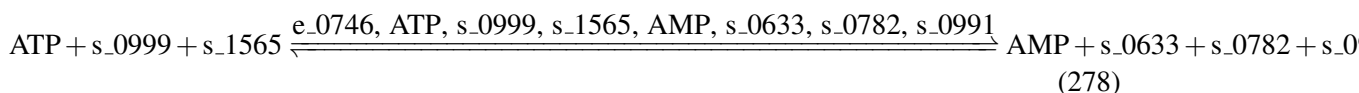
6.139 Reaction r_0514

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 557: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s ₀₉₉₉	L-glutamine	
s ₁₅₆₅	xanthosine-5-phosphate	

Modifiers

Table 558: Properties of each modifier.

Id	Name	SBO
e_0746	GUA1	0000460
ATP	ATP	
s_0999	L-glutamine	
s_1565	xanthosine-5-phosphate	
AMP	AMP	
s_0633	diphosphate	
s_0782	GMP	
s_0991	L-glutamate	

Products

Table 559: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_0782	GMP	
s_0991	L-glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{139} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{0999}] \cdot [\text{s}_{1565}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{0782}] \cdot [\text{s}_{0991}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0999}} \cdot K_{\text{m1565}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0999}]}{K_{\text{m0999}}} \right) \cdot \left(1 + \frac{[\text{s}_{1565}]}{K_{\text{m1565}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{0782}]}{K_{\text{m0782}}} \right) \cdot \left(1 + \frac{[\text{s}_{0991}]}{K_{\text{m0991}}} \right)}$$

(279)

Table 560: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.098	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.023	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0999		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km1565		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmAMP		0000323	0.293	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0782		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0991		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

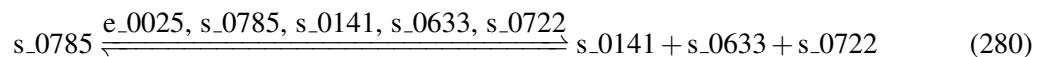
6.140 Reaction r_0525

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

Name GTP cyclohydrolase II

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 561: Properties of each reactant.

Id	Name	SBO
s_0785	GTP	

Modifiers

Table 562: Properties of each modifier.

Id	Name	SBO
e_0025	RIB1	0000460
s_0785	GTP	
s_0141	2,5-diamino-4-hydroxy-6-(5-phosphoribosylamino)pyrimidine	
s_0633	diphosphate	
s_0722	formate	

Products

Table 563: Properties of each product.

Id	Name	SBO
s_0141	2,5-diamino-4-hydroxy-6-(5-phosphoribosylamino)pyrimidine	
s_0633	diphosphate	
s_0722	formate	

Kinetic Law

Derived unit contains undeclared units

$$v_{140} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0785}] - \frac{[s_{0141}] \cdot [s_{0633}] \cdot [s_{0722}]}{K_{\text{eq}}}}{K_{m0785}} \right)}{1 + \frac{[s_{0785}]}{K_{m0785}} + \left(1 + \frac{[s_{0141}]}{K_{m0141}} \right) \cdot \left(1 + \frac{[s_{0633}]}{K_{m0633}} \right) \cdot \left(1 + \frac{[s_{0722}]}{K_{m0722}} \right) - 1} \quad (281)$$

Table 564: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.25595995293758 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$7.66072791528529 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.020	$\text{mmol}^2 \cdot \text{l}^{-2}$	✓
Km0785		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0141		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0722		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

6.141 Reaction r_0528

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

Name guanylate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 565: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0782	GMP	

Modifiers

Table 566: Properties of each modifier.

Id	Name	SBO
e_0234	GUK1	0000460
ATP	ATP	
s_0782	GMP	
ADP	ADP	
s_0739	GDP	

Products

Table 567: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_0739	GDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{141} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0782] - \frac{[\text{ADP}] \cdot [\text{s}_0739]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0782}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0782]}{K_{\text{m0782}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_0739]}{K_{\text{m0739}}} \right) - 1} \quad (283)$$

Table 568: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.2867193132727 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	1.015	dimensionless	✓
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓

Id	Name	SBO	Value	Unit	Constant
Km0782		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0739		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

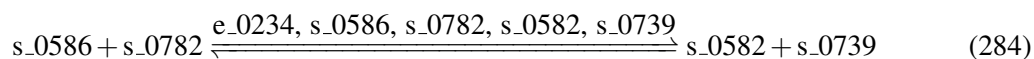
6.142 Reaction r_0529

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

Name guanylate kinase (GMP:dATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 569: Properties of each reactant.

Id	Name	SBO
s_0586	dATP	
s_0782	GMP	

Modifiers

Table 570: Properties of each modifier.

Id	Name	SBO
e_0234	GUK1	0000460
s_0586	dATP	
s_0782	GMP	
s_0582	dADP	
s_0739	GDP	

Products

Table 571: Properties of each product.

Id	Name	SBO
s_0582	dADP	
s_0739	GDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{142} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0586] \cdot [s_0782] - \frac{[s_0582] \cdot [s_0739]}{K_{\text{eq}}}}{K_{\text{m0586}} \cdot K_{\text{m0782}}} \right)}{\left(1 + \frac{[s_0586]}{K_{\text{m0586}}} \right) \cdot \left(1 + \frac{[s_0782]}{K_{\text{m0782}}} \right) + \left(1 + \frac{[s_0582]}{K_{\text{m0582}}} \right) \cdot \left(1 + \frac{[s_0739]}{K_{\text{m0739}}} \right) - 1} \quad (285)$$

Table 572: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.28671814146884 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0586		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0782		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0582		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0739		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

6.143 Reaction HXK

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

Name hexokinase (D-glucose:ATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 573: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
GLC	D-glucose	

Modifiers

Table 574: Properties of each modifier.

Id	Name	SBO
e_0106	GLK1	0000460
e_0325	H XK1	0000460
e_0355	H XK2	0000460
GLC	D-glucose	
ATP	ATP	
G6P	D-glucose 6-phosphate	
ADP	ADP	

Products

Table 575: Properties of each product.

Id	Name	SBO
ADP	ADP	
G6P	D-glucose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{143} = \text{vol}(\text{cell}) \cdot \frac{V_{\max} \cdot \left(\frac{[\text{GLC}] \cdot [\text{ATP}]}{K_{\text{glc}} \cdot K_{\text{atp}}} - \frac{[\text{G6P}] \cdot [\text{ADP}]}{K_{\text{glc}} \cdot K_{\text{atp}} \cdot K_{\text{eq}}} \right)}{\left(1 + \frac{[\text{GLC}]}{K_{\text{glc}}} + \frac{[\text{G6P}]}{K_{\text{g6p}}} \right) \cdot \left(1 + \frac{[\text{ATP}]}{K_{\text{atp}}} + \frac{[\text{ADP}]}{K_{\text{adp}}} \right)} \quad (287)$$

Table 576: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			3.945	mmol · l ⁻¹ · s ⁻¹	✓
Kglc			0.080	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Katp			0.150	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Keq			2000.000	dimensionless	<input checked="" type="checkbox"/>
Kg6p			30.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Kadp			0.230	mmol · l ⁻¹	<input checked="" type="checkbox"/>
FLUX_VALUE			1.489	dimensionless	<input checked="" type="checkbox"/>

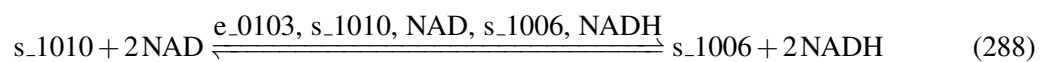
6.144 Reaction r_0536

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 577: Properties of each reactant.

Id	Name	SBO
s_1010	L-histidinol	
NAD	NAD	

Modifiers

Table 578: Properties of each modifier.

Id	Name	SBO
e_0103	HIS4	0000460
s_1010	L-histidinol	
NAD	NAD	
s_1006	L-histidine	
NADH	NADH	

Products

Table 579: Properties of each product.

Id	Name	SBO
s_1006	L-histidine	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{144} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{s}_{1010}] \cdot [\text{NAD}]^2 - \frac{[\text{s}_{1006}] \cdot [\text{NADH}]^2}{K_{\text{eq}}}}{K_{\text{m1010}} \cdot K_{\text{mNAD}}^2} \right)}{\left(1 + \frac{[\text{s}_{1010}]}{K_{\text{m1010}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right)^2 + \left(1 + \frac{[\text{s}_{1006}]}{K_{\text{m1006}}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right)^2} - 1 \quad (289)$$

Table 580: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.086	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.007	dimensionless	✓
Km1010		0000322	0.100	mmol · l ⁻¹	✓
KmNAD		0000322	1.503	mmol · l ⁻¹	✓
Km1006		0000323	0.100	mmol · l ⁻¹	✓
KmNADH		0000323	0.087	mmol · l ⁻¹	✓

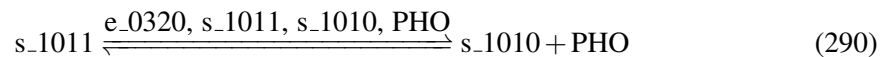
6.145 Reaction r_0537

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 581: Properties of each reactant.

Id	Name	SBO
s_1011	L-histidinol phosphate	

Modifiers

Table 582: Properties of each modifier.

Id	Name	SBO
e_0320	HIS2	0000460
s_1011	L-histidinol phosphate	
s_1010	L-histidinol	
PHO	phosphate	

Products

Table 583: Properties of each product.

Id	Name	SBO
s_1010	L-histidinol	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{145} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{1011}] - \frac{[s_{1010}] \cdot [\text{PHO}]}{K_{\text{eq}}} \right)}{1 + \frac{[s_{1011}]}{K_{m1011}} + \left(1 + \frac{[s_{1010}]}{K_{m1010}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}} \right) - 1} \quad (291)$$

Table 584: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.029	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km1011		0000322	0.100	mmol · l ⁻¹	✓
Km1010		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

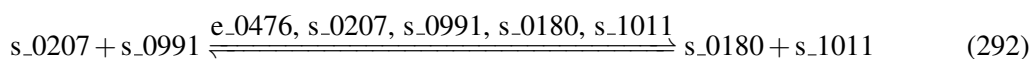
6.146 Reaction r_0538

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 585: Properties of each reactant.

Id	Name	SBO
s_0207	3-(imidazol-4-yl)-2-oxopropyl dihydrogen phosphate	
s_0991	L-glutamate	

Modifiers

Table 586: Properties of each modifier.

Id	Name	SBO
e_0476	HIS5	0000460
s_0207	3-(imidazol-4-yl)-2-oxopropyl dihydrogen phosphate	
s_0991	L-glutamate	
s_0180	2-oxoglutarate	
s_1011	L-histidinol phosphate	

Products

Table 587: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1011	L-histidinol phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{146} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0207] \cdot [s_0991] - \frac{[s_0180] \cdot [s_1011]}{K_{\text{eq}}}}{K_{\text{m0207}} \cdot K_{\text{m0991}}} \right)}{\left(1 + \frac{[s_0207]}{K_{\text{m0207}}} \right) \cdot \left(1 + \frac{[s_0991]}{K_{\text{m0991}}} \right) + \left(1 + \frac{[s_0180]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_1011]}{K_{\text{m1011}}} \right) - 1} \quad (293)$$

Table 588: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.040	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0207		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0991		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1011		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

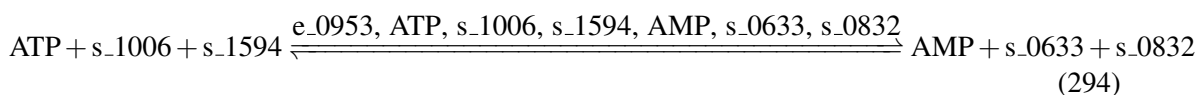
6.147 Reaction r_0539

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

Name histidyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 589: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1006	L-histidine	
s_1594	tRNA(His)	

Modifiers

Table 590: Properties of each modifier.

Id	Name	SBO
e_0953	HTS1	0000460
ATP	ATP	
s_1006	L-histidine	
s_1594	tRNA(His)	
AMP	AMP	
s_0633	diphosphate	
s_0832	His-tRNA(His)	

Products

Table 591: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_0832	His-tRNA(His)	

Kinetic Law

Derived unit contains undeclared units

$$v_{147} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1006] \cdot [\text{s}_1594] - \frac{[\text{AMP}] \cdot [\text{s}_0633] \cdot [\text{s}_0832]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1006}} \cdot K_{\text{m1594}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1006]}{K_{\text{m1006}}} \right) \cdot \left(1 + \frac{[\text{s}_1594]}{K_{\text{m1594}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_0832]}{K_{\text{m0832}}} \right) - 1} \quad (295)$$

Table 592: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.086	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1006		0000322	0.100	mmol · l ⁻¹	✓
Km1594		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km0832		0000323	0.100	mmol · l ⁻¹	✓

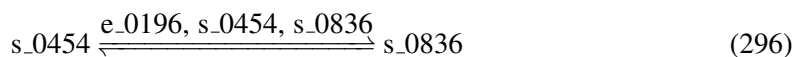
6.148 Reaction r_0542

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

Name homoacontinate hydratase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 593: Properties of each reactant.

Id	Name	SBO
s_0454	but-1-ene-1,2,4-tricarboxylic acid	

Modifiers

Table 594: Properties of each modifier.

Id	Name	SBO
e_0196	LYS4	0000460
s_0454	but-1-ene-1,2,4-tricarboxylic acid	
s_0836	homoisocitrate	

Product

Table 595: Properties of each product.

Id	Name	SBO
s_0836	homoisocitrate	

Kinetic Law

Derived unit contains undeclared units

$$v_{148} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0454]}{K_{\text{eq}}} - \frac{[s_0836]}{K_{\text{eq}}} \right)}{1 + \frac{[s_0454]}{K_{m0454}} + 1 + \frac{[s_0836]}{K_{m0836}} - 1} \quad (297)$$

Table 596: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.074	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0454		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0836		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

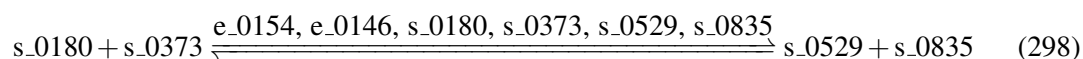
6.149 Reaction r_0543

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

Name homocitrate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 597: Properties of each reactant.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_0373	acetyl-CoA	

Modifiers

Table 598: Properties of each modifier.

Id	Name	SBO
e_0154	LYS20	0000460
e_0146	LYS21	0000460
s_0180	2-oxoglutarate	
s_0373	acetyl-CoA	
s_0529	coenzyme A	
s_0835	homocitrate	

Products

Table 599: Properties of each product.

Id	Name	SBO
s_0529	coenzyme A	
s_0835	homocitrate	

Kinetic Law

Derived unit contains undeclared units

$$v_{149} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0180}] \cdot [s_{0373}] - \frac{[s_{0529}] \cdot [s_{0835}]}{K_{eq}}}{K_{m0180} \cdot K_{m0373}} \right)}{\left(1 + \frac{[s_{0180}]}{K_{m0180}} \right) \cdot \left(1 + \frac{[s_{0373}]}{K_{m0373}} \right) + \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) \cdot \left(1 + \frac{[s_{0835}]}{K_{m0835}} \right) - 1} \quad (299)$$

Table 600: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	✓
Vmax		0000324	0.172	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0180		0000322	0.100	mmol · l ⁻¹	✓
Km0373		0000322	0.100	mmol · l ⁻¹	✓
Km0529		0000323	0.100	mmol · l ⁻¹	✓
Km0835		0000323	0.100	mmol · l ⁻¹	✓

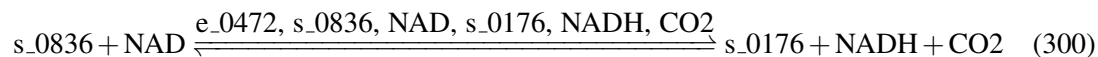
6.150 Reaction r_0545

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

Name homoisocitrate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 601: Properties of each reactant.

Id	Name	SBO
s_0836	homoisocitrate	
NAD	NAD	

Modifiers

Table 602: Properties of each modifier.

Id	Name	SBO
e_0472	LYS12	0000460
s_0836	homoisocitrate	
NAD	NAD	
s_0176	2-oxoadipic acid	
NADH	NADH	
CO2	carbon dioxide	

Products

Table 603: Properties of each product.

Id	Name	SBO
s_0176	2-oxoadipic acid	
NADH	NADH	
CO2	carbon dioxide	

Kinetic Law

Derived unit contains undeclared units

$$v_{150} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0836}] \cdot [NAD] - \frac{[s_{0176}] \cdot [NADH] \cdot [CO_2]}{K_{eq}}}{K_{m0836} \cdot K_{mNAD}} \right)}{\left(1 + \frac{[s_{0836}]}{K_{m0836}} \right) \cdot \left(1 + \frac{[NAD]}{K_{mNAD}} \right) + \left(1 + \frac{[s_{0176}]}{K_{m0176}} \right) \cdot \left(1 + \frac{[NADH]}{K_{mNADH}} \right) \cdot \left(1 + \frac{[CO_2]}{K_{mCO_2}} \right) - 1} \quad (301)$$

Table 604: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.271	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.115	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0836		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000322	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0176		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNADH		0000323	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>

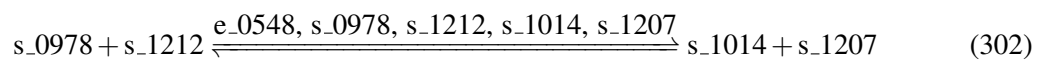
6.151 Reaction r_0547

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

Name homoserine dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 605: Properties of each reactant.

Id	Name	SBO
s_0978	L-aspartate 4-semialdehyde	
s_1212	NADPH	

Modifiers

Table 606: Properties of each modifier.

Id	Name	SBO
e_0548	HOM6	0000460
s_0978	L-aspartate 4-semialdehyde	
s_1212	NADPH	
s_1014	L-homoserine	
s_1207	NADP(+)	

Products

Table 607: Properties of each product.

Id	Name	SBO
s_1014	L-homoserine	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{151} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0978}] \cdot [s_{1212}] - \frac{[s_{1014}] \cdot [s_{1207}]}{K_{\text{eq}}}}{K_{\text{m0978}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_{0978}]}{K_{\text{m0978}}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_{1014}]}{K_{\text{m1014}}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right) - 1} \quad (303)$$

Table 608: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.036	dimensionless	✓
Vmax		0000324	0.502	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0978		0000322	0.100	mmol · l ⁻¹	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km1014		0000323	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓

6.152 Reaction r_0548

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 609: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1014	L-homoserine	

Modifiers

Table 610: Properties of each modifier.

Id	Name	SBO
e_0428	THR1	0000460
ATP	ATP	
s_1014	L-homoserine	
ADP	ADP	
s_1238	O-phospho-L-homoserine	

Products

Table 611: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_1238	O-phospho-L-homoserine	

Kinetic Law

Derived unit contains undeclared units

$$v_{152} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1014] - \frac{[\text{ADP}] \cdot [\text{s}_1238]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1014}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1014]}{K_{\text{m1014}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_1238]}{K_{\text{m1238}}} \right) - 1} \quad (305)$$

Table 612: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.029	dimensionless	✓
Vmax		0000324	0.412	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km1014		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1238		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

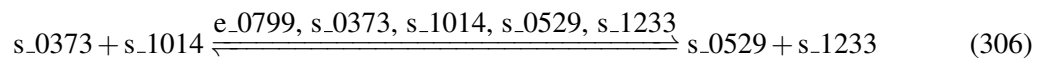
6.153 Reaction r_0549

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

Name homoserine O-trans-acetylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 613: Properties of each reactant.

Id	Name	SBO
s_0373	acetyl-CoA	
s_1014	L-homoserine	

Modifiers

Table 614: Properties of each modifier.

Id	Name	SBO
e_0799	MET2	0000460
s_0373	acetyl-CoA	
s_1014	L-homoserine	
s_0529	coenzyme A	
s_1233	O-acetyl-L-homoserine	

Products

Table 615: Properties of each product.

Id	Name	SBO
s_0529	coenzyme A	
s_1233	O-acetyl-L-homoserine	

Kinetic Law

Derived unit contains undeclared units

$$v_{153} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0373}] \cdot [s_{1014}] - \frac{[s_{0529}] \cdot [s_{1233}]}{K_{\text{eq}}}}{K_{\text{m0373}} \cdot K_{\text{m1014}}} \right)}{\left(1 + \frac{[s_{0373}]}{K_{\text{m0373}}} \right) \cdot \left(1 + \frac{[s_{1014}]}{K_{\text{m1014}}} \right) + \left(1 + \frac{[s_{0529}]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[s_{1233}]}{K_{\text{m1233}}} \right) - 1} \quad (307)$$

Table 616: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.006	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.090	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0373		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1014		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1233		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

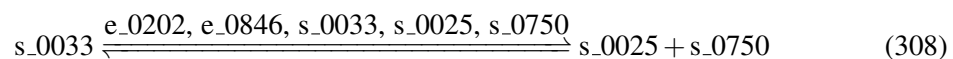
6.154 Reaction r_0553

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

Name hydroxyacylglutathione hydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 617: Properties of each reactant.

Id	Name	SBO
s_0033	(R)-S-lactoylglutathione	

Modifiers

Table 618: Properties of each modifier.

Id	Name	SBO
e_0202	GLO2	0000460
e_0846	GLO4	0000460
s_0033	(R)-S-lactoylglutathione	
s_0025	(R)-lactate	
s_0750	glutathione	

Products

Table 619: Properties of each product.

Id	Name	SBO
s_0025	(R)-lactate	
s_0750	glutathione	

Kinetic Law

Derived unit contains undeclared units

$$v_{154} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0033}] - \frac{[s_{0025}] \cdot [s_{0750}]}{K_{\text{eq}}}}{K_{m0033}} \right)}{1 + \frac{[s_{0033}]}{K_{m0033}} + \left(1 + \frac{[s_{0025}]}{K_{m0025}} \right) \cdot \left(1 + \frac{[s_{0750}]}{K_{m0750}} \right) - 1} \quad (309)$$

Table 620: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.165	dimensionless	✓
Vmax		0000324	1.647	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0033		0000322	0.100	mmol · l ⁻¹	✓
Km0025		0000323	0.100	mmol · l ⁻¹	✓
Km0750		0000323	0.100	mmol · l ⁻¹	✓

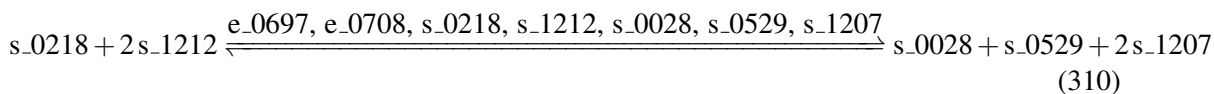
6.155 Reaction r_0558

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

Name hydroxymethylglutaryl CoA reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 621: Properties of each reactant.

Id	Name	SBO
s_0218	3-hydroxy-3-methylglutaryl-CoA	
s_1212	NADPH	

Modifiers

Table 622: Properties of each modifier.

Id	Name	SBO
e_0697	HMG2	0000460
e_0708	HMG1	0000460
s_0218	3-hydroxy-3-methylglutaryl-CoA	
s_1212	NADPH	
s_0028	(R)-mevalonate	
s_0529	coenzyme A	
s_1207	NADP(+)	

Products

Table 623: Properties of each product.

Id	Name	SBO
s_0028	(R)-mevalonate	
s_0529	coenzyme A	

Id	Name	SBO
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{155} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0218}] \cdot [s_{1212}]^2 - \frac{[s_{0028}] \cdot [s_{0529}] \cdot [s_{1207}]^2}{K_{\text{eq}}}}{K_{\text{m0218}} \cdot K_{\text{m1212}}^2} \right)}{\left(1 + \frac{[s_{0218}]}{K_{\text{m0218}}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right)^2 + \left(1 + \frac{[s_{0028}]}{K_{\text{m0028}}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{\text{m0529}}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right)^2 - 1} \quad (311)$$

Table 624: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.081	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0218		0000322	0.100	mmol · l ⁻¹	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km0028		0000323	0.100	mmol · l ⁻¹	✓
Km0529		0000323	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓

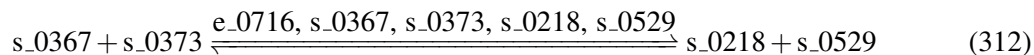
6.156 Reaction r_0559

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

Name hydroxymethylglutaryl CoA synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 625: Properties of each reactant.

Id	Name	SBO
s_0367	acetoacetyl-CoA	
s_0373	acetyl-CoA	

Modifiers

Table 626: Properties of each modifier.

Id	Name	SBO
e_0716	ERG13	0000460
s_0367	acetoacetyl-CoA	
s_0373	acetyl-CoA	
s_0218	3-hydroxy-3-methylglutaryl-CoA	
s_0529	coenzyme A	

Products

Table 627: Properties of each product.

Id	Name	SBO
s_0218	3-hydroxy-3-methylglutaryl-CoA	
s_0529	coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{156} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0367}] \cdot [s_{0373}] - \frac{[s_{0218}] \cdot [s_{0529}]}{K_{\text{eq}}}}{K_{\text{m0367}} \cdot K_{\text{m0373}}} \right)}{\left(1 + \frac{[s_{0367}]}{K_{\text{m0367}}} \right) \cdot \left(1 + \frac{[s_{0373}]}{K_{\text{m0373}}} \right) + \left(1 + \frac{[s_{0218}]}{K_{\text{m0218}}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{\text{m0529}}} \right) - 1} \quad (313)$$

Table 628: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.025	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0367		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km0373		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0218		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0529		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

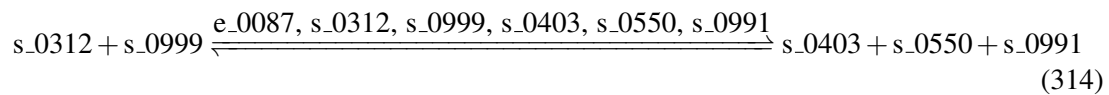
6.157 Reaction r_0563

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

Name Imidazole-glycerol-3-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 629: Properties of each reactant.

Id	Name
s_0312	5-[(5-phospho-1-deoxy-D-ribulos-1-ylamino)methylideneamino]-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide
s_0999	L-glutamine

Modifiers

Table 630: Properties of each modifier.

Id	Name
e_0087	HIS7
s_0312	5-[(5-phospho-1-deoxy-D-ribulos-1-ylamino)methylideneamino]-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide
s_0999	L-glutamine
s_0403	AICAR
s_0550	D-erythro-1-(imidazol-4-yl)glycerol 3-phosphate
s_0991	L-glutamate

Products

Table 631: Properties of each product.

Id	Name	SBO
s_0403	AICAR	
s_0550	D-erythro-1-(imidazol-4-yl)glycerol 3-phosphate	
s_0991	L-glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{157} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0312}] \cdot [s_{0999}] - \frac{[s_{0403}] \cdot [s_{0550}] \cdot [s_{0991}]}{K_{\text{eq}}}}{K_{m0312} \cdot K_{m0999}} \right)}{\left(1 + \frac{[s_{0312}]}{K_{m0312}} \right) \cdot \left(1 + \frac{[s_{0999}]}{K_{m0999}} \right) + \left(1 + \frac{[s_{0403}]}{K_{m0403}} \right) \cdot \left(1 + \frac{[s_{0550}]}{K_{m0550}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{m0991}} \right) - 1} \quad (315)$$

Table 632: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.063	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0312		0000322	0.100	mmol · l ⁻¹	✓
Km0999		0000322	0.100	mmol · l ⁻¹	✓
Km0403		0000323	0.100	mmol · l ⁻¹	✓
Km0550		0000323	0.100	mmol · l ⁻¹	✓
Km0991		0000323	0.100	mmol · l ⁻¹	✓

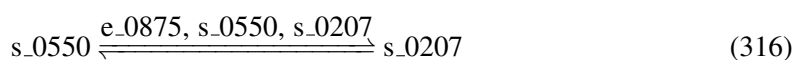
6.158 Reaction r_0564

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 633: Properties of each reactant.

Id	Name	SBO
s_0550	D-erythro-1-(imidazol-4-yl)glycerol 3-phosphate	

Modifiers

Table 634: Properties of each modifier.

Id	Name	SBO
e_0875	HIS3	0000460
s_0550	D-erythro-1-(imidazol-4-yl)glycerol 3-phosphate	
s_0207	3-(imidazol-4-yl)-2-oxopropyl dihydrogen phosphate	

Product

Table 635: Properties of each product.

Id	Name	SBO
s_0207	3-(imidazol-4-yl)-2-oxopropyl dihydrogen phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{158} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0550}]}{K_{m0550}} - \frac{[s_{0207}]}{K_{eq}} \right)}{1 + \frac{[s_{0550}]}{K_{m0550}} + 1 + \frac{[s_{0207}]}{K_{m0207}} - 1} \quad (317)$$

Table 636: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.017	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0550		0000322	0.100	mmol · l ⁻¹	✓
Km0207		0000323	0.100	mmol · l ⁻¹	✓

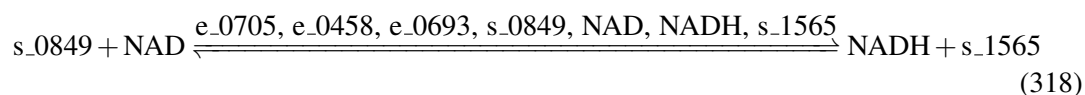
6.159 Reaction r_0565

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

Name IMP dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 637: Properties of each reactant.

Id	Name	SBO
s_0849	IMP	
NAD	NAD	

Modifiers

Table 638: Properties of each modifier.

Id	Name	SBO
e_0705	IMD4	0000460
e_0458	IMD2	0000460
e_0693	IMD3	0000460
s_0849	IMP	
NAD	NAD	
NADH	NADH	
s_1565	xanthosine-5-phosphate	

Products

Table 639: Properties of each product.

Id	Name	SBO
NADH	NADH	
s_1565	xanthosine-5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{159} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0849}] \cdot [\text{NAD}] - \frac{[\text{NADH}] \cdot [s_{1565}]}{K_{\text{eq}}}}{K_{\text{m0849}} \cdot K_{\text{mNAD}}} \right)}{\left(1 + \frac{[s_{0849}]}{K_{\text{m0849}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right) + \left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right) \cdot \left(1 + \frac{[s_{1565}]}{K_{\text{m1565}}} \right) - 1} \quad (319)$$

Table 640: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.030	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.115	dimensionless	<input checked="" type="checkbox"/>
Km0849		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000322	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNADH		0000323	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1565		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

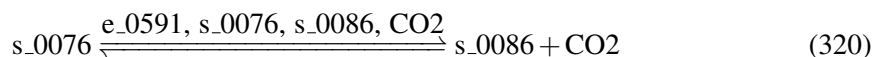
6.160 Reaction r_0566

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 641: Properties of each reactant.

Id	Name	SBO
s_0076	1-(2-carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Modifiers

Table 642: Properties of each modifier.

Id	Name	SBO
e_0591	TRP3	0000460
s_0076	1-(2-carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	
s_0086	1-C-(indol-3-yl)glycerol 3-phosphate	
C02	carbon dioxide	

Products

Table 643: Properties of each product.

Id	Name	SBO
s_0086	1-C-(indol-3-yl)glycerol 3-phosphate	
C02	carbon dioxide	

Kinetic Law

Derived unit contains undeclared units

$$v_{160} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0076] - \frac{[s_0086] \cdot [C02]}{K_{\text{eq}}}}{K_{\text{m0076}}} \right)}{1 + \frac{[s_0076]}{K_{\text{m0076}}} + \left(1 + \frac{[s_0086]}{K_{\text{m0086}}} \right) \cdot \left(1 + \frac{[C02]}{K_{\text{mC02}}} \right) - 1} \quad (321)$$

Table 644: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	✓
Vmax		0000324	0.012	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	mmol · l ⁻¹	✓
Km0076		0000322	0.100	mmol · l ⁻¹	✓
Km0086		0000323	0.100	mmol · l ⁻¹	✓
KmC02		0000323	1.000	mmol · l ⁻¹	✓

6.161 Reaction r_0568

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

Name inorganic diphosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 645: Properties of each reactant.

Id	Name	SBO
s_0633	diphosphate	

Modifiers

Table 646: Properties of each modifier.

Id	Name	SBO
e_0038	IPP1	0000460
e_0754	PPA2	0000460
s_0633	diphosphate	
PHO	phosphate	

Product

Table 647: Properties of each product.

Id	Name	SBO
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{161} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{0633}] - \frac{[\text{PHO}]^2}{K_{\text{eq}}} \right)}{K_{m0633} + \left(1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}} \right)^2 - 1}$$

(323)

Table 648: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.345	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	3.447	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

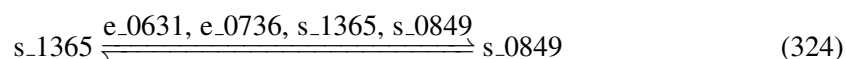
6.162 Reaction r_0570

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

Name inosine monophosphate cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 649: Properties of each reactant.

Id	Name	SBO
s_1365	phosphoribosyl-formamido-carboxamide	

Modifiers

Table 650: Properties of each modifier.

Id	Name	SBO
e_0631	ADE16	0000460
e_0736	ADE17	0000460
s_1365	phosphoribosyl-formamido-carboxamide	
s_0849	IMP	

Product

Table 651: Properties of each product.

Id	Name	SBO
s_0849	IMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{162} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1365}] - \frac{[s_{0849}]}{K_{\text{eq}}}}{K_{m1365}} \right)}{1 + \frac{[s_{1365}]}{K_{m1365}} + 1 + \frac{[s_{0849}]}{K_{m0849}} - 1} \quad (325)$$

Table 652: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.043	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km1365		0000322	0.100	mmol · l ⁻¹	✓
Km0849		0000323	0.100	mmol · l ⁻¹	✓

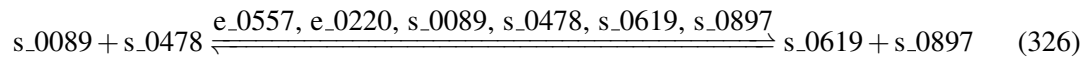
6.163 Reaction r_0591

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

Name IPC synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 653: Properties of each reactant.

Id	Name	SBO
s_0089	1-phosphatidyl-1D-myo-inositol	
s_0478	ceramide-1 (C26)	

Modifiers

Table 654: Properties of each modifier.

Id	Name	SBO
e_0557	AUR1	0000460
e_0220	KEI1	0000460
s_0089	1-phosphatidyl-1D-myo-inositol	
s_0478	ceramide-1 (C26)	
s_0619	diglyceride	
s_0897	inositol-P-ceramide A (C26)	

Products

Table 655: Properties of each product.

Id	Name	SBO
s_0619	diglyceride	
s_0897	inositol-P-ceramide A (C26)	

Kinetic Law

Derived unit contains undeclared units

$$v_{163} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0089}] \cdot [s_{0478}] - \frac{[s_{0619}] \cdot [s_{0897}]}{K_{\text{eq}}}}{K_{\text{m0089}} \cdot K_{\text{m0478}}} \right)}{\left(1 + \frac{[s_{0089}]}{K_{\text{m0089}}} \right) \cdot \left(1 + \frac{[s_{0478}]}{K_{\text{m0478}}} \right) + \left(1 + \frac{[s_{0619}]}{K_{\text{m0619}}} \right) \cdot \left(1 + \frac{[s_{0897}]}{K_{\text{m0897}}} \right) - 1} \quad (327)$$

Table 656: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.22289676445616 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$3.11205547023725 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0089		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0478		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0619		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0897		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

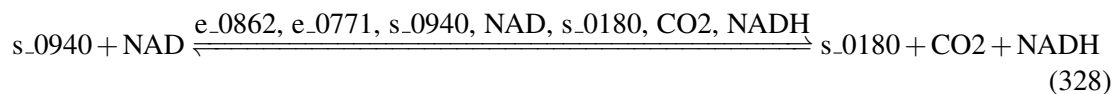
6.164 Reaction r_0658

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

Name isocitrate dehydrogenase (NAD+)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 657: Properties of each reactant.

Id	Name	SBO
s_0940	isocitrate	
NAD	NAD	

Modifiers

Table 658: Properties of each modifier.

Id	Name	SBO
e_0862	IDH2	0000460
e_0771	IDH1	0000460
s_0940	isocitrate	
NAD	NAD	
s_0180	2-oxoglutarate	
CO2	carbon dioxide	
NADH	NADH	

Products

Table 659: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
CO2	carbon dioxide	

Id	Name	SBO
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{164} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0940] \cdot [NAD] - \frac{[s_0180] \cdot [CO2] \cdot [NADH]}{K_{\text{eq}}}}{K_{\text{m0940}} \cdot K_{\text{mNAD}}} \right)}{\left(1 + \frac{[s_0940]}{K_{\text{m0940}}} \right) \cdot \left(1 + \frac{[NAD]}{K_{\text{mNAD}}} \right) + \left(1 + \frac{[s_0180]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[CO2]}{K_{\text{mCO2}}} \right) \cdot \left(1 + \frac{[NADH]}{K_{\text{mNADH}}} \right) - 1} \quad (329)$$

Table 660: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.022	dimensionless	✓
Vmax		0000324	0.482	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.115	mmol · l ⁻¹	✓
Km0940		0000322	0.100	mmol · l ⁻¹	✓
KmNAD		0000322	1.503	mmol · l ⁻¹	✓
Km0180		0000323	0.100	mmol · l ⁻¹	✓
KmCO2		0000323	1.000	mmol · l ⁻¹	✓
KmNADH		0000323	0.087	mmol · l ⁻¹	✓

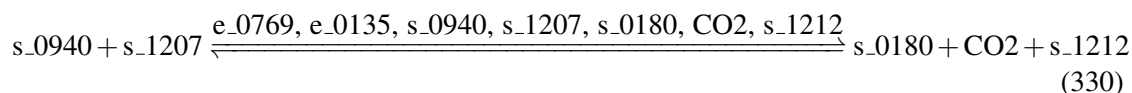
6.165 Reaction r_0661

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

Name isocitrate dehydrogenase (NADP+), peroxisomal

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 661: Properties of each reactant.

Id	Name	SBO
s_0940	isocitrate	
s_1207	NADP(+)	

Modifiers

Table 662: Properties of each modifier.

Id	Name	SBO
e_0769	IDP3	0000460
e_0135	IDP1	0000460
s_0940	isocitrate	
s_1207	NADP(+)	
s_0180	2-oxoglutarate	
C02	carbon dioxide	
s_1212	NADPH	

Products

Table 663: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
C02	carbon dioxide	
s_1212	NADPH	

Kinetic Law

Derived unit contains undeclared units

$$v_{165} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0940}] \cdot [s_{1207}] - \frac{[s_{0180}] \cdot [C02] \cdot [s_{1212}]}{K_{\text{eq}}}}{K_{m0940} \cdot K_{m1207}} \right)}{\left(1 + \frac{[s_{0940}]}{K_{m0940}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) + \left(1 + \frac{[s_{0180}]}{K_{m0180}} \right) \cdot \left(1 + \frac{[C02]}{K_{mC02}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) - 1} \quad (331)$$

Table 664: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.022	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.482	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0940		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1212		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

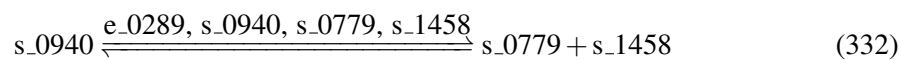
6.166 Reaction r_0662

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

Name isocitrate lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 665: Properties of each reactant.

Id	Name	SBO
s_0940	isocitrate	

Modifiers

Table 666: Properties of each modifier.

Id	Name	SBO
e_0289	ICL1	0000460
s_0940	isocitrate	
s_0779	glyoxylate	
s_1458	succinate	

Products

Table 667: Properties of each product.

Id	Name	SBO
s_0779	glyoxylate	
s_1458	succinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{166} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0940}] - \frac{[s_{0779}] \cdot [s_{1458}]}{K_{eq}}}{K_{m0940}} \right)}{1 + \frac{[s_{0940}]}{K_{m0940}} + \left(1 + \frac{[s_{0779}]}{K_{m0779}} \right) \cdot \left(1 + \frac{[s_{1458}]}{K_{m1458}} \right) - 1} \quad (333)$$

Table 668: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.033	dimensionless	✓
Vmax		0000324	0.328	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0940		0000322	0.100	mmol · l ⁻¹	✓
Km0779		0000323	0.100	mmol · l ⁻¹	✓
Km1458		0000323	0.100	mmol · l ⁻¹	✓

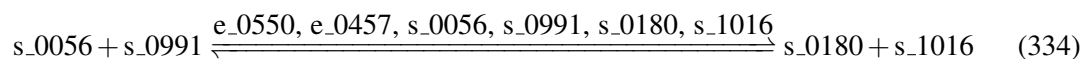
6.167 Reaction r_0663

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

Name isoleucine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 669: Properties of each reactant.

Id	Name	SBO
s_0056	(S)-3-methyl-2-oxopentanoate	
s_0991	L-glutamate	

Modifiers

Table 670: Properties of each modifier.

Id	Name	SBO
e_0550	BAT2	0000460
e_0457	BAT1	0000460
s_0056	(S)-3-methyl-2-oxopentanoate	
s_0991	L-glutamate	
s_0180	2-oxoglutarate	
s_1016	L-isoleucine	

Products

Table 671: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1016	L-isoleucine	

Kinetic Law

Derived unit contains undeclared units

$$v_{167} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0056}] \cdot [s_{0991}] - \frac{[s_{0180}] \cdot [s_{1016}]}{K_{\text{eq}}}}{K_{\text{m0056}} \cdot K_{\text{m0991}}} \right)}{\left(1 + \frac{[s_{0056}]}{K_{\text{m0056}}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{\text{m0991}}} \right) + \left(1 + \frac{[s_{0180}]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_{1016}]}{K_{\text{m1016}}} \right) - 1} \quad (335)$$

Table 672: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	✓
Vmax		0000324	0.116	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓

Id	Name	SBO	Value	Unit	Constant
Km0056		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0991		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1016		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

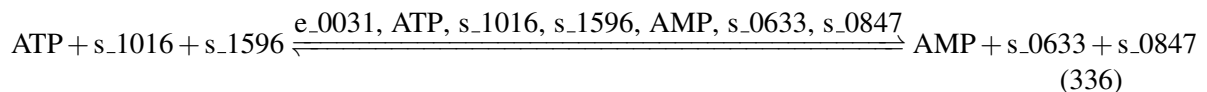
6.168 Reaction r_0665

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

Name isoleucyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 673: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1016	L-isoleucine	
s_1596	tRNA(Ile)	

Modifiers

Table 674: Properties of each modifier.

Id	Name	SBO
e_0031	ILS1	0000460
ATP	ATP	
s_1016	L-isoleucine	
s_1596	tRNA(Ile)	
AMP	AMP	
s_0633	diphosphate	
s_0847	Ile-tRNA(Ile)	

Products

Table 675: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_0847	Ile-tRNA(Ile)	

Kinetic Law

Derived unit contains undeclared units

$$v_{168} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([\text{ATP}] \cdot [s_{1016}] \cdot [s_{1596}] - \frac{[\text{AMP}] \cdot [s_{0633}] \cdot [s_{0847}]}{K_{\text{eq}}} \right)}{K_{\text{mATP}} \cdot K_{\text{m1016}} \cdot K_{\text{m1596}} + \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[s_{1016}]}{K_{\text{m1016}}} \right) \cdot \left(1 + \frac{[s_{1596}]}{K_{\text{m1596}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[s_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[s_{0847}]}{K_{\text{m0847}}} \right) - 1} \quad (337)$$

Table 676: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	✓
Vmax		0000324	0.249	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1016		0000322	0.100	mmol · l ⁻¹	✓
Km1596		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km0847		0000323	0.100	mmol · l ⁻¹	✓

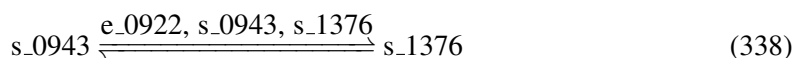
6.169 Reaction r_0667

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

Name isopentenyl-diphosphate D-isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 677: Properties of each reactant.

Id	Name	SBO
s_0943	isopentenyl diphosphate	

Modifiers

Table 678: Properties of each modifier.

Id	Name	SBO
e_0922	IDI1	0000460
s_0943	isopentenyl diphosphate	
s_1376	prenyl diphosphate	

Product

Table 679: Properties of each product.

Id	Name	SBO
s_1376	prenyl diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{169} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0943}] - \frac{[s_{1376}]}{K_{\text{eq}}}}{K_{m0943}} \right)}{1 + \frac{[s_{0943}]}{K_{m0943}} + 1 + \frac{[s_{1376}]}{K_{m1376}} - 1} \quad (339)$$

Table 680: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$5.88956076077212 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.004	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0943		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1376		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

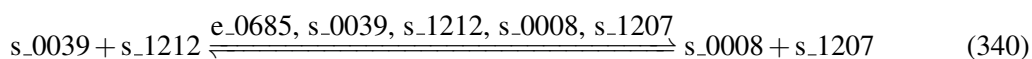
6.170 Reaction r_0669

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

Name ketol-acid reductoisomerase (2-aceto-2-hydroxybutanoate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 681: Properties of each reactant.

Id	Name	SBO
s_0039	(S)-2-acetyl-2-hydroxybutanoate	
s_1212	NADPH	

Modifiers

Table 682: Properties of each modifier.

Id	Name	SBO
e_0685	ILV5	0000460
s_0039	(S)-2-acetyl-2-hydroxybutanoate	
s_1212	NADPH	
s_0008	(2R,3R)-2,3-dihydroxy-3-methylpentanoate	
s_1207	NADP(+)	

Products

Table 683: Properties of each product.

Id	Name	SBO
s_0008	(2R,3R)-2,3-dihydroxy-3-methylpentanoate	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{170} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0039] \cdot [s_1212] - \frac{[s_0008] \cdot [s_1207]}{K_{\text{eq}}}}{K_{\text{m0039}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_0039]}{K_{\text{m0039}}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_0008]}{K_{\text{m0008}}} \right) \cdot \left(1 + \frac{[s_1207]}{K_{\text{m1207}}} \right) - 1} \quad (341)$$

Table 684: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.116	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0039		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0008		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

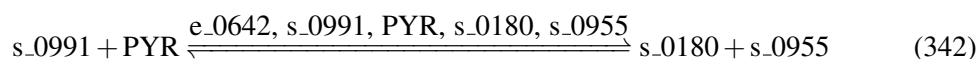
6.171 Reaction r_0674

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

Name L-alanine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 685: Properties of each reactant.

Id	Name	SBO
s_0991	L-glutamate	
PYR	pyruvate	

Modifiers

Table 686: Properties of each modifier.

Id	Name	SBO
e_0642	ALT1	0000460

Id	Name	SBO
s_0991	L-glutamate	
PYR	pyruvate	
s_0180	2-oxoglutarate	
s_0955	L-alanine	

Products

Table 687: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_0955	L-alanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{171} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0991}] \cdot [\text{PYR}] - \frac{[s_{0180}] \cdot [s_{0955}]}{K_{\text{eq}}}}{K_{\text{m0991}} \cdot K_{\text{mPYR}}} \right)}{\left(1 + \frac{[s_{0991}]}{K_{\text{m0991}}} \right) \cdot \left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right) + \left(1 + \frac{[s_{0180}]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_{0955}]}{K_{\text{m0955}}} \right) - 1} \quad (343)$$

Table 688: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.053	dimensionless	✓
Vmax		0000324	0.736	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.110	dimensionless	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓
KmPYR		0000322	1.815	mmol · l ⁻¹	✓
Km0180		0000323	0.100	mmol · l ⁻¹	✓
Km0955		0000323	0.100	mmol · l ⁻¹	✓

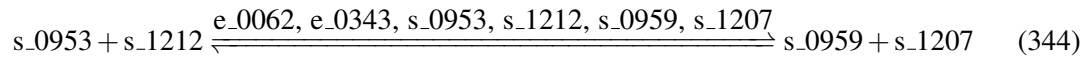
6.172 Reaction r_0678

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

Name L-aminoadipate-semialdehyde dehydrogenase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 689: Properties of each reactant.

Id	Name	SBO
s_0953	L-2-aminoadipate	
s_1212	NADPH	

Modifiers

Table 690: Properties of each modifier.

Id	Name	SBO
e_0062	LYS2	0000460
e_0343	LYS5	0000460
s_0953	L-2-aminoadipate	
s_1212	NADPH	
s_0959	L-allysine	
s_1207	NADP(+)	

Products

Table 691: Properties of each product.

Id	Name	SBO
s_0959	L-allysine	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{172} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0953] \cdot [s_1212] - \frac{[s_0959] \cdot [s_1207]}{K_{\text{eq}}}}{K_{\text{m0953}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_0953]}{K_{\text{m0953}}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_0959]}{K_{\text{m0959}}} \right) \cdot \left(1 + \frac{[s_1207]}{K_{\text{m1207}}} \right) - 1} \quad (345)$$

Table 692: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.172	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0953		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0959		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

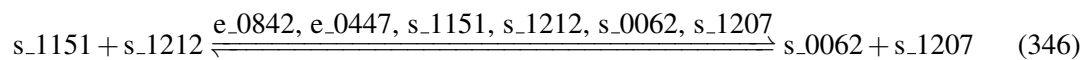
6.173 Reaction r_0688

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

Name L-lactaldehyde:NADP+ 1-oxidoreductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 693: Properties of each reactant.

Id	Name	SBO
s_1151	methylglyoxal	
s_1212	NADPH	

Modifiers

Table 694: Properties of each modifier.

Id	Name	SBO
e_0842	GRE2	0000460
e_0447	GRE3	0000460
s_1151	methylglyoxal	
s_1212	NADPH	
s_0062	(S)-lactaldehyde	
s_1207	NADP(+)	

Products

Table 695: Properties of each product.

Id	Name	SBO
s_0062	(S)-lactaldehyde	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{173} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1151}] \cdot [s_{1212}] - \frac{[s_{0062}] \cdot [s_{1207}]}{K_{eq}}}{K_{m1151} \cdot K_{m1212}} \right)}{\left(1 + \frac{[s_{1151}]}{K_{m1151}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) + \left(1 + \frac{[s_{0062}]}{K_{m0062}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) - 1} \quad (347)$$

Table 696: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	✓
Vmax		0000324	0.715	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km1151		0000322	0.100	mmol · l ⁻¹	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km0062		0000323	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓

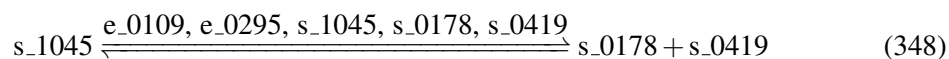
6.174 Reaction r_0692

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 697: Properties of each reactant.

Id	Name	SBO
s_1045	L-threonine	

Modifiers

Table 698: Properties of each modifier.

Id	Name	SBO
e_0109	CHA1	0000460
e_0295	ILV1	0000460
s_1045	L-threonine	
s_0178	2-oxobutanoate	
s_0419	ammonium	

Products

Table 699: Properties of each product.

Id	Name	SBO
s_0178	2-oxobutanoate	
s_0419	ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{174} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1045}] - \frac{[s_{0178}] \cdot [s_{0419}]}{K_{\text{eq}}}}{K_{m1045}} \right)}{1 + \frac{[s_{1045}]}{K_{m1045}} + \left(1 + \frac{[s_{0178}]}{K_{m0178}} \right) \cdot \left(1 + \frac{[s_{0419}]}{K_{m0419}} \right) - 1} \quad (349)$$

Table 700: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.040	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km1045		0000322	0.100	mmol · l ⁻¹	✓
Km0178		0000323	0.100	mmol · l ⁻¹	✓
Km0419		0000323	0.100	mmol · l ⁻¹	✓

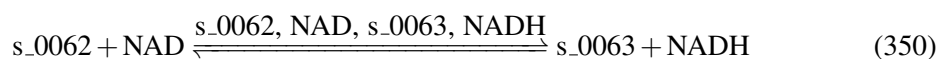
6.175 Reaction r_0696

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

Name lactaldehyde dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 701: Properties of each reactant.

Id	Name	SBO
s_0062	(S)-lactaldehyde	
NAD	NAD	

Modifiers

Table 702: Properties of each modifier.

Id	Name	SBO
s_0062	(S)-lactaldehyde	
NAD	NAD	
s_0063	(S)-lactate	
NADH	NADH	

Products

Table 703: Properties of each product.

Id	Name	SBO
s_0063	(S)-lactate	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{175} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0062] \cdot [\text{NAD}] - \frac{[\text{s}_0063] \cdot [\text{NADH}]}{K_{\text{eq}}}}{K_{\text{m0062}} \cdot K_{\text{mNAD}}} \right)}{\left(1 + \frac{[\text{s}_0062]}{K_{\text{m0062}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right) + \left(1 + \frac{[\text{s}_0063]}{K_{\text{m0063}}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right)} - 1 \quad (351)$$

Table 704: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.051	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.715	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.115	dimensionless	<input checked="" type="checkbox"/>
Km0062		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000322	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>
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KmNADH		0000323	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>

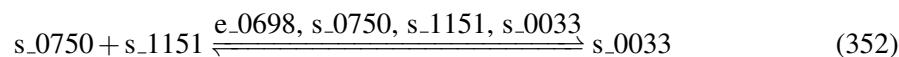
6.176 Reaction r_0697

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

Name lactoylglutathione lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 705: Properties of each reactant.

Id	Name	SBO
s_0750	glutathione	
s_1151	methyglyoxal	

Modifiers

Table 706: Properties of each modifier.

Id	Name	SBO
e_0698	GLO1	0000460

Id	Name	SBO
s_0750	glutathione	
s_1151	methylglyoxal	
s_0033	(R)-S-lactoylglutathione	

Product

Table 707: Properties of each product.

Id	Name	SBO
s_0033	(R)-S-lactoylglutathione	

Kinetic Law

Derived unit contains undeclared units

$$v_{176} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0750] \cdot [\text{s}_1151] - \frac{[\text{s}_0033]}{K_{\text{eq}}}}{K_{\text{m0750}} \cdot K_{\text{m1151}}} \right)}{\left(1 + \frac{[\text{s}_0750]}{K_{\text{m0750}}} \right) \cdot \left(1 + \frac{[\text{s}_1151]}{K_{\text{m1151}}} \right) + 1 + \frac{[\text{s}_0033]}{K_{\text{m0033}}} - 1} \quad (353)$$

Table 708: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.165	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	1.647	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	20.000	mmol ⁻¹ · l	<input checked="" type="checkbox"/>
Km0750		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1151		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0033		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

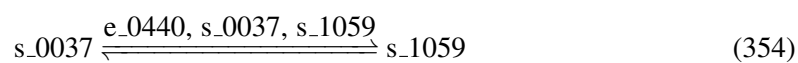
6.177 Reaction r_0698

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

Name lanosterol synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 709: Properties of each reactant.

Id	Name	SBO
s_0037	(S)-2,3-epoxysqualene	

Modifiers

Table 710: Properties of each modifier.

Id	Name	SBO
e_0440	ERG7	0000460
s_0037	(S)-2,3-epoxysqualene	
s_1059	lanosterol	

Product

Table 711: Properties of each product.

Id	Name	SBO
s_1059	lanosterol	

Kinetic Law

Derived unit contains undeclared units

$$v_{177} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0037}]}{K_{\text{eq}}} - 1 \right)}{1 + \frac{[s_{0037}]}{K_{m0037}} + 1 + \frac{[s_{1059}]}{K_{m1059}} - 1} \quad (355)$$

Table 712: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.94478036673883 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0037		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1059		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

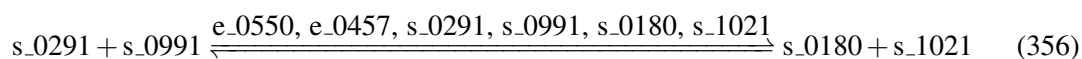
6.178 Reaction r_0699

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

Name leucine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 713: Properties of each reactant.

Id	Name	SBO
s_0291	4-methyl-2-oxopentanoate	
s_0991	L-glutamate	

Modifiers

Table 714: Properties of each modifier.

Id	Name	SBO
e_0550	BAT2	0000460
e_0457	BAT1	0000460
s_0291	4-methyl-2-oxopentanoate	
s_0991	L-glutamate	
s_0180	2-oxoglutarate	
s_1021	L-leucine	

Products

Table 715: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1021	L-leucine	

Kinetic Law

Derived unit contains undeclared units

$$v_{178} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{.0291}] \cdot [s_{.0991}] - \frac{[s_{.0180}] \cdot [s_{.1021}]}{K_{\text{eq}}}}{K_{\text{m0291}} \cdot K_{\text{m0991}}} \right)}{\left(1 + \frac{[s_{.0291}]}{K_{\text{m0291}}} \right) \cdot \left(1 + \frac{[s_{.0991}]}{K_{\text{m0991}}} \right) + \left(1 + \frac{[s_{.0180}]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_{.1021}]}{K_{\text{m1021}}} \right) - 1} \quad (357)$$

Table 716: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.178	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0291		0000322	0.100	mmol · l ⁻¹	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓
Km0180		0000323	0.100	mmol · l ⁻¹	✓
Km1021		0000323	0.100	mmol · l ⁻¹	✓

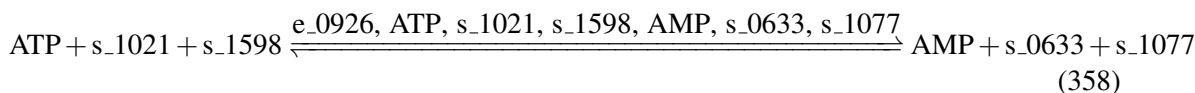
6.179 Reaction r_0701

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

Name leucyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 717: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1021	L-leucine	
s_1598	tRNA(Leu)	

Modifiers

Table 718: Properties of each modifier.

Id	Name	SBO
e_0926	CDC60	0000460
ATP	ATP	
s_1021	L-leucine	
s_1598	tRNA(Leu)	
AMP	AMP	
s_0633	diphosphate	
s_1077	Leu-tRNA(Leu)	

Products

Table 719: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1077	Leu-tRNA(Leu)	

Kinetic Law

Derived unit contains undeclared units

$$v_{179} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1021] \cdot [\text{s}_1598] - \frac{[\text{AMP}] \cdot [\text{s}_0633] \cdot [\text{s}_1077]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1021}} \cdot K_{\text{m1598}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1021]}{K_{\text{m1021}}} \right) \cdot \left(1 + \frac{[\text{s}_1598]}{K_{\text{m1598}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_1077]}{K_{\text{m1077}}} \right) - 1} \quad (359)$$

Table 720: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.382	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1021		0000322	0.100	mmol · l ⁻¹	✓
Km1598		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km0633		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1077		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

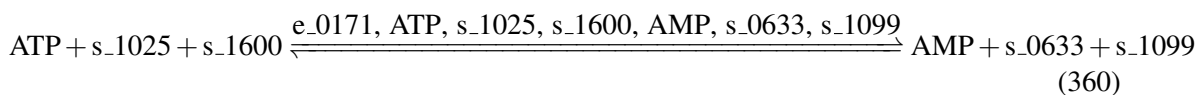
6.180 Reaction r_0711

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

Name lysyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 721: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1025	L-lysine	
s_1600	tRNA(Lys)	

Modifiers

Table 722: Properties of each modifier.

Id	Name	SBO
e_0171	KRS1	0000460
ATP	ATP	
s_1025	L-lysine	
s_1600	tRNA(Lys)	
AMP	AMP	
s_0633	diphosphate	
s_1099	Lys-tRNA(Lys)	

Products

Table 723: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1099	Lys-tRNA(Lys)	

Kinetic Law

Derived unit contains undeclared units

v_{180}

(361)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1025}] \cdot [\text{s}_{1600}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{1099}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1025}} \cdot K_{\text{m1600}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1025}]}{K_{\text{m1025}}} \right) \cdot \left(1 + \frac{[\text{s}_{1600}]}{K_{\text{m1600}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{1099}]}{K_{\text{m1099}}} \right) - 1}$$

Table 724: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	✓
Vmax		0000324	0.369	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1025		0000322	0.100	mmol · l ⁻¹	✓
Km1600		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km1099		0000323	0.100	mmol · l ⁻¹	✓

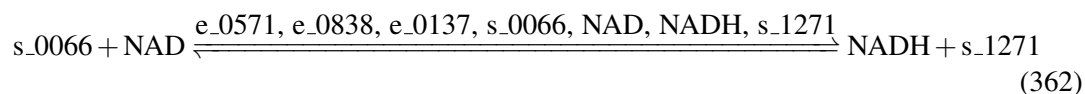
6.181 Reaction r_0713

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

Name malate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 725: Properties of each reactant.

Id	Name	SBO
s_0066	(S)-malate	
NAD	NAD	

Modifiers

Table 726: Properties of each modifier.

Id	Name	SBO
e_0571	MDH1	0000460
e_0838	MDH2	0000460
e_0137	MDH3	0000460
s_0066	(S)-malate	
NAD	NAD	
NADH	NADH	
s_1271	oxaloacetate	

Products

Table 727: Properties of each product.

Id	Name	SBO
NADH	NADH	
s_1271	oxaloacetate	

Kinetic Law

Derived unit contains undeclared units

$$v_{181} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0066] \cdot [NAD] - \frac{[NADH] \cdot [s_1271]}{K_{eq}} \right)}{K_{m0066} \cdot K_{mNAD} \cdot \left(\left(1 + \frac{[s_0066]}{K_{m0066}} \right) \cdot \left(1 + \frac{[NAD]}{K_{mNAD}} \right) + \left(1 + \frac{[NADH]}{K_{mNADH}} \right) \cdot \left(1 + \frac{[s_1271]}{K_{m1271}} \right) - 1} \right)} \quad (363)$$

Table 728: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.033	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.456	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.115	dimensionless	<input checked="" type="checkbox"/>
Km0066		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000322	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNADH		0000323	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1271		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

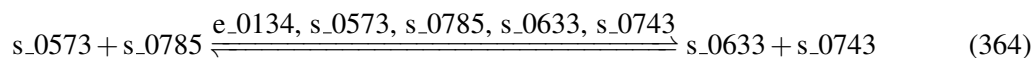
6.182 Reaction r_0722

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

Name mannose-1-phosphate guanylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 729: Properties of each reactant.

Id	Name	SBO
s_0573	D-mannose 1-phosphate	
s_0785	GTP	

Modifiers

Table 730: Properties of each modifier.

Id	Name	SBO
e_0134	PSA1	0000460
s_0573	D-mannose 1-phosphate	
s_0785	GTP	
s_0633	diphosphate	
s_0743	GDP-alpha-D-mannose	

Products

Table 731: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
s_0743	GDP-alpha-D-mannose	

Kinetic Law

Derived unit contains undeclared units

$$v_{182} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0573}] \cdot [s_{0785}] - \frac{[s_{0633}] \cdot [s_{0743}]}{K_{eq}}}{K_{m0573} \cdot K_{m0785}} \right)}{\left(1 + \frac{[s_{0573}]}{K_{m0573}} \right) \cdot \left(1 + \frac{[s_{0785}]}{K_{m0785}} \right) + \left(1 + \frac{[s_{0633}]}{K_{m0633}} \right) \cdot \left(1 + \frac{[s_{0743}]}{K_{m0743}} \right) - 1} \quad (365)$$

Table 732: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	✓
Vmax		0000324	0.486	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0573		0000322	0.100	mmol · l ⁻¹	✓
Km0785		0000322	0.100	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km0743		0000323	0.100	mmol · l ⁻¹	✓

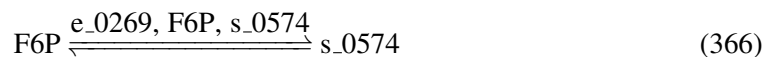
6.183 Reaction r_0723

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

Name mannose-6-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 733: Properties of each reactant.

Id	Name	SBO
F6P	D-fructose 6-phosphate	

Modifiers

Table 734: Properties of each modifier.

Id	Name	SBO
e_0269	PMI40	0000460
F6P	D-fructose 6-phosphate	
s_0574	D-mannose 6-phosphate	

Product

Table 735: Properties of each product.

Id	Name	SBO
s_0574	D-mannose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{183} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([\text{F6P}] - \frac{[\text{s}_0574]}{K_{\text{eq}}} \right)}{K_{\text{mF6P}}} \quad (367)$$

$$1 + \frac{[\text{F6P}]}{K_{\text{mF6P}}} + 1 + \frac{[\text{s}_0574]}{K_{\text{m0574}}} - 1$$

Table 736: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.208	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.320	dimensionless	<input checked="" type="checkbox"/>
KmF6P		0000322	0.625	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0574		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

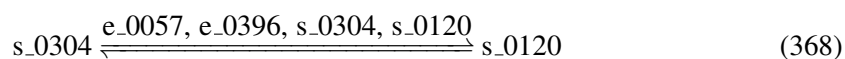
6.184 Reaction r_0724

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

Name methenyltetrahydrifivate cyclohydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 737: Properties of each reactant.

Id	Name	SBO
s_0304	5,10-methenyl-THF	

Modifiers

Table 738: Properties of each modifier.

Id	Name	SBO
e_0057	MIS1	0000460
e_0396	ADE3	0000460
s_0304	5,10-methenyl-THF	
s_0120	10-formyl-THF	

Product

Table 739: Properties of each product.

Id	Name	SBO
s_0120	10-formyl-THF	

Kinetic Law

Derived unit contains undeclared units

$$v_{184} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0304]}{K_{\text{eq}}} - \frac{[s_0120]}{K_{\text{eq}}} \right)}{1 + \frac{[s_0304]}{K_{m0304}} + 1 + \frac{[s_0120]}{K_{m0120}} - 1} \quad (369)$$

Table 740: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.066	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0304		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0120		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

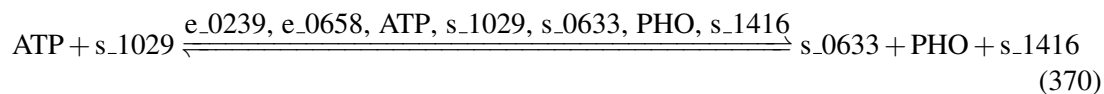
6.185 Reaction r_0726

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

Name methionine adenosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 741: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1029	L-methionine	

Modifiers

Table 742: Properties of each modifier.

Id	Name	SBO
e_0239	SAM2	0000460
e_0658	SAM1	0000460
ATP	ATP	
s_1029	L-methionine	
s_0633	diphosphate	
PHO	phosphate	

Id	Name	SBO
s_1416	S-adenosyl-L-methionine	

Products

Table 743: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
PHO	phosphate	
s_1416	S-adenosyl-L-methionine	

Kinetic Law

Derived unit contains undeclared units

$$v_{185} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1029] - \frac{[\text{s}_0633] \cdot [\text{PHO}] \cdot [\text{s}_1416]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1029}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1029]}{K_{\text{m1029}}} \right) + \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) \cdot \left(1 + \frac{[\text{s}_1416]}{K_{\text{m1416}}} \right) - 1} \quad (371)$$

Table 744: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$6.61479358800954 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.015	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.008	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1029		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmPHO		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1416		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

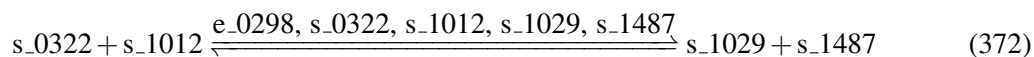
6.186 Reaction r_0727

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

Name methionine synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 745: Properties of each reactant.

Id	Name	SBO
s_0322	5-methyltetrahydrofolate	
s_1012	L-homocysteine	

Modifiers

Table 746: Properties of each modifier.

Id	Name	SBO
e_0298	MET6	0000460
s_0322	5-methyltetrahydrofolate	
s_1012	L-homocysteine	
s_1029	L-methionine	
s_1487	THF	

Products

Table 747: Properties of each product.

Id	Name	SBO
s_1029	L-methionine	
s_1487	THF	

Kinetic Law

Derived unit contains undeclared units

$$v_{186} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0322] \cdot [s_1012] - \frac{[s_1029] \cdot [s_1487]}{K_{\text{eq}}}}{K_{m0322} \cdot K_{m1012}} \right)}{\left(1 + \frac{[s_0322]}{K_{m0322}} \right) \cdot \left(1 + \frac{[s_1012]}{K_{m1012}} \right) + \left(1 + \frac{[s_1029]}{K_{m1029}} \right) \cdot \left(1 + \frac{[s_1487]}{K_{m1487}} \right) - 1} \quad (373)$$

Table 748: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.040	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0322		0000322	0.100	mmol · l ⁻¹	✓
Km1012		0000322	0.100	mmol · l ⁻¹	✓
Km1029		0000323	0.100	mmol · l ⁻¹	✓
Km1487		0000323	0.100	mmol · l ⁻¹	✓

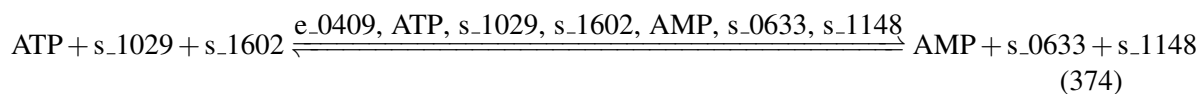
6.187 Reaction r_0729

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

Name methionyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 749: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1029	L-methionine	
s_1602	tRNA(Met)	

Modifiers

Table 750: Properties of each modifier.

Id	Name	SBO
e_0409	MES1	0000460
ATP	ATP	
s_1029	L-methionine	

Id	Name	SBO
s_1602	tRNA(Met)	
AMP	AMP	
s_0633	diphosphate	
s_1148	Met-tRNA(Met)	

Products

Table 751: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1148	Met-tRNA(Met)	

Kinetic Law

Derived unit contains undeclared units

$$v_{187} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [s_{1029}] \cdot [s_{1602}] - \frac{[\text{AMP}] \cdot [s_{0633}] \cdot [s_{1148}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1029}} \cdot K_{\text{m1602}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[s_{1029}]}{K_{\text{m1029}}} \right) \cdot \left(1 + \frac{[s_{1602}]}{K_{\text{m1602}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[s_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[s_{1148}]}{K_{\text{m1148}}} \right) - 1} \quad (375)$$

Table 752: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.065	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.232	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1029		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1602		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmAMP		0000323	0.293	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1148		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

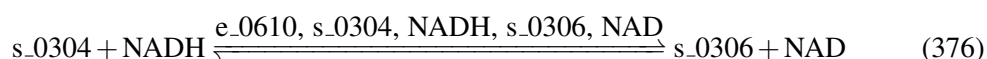
6.188 Reaction r_0731

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

Name methylenetetrahydrofolate dehydrogenase (NAD)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 753: Properties of each reactant.

Id	Name	SBO
s_0304	5,10-methenyl-THF	
NADH	NADH	

Modifiers

Table 754: Properties of each modifier.

Id	Name	SBO
e_0610	MTD1	0000460
s_0304	5,10-methenyl-THF	
NADH	NADH	
s_0306	5,10-methylenetetrahydrofolate	
NAD	NAD	

Products

Table 755: Properties of each product.

Id	Name	SBO
s_0306	5,10-methylenetetrahydrofolate	
NAD	NAD	

Kinetic Law

Derived unit contains undeclared units

$$v_{188} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s_0304}] \cdot [\text{NADH}]}{\text{Km0304} \cdot \text{KmNADH}} - \frac{[\text{s_0306}] \cdot [\text{NAD}]}{\text{K}_{\text{eq}}} \right)}{\left(1 + \frac{[\text{s_0304}]}{\text{Km0304}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{\text{KmNADH}} \right) + \left(1 + \frac{[\text{s_0306}]}{\text{Km0306}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{\text{KmNAD}} \right)} - 1 \quad (377)$$

Table 756: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.08627601042622 \cdot 10^{-12}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$9.92078641462824 \cdot 10^{-11}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	34.674	dimensionless	<input checked="" type="checkbox"/>
Km0304		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmNADH		0000322	0.087	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0306		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmNAD		0000323	1.503	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

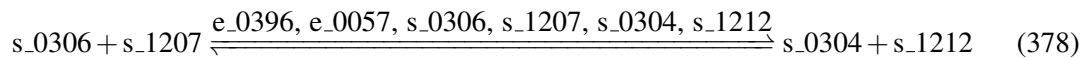
6.189 Reaction r_0732

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

Name methylenetetrahydrofolate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 757: Properties of each reactant.

Id	Name	SBO
s_0306	5,10-methylenetetrahydrofolate	
s_1207	NADP(+)	

Modifiers

Table 758: Properties of each modifier.

Id	Name	SBO
e_0396	ADE3	0000460
e_0057	MIS1	0000460
s_0306	5,10-methylenetetrahydrofolate	
s_1207	NADP(+)	
s_0304	5,10-methenyl-THF	
s_1212	NADPH	

Products

Table 759: Properties of each product.

Id	Name	SBO
s_0304	5,10-methenyl-THF	
s_1212	NADPH	

Kinetic Law

Derived unit contains undeclared units

$$v_{189} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0306] \cdot [s_1207] - \frac{[s_0304] \cdot [s_1212]}{K_{eq}}}{K_{m0306} \cdot K_{m1207}} \right)}{\left(1 + \frac{[s_0306]}{K_{m0306}} \right) \cdot \left(1 + \frac{[s_1207]}{K_{m1207}} \right) + \left(1 + \frac{[s_0304]}{K_{m0304}} \right) \cdot \left(1 + \frac{[s_1212]}{K_{m1212}} \right) - 1} \quad (379)$$

Table 760: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.153	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0306		0000322	0.100	mmol · l ⁻¹	✓
Km1207		0000322	0.100	mmol · l ⁻¹	✓
Km0304		0000323	0.100	mmol · l ⁻¹	✓
Km1212		0000323	0.100	mmol · l ⁻¹	✓

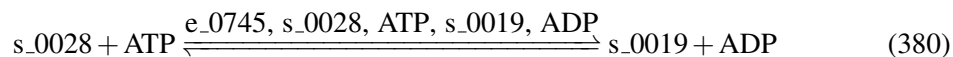
6.190 Reaction r_0735

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

Name mevalonate kinase (atp)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 761: Properties of each reactant.

Id	Name	SBO
s_0028	(R)-mevalonate	
ATP	ATP	

Modifiers

Table 762: Properties of each modifier.

Id	Name	SBO
e_0745	ERG12	0000460
s_0028	(R)-mevalonate	
ATP	ATP	
s_0019	(R)-5-phosphomevalonic acid	
ADP	ADP	

Products

Table 763: Properties of each product.

Id	Name	SBO
s_0019	(R)-5-phosphomevalonic acid	
ADP	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{190} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0028] \cdot [ATP] - \frac{[s_0019] \cdot [ADP]}{K_{\text{eq}}}}{K_{\text{m0028}} \cdot K_{\text{mATP}}} \right)}{\left(1 + \frac{[s_0028]}{K_{\text{m0028}}} \right) \cdot \left(1 + \frac{[ATP]}{K_{\text{mATP}}} \right) + \left(1 + \frac{[s_0019]}{K_{\text{m0019}}} \right) \cdot \left(1 + \frac{[ADP]}{K_{\text{mADP}}} \right) - 1} \quad (381)$$

Table 764: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.44184282113713 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$2.01857994959905 \cdot 10^{-5}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
Km0028		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0019		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

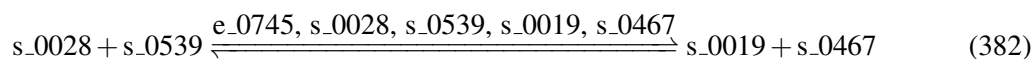
6.191 Reaction [r_0736](#)

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

Name mevalonate kinase (ctp)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 765: Properties of each reactant.

Id	Name	SBO
s_0028	(R)-mevalonate	
s_0539	CTP	

Modifiers

Table 766: Properties of each modifier.

Id	Name	SBO
e_0745	ERG12	0000460
s_0028	(R)-mevalonate	
s_0539	CTP	
s_0019	(R)-5-phosphomevalonic acid	
s_0467	CDP	

Products

Table 767: Properties of each product.

Id	Name	SBO
s_0019	(R)-5-phosphomevalonic acid	
s_0467	CDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{191} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0028}] \cdot [s_{0539}] - \frac{[s_{0019}] \cdot [s_{0467}]}{K_{\text{eq}}}}{K_{\text{m0028}} \cdot K_{\text{m0539}}} \right)}{\left(1 + \frac{[s_{0028}]}{K_{\text{m0028}}} \right) \cdot \left(1 + \frac{[s_{0539}]}{K_{\text{m0539}}} \right) + \left(1 + \frac{[s_{0019}]}{K_{\text{m0019}}} \right) \cdot \left(1 + \frac{[s_{0467}]}{K_{\text{m0467}}} \right) - 1} \quad (383)$$

Table 768: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.025	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0028		0000322	0.100	mmol · l ⁻¹	✓
Km0539		0000322	0.100	mmol · l ⁻¹	✓
Km0019		0000323	0.100	mmol · l ⁻¹	✓
Km0467		0000323	0.100	mmol · l ⁻¹	✓

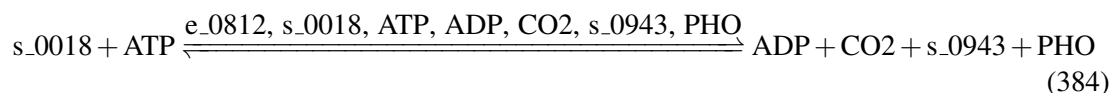
6.192 Reaction r_0739

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

Name mevalonate pyrophoshate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 769: Properties of each reactant.

Id	Name	SBO
s_0018	(R)-5-diphosphomevalonic acid	
ATP	ATP	

Modifiers

Table 770: Properties of each modifier.

Id	Name	SBO
e_0812	MVD1	0000460
s_0018	(R)-5-diphosphomevalonic acid	
ATP	ATP	
ADP	ADP	
CO2	carbon dioxide	
s_0943	isopentenyl diphosphate	
PHO	phosphate	

Products

Table 771: Properties of each product.

Id	Name	SBO
ADP	ADP	
CO2	carbon dioxide	
s_0943	isopentenyl diphosphate	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{192} & \quad (385) \\
 &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0018}] \cdot [ATP] - \frac{[ADP] \cdot [CO_2] \cdot [s_{0943}] \cdot [PHO]}{K_{eq}}}{K_{m0018} \cdot K_{mATP}} \right)}{\left(1 + \frac{[s_{0018}]}{K_{m0018}} \right) \cdot \left(1 + \frac{[ATP]}{K_{mATP}} \right) + \left(1 + \frac{[ADP]}{K_{mADP}} \right) \cdot \left(1 + \frac{[CO_2]}{K_{mCO_2}} \right) \cdot \left(1 + \frac{[s_{0943}]}{K_{m0943}} \right) \cdot \left(1 + \frac{[PHO]}{K_{mPHO}} \right) - 1}
 \end{aligned}$$

Table 772: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.067	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.102	$\text{mmol}^2 \cdot \text{l}^{-2}$	<input checked="" type="checkbox"/>
Km0018		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0943		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

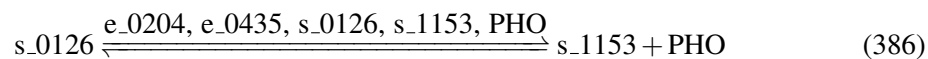
6.193 Reaction r_0757

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

Name myo-inositol 1-phosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 773: Properties of each reactant.

Id	Name	SBO
s_0126	1D-myo-inositol 1-phosphate	

Modifiers

Table 774: Properties of each modifier.

Id	Name	SBO
e_0204	INM2	0000460
e_0435	INM1	0000460
s_0126	1D-myo-inositol 1-phosphate	
s_1153	myo-inositol	
PHO	phosphate	

Products

Table 775: Properties of each product.

Id	Name	SBO
s_1153	myo-inositol	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{193} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0126}] - \frac{[s_{1153}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{m0126}} \right)}{1 + \frac{[s_{0126}]}{K_{m0126}} + \left(1 + \frac{[s_{1153}]}{K_{m1153}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}} \right) - 1} \quad (387)$$

Table 776: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.028139427404 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$9.028139427408 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0126		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1153		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

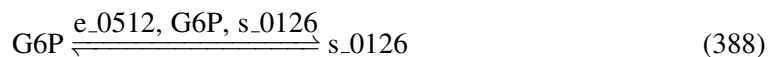
6.194 Reaction r_0758

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

Name myo-inositol-1-phosphate synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 777: Properties of each reactant.

Id	Name	SBO
G6P	D-glucose 6-phosphate	

Modifiers

Table 778: Properties of each modifier.

Id	Name	SBO
e_0512	INO1	0000460
G6P	D-glucose 6-phosphate	
s_0126	1D-myo-inositol 1-phosphate	

Product

Table 779: Properties of each product.

Id	Name	SBO
s_0126	1D-myo-inositol 1-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{194} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([\text{G6P}] - \frac{[\text{s}_0126]}{K_{\text{eq}}} \right)}{K_{\text{mG6P}}} \quad (389)$$

$$1 + \frac{[\text{G6P}]}{K_{\text{mG6P}}} + 1 + \frac{[\text{s}_0126]}{K_{\text{m0126}}} - 1$$

Table 780: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.02813775553284 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$5.4168826533146 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.075	dimensionless	✓
KmG6P		0000322	2.675	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0126		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

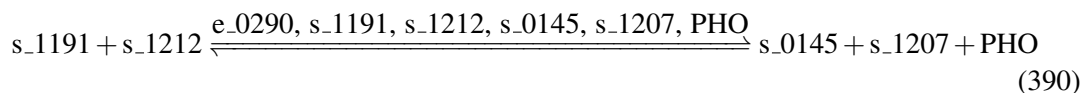
6.195 Reaction r_0759

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 781: Properties of each reactant.

Id	Name	SBO
s_1191	N-acetyl-L-gamma-glutamyl phosphate	
s_1212	NADPH	

Modifiers

Table 782: Properties of each modifier.

Id	Name	SBO
e_0290	ARG5,6	0000460
s_1191	N-acetyl-L-gamma-glutamyl phosphate	
s_1212	NADPH	
s_0145	2-acetamido-5-oxopentanoate	
s_1207	NADP(+)	
PHO	phosphate	

Products

Table 783: Properties of each product.

Id	Name	SBO
s_0145	2-acetamido-5-oxopentanoate	
s_1207	NADP(+)	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{195} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1191}] \cdot [s_{1212}] - \frac{[s_{0145}] \cdot [s_{1207}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{m1191} \cdot K_{m1212}} \right)}{\left(1 + \frac{[s_{1191}]}{K_{m1191}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) + \left(1 + \frac{[s_{0145}]}{K_{m0145}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}} \right) - 1} \quad (391)$$

Table 784: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.152	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1191		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0145		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

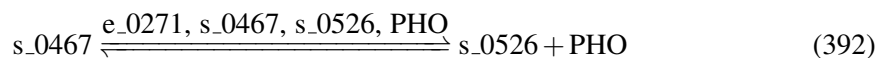
6.196 Reaction r_0792

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

Name nucleoside diphosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 785: Properties of each reactant.

Id	Name	SBO
s_0467	CDP	

Modifiers

Table 786: Properties of each modifier.

Id	Name	SBO
e_0271	YND1	0000460
s_0467	CDP	
s_0526	CMP	
PH0	phosphate	

Products

Table 787: Properties of each product.

Id	Name	SBO
s_0526	CMP	
PH0	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{196} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0467] - \frac{[s_0526] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0467}}} \right)}{1 + \frac{[s_0467]}{K_{\text{m0467}}} + \left(1 + \frac{[s_0526]}{K_{\text{m0526}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (393)$$

Table 788: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.017	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0467		0000322	0.100	mmol · l ⁻¹	✓
Km0526		0000323	0.100	mmol · l ⁻¹	✓
KmPH0		0000323	0.100	mmol · l ⁻¹	✓

6.197 Reaction r_0800

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

Name nucleoside diphosphate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 789: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0739	GDP	

Modifiers

Table 790: Properties of each modifier.

Id	Name	SBO
e_0568	YNK1	0000460
ATP	ATP	
s_0739	GDP	
ADP	ADP	
s_0785	GTP	

Products

Table 791: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_0785	GTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{197} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s_0739}] - \frac{[\text{ADP}] \cdot [\text{s_0785}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0739}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s_0739}]}{K_{\text{m0739}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s_0785}]}{K_{\text{m0785}}} \right) - 1} \quad (395)$$

Table 792: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.229	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	3.209	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0739		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0785		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.198 Reaction r_0811

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

Name nucleoside-diphosphate kinase (ATP:UDP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 793: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1538	UDP	

Modifiers

Table 794: Properties of each modifier.

Id	Name	SBO
e_0568	YNK1	0000460
ATP	ATP	
s_1538	UDP	
ADP	ADP	
s_1559	UTP	

Products

Table 795: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_1559	UTP	

Kinetic Law

Derived unit contains undeclared units

$$v_{198} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1538] - \frac{[\text{ADP}] \cdot [\text{s}_1559]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1538}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1538]}{K_{\text{m1538}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_1559]}{K_{\text{m1559}}} \right) - 1} \quad (397)$$

Table 796: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.123	dimensionless	✓
Vmax		0000324	1.723	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1538		0000322	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓
Km1559		0000323	0.100	mmol · l ⁻¹	✓

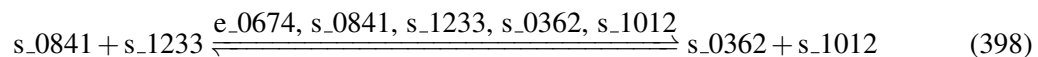
6.199 Reaction r_0813

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

Name O-acetylhomoserine (thiol)-lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 797: Properties of each reactant.

Id	Name	SBO
s_0841	hydrogen sulfide	
s_1233	O-acetyl-L-homoserine	

Modifiers

Table 798: Properties of each modifier.

Id	Name	SBO
e_0674	MET17	0000460
s_0841	hydrogen sulfide	
s_1233	O-acetyl-L-homoserine	
s_0362	acetate	
s_1012	L-homocysteine	

Products

Table 799: Properties of each product.

Id	Name	SBO
s_0362	acetate	
s_1012	L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{199} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0841}] \cdot [s_{1233}] - \frac{[s_{0362}] \cdot [s_{1012}]}{K_{\text{eq}}}}{K_{\text{m0841}} \cdot K_{\text{m1233}}} \right)}{\left(1 + \frac{[s_{0841}]}{K_{\text{m0841}}} \right) \cdot \left(1 + \frac{[s_{1233}]}{K_{\text{m1233}}} \right) + \left(1 + \frac{[s_{0362}]}{K_{\text{m0362}}} \right) \cdot \left(1 + \frac{[s_{1012}]}{K_{\text{m1012}}} \right) - 1} \quad (399)$$

Table 800: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.034	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0841		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km1233		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0362		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1012		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

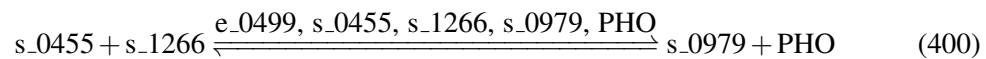
6.200 Reaction r_0816

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

Name ornithine carbamoyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 801: Properties of each reactant.

Id	Name	SBO
s_0455	carbamoyl phosphate	
s_1266	ornithine	

Modifiers

Table 802: Properties of each modifier.

Id	Name	SBO
e_0499	ARG3	0000460
s_0455	carbamoyl phosphate	
s_1266	ornithine	
s_0979	L-citrulline	
PHO	phosphate	

Products

Table 803: Properties of each product.

Id	Name	SBO
s_0979	L-citrulline	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{200} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0455}] \cdot [s_{1266}] - \frac{[s_{0979}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0455}} \cdot K_{\text{m1266}}} \right)}{\left(1 + \frac{[s_{0455}]}{K_{\text{m0455}}} \right) \cdot \left(1 + \frac{[s_{1266}]}{K_{\text{m1266}}} \right) + \left(1 + \frac{[s_{0979}]}{K_{\text{m0979}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (401)$$

Table 804: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.097	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0455		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1266		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0979		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

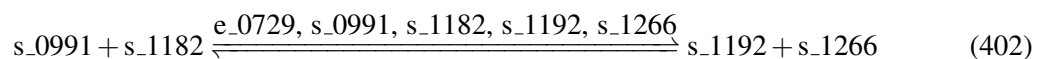
6.201 Reaction r_0818

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

Name ornithine transacetylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 805: Properties of each reactant.

Id	Name	SBO
s_0991	L-glutamate	
s_1182	N(2)-acetyl-L-ornithine	

Modifiers

Table 806: Properties of each modifier.

Id	Name	SBO
e_0729	ARG7	0000460
s_0991	L-glutamate	
s_1182	N(2)-acetyl-L-ornithine	
s_1192	N-acetyl-L-glutamate	
s_1266	ornithine	

Products

Table 807: Properties of each product.

Id	Name	SBO
s_1192	N-acetyl-L-glutamate	
s_1266	ornithine	

Kinetic Law

Derived unit contains undeclared units

$$v_{201} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0991}] \cdot [s_{1182}] - \frac{[s_{1192}] \cdot [s_{1266}]}{K_{\text{eq}}}}{K_{\text{m}0991} \cdot K_{\text{m}1182}} \right)}{\left(1 + \frac{[s_{0991}]}{K_{\text{m}0991}} \right) \cdot \left(1 + \frac{[s_{1182}]}{K_{\text{m}1182}} \right) + \left(1 + \frac{[s_{1192}]}{K_{\text{m}1192}} \right) \cdot \left(1 + \frac{[s_{1266}]}{K_{\text{m}1266}} \right) - 1} \quad (403)$$

Table 808: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.097	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km1182		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1192		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1266		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

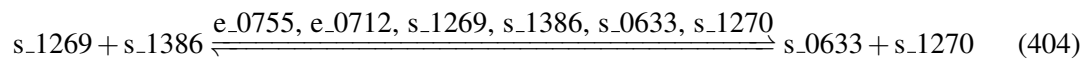
6.202 Reaction r_0820

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

Name orotate phosphoribosyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 809: Properties of each reactant.

Id	Name	SBO
s_1269	orotate	
s_1386	PRPP	

Modifiers

Table 810: Properties of each modifier.

Id	Name	SBO
e_0755	URA10	0000460
e_0712	URA5	0000460
s_1269	orotate	
s_1386	PRPP	
s_0633	diphosphate	
s_1270	orotidine 5'-(dihydrogen phosphate)	

Products

Table 811: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
s_1270	orotidine 5'-(dihydrogen phosphate)	

Kinetic Law

Derived unit contains undeclared units

$$v_{202} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1269}] \cdot [s_{1386}] - \frac{[s_{0633}] \cdot [s_{1270}]}{K_{\text{eq}}}}{K_{m1269} \cdot K_{m1386}} \right)}{\left(1 + \frac{[s_{1269}]}{K_{m1269}} \right) \cdot \left(1 + \frac{[s_{1386}]}{K_{m1386}} \right) + \left(1 + \frac{[s_{0633}]}{K_{m0633}} \right) \cdot \left(1 + \frac{[s_{1270}]}{K_{m1270}} \right) - 1} \quad (405)$$

Table 812: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.067	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1269		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1386		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1270		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

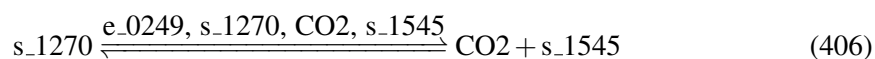
6.203 Reaction r_0821

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 813: Properties of each reactant.

Id	Name	SBO
s_1270	orotidine 5'-(dihydrogen phosphate)	

Modifiers

Table 814: Properties of each modifier.

Id	Name	SBO
e_0249	URA3	0000460
s_1270	orotidine 5'-(dihydrogen phosphate)	
C02	carbon dioxide	
s_1545	UMP	

Products

Table 815: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_1545	UMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{203} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{1270}] - \frac{[C02] \cdot [s_{1545}]}{K_{\text{eq}}} \right)}{K_{m1270} + \left(1 + \frac{[s_{1270}]}{K_{m1270}} + \left(1 + \frac{[C02]}{K_{mC02}} \right) \cdot \left(1 + \frac{[s_{1545}]}{K_{m1545}} \right) - 1 \right)} \quad (407)$$

Table 816: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	✓
Vmax		0000324	0.048	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	mmol · l ⁻¹	✓
Km1270		0000322	0.100	mmol · l ⁻¹	✓
KmC02		0000323	1.000	mmol · l ⁻¹	✓
Km1545		0000323	0.100	mmol · l ⁻¹	✓

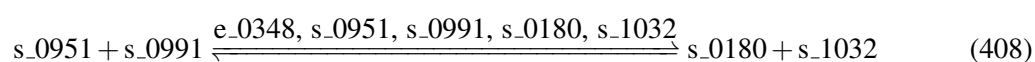
6.204 Reaction r_0851

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

Name phenylalanine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 817: Properties of each reactant.

Id	Name	SBO
s_0951	keto-phenylpyruvate	
s_0991	L-glutamate	

Modifiers

Table 818: Properties of each modifier.

Id	Name	SBO
e_0348	ARO8	0000460
s_0951	keto-phenylpyruvate	
s_0991	L-glutamate	
s_0180	2-oxoglutarate	
s_1032	L-phenylalanine	

Products

Table 819: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1032	L-phenylalanine	

Kinetic Law

Derived unit contains undeclared units

$$v_{204} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{.0951}] \cdot [s_{.0991}] - \frac{[s_{.0180}] \cdot [s_{.1032}]}{K_{\text{eq}}}}{K_{\text{m0951}} \cdot K_{\text{m0991}}} \right)}{\left(1 + \frac{[s_{.0951}]}{K_{\text{m0951}}} \right) \cdot \left(1 + \frac{[s_{.0991}]}{K_{\text{m0991}}} \right) + \left(1 + \frac{[s_{.0180}]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_{.1032}]}{K_{\text{m1032}}} \right) - 1} \quad (409)$$

Table 820: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.006	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.081	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0951		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0991		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1032		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

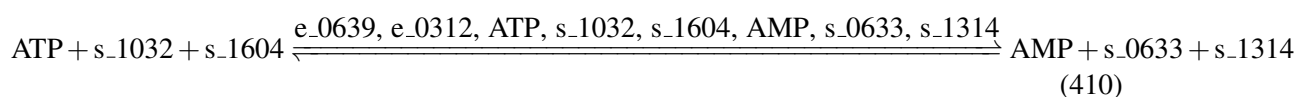
6.205 Reaction r_0852

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

Name phenylalanyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 821: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1032	L-phenylalanine	
s_1604	tRNA(Phe)	

Modifiers

Table 822: Properties of each modifier.

Id	Name	SBO
e_0639	FRS1	0000460
e_0312	FRS2	0000460
ATP	ATP	
s_1032	L-phenylalanine	
s_1604	tRNA(Phe)	
AMP	AMP	
s_0633	diphosphate	
s_1314	Phe-tRNA(Phe)	

Products

Table 823: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1314	Phe-tRNA(Phe)	

Kinetic Law

Derived unit contains undeclared units

$$v_{205} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1032] \cdot [\text{s}_1604] - \frac{[\text{AMP}] \cdot [\text{s}_0633] \cdot [\text{s}_1314]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1032}} \cdot K_{\text{m1604}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1032]}{K_{\text{m1032}}} \right) \cdot \left(1 + \frac{[\text{s}_1604]}{K_{\text{m1604}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_1314]}{K_{\text{m1314}}} \right) - 1} \quad (411)$$

Table 824: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.006	dimensionless	✓
Vmax		0000324	0.173	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1032		0000322	0.100	mmol · l ⁻¹	✓
Km1604		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km1314		0000323	0.100	mmol · l ⁻¹	✓

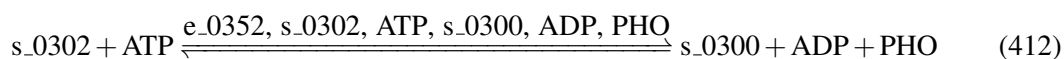
6.206 Reaction r_0855

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

Name phopshoribosylaminoimidazole synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 825: Properties of each reactant.

Id	Name	SBO
s_0302	5'-phosphoribosyl-N-formylglycineamidine	
ATP	ATP	

Modifiers

Table 826: Properties of each modifier.

Id	Name	SBO
e_0352	ADE5,7	0000460
s_0302	5'-phosphoribosyl-N-formylglycineamidine	
ATP	ATP	
s_0300	5'-phosphoribosyl-5-aminoimidazole	
ADP	ADP	
PHO	phosphate	

Products

Table 827: Properties of each product.

Id	Name	SBO
s_0300	5'-phosphoribosyl-5-aminoimidazole	
ADP	ADP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{206} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0302] \cdot [\text{ATP}] - \frac{[\text{s}_0300] \cdot [\text{ADP}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0302}} \cdot K_{\text{mATP}}} \right)}{\left(1 + \frac{[\text{s}_0302]}{K_{\text{m0302}}} \right) \cdot \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) + \left(1 + \frac{[\text{s}_0300]}{K_{\text{m0300}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (413)$$

Table 828: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.094	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.102	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0302		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0300		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

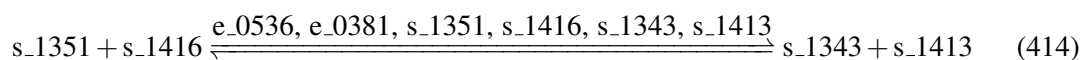
6.207 Reaction r_0858

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

Name phosphatidylethanolamine methyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 829: Properties of each reactant.

Id	Name	SBO
s_1351	phosphatidylethanolamine	
s_1416	S-adenosyl-L-methionine	

Modifiers

Table 830: Properties of each modifier.

Id	Name	SBO
e_0536	OPI3	0000460
e_0381	CHO2	0000460
s_1351	phosphatidylethanolamine	
s_1416	S-adenosyl-L-methionine	
s_1343	phosphatidyl-N-methylethanolamine	
s_1413	S-adenosyl-L-homocysteine	

Products

Table 831: Properties of each product.

Id	Name	SBO
s_1343	phosphatidyl-N-methylethanolamine	
s_1413	S-adenosyl-L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{207} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1351}] \cdot [s_{1416}] - \frac{[s_{1343}] \cdot [s_{1413}]}{K_{\text{eq}}}}{K_{\text{m1351}} \cdot K_{\text{m1416}}} \right)}{\left(1 + \frac{[s_{1351}]}{K_{\text{m1351}}} \right) \cdot \left(1 + \frac{[s_{1416}]}{K_{\text{m1416}}} \right) + \left(1 + \frac{[s_{1343}]}{K_{\text{m1343}}} \right) \cdot \left(1 + \frac{[s_{1413}]}{K_{\text{m1413}}} \right) - 1} \quad (415)$$

Table 832: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.23809739802672 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km1351		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1416		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1343		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1413		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

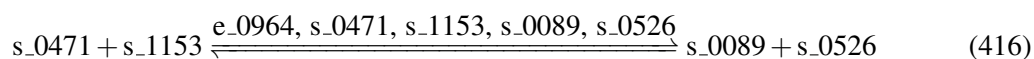
6.208 Reaction r_0874

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

Name phosphatidylinositol synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 833: Properties of each reactant.

Id	Name	SBO
s_0471	CDP-diacylglycerol	
s_1153	myo-inositol	

Modifiers

Table 834: Properties of each modifier.

Id	Name	SBO
e_0964	PIS1	0000460
s_0471	CDP-diacylglycerol	
s_1153	myo-inositol	
s_0089	1-phosphatidyl-1D-myo-inositol	
s_0526	CMP	

Products

Table 835: Properties of each product.

Id	Name	SBO
s_0089	1-phosphatidyl-1D-myo-inositol	
s_0526	CMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{208} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0471] \cdot [s_1153] - \frac{[s_0089] \cdot [s_0526]}{K_{\text{eq}}}}{K_{\text{m0471}} \cdot K_{\text{m1153}}} \right)}{\left(1 + \frac{[s_0471]}{K_{\text{m0471}}} \right) \cdot \left(1 + \frac{[s_1153]}{K_{\text{m1153}}} \right) + \left(1 + \frac{[s_0089]}{K_{\text{m0089}}} \right) \cdot \left(1 + \frac{[s_0526]}{K_{\text{m0526}}} \right) - 1} \quad (417)$$

Table 836: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.028139427404 \cdot 10^{-5}$	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"/>
Km0471		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1153		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0089		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0526		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

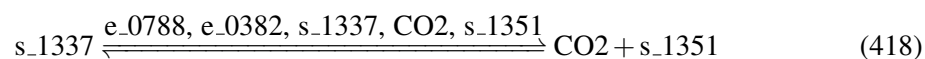
6.209 Reaction r_0877

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

Name phosphatidylserine decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 837: Properties of each reactant.

Id	Name	SBO
s_1337	phosphatidyl-L-serine	

Modifiers

Table 838: Properties of each modifier.

Id	Name	SBO
e_0788	PSD1	0000460
e_0382	PSD2	0000460

Id	Name	SBO
s_1337	phosphatidyl-L-serine	
C02	carbon dioxide	
s_1351	phosphatidylethanolamine	

Products

Table 839: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_1351	phosphatidylethanolamine	

Kinetic Law

Derived unit contains undeclared units

$$v_{209} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_1337] - \frac{[\text{CO}_2] \cdot [\text{s}_1351]}{K_{\text{eq}}}}{K_{\text{m}1337}} \right)}{1 + \frac{[\text{s}_1337]}{K_{\text{m}1337}} + \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[\text{s}_1351]}{K_{\text{m}1351}} \right) - 1} \quad (419)$$

Table 840: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.53773416789459 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1337		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1351		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

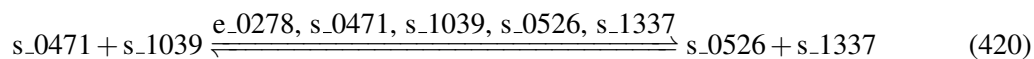
6.210 Reaction r_0880

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

Name phosphatidylserine synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 841: Properties of each reactant.

Id	Name	SBO
s_0471	CDP-diacylglycerol	
s_1039	L-serine	

Modifiers

Table 842: Properties of each modifier.

Id	Name	SBO
e_0278	CHO1	0000460
s_0471	CDP-diacylglycerol	
s_1039	L-serine	
s_0526	CMP	
s_1337	phosphatidyl-L-serine	

Products

Table 843: Properties of each product.

Id	Name	SBO
s_0526	CMP	
s_1337	phosphatidyl-L-serine	

Kinetic Law

Derived unit contains undeclared units

$$v_{210} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0471] \cdot [s_1039]}{K_{\text{m}0471} \cdot K_{\text{m}1039}} - \frac{[s_0526] \cdot [s_1337]}{K_{\text{eq}}} \right)}{\left(1 + \frac{[s_0471]}{K_{\text{m}0471}} \right) \cdot \left(1 + \frac{[s_1039]}{K_{\text{m}1039}} \right) + \left(1 + \frac{[s_0526]}{K_{\text{m}0526}} \right) \cdot \left(1 + \frac{[s_1337]}{K_{\text{m}1337}} \right) - 1} \quad (421)$$

Table 844: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.70539319634365 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0471		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1039		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0526		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1337		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

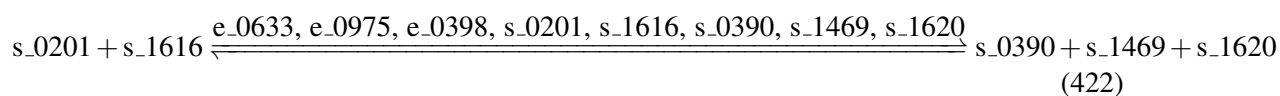
6.211 Reaction r_0883

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 845: Properties of each reactant.

Id	Name	SBO
s_0201	3'-phospho-5'-adenylyl sulfate	
s_1616	TRX1	

Modifiers

Table 846: Properties of each modifier.

Id	Name	SBO
e_0633	TRX1	0000460
e_0975	MET16	0000460
e_0398	TRX2	0000460
s_0201	3'-phospho-5'-adenylyl sulfate	

Id	Name	SBO
s_1616	TRX1	
s_0390	adenosine 3',5'-bimonophosphate	
s_1469	sulphite	
s_1620	TRX1 disulphide	

Products

Table 847: Properties of each product.

Id	Name	SBO
s_0390	adenosine 3',5'-bimonophosphate	
s_1469	sulphite	
s_1620	TRX1 disulphide	

Kinetic Law

Derived unit contains undeclared units

$$v_{211} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0201] \cdot [s_1616] - \frac{[s_0390] \cdot [s_1469] \cdot [s_1620]}{K_{\text{eq}}}}{K_{\text{m0201}} \cdot K_{\text{m1616}}} \right)}{\left(1 + \frac{[s_0201]}{K_{\text{m0201}}} \right) \cdot \left(1 + \frac{[s_1616]}{K_{\text{m1616}}} \right) + \left(1 + \frac{[s_0390]}{K_{\text{m0390}}} \right) \cdot \left(1 + \frac{[s_1469]}{K_{\text{m1469}}} \right) \cdot \left(1 + \frac{[s_1620]}{K_{\text{m1620}}} \right) - 1} \quad (423)$$

Table 848: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.054	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0201		0000322	0.100	mmol · l ⁻¹	✓
Km1616		0000322	0.100	mmol · l ⁻¹	✓
Km0390		0000323	0.100	mmol · l ⁻¹	✓
Km1469		0000323	0.100	mmol · l ⁻¹	✓
Km1620		0000323	0.100	mmol · l ⁻¹	✓

6.212 Reaction r_0884

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

Name phosphoenolpyruvate carboxykinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 849: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1271	oxaloacetate	

Modifiers

Table 850: Properties of each modifier.

Id	Name	SBO
e_0612	PCK1	0000460
ATP	ATP	
s_1271	oxaloacetate	
ADP	ADP	
CO2	carbon dioxide	
PEP	phosphoenolpyruvate	

Products

Table 851: Properties of each product.

Id	Name	SBO
ADP	ADP	
CO2	carbon dioxide	
PEP	phosphoenolpyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{212} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1271] - \frac{[\text{ADP}] \cdot [\text{CO}_2] \cdot [\text{PEP}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1271}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1271]}{K_{\text{m1271}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[\text{PEP}]}{K_{\text{mPEP}}} \right) - 1} \quad (425)$$

Table 852: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.023	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.500	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.642	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1271		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPEP		0000323	0.063	mmol · l ⁻¹	<input checked="" type="checkbox"/>

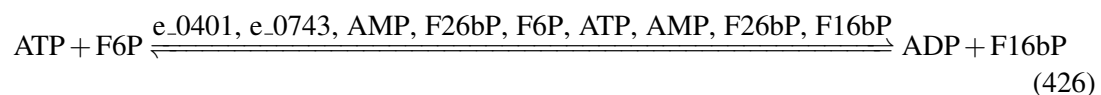
6.213 Reaction PFK

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

Name phosphofructokinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 853: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
F6P	D-fructose 6-phosphate	

Modifiers

Table 854: Properties of each modifier.

Id	Name	SBO
e_0401	PFK1	0000460
e_0743	PFK2	0000460
AMP	AMP	
F26bP	beta-D-fructose 2,6-bisphosphate	
F6P	D-fructose 6-phosphate	
ATP	ATP	
AMP	AMP	
F26bP	beta-D-fructose 2,6-bisphosphate	
F16bP	D-fructose 1,6-bisphosphate	

Products

Table 855: Properties of each product.

Id	Name	SBO
ADP	ADP	
F16bP	D-fructose 1,6-bisphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{213} = \text{vol}(\text{cell}) \cdot V_{\max} \quad (427)$$

$$\cdot \frac{gR \cdot \frac{[F6P]}{Kf6p} \cdot \frac{[ATP]}{Katp} \cdot \left(1 + \frac{[F6P]}{Kf6p} + \frac{[ATP]}{Katp} + \frac{gR \cdot [F6P]}{Kf6p} \cdot \frac{[ATP]}{Katp}\right)}{\left(1 + \frac{[F6P]}{Kf6p} + \frac{[ATP]}{Katp} + \frac{gR \cdot [F6P]}{Kf6p} \cdot \frac{[ATP]}{Katp}\right)^2 + L0 \cdot \left(\frac{1 + \frac{Ciatp \cdot [ATP]}{Kiatp}}{1 + \frac{[ATP]}{Kiatp}}\right)^2 \cdot \left(\frac{1 + \frac{Camp \cdot [AMP]}{Kamp}}{1 + \frac{[AMP]}{Kamp}}\right)^2 \cdot \left(\frac{1 + \frac{Cf26 \cdot [F26bP]}{Kf26} + \frac{Cf16 \cdot [F16bP]}{Kf16}}{1 + \frac{[F26bP]}{Kf26} + \frac{[F16bP]}{Kf16}}\right)^2 \cdot \left(1 + \frac{Camp \cdot [AMP]}{Kamp}\right)}$$

Table 856: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			1.833	mmol · l ⁻¹ · s ⁻¹	✓
gR			5.120	dimensionless	✓
Kf6p			0.100	mmol · l ⁻¹	✓
Katp			0.710	mmol · l ⁻¹	✓
L0			0.660	dimensionless	✓
Ciatp			100.000	dimensionless	✓
Kiatp			0.650	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Camp			0.085	dimensionless	<input checked="" type="checkbox"/>
Kamp			0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Cf26			0.017	dimensionless	<input checked="" type="checkbox"/>
Kf26			6.82 · 10 ⁻⁴	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Cf16			0.397	dimensionless	<input checked="" type="checkbox"/>
Kf16			0.111	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Catp			3.000	dimensionless	<input checked="" type="checkbox"/>
FLUX_VALUE			1.309	dimensionless	<input checked="" type="checkbox"/>

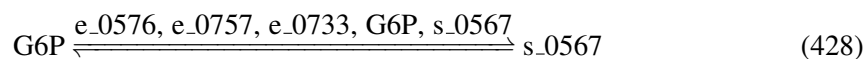
6.214 Reaction r_0888

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

Name phosphoglucomutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 857: Properties of each reactant.

Id	Name	SBO
G6P	D-glucose 6-phosphate	

Modifiers

Table 858: Properties of each modifier.

Id	Name	SBO
e_0576	PGM1	0000460
e_0757	PGM3	0000460
e_0733	PGM2	0000460
G6P	D-glucose 6-phosphate	
s_0567	D-glucose 1-phosphate	

Product

Table 859: Properties of each product.

Id	Name	SBO
s_0567	D-glucose 1-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{214} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([\text{G6P}] - \frac{[\text{s}_0567]}{K_{\text{eq}}} \right)}{K_{\text{mG6P}} + 1 + \frac{[\text{G6P}]}{K_{\text{mG6P}}} + 1 + \frac{[\text{s}_0567]}{K_{\text{m0567}}} - 1} \quad (429)$$

Table 860: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	✓
Vmax		0000324	0.725	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.075	dimensionless	✓
KmG6P		0000322	2.675	mmol · l ⁻¹	✓
Km0567		0000323	0.100	mmol · l ⁻¹	✓

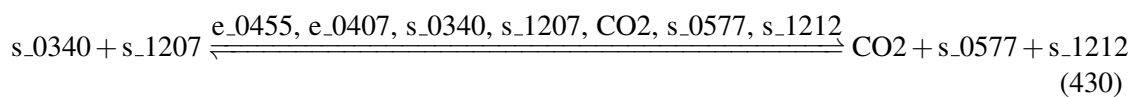
6.215 Reaction r_0889

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

Name phosphogluconate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 861: Properties of each reactant.

Id	Name	SBO
s_0340	6-phospho-D-gluconate	

Id	Name	SBO
s_1207	NADP(+)	

Modifiers

Table 862: Properties of each modifier.

Id	Name	SBO
e_0455	GND1	0000460
e_0407	GND2	0000460
s_0340	6-phospho-D-gluconate	
s_1207	NADP(+)	
C02	carbon dioxide	
s_0577	D-ribulose 5-phosphate	
s_1212	NADPH	

Products

Table 863: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0577	D-ribulose 5-phosphate	
s_1212	NADPH	

Kinetic Law

Derived unit contains undeclared units

$$v_{215} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{s}_0340] \cdot [\text{s}_1207] - \frac{[\text{CO}_2] \cdot [\text{s}_0577] \cdot [\text{s}_1212]}{\text{Keq}}}{\text{Km}0340 \cdot \text{Km}1207} \right)}{\left(1 + \frac{[\text{s}_0340]}{\text{Km}0340} \right) \cdot \left(1 + \frac{[\text{s}_1207]}{\text{Km}1207} \right) + \left(1 + \frac{[\text{CO}_2]}{\text{KmCO}_2} \right) \cdot \left(1 + \frac{[\text{s}_0577]}{\text{Km}0577} \right) \cdot \left(1 + \frac{[\text{s}_1212]}{\text{Km}1212} \right) - 1} \quad (431)$$

Table 864: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.058	dimensionless	✓
Vmax		0000324	1.277	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Km0340		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmC02		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0577		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1212		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

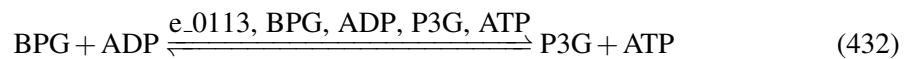
6.216 Reaction PGK

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 865: Properties of each reactant.

Id	Name	SBO
BPG	1,3-bisphospho-D-glycerate	
ADP	ADP	

Modifiers

Table 866: Properties of each modifier.

Id	Name	SBO
e_0113	PGK1	0000460
BPG	1,3-bisphospho-D-glycerate	
ADP	ADP	
P3G	3-phosphoglycerate	
ATP	ATP	

Products

Table 867: Properties of each product.

Id	Name	SBO
P3G	3-phosphoglycerate	
ATP	ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{216} = \text{vol}(\text{cell}) \cdot \frac{V_{\max} \cdot \left(\frac{[\text{BPG}] \cdot [\text{ADP}]}{K_{\text{bpg}} \cdot K_{\text{adp}}} - \frac{[\text{P3G}] \cdot [\text{ATP}]}{K_{\text{bpg}} \cdot K_{\text{adp}} \cdot K_{\text{eq}}} \right)}{\left(1 + \frac{[\text{BPG}]}{K_{\text{bpg}}} + \frac{[\text{P3G}]}{K_{\text{p3g}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{adp}}} + \frac{[\text{ATP}]}{K_{\text{atp}}} \right)} \quad (433)$$

Table 868: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			259.220	mmol · l ⁻¹ · s ⁻¹	✓
Keq			3200.000	dimensionless	✓
Kp3g			0.530	mmol · l ⁻¹	✓
Katp			0.300	mmol · l ⁻¹	✓
Kbpg			0.003	mmol · l ⁻¹	✓
Kadp			0.200	mmol · l ⁻¹	✓
FLUX_VALUE			2.300	dimensionless	✓

6.217 Reaction GPM

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

Name phosphoglycerate mutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 869: Properties of each reactant.

Id	Name	SBO
P3G	3-phosphoglycerate	

Modifiers

Table 870: Properties of each modifier.

Id	Name	SBO
e_0582	GPM1	0000460
P3G	3-phosphoglycerate	
P2G	2-phospho-D-glyceric acid	

Product

Table 871: Properties of each product.

Id	Name	SBO
P2G	2-phospho-D-glyceric acid	

Kinetic Law

Derived unit contains undeclared units

$$v_{217} = \text{vol}(\text{cell}) \cdot \frac{V_{\max} \cdot \left(\frac{[\text{P3G}]}{K_{\text{p3g}}} - \frac{[\text{P2G}]}{K_{\text{p3g}} \cdot K_{\text{eq}}} \right)}{1 + \frac{[\text{P3G}]}{K_{\text{p3g}}} + \frac{[\text{P2G}]}{K_{\text{p2g}}}} \quad (435)$$

Table 872: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			43.083	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Kp3g			1.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Keq			0.190	dimensionless	<input checked="" type="checkbox"/>
Kp2g			0.080	mmol · l ⁻¹	<input checked="" type="checkbox"/>
FLUX_VALUE			2.300	dimensionless	<input checked="" type="checkbox"/>

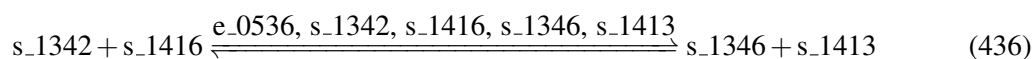
6.218 Reaction r_0900

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

Name phospholipid methyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 873: Properties of each reactant.

Id	Name	SBO
s_1342	phosphatidyl-N,N-dimethylethanolamine	
s_1416	S-adenosyl-L-methionine	

Modifiers

Table 874: Properties of each modifier.

Id	Name	SBO
e_0536	OPI3	0000460
s_1342	phosphatidyl-N,N-dimethylethanolamine	
s_1416	S-adenosyl-L-methionine	
s_1346	phosphatidylcholine	
s_1413	S-adenosyl-L-homocysteine	

Products

Table 875: Properties of each product.

Id	Name	SBO
s_1346	phosphatidylcholine	
s_1413	S-adenosyl-L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{218} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_1342] \cdot [\text{s}_1416] - \frac{[\text{s}_1346] \cdot [\text{s}_1413]}{K_{\text{eq}}}}{K_{\text{m1342}} \cdot K_{\text{m1416}}} \right)}{\left(1 + \frac{[\text{s}_1342]}{K_{\text{m1342}}} \right) \cdot \left(1 + \frac{[\text{s}_1416]}{K_{\text{m1416}}} \right) + \left(1 + \frac{[\text{s}_1346]}{K_{\text{m1346}}} \right) \cdot \left(1 + \frac{[\text{s}_1413]}{K_{\text{m1413}}} \right) - 1} \quad (437)$$

Table 876: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.23809739802672 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km1342		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1416		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1346		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1413		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

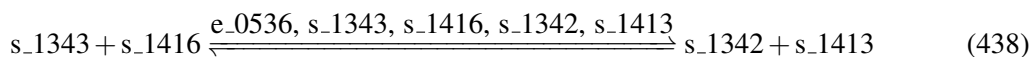
6.219 Reaction r_0901

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

Name phospholipid methyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 877: Properties of each reactant.

Id	Name	SBO
s_1343	phosphatidyl-N-methylethanolamine	
s_1416	S-adenosyl-L-methionine	

Modifiers

Table 878: Properties of each modifier.

Id	Name	SBO
e_0536	OPI3	0000460

Id	Name	SBO
s_1343	phosphatidyl-N-methylethanolamine	
s_1416	S-adenosyl-L-methionine	
s_1342	phosphatidyl-N,N-dimethylethanolamine	
s_1413	S-adenosyl-L-homocysteine	

Products

Table 879: Properties of each product.

Id	Name	SBO
s_1342	phosphatidyl-N,N-dimethylethanolamine	
s_1413	S-adenosyl-L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{219} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_1343] \cdot [\text{s}_1416] - \frac{[\text{s}_1342] \cdot [\text{s}_1413]}{K_{\text{eq}}}}{K_{\text{m}1343} \cdot K_{\text{m}1416}} \right)}{\left(1 + \frac{[\text{s}_1343]}{K_{\text{m}1343}} \right) \cdot \left(1 + \frac{[\text{s}_1416]}{K_{\text{m}1416}} \right) + \left(1 + \frac{[\text{s}_1342]}{K_{\text{m}1342}} \right) \cdot \left(1 + \frac{[\text{s}_1413]}{K_{\text{m}1413}} \right) - 1} \quad (439)$$

Table 880: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.23809739802672 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km1343		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1416		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1342		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1413		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

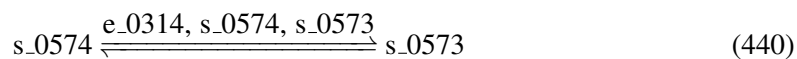
6.220 Reaction r_0902

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

Name phosphomannomutase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 881: Properties of each reactant.

Id	Name	SBO
s_0574	D-mannose 6-phosphate	

Modifiers

Table 882: Properties of each modifier.

Id	Name	SBO
e_0314	SEC53	0000460
s_0574	D-mannose 6-phosphate	
s_0573	D-mannose 1-phosphate	

Product

Table 883: Properties of each product.

Id	Name	SBO
s_0573	D-mannose 1-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{220} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0574]}{K_{m0574}} - \frac{[s_0573]}{K_{eq}} \right)}{1 + \frac{[s_0574]}{K_{m0574}} + 1 + \frac{[s_0573]}{K_{m0573}} - 1} \quad (441)$$

Table 884: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.035	dimensionless	✓
Vmax		0000324	0.208	mmol · l ⁻¹ · s ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0574		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0573		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

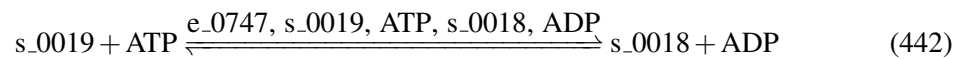
6.221 Reaction r_0904

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

Name phosphomevalonate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 885: Properties of each reactant.

Id	Name	SBO
s_0019	(R)-5-phosphomevalonic acid	
ATP	ATP	

Modifiers

Table 886: Properties of each modifier.

Id	Name	SBO
e_0747	ERG8	0000460
s_0019	(R)-5-phosphomevalonic acid	
ATP	ATP	
s_0018	(R)-5-diphosphomevalonic acid	
ADP	ADP	

Products

Table 887: Properties of each product.

Id	Name	SBO
s_0018	(R)-5-diphosphomevalonic acid	
ADP	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{221} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0019}] \cdot [ATP] - \frac{[s_{0018}] \cdot [ADP]}{K_{eq}}}{K_{m0019} \cdot K_{mATP}} \right)}{\left(1 + \frac{[s_{0019}]}{K_{m0019}} \right) \cdot \left(1 + \frac{[ATP]}{K_{mATP}} \right) + \left(1 + \frac{[s_{0018}]}{K_{m0018}} \right) \cdot \left(1 + \frac{[ADP]}{K_{mADP}} \right) - 1} \quad (443)$$

Table 888: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.025	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
Km0019		0000322	0.100	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0018		0000323	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓

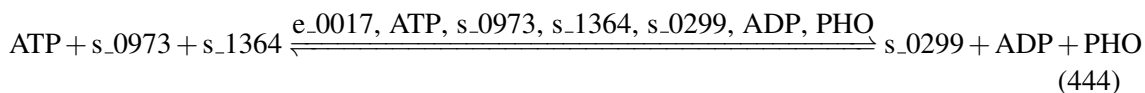
6.222 Reaction r_0908

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

Name phosphoribosyl amino imidazolesuccinocarboxamide synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 889: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0973	L-aspartate	
s_1364	phosphoribosyl-carboxy-aminoimidazole	

Modifiers

Table 890: Properties of each modifier.

Id	Name	SBO
e_0017	ADE1	0000460
ATP	ATP	
s_0973	L-aspartate	
s_1364	phosphoribosyl-carboxy-aminoimidazole	
s_0299	5'-phosphoribosyl-4-(N-succinocarboxamide)-5-aminoimidazole	
ADP	ADP	
PHO	phosphate	

Products

Table 891: Properties of each product.

Id	Name	SBO
s_0299	5'-phosphoribosyl-4-(N-succinocarboxamide)-5-aminoimidazole	
ADP	ADP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 &v_{222} \quad (445) \\
 &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_0973] \cdot [\text{s}_1364] - \frac{[\text{s}_0299] \cdot [\text{ADP}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0973}} \cdot K_{\text{m1364}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0973]}{K_{\text{m0973}}} \right) \cdot \left(1 + \frac{[\text{s}_1364]}{K_{\text{m1364}}} \right) + \left(1 + \frac{[\text{s}_0299]}{K_{\text{m0299}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1}
 \end{aligned}$$

Table 892: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.128	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0973		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1364		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0299		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

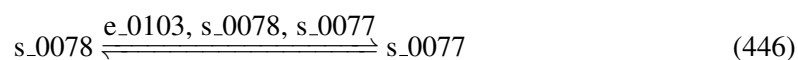
6.223 Reaction r_0909

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 893: Properties of each reactant.

Id	Name	SBO
s_0078	1-(5-phosphoribosyl)-5'-AMP	

Modifiers

Table 894: Properties of each modifier.

Id	Name
e_0103	HIS4
s_0078	1-(5-phosphoribosyl)-5'-AMP
s_0077	1-(5-phospho-D-ribosyl)-5-[(5-phospho-D-ribosylamino)methylideneamino]imidazole-4-carboxamide

Product

Table 895: Properties of each product.

Id	Name
s_0077	1-(5-phospho-D-ribosyl)-5-[(5-phospho-D-ribosylamino)methylideneamino]imidazole-4-carboxamide

Kinetic Law

Derived unit contains undeclared units

$$v_{223} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0078}] - \frac{[s_{0077}]}{K_{\text{eq}}}}{K_{m0078}} \right)}{1 + \frac{[s_{0078}]}{K_{m0078}} + 1 + \frac{[s_{0077}]}{K_{m0077}} - 1} \quad (447)$$

Table 896: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.017	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0078		0000322	0.100	mmol · l ⁻¹	✓
Km0077		0000323	0.100	mmol · l ⁻¹	✓

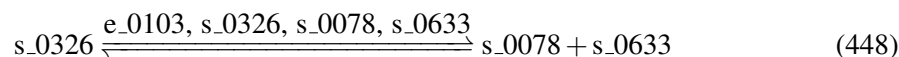
6.224 Reaction r_0910

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 897: Properties of each reactant.

Id	Name	SBO
s_0326	5-phosphoribosyl-ATP	

Modifiers

Table 898: Properties of each modifier.

Id	Name	SBO
e_0103	HIS4	0000460
s_0326	5-phosphoribosyl-ATP	
s_0078	1-(5-phosphoribosyl)-5'-AMP	
s_0633	diphosphate	

Products

Table 899: Properties of each product.

Id	Name	SBO
s_0078	1-(5-phosphoribosyl)-5'-AMP	
s_0633	diphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{224} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0326}] - \frac{[s_{0078}][s_{0633}]}{K_{\text{eq}}}}{K_{\text{m0326}}} \right)}{1 + \frac{[s_{0326}]}{K_{\text{m0326}}} + \left(1 + \frac{[s_{0078}]}{K_{\text{m0078}}} \right) \cdot \left(1 + \frac{[s_{0633}]}{K_{\text{m0633}}} \right) - 1} \quad (449)$$

Table 900: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.029	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0326		0000322	0.100	mmol · l ⁻¹	✓
Km0078		0000323	0.100	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓

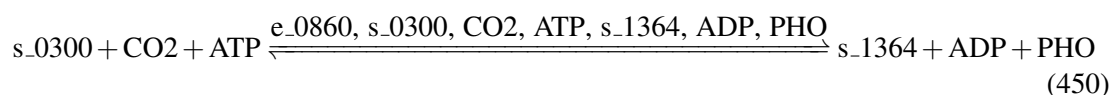
6.225 Reaction r_0911

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 901: Properties of each reactant.

Id	Name	SBO
s_0300	5'-phosphoribosyl-5-aminoimidazole	
CO2	carbon dioxide	
ATP	ATP	

Modifiers

Table 902: Properties of each modifier.

Id	Name	SBO
e_0860	ADE2	0000460
s_0300	5'-phosphoribosyl-5-aminoimidazole	
CO2	carbon dioxide	
ATP	ATP	
s_1364	phosphoribosyl-carboxy-aminoimidazole	
ADP	ADP	
PHO	phosphate	

Products

Table 903: Properties of each product.

Id	Name	SBO
s_1364	phosphoribosyl-carboxy-aminoimidazole	
ADP	ADP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{225} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0300}] \cdot [\text{CO}_2] \cdot [\text{ATP}] - \frac{[s_{1364}] \cdot [\text{ADP}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0300}} \cdot K_{\text{mCO}_2} \cdot K_{\text{mATP}}} \right)}{\left(1 + \frac{[s_{0300}]}{K_{\text{m0300}}} \right) \cdot \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) + \left(1 + \frac{[s_{1364}]}{K_{\text{m1364}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (451)$$

Table 904: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.128	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.102	dimensionless	<input checked="" type="checkbox"/>
Km0300		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmCO2		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1364		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

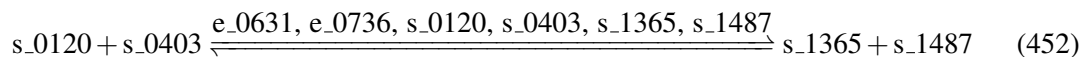
6.226 Reaction r_0912

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

Name phosphoribosylaminoimidazolecarboxamide formyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 905: Properties of each reactant.

Id	Name	SBO
s_0120	10-formyl-THF	
s_0403	AICAR	

Modifiers

Table 906: Properties of each modifier.

Id	Name	SBO
e_0631	ADE16	0000460
e_0736	ADE17	0000460
s_0120	10-formyl-THF	
s_0403	AICAR	
s_1365	phosphoribosyl-formamido-carboxamide	
s_1487	THF	

Products

Table 907: Properties of each product.

Id	Name	SBO
s_1365	phosphoribosyl-formamido-carboxamide	
s_1487	THF	

Kinetic Law

Derived unit contains undeclared units

$$v_{226} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0120}] \cdot [s_{0403}] - \frac{[s_{1365}] \cdot [s_{1487}]}{K_{eq}}}{K_{m0120} \cdot K_{m0403}} \right)}{\left(1 + \frac{[s_{0120}]}{K_{m0120}} \right) \cdot \left(1 + \frac{[s_{0403}]}{K_{m0403}} \right) + \left(1 + \frac{[s_{1365}]}{K_{m1365}} \right) \cdot \left(1 + \frac{[s_{1487}]}{K_{m1487}} \right) - 1} \quad (453)$$

Table 908: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.099	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0120		0000322	0.100	mmol · l ⁻¹	✓
Km0403		0000322	0.100	mmol · l ⁻¹	✓
Km1365		0000323	0.100	mmol · l ⁻¹	✓
Km1487		0000323	0.100	mmol · l ⁻¹	✓

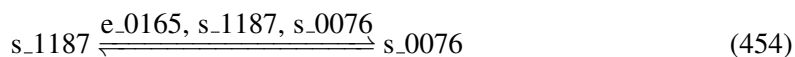
6.227 Reaction r_0913

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

Name phosphoribosylanthranilate isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 909: Properties of each reactant.

Id	Name	SBO
s_1187	N-(5-phospho-beta-D-ribose)anthranilate	

Modifiers

Table 910: Properties of each modifier.

Id	Name	SBO
e_0165	TRP1	0000460
s_1187	N-(5-phospho-beta-D-ribose)anthranilate	
s_0076	1-(2-carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Product

Table 911: Properties of each product.

Id	Name	SBO
s_0076	1-(2-carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{227} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_1187] - \frac{[s_0076]}{K_{\text{eq}}}}{K_{\text{m}1187}} \right)}{1 + \frac{[s_1187]}{K_{\text{m}1187}} + 1 + \frac{[s_0076]}{K_{\text{m}0076}} - 1} \quad (455)$$

Table 912: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.007	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1187		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0076		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

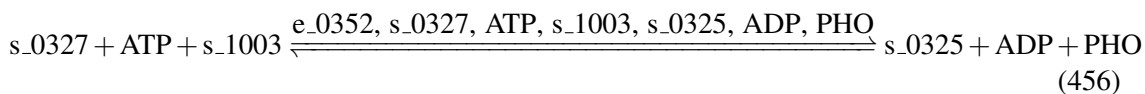
6.228 Reaction r_0914

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

Name phosphoribosylglycinamide synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 913: Properties of each reactant.

Id	Name	SBO
s_0327	5-phosphoribosylamine	
ATP	ATP	
s_1003	L-glycine	

Modifiers

Table 914: Properties of each modifier.

Id	Name	SBO
e_0352	ADE5,7	0000460
s_0327	5-phosphoribosylamine	
ATP	ATP	
s_1003	L-glycine	
s_0325	5-phospho-ribosyl-glycineamide	

Id	Name	SBO
ADP	ADP	
PHO	phosphate	

Products

Table 915: Properties of each product.

Id	Name	SBO
s_0325	5-phospho-ribosyl-glycineamide	
ADP	ADP	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{228} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0327}] \cdot [\text{ATP}] \cdot [s_{1003}] - \frac{[s_{0325}] \cdot [\text{ADP}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0327}} \cdot K_{\text{mATP}} \cdot K_{\text{m1003}}} \right)}{\left(1 + \frac{[s_{0327}]}{K_{\text{m0327}}} \right) \cdot \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[s_{1003}]}{K_{\text{m1003}}} \right) + \left(1 + \frac{[s_{0325}]}{K_{\text{m0325}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (457)$$

Table 916: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.128	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.015	dimensionless	✓
Km0327		0000322	0.100	mmol · l ⁻¹	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1003		0000322	0.100	mmol · l ⁻¹	✓
Km0325		0000323	0.100	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

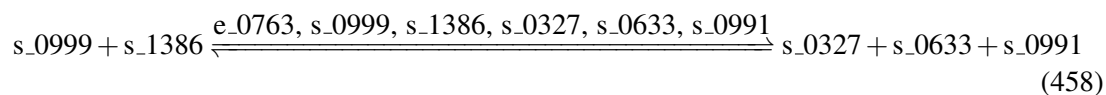
6.229 Reaction r_0915

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

Name phosphoribosylpyrophosphate amidotransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 917: Properties of each reactant.

Id	Name	SBO
s_0999	L-glutamine	
s_1386	PRPP	

Modifiers

Table 918: Properties of each modifier.

Id	Name	SBO
e_0763	ADE4	0000460
s_0999	L-glutamine	
s_1386	PRPP	
s_0327	5-phosphoribosylamine	
s_0633	diphosphate	
s_0991	L-glutamate	

Products

Table 919: Properties of each product.

Id	Name	SBO
s_0327	5-phosphoribosylamine	
s_0633	diphosphate	
s_0991	L-glutamate	

Kinetic Law

Derived unit contains undeclared units

$$v_{229} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{0999}] \cdot [\text{s}_{1386}] - \frac{[\text{s}_{0327}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{0991}]}{\text{K}_{\text{eq}}}}{\text{K}_{\text{m0999}} \cdot \text{K}_{\text{m1386}}} \right)}{\left(1 + \frac{[\text{s}_{0999}]}{\text{K}_{\text{m0999}}} \right) \cdot \left(1 + \frac{[\text{s}_{1386}]}{\text{K}_{\text{m1386}}} \right) + \left(1 + \frac{[\text{s}_{0327}]}{\text{K}_{\text{m0327}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{\text{K}_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{0991}]}{\text{K}_{\text{m0991}}} \right) - 1} \quad (459)$$

Table 920: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.094	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km0999		0000322	0.100	mmol · l ⁻¹	✓
Km1386		0000322	0.100	mmol · l ⁻¹	✓
Km0327		0000323	0.100	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km0991		0000323	0.100	mmol · l ⁻¹	✓

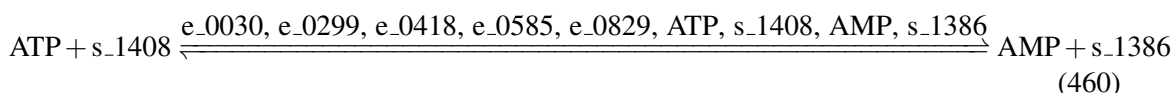
6.230 Reaction r_0916

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

Name phosphoribosylpyrophosphate synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 921: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1408	ribose-5-phosphate	

Modifiers

Table 922: Properties of each modifier.

Id	Name	SBO
e_0030	PRS4	0000460
e_0299	PRS2	0000460
e_0418	PRS3	0000460
e_0585	PRS1	0000460
e_0829	PRS5	0000460
ATP	ATP	
s_1408	ribose-5-phosphate	
AMP	AMP	
s_1386	PRPP	

Products

Table 923: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_1386	PRPP	

Kinetic Law

Derived unit contains undeclared units

$$v_{230} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1408}] - \frac{[\text{AMP}] \cdot [\text{s}_{1386}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1408}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1408}]}{K_{\text{m1408}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1386}]}{K_{\text{m1386}}} \right) - 1} \quad (461)$$

Table 924: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.013	dimensionless	✓
Vmax		0000324	0.183	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1408		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km1386		0000323	0.100	mmol · l ⁻¹	✓

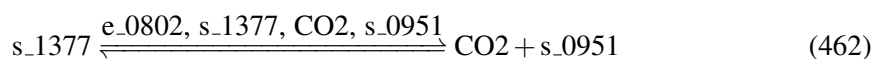
6.231 Reaction r_0938

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 925: Properties of each reactant.

Id	Name	SBO
s_1377	prephenate	

Modifiers

Table 926: Properties of each modifier.

Id	Name	SBO
e_0802	PHA2	0000460
s_1377	prephenate	
C02	carbon dioxide	
s_0951	keto-phenylpyruvate	

Products

Table 927: Properties of each product.

Id	Name	SBO
C02	carbon dioxide	
s_0951	keto-phenylpyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{231} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1377}] - \frac{[\text{CO}_2] \cdot [s_{0951}]}{K_{\text{eq}}}}{K_{\text{m1377}}} \right)}{1 + \frac{[s_{1377}]}{K_{\text{m1377}}} + \left(1 + \frac{[\text{CO}_2]}{K_{\text{mCO}_2}} \right) \cdot \left(1 + \frac{[s_{0951}]}{K_{\text{m0951}}} \right) - 1} \quad (463)$$

Table 928: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.006	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.058	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1377		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmCO2		0000323	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0951		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

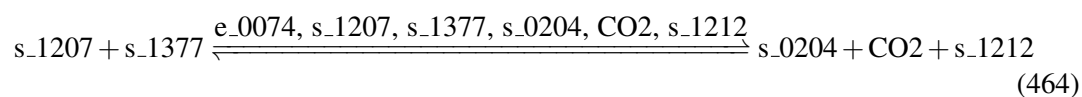
6.232 Reaction r_0939

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

Name prephenate dehydrogenase (NADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 929: Properties of each reactant.

Id	Name	SBO
s_1207	NADP(+)	
s_1377	prephenate	

Modifiers

Table 930: Properties of each modifier.

Id	Name	SBO
e_0074	TYR1	0000460

Id	Name	SBO
s_1207	NADP(+)	
s_1377	prephenate	
s_0204	3-(4-hydroxyphenyl)pyruvate	
C02	carbon dioxide	
s_1212	NADPH	

Products

Table 931: Properties of each product.

Id	Name	SBO
s_0204	3-(4-hydroxyphenyl)pyruvate	
C02	carbon dioxide	
s_1212	NADPH	

Kinetic Law

Derived unit contains undeclared units

$$v_{232} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1207}] \cdot [s_{1377}] - \frac{[s_{0204}] \cdot [C02] \cdot [s_{1212}]}{K_{\text{eq}}}}{K_{m1207} \cdot K_{m1377}} \right)}{\left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) \cdot \left(1 + \frac{[s_{1377}]}{K_{m1377}} \right) + \left(1 + \frac{[s_{0204}]}{K_{m0204}} \right) \cdot \left(1 + \frac{[C02]}{K_{mC02}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) - 1} \quad (465)$$

Table 932: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
Vmax		0000324	0.096	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	mmol · l ⁻¹	✓
Km1207		0000322	0.100	mmol · l ⁻¹	✓
Km1377		0000322	0.100	mmol · l ⁻¹	✓
Km0204		0000323	0.100	mmol · l ⁻¹	✓
KmC02		0000323	1.000	mmol · l ⁻¹	✓
Km1212		0000323	0.100	mmol · l ⁻¹	✓

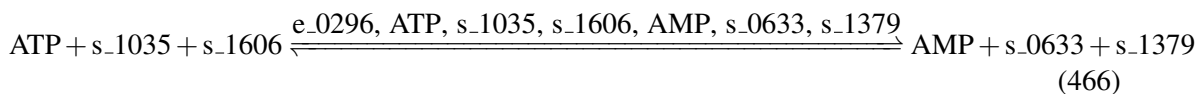
6.233 Reaction r_0941

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

Name prolyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 933: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1035	L-proline	
s_1606	tRNA(Pro)	

Modifiers

Table 934: Properties of each modifier.

Id	Name	SBO
e_0296	AIM10	0000460
ATP	ATP	
s_1035	L-proline	
s_1606	tRNA(Pro)	
AMP	AMP	
s_0633	diphosphate	
s_1379	Pro-tRNA(Pro)	

Products

Table 935: Properties of each product.

Id	Name	SBO
AMP	AMP	

Id	Name	SBO
s_0633	diphosphate	
s_1379	Pro-tRNA(Pro)	

Kinetic Law

Derived unit contains undeclared units

$$v_{233} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1035}] \cdot [\text{s}_{1606}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{1379}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1035}} \cdot K_{\text{m1606}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1035}]}{K_{\text{m1035}}} \right) \cdot \left(1 + \frac{[\text{s}_{1606}]}{K_{\text{m1606}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{1379}]}{K_{\text{m1379}}} \right) - 1} \quad (467)$$

Table 936: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.212	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1035		0000322	0.100	mmol · l ⁻¹	✓
Km1606		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km1379		0000323	0.100	mmol · l ⁻¹	✓

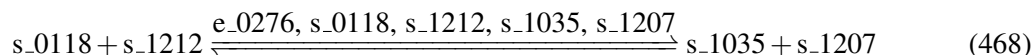
6.234 Reaction r_0957

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 937: Properties of each reactant.

Id	Name	SBO
s_0118	1-pyrroline-5-carboxylate	
s_1212	NADPH	

Modifiers

Table 938: Properties of each modifier.

Id	Name	SBO
e_0276	PRO3	0000460
s_0118	1-pyrroline-5-carboxylate	
s_1212	NADPH	
s_1035	L-proline	
s_1207	NADP(+)	

Products

Table 939: Properties of each product.

Id	Name	SBO
s_1035	L-proline	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{234} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0118}] \cdot [s_{1212}] - \frac{[s_{1035}] \cdot [s_{1207}]}{K_{\text{eq}}}}{K_{m0118} \cdot K_{m1212}} \right)}{\left(1 + \frac{[s_{0118}]}{K_{m0118}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) + \left(1 + \frac{[s_{1035}]}{K_{m1035}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) - 1} \quad (469)$$

Table 940: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	☑
Vmax		0000324	0.099	mmol · l ⁻¹ · s ⁻¹	☑
Keq		0000281	2.000	dimensionless	☑
Km0118		0000322	0.100	mmol · l ⁻¹	☑

Id	Name	SBO	Value	Unit	Constant
Km1212		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1035		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

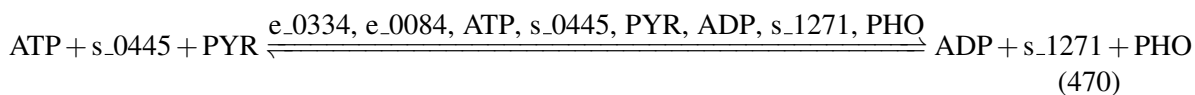
6.235 Reaction r_0958

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

Name pyruvate carboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 941: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_0445	bicarbonate	
PYR	pyruvate	

Modifiers

Table 942: Properties of each modifier.

Id	Name	SBO
e_0334	PYC1	0000460
e_0084	PYC2	0000460
ATP	ATP	
s_0445	bicarbonate	
PYR	pyruvate	
ADP	ADP	
s_1271	oxaloacetate	
PHO	phosphate	

Products

Table 943: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_1271	oxaloacetate	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{235} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{0445}] \cdot [\text{PYR}] - \frac{[\text{ADP}] \cdot [\text{s}_{1271}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m0445}} \cdot K_{\text{mPYR}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0445}]}{K_{\text{m0445}}} \right) \cdot \left(1 + \frac{[\text{PYR}]}{K_{\text{mPYR}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1271}]}{K_{\text{m1271}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (471)$$

Table 944: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.141	dimensionless	✓
Vmax		0000324	4.222	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.056	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km0445		0000322	0.100	mmol · l ⁻¹	✓
KmPYR		0000322	1.815	mmol · l ⁻¹	✓
KmADP		0000323	1.282	mmol · l ⁻¹	✓
Km1271		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

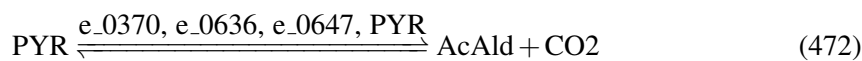
6.236 Reaction PDC

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

Name pyruvate decarboxylase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 945: Properties of each reactant.

Id	Name	SBO
PYR	pyruvate	

Modifiers

Table 946: Properties of each modifier.

Id	Name	SBO
e_0370	PDC6	0000460
e_0636	PDC1	0000460
e_0647	PDC5	0000460
PYR	pyruvate	

Products

Table 947: Properties of each product.

Id	Name	SBO
AcAlid	acetaldehyde	
CO2	carbon dioxide	

Kinetic Law

Derived unit contains undeclared units

$$v_{236} = \text{vol}(\text{cell}) \cdot \frac{V_{\max} \cdot \left(\frac{[\text{PYR}]}{K_{\text{pyr}}} \right)^{nH}}{1 + \left(\frac{[\text{PYR}]}{K_{\text{pyr}}} \right)^{nH}} \quad (473)$$

Table 948: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			14.297	mmol · l ⁻¹ · s ⁻¹	✓
Kpyr			4.330	mmol · l ⁻¹	✓
nH			1.900	dimensionless	✓
FLUX_VALUE			2.300	dimensionless	✓

6.237 Reaction PYK

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

Name pyruvate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 949: Properties of each reactant.

Id	Name	SBO
ADP	ADP	
PEP	phosphoenolpyruvate	

Modifiers

Table 950: Properties of each modifier.

Id	Name	SBO
e_0011	CDC19	0000460
e_0895	PYK2	0000460
PEP	phosphoenolpyruvate	
ADP	ADP	
PYR	pyruvate	
ATP	ATP	

Products

Table 951: Properties of each product.

Id	Name	SBO
ATP	ATP	
PYR	pyruvate	

Kinetic Law

Derived unit contains undeclared units

$$v_{237} = \text{vol}(\text{cell}) \cdot \frac{V_{\max} \cdot \left(\frac{[\text{PEP}] \cdot [\text{ADP}]}{K_{\text{pep}} \cdot K_{\text{adp}}} - \frac{[\text{PYR}] \cdot [\text{ATP}]}{K_{\text{pep}} \cdot K_{\text{adp}} \cdot K_{\text{eq}}} \right)}{\left(1 + \frac{[\text{PEP}]}{K_{\text{pep}}} + \frac{[\text{PYR}]}{K_{\text{pyr}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{adp}}} + \frac{[\text{ATP}]}{K_{\text{atp}}} \right)} \quad (475)$$

Table 952: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			16.667	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Kpep			0.140	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Kadp			0.530	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Keq			6500.000	dimensionless	<input checked="" type="checkbox"/>
Kpyr			21.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Katp			1.500	mmol · l ⁻¹	<input checked="" type="checkbox"/>
FLUX_VALUE			2.300	dimensionless	<input checked="" type="checkbox"/>

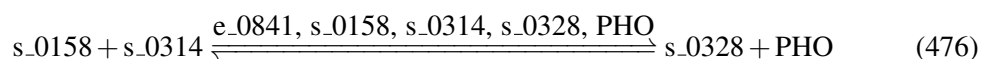
6.238 Reaction r_0967

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 953: Properties of each reactant.

Id	Name	SBO
s_0158	2-hydroxy-3-oxobutyl phosphate	
s_0314	5-amino-6-(D-ribitylamino)uracil	

Modifiers

Table 954: Properties of each modifier.

Id	Name	SBO
e_0841	RIB4	0000460
s_0158	2-hydroxy-3-oxobutyl phosphate	
s_0314	5-amino-6-(D-ribitylamino)uracil	
s_0328	6,7-dimethyl-8-(1-D-ribityl)lumazine	
PHO	phosphate	

Products

Table 955: Properties of each product.

Id	Name	SBO
s_0328	6,7-dimethyl-8-(1-D-ribityl)lumazine	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{238} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0158}] \cdot [s_{0314}] - \frac{[s_{0328}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m0158}} \cdot K_{\text{m0314}}} \right)}{\left(1 + \frac{[s_{0158}]}{K_{\text{m0158}}} \right) \cdot \left(1 + \frac{[s_{0314}]}{K_{\text{m0314}}} \right) + \left(1 + \frac{[s_{0328}]}{K_{\text{m0328}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (477)$$

Table 956: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$8.51191990587516 \cdot 10^{-5}$	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"/>
Km0158		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0314		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"/>
KmPHO		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

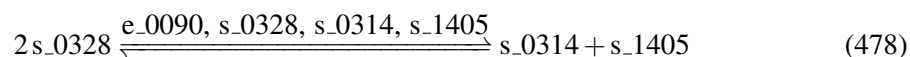
6.239 Reaction r_0968

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 957: Properties of each reactant.

Id	Name	SBO
s_0328	6,7-dimethyl-8-(1-D-ribityl)lumazine	

Modifiers

Table 958: Properties of each modifier.

Id	Name	SBO
e_0090	RIB5	0000460
s_0328	6,7-dimethyl-8-(1-D-ribityl)lumazine	
s_0314	5-amino-6-(D-ribitylamino)uracil	
s_1405	riboflavin	

Products

Table 959: Properties of each product.

Id	Name	SBO
s_0314	5-amino-6-(D-ribitylamino)uracil	
s_1405	riboflavin	

Kinetic Law

Derived unit contains undeclared units

$$v_{239} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s_0328}]^2 - \frac{[\text{s_0314}] \cdot [\text{s_1405}]}{K_{\text{eq}}}}{K_{\text{m0328}}^2} \right)}{\left(1 + \frac{[\text{s_0328}]}{K_{\text{m0328}}} \right)^2 + \left(1 + \frac{[\text{s_0314}]}{K_{\text{m0314}}} \right) \cdot \left(1 + \frac{[\text{s_1405}]}{K_{\text{m1405}}} \right) - 1} \quad (479)$$

Table 960: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$4.25595995293758 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$5.95834393411522 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0328		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0314		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1405		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

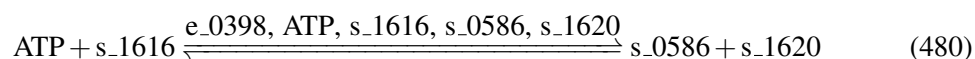
6.240 Reaction r_0970

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

Name ribonucleoside-triphosphate reductase (ATP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 961: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1616	TRX1	

Modifiers

Table 962: Properties of each modifier.

Id	Name	SBO
e_0398	TRX2	0000460
ATP	ATP	
s_1616	TRX1	
s_0586	dATP	
s_1620	TRX1 disulphide	

Products

Table 963: Properties of each product.

Id	Name	SBO
s_0586	dATP	
s_1620	TRX1 disulphide	

Kinetic Law

Derived unit contains undeclared units

$$v_{240} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1616] - \frac{[\text{s}_0586] \cdot [\text{s}_1620]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1616}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1616]}{K_{\text{m1616}}} \right) + \left(1 + \frac{[\text{s}_0586]}{K_{\text{m0586}}} \right) \cdot \left(1 + \frac{[\text{s}_1620]}{K_{\text{m1620}}} \right) - 1} \quad (481)$$

Table 964: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$7.28671814146884 \cdot 10^{-5}$	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	0.079	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1616		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0586		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1620		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

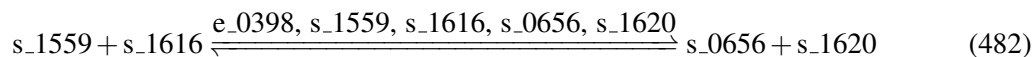
6.241 Reaction r_0973

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

Name ribonucleoside-triphosphate reductase (UTP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 965: Properties of each reactant.

Id	Name	SBO
s_1559	UTP	
s_1616	TRX1	

Modifiers

Table 966: Properties of each modifier.

Id	Name	SBO
e_0398	TRX2	0000460
s_1559	UTP	
s_1616	TRX1	
s_0656	dUTP	
s_1620	TRX1 disulphide	

Products

Table 967: Properties of each product.

Id	Name	SBO
s_0656	dUTP	
s_1620	TRX1 disulphide	

Kinetic Law

Derived unit contains undeclared units

$$v_{241} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1559}] \cdot [s_{1616}] - \frac{[s_{0656}] \cdot [s_{1620}]}{K_{\text{eq}}}}{K_{\text{m1559}} \cdot K_{\text{m1616}}} \right)}{\left(1 + \frac{[s_{1559}]}{K_{\text{m1559}}} \right) \cdot \left(1 + \frac{[s_{1616}]}{K_{\text{m1616}}} \right) + \left(1 + \frac{[s_{0656}]}{K_{\text{m0656}}} \right) \cdot \left(1 + \frac{[s_{1620}]}{K_{\text{m1620}}} \right) - 1} \quad (483)$$

Table 968: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.53320048576619 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km1559		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

Id	Name	SBO	Value	Unit	Constant
Km1616		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0656		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1620		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

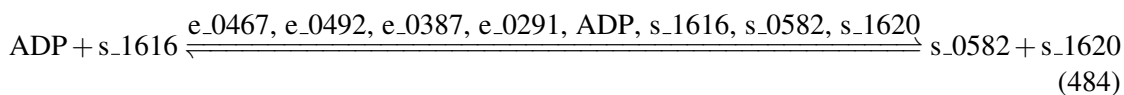
6.242 Reaction r_0974

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

Name ribonucleotide reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 969: Properties of each reactant.

Id	Name	SBO
ADP	ADP	
s_1616	TRX1	

Modifiers

Table 970: Properties of each modifier.

Id	Name	SBO
e_0467	RNR3	0000460
e_0492	RNR2	0000460
e_0387	RNR4	0000460
e_0291	RNR1	0000460
ADP	ADP	
s_1616	TRX1	
s_0582	dADP	
s_1620	TRX1 disulphide	

Products

Table 971: Properties of each product.

Id	Name	SBO
s_0582	dADP	
s_1620	TRX1 disulphide	

Kinetic Law

Derived unit contains undeclared units

$$v_{242} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ADP}] \cdot [\text{s}_1616] - \frac{[\text{s}_0582] \cdot [\text{s}_1620]}{K_{\text{eq}}}}{K_{\text{mADP}} \cdot K_{\text{m1616}}} \right)}{\left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_1616]}{K_{\text{m1616}}} \right) + \left(1 + \frac{[\text{s}_0582]}{K_{\text{m0582}}} \right) \cdot \left(1 + \frac{[\text{s}_1620]}{K_{\text{m1620}}} \right) - 1} \quad (485)$$

Table 972: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$8.18949921570746 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	0.156	dimensionless	✓
KmADP		0000322	1.282	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1616		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0582		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1620		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

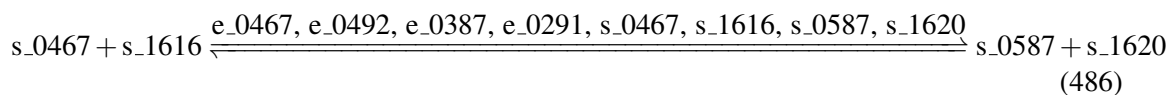
6.243 Reaction r_0976

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

Name ribonucleotide reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 973: Properties of each reactant.

Id	Name	SBO
s_0467	CDP	
s_1616	TRX1	

Modifiers

Table 974: Properties of each modifier.

Id	Name	SBO
e_0467	RNR3	0000460
e_0492	RNR2	0000460
e_0387	RNR4	0000460
e_0291	RNR1	0000460
s_0467	CDP	
s_1616	TRX1	
s_0587	dCDP	
s_1620	TRX1 disulphide	

Products

Table 975: Properties of each product.

Id	Name	SBO
s_0587	dCDP	
s_1620	TRX1 disulphide	

Kinetic Law

Derived unit contains undeclared units

$$v_{243} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0467}] \cdot [s_{1616}] - \frac{[s_{0587}] \cdot [s_{1620}]}{K_{\text{eq}}}}{K_{\text{m0467}} \cdot K_{\text{m1616}}} \right)}{\left(1 + \frac{[s_{0467}]}{K_{\text{m0467}}} \right) \cdot \left(1 + \frac{[s_{1616}]}{K_{\text{m1616}}} \right) + \left(1 + \frac{[s_{0587}]}{K_{\text{m0587}}} \right) \cdot \left(1 + \frac{[s_{1620}]}{K_{\text{m1620}}} \right) - 1} \quad (487)$$

Table 976: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.04616655671391 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
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"/>
Km1616		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0587		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1620		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

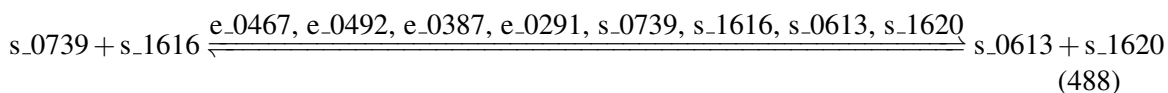
6.244 Reaction r_0978

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

Name ribonucleotide reductase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 977: Properties of each reactant.

Id	Name	SBO
s_0739	GDP	
s_1616	TRX1	

Modifiers

Table 978: Properties of each modifier.

Id	Name	SBO
e_0467	RNR3	0000460
e_0492	RNR2	0000460
e_0387	RNR4	0000460
e_0291	RNR1	0000460
s_0739	GDP	
s_1616	TRX1	
s_0613	dGDP	
s_1620	TRX1 disulphide	

Products

Table 979: Properties of each product.

Id	Name	SBO
s_0613	dGDP	
s_1620	TRX1 disulphide	

Kinetic Law

Derived unit contains undeclared units

$$v_{244} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0739] \cdot [\text{s}_{1616}] - \frac{[\text{s}_{0613}] \cdot [\text{s}_{1620}]}{K_{\text{eq}}}}{K_{\text{m0739}} \cdot K_{\text{m1616}}} \right)}{\left(1 + \frac{[\text{s}_0739]}{K_{\text{m0739}}} \right) \cdot \left(1 + \frac{[\text{s}_{1616}]}{K_{\text{m1616}}} \right) + \left(1 + \frac{[\text{s}_{0613}]}{K_{\text{m0613}}} \right) \cdot \left(1 + \frac{[\text{s}_{1620}]}{K_{\text{m1620}}} \right) - 1} \quad (489)$$

Table 980: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.03174784204643 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.001	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	dimensionless	✓
Km0739		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1616		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0613		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1620		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

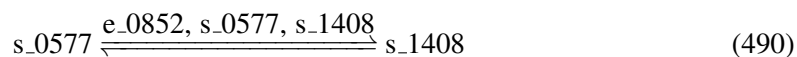
6.245 Reaction r_0982

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

Name ribose-5-phosphate isomerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 981: Properties of each reactant.

Id	Name	SBO
s_0577	D-ribulose 5-phosphate	

Modifiers

Table 982: Properties of each modifier.

Id	Name	SBO
e_0852	RKI1	0000460
s_0577	D-ribulose 5-phosphate	
s_1408	ribose-5-phosphate	

Product

Table 983: Properties of each product.

Id	Name	SBO
s_1408	ribose-5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{245} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0577}] - \frac{[s_{1408}]}{K_{\text{eq}}}}{K_{m0577}} \right)}{1 + \frac{[s_{0577}]}{K_{m0577}} + 1 + \frac{[s_{1408}]}{K_{m1408}} - 1} \quad (491)$$

Table 984: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.032	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.191	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0577		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1408		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

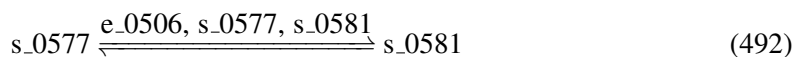
6.246 Reaction r_0984

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

Name ribulose 5-phosphate 3-epimerase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 985: Properties of each reactant.

Id	Name	SBO
s_0577	D-ribulose 5-phosphate	

Modifiers

Table 986: Properties of each modifier.

Id	Name	SBO
e_0506	RPE1	0000460
s_0577	D-ribulose 5-phosphate	
s_0581	D-xylulose 5-phosphate	

Product

Table 987: Properties of each product.

Id	Name	SBO
s_0581	D-xylulose 5-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{246} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0577]}{K_{\text{eq}}} - \frac{[s_0581]}{K_{\text{eq}}} \right)}{1 + \frac{[s_0577]}{K_{m0577}} + 1 + \frac{[s_0581]}{K_{m0581}} - 1} \quad (493)$$

Table 988: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.026	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.157	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0577		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0581		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

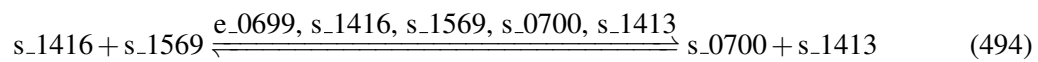
6.247 Reaction r_0986

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

Name S-adenosyl-methionine delta-24-sterol-c-methyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 989: Properties of each reactant.

Id	Name	SBO
s_1416	S-adenosyl-L-methionine	
s_1569	zymosterol	

Modifiers

Table 990: Properties of each modifier.

Id	Name	SBO
e_0699	ERG6	0000460
s_1416	S-adenosyl-L-methionine	
s_1569	zymosterol	
s_0700	fecosterol	
s_1413	S-adenosyl-L-homocysteine	

Products

Table 991: Properties of each product.

Id	Name	SBO
s_0700	fecosterol	
s_1413	S-adenosyl-L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{247} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1416}] \cdot [s_{1569}] - \frac{[s_{0700}] \cdot [s_{1413}]}{K_{\text{eq}}}}{K_{\text{m1416}} \cdot K_{\text{m1569}}} \right)}{\left(1 + \frac{[s_{1416}]}{K_{\text{m1416}}} \right) \cdot \left(1 + \frac{[s_{1569}]}{K_{\text{m1569}}} \right) + \left(1 + \frac{[s_{0700}]}{K_{\text{m0700}}} \right) \cdot \left(1 + \frac{[s_{1413}]}{K_{\text{m1413}}} \right) - 1} \quad (495)$$

Table 992: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$9.0277971522068 \cdot 10^{-6}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$1.2638916013079 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km1416		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1569		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0700		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1413		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

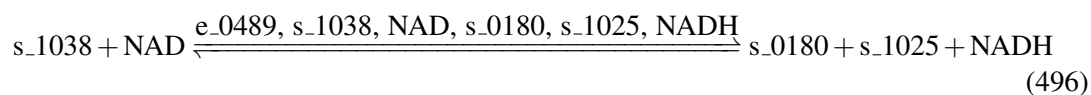
6.248 Reaction r_0988

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

Name saccharopine dehydrogenase (NAD, L-lysine forming)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 993: Properties of each reactant.

Id	Name	SBO
s_1038	L-saccharopine	
NAD	NAD	

Modifiers

Table 994: Properties of each modifier.

Id	Name	SBO
e_0489	LYS1	0000460
s_1038	L-saccharopine	
NAD	NAD	
s_0180	2-oxoglutarate	
s_1025	L-lysine	
NADH	NADH	

Products

Table 995: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1025	L-lysine	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{248} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_1038] \cdot [\text{NAD}] - \frac{[\text{s}_0180] \cdot [\text{s}_1025] \cdot [\text{NADH}]}{K_{\text{eq}}}}{K_{\text{m}1038} \cdot K_{\text{m}NAD}} \right)}{\left(1 + \frac{[\text{s}_1038]}{K_{\text{m}1038}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{m}NAD}} \right) + \left(1 + \frac{[\text{s}_0180]}{K_{\text{m}0180}} \right) \cdot \left(1 + \frac{[\text{s}_1025]}{K_{\text{m}1025}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{K_{\text{m}NADH}} \right) - 1} \quad (497)$$

Table 996: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.271	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.012	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1038		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000322	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1025		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNADH		0000323	0.087	mmol · l ⁻¹	<input checked="" type="checkbox"/>

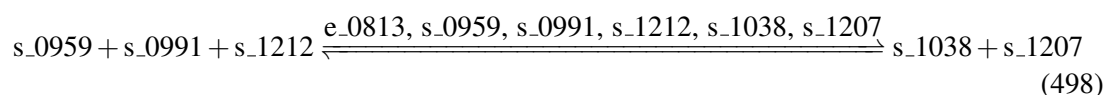
6.249 Reaction r_0989

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

Name saccharopine dehydrogenase (NADP, L-glutamate forming)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 997: Properties of each reactant.

Id	Name	SBO
s_0959	L-allysine	
s_0991	L-glutamate	
s_1212	NADPH	

Modifiers

Table 998: Properties of each modifier.

Id	Name	SBO
e_0813	LYS9	0000460
s_0959	L-allysine	
s_0991	L-glutamate	
s_1212	NADPH	
s_1038	L-saccharopine	
s_1207	NADP(+)	

Products

Table 999: Properties of each product.

Id	Name	SBO
s_1038	L-saccharopine	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{249} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0959}] \cdot [s_{0991}] \cdot [s_{1212}] - \frac{[s_{1038}] \cdot [s_{1207}]}{K_{\text{eq}}}}{K_{\text{m0959}} \cdot K_{\text{m0991}} \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_{0959}]}{K_{\text{m0959}}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{\text{m0991}}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_{1038}]}{K_{\text{m1038}}} \right) \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right) - 1} \quad (499)$$

Table 1000: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.012	dimensionless	✓
Vmax		0000324	0.271	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	20.000	mmol ⁻¹ · l	✓
Km0959		0000322	0.100	mmol · l ⁻¹	✓
Km0991		0000322	0.100	mmol · l ⁻¹	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km1038		0000323	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓

6.250 Reaction r_0990

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

Name sedoheptulose 1,7-bisphosphate D-glyceraldehyde-3-phosphate-lyase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1001: Properties of each reactant.

Id	Name	SBO
s_0551	D-erythrose 4-phosphate	
DHAP	dihydroxyacetone phosphate	

Modifiers

Table 1002: Properties of each modifier.

Id	Name	SBO
e_0567	FBA1	0000460
s_0551	D-erythrose 4-phosphate	
DHAP	dihydroxyacetone phosphate	
s_1426	sedoheptulose 1,7-bisphosphate	

Product

Table 1003: Properties of each product.

Id	Name	SBO
s_1426	sedoheptulose 1,7-bisphosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{250} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_{0551}] \cdot [\text{DHAP}] - \frac{[s_{1426}]}{K_{\text{eq}}} \right)}{K_{m0551} \cdot K_{m\text{DHAP}}} \cdot \left(1 + \frac{[s_{0551}]}{K_{m0551}} \right) \cdot \left(1 + \frac{[\text{DHAP}]}{K_{m\text{DHAP}}} \right) + 1 + \frac{[s_{1426}]}{K_{m1426}} - 1 \quad (501)$$

Table 1004: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	✓
Vmax		0000324	0.086	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	1.992	mmol ⁻¹ · l	✓
Km0551		0000322	0.100	mmol · l ⁻¹	✓

Id	Name	SBO	Value	Unit	Constant
KmDHAP		0000322	1.004	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1426		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

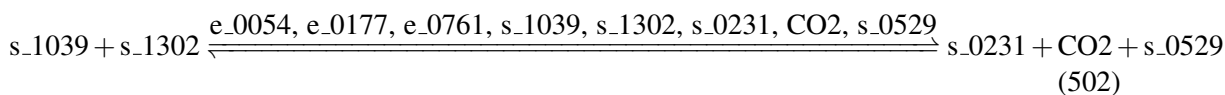
6.251 Reaction r_0993

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

Name serine palmitotransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1005: Properties of each reactant.

Id	Name	SBO
s_1039	L-serine	
s_1302	palmitoyl-CoA	

Modifiers

Table 1006: Properties of each modifier.

Id	Name	SBO
e_0054	TSC3	0000460
e_0177	LCB2	0000460
e_0761	LCB1	0000460
s_1039	L-serine	
s_1302	palmitoyl-CoA	
s_0231	3-ketosphinganine	
CO2	carbon dioxide	
s_0529	coenzyme A	

Products

Table 1007: Properties of each product.

Id	Name	SBO
s_0231	3-ketosphinganine	
C02	carbon dioxide	
s_0529	coenzyme A	

Kinetic Law

Derived unit contains undeclared units

$$v_{251} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1039}] \cdot [s_{1302}] - \frac{[s_{0231}] \cdot [C02] \cdot [s_{0529}]}{K_{\text{eq}}}}{K_{m1039} \cdot K_{m1302}} \right)}{\left(1 + \frac{[s_{1039}]}{K_{m1039}} \right) \cdot \left(1 + \frac{[s_{1302}]}{K_{m1302}} \right) + \left(1 + \frac{[s_{0231}]}{K_{m0231}} \right) \cdot \left(1 + \frac{[C02]}{K_{mC02}} \right) \cdot \left(1 + \frac{[s_{0529}]}{K_{m0529}} \right) - 1} \quad (503)$$

Table 1008: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.22290041668838 \cdot 10^{-5}$	dimensionless	✓
Vmax		0000324	$4.89038091671887 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	2.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1039		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1302		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0231		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmC02		0000323	1.000	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0529		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

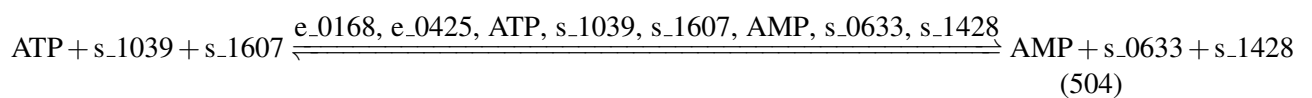
6.252 Reaction r_0995

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

Name seryl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1009: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1039	L-serine	
s_1607	tRNA(Ser)	

Modifiers

Table 1010: Properties of each modifier.

Id	Name	SBO
e_0168	SES1	0000460
e_0425	DIA4	0000460
ATP	ATP	
s_1039	L-serine	
s_1607	tRNA(Ser)	
AMP	AMP	
s_0633	diphosphate	
s_1428	Ser-tRNA(Ser)	

Products

Table 1011: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1428	Ser-tRNA(Ser)	

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{252} & \quad (505) \\
 &= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1039] \cdot [\text{s}_1607] - \frac{[\text{AMP}] \cdot [\text{s}_0633] \cdot [\text{s}_1428]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1039}} \cdot K_{\text{m1607}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1039]}{K_{\text{m1039}}} \right) \cdot \left(1 + \frac{[\text{s}_1607]}{K_{\text{m1607}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_0633]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_1428]}{K_{\text{m1428}}} \right) - 1}
 \end{aligned}$$

Table 1012: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.239	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.232	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1039		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1607		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmAMP		0000323	0.293	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1428		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

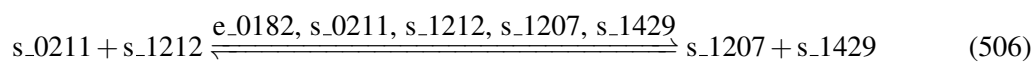
6.253 Reaction r_0996

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

Name shikimate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1013: Properties of each reactant.

Id	Name	SBO
s_0211	3-dehydroshikimate	
s_1212	NADPH	

Modifiers

Table 1014: Properties of each modifier.

Id	Name	SBO
e_0182	ARO1	0000460
s_0211	3-dehydroshikimate	
s_1212	NADPH	
s_1207	NADP(+)	

Id	Name	SBO
s_1429	shikimate	

Products

Table 1015: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1429	shikimate	

Kinetic Law

Derived unit contains undeclared units

$$v_{253} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0211}] \cdot [s_{1212}] - \frac{[s_{1207}] \cdot [s_{1429}]}{K_{\text{eq}}}}{K_{m0211} \cdot K_{m1212}} \right)}{\left(1 + \frac{[s_{0211}]}{K_{m0211}} \right) \cdot \left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) + \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) \cdot \left(1 + \frac{[s_{1429}]}{K_{m1429}} \right) - 1} \quad (507)$$

Table 1016: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.159	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0211		0000322	0.100	mmol · l ⁻¹	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓
Km1429		0000323	0.100	mmol · l ⁻¹	✓

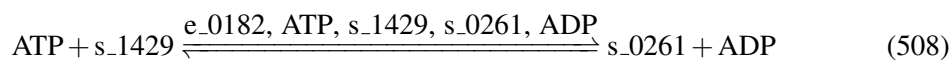
6.254 Reaction r_0997

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

Name shikimate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1017: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1429	shikimate	

Modifiers

Table 1018: Properties of each modifier.

Id	Name	SBO
e_0182	ARO1	0000460
ATP	ATP	
s_1429	shikimate	
s_0261	3-phosphoshikimic acid	
ADP	ADP	

Products

Table 1019: Properties of each product.

Id	Name	SBO
s_0261	3-phosphoshikimic acid	
ADP	ADP	

Kinetic Law

Derived unit contains undeclared units

$$v_{254} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_1429] - \frac{[\text{s}_0261] \cdot [\text{ADP}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1429}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_1429]}{K_{\text{m1429}}} \right) + \left(1 + \frac{[\text{s}_0261]}{K_{\text{m0261}}} \right) \cdot \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) - 1}$$

(509)

Table 1020: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.159	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1429		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0261		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>

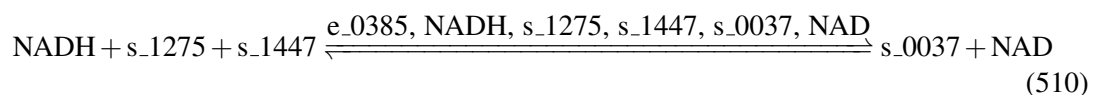
6.255 Reaction r_1010

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

Name squalene epoxidase (NAD)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1021: Properties of each reactant.

Id	Name	SBO
NADH	NADH	
s_1275	oxygen	
s_1447	squalene	

Modifiers

Table 1022: Properties of each modifier.

Id	Name	SBO
e_0385	ERG1	0000460
NADH	NADH	
s_1275	oxygen	
s_1447	squalene	
s_0037	(S)-2,3-epoxysqualene	
NAD	NAD	

Products

Table 1023: Properties of each product.

Id	Name	SBO
s_0037	(S)-2,3-epoxysqualene	
NAD	NAD	

Kinetic Law

Derived unit contains undeclared units

$$v_{255} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{NADH}] \cdot [\text{s}_{1275}] \cdot [\text{s}_{1447}] - \frac{[\text{s}_{0037}] \cdot [\text{NAD}]}{K_{\text{eq}}}}{K_{\text{mNADH}} \cdot K_{\text{m1275}} \cdot K_{\text{m1447}}} \right)}{\left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right) \cdot \left(1 + \frac{[\text{s}_{1275}]}{K_{\text{m1275}}} \right) \cdot \left(1 + \frac{[\text{s}_{1447}]}{K_{\text{m1447}}} \right) + \left(1 + \frac{[\text{s}_{0037}]}{K_{\text{m0037}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right) - 1} \quad (511)$$

Table 1024: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.94478038038606 \cdot 10^{-4}$	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	346.741	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
KmNADH		0000322	0.087	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1275		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1447		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0037		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmNAD		0000323	1.503	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

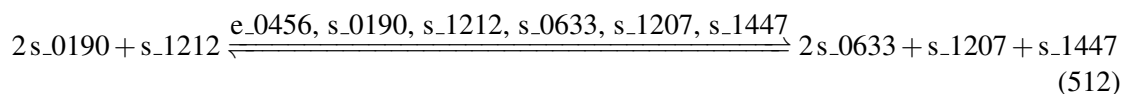
6.256 Reaction r_1012

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

Name squalene synthase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1025: Properties of each reactant.

Id	Name	SBO
s_0190	farnesyl diphosphate	
s_1212	NADPH	

Modifiers

Table 1026: Properties of each modifier.

Id	Name	SBO
e_0456	ERG9	0000460
s_0190	farnesyl diphosphate	
s_1212	NADPH	
s_0633	diphosphate	
s_1207	NADP(+)	
s_1447	squalene	

Products

Table 1027: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
s_1207	NADP(+)	
s_1447	squalene	

Kinetic Law

Derived unit contains undeclared units

$$v_{256} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0190}]^2 \cdot [s_{1212}] - \frac{[s_{0633}]^2 \cdot [s_{1207}] \cdot [s_{1447}]}{K_{\text{eq}}}}{K_{\text{m0190}}^2 \cdot K_{\text{m1212}}} \right)}{\left(1 + \frac{[s_{0190}]}{K_{\text{m0190}}} \right)^2 \cdot \left(1 + \frac{[s_{1212}]}{K_{\text{m1212}}} \right) + \left(1 + \frac{[s_{0633}]}{K_{\text{m0633}}} \right)^2 \cdot \left(1 + \frac{[s_{1207}]}{K_{\text{m1207}}} \right) \cdot \left(1 + \frac{[s_{1447}]}{K_{\text{m1447}}} \right) - 1} \quad (513)$$

Table 1028: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.94478038038606 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.014	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0190		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1212		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0633		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1447		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

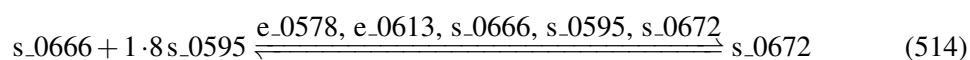
6.257 Reaction r_1014

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

Name steryl ester hydrolase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1029: Properties of each reactant.

Id	Name	SBO
s_0666	ergosterol	
s_0595	decanoate	

Modifiers

Table 1030: Properties of each modifier.

Id	Name	SBO
e_0578	TGL1	0000460
e_0613	YEH1	0000460
s_0666	ergosterol	
s_0595	decanoate	
s_0672	ergosterol ester	

Product

Table 1031: Properties of each product.

Id	Name	SBO
s_0672	ergosterol ester	

Kinetic Law

Derived unit contains undeclared units

$$v_{257} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0666}] \cdot [s_{0595}] - \frac{[s_{0672}]}{K_{\text{eq}}}}{K_{m0666} \cdot K_{m0595}} \right)}{\left(1 + \frac{[s_{0666}]}{K_{m0666}} \right) \cdot \left(1 + \frac{[s_{0595}]}{K_{m0595}} \right) + 1 + \frac{[s_{0672}]}{K_{m0672}}} - 1 \quad (515)$$

Table 1032: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$3.49074696876419 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$3.49074696876838 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
Km0666		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0595		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0672		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

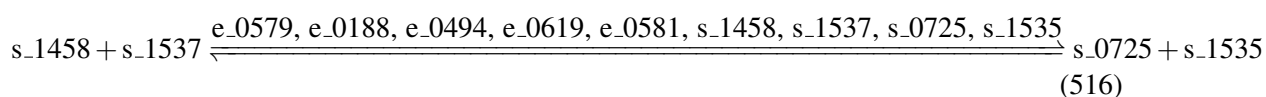
6.258 Reaction r_1021

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

Name succinate dehydrogenase (ubiquinone-6)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1033: Properties of each reactant.

Id	Name	SBO
s_1458	succinate	
s_1537	ubiquinone-6	

Modifiers

Table 1034: Properties of each modifier.

Id	Name	SBO
e_0579	SDH3	0000460
e_0188	SDH4	0000460
e_0494	YJL045W	0000460
e_0619	SDH2	0000460
e_0581	SDH1	0000460
s_1458	succinate	
s_1537	ubiquinone-6	
s_0725	fumarate	
s_1535	ubiquinol-6	

Products

Table 1035: Properties of each product.

Id	Name	SBO
s_0725	fumarate	
s_1535	ubiquinol-6	

Kinetic Law

Derived unit contains undeclared units

$$v_{258} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1458}] \cdot [s_{1537}] - \frac{[s_{0725}] \cdot [s_{1535}]}{K_{\text{eq}}}}{K_{\text{m1458}} \cdot K_{\text{m1537}}} \right)}{\left(1 + \frac{[s_{1458}]}{K_{\text{m1458}}} \right) \cdot \left(1 + \frac{[s_{1537}]}{K_{\text{m1537}}} \right) + \left(1 + \frac{[s_{0725}]}{K_{\text{m0725}}} \right) \cdot \left(1 + \frac{[s_{1535}]}{K_{\text{m1535}}} \right) - 1} \tag{517}$$

Table 1036: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.016	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"/>
Km1458		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1537		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0725		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1535		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

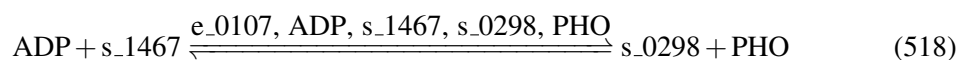
6.259 Reaction r_1026

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

Name sulfate adenylyltransferase (ADP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1037: Properties of each reactant.

Id	Name	SBO
ADP	ADP	
s_1467	sulphate	

Modifiers

Table 1038: Properties of each modifier.

Id	Name	SBO
e_0107	APA1	0000460
ADP	ADP	
s_1467	sulphate	
s_0298	5'-adenylyl sulfate	
PHO	phosphate	

Products

Table 1039: Properties of each product.

Id	Name	SBO
s_0298	5'-adenylyl sulfate	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{259} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{ADP}] \cdot [\text{s}_{1467}] - \frac{[\text{s}_{0298}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{mADP}} \cdot K_{\text{m1467}}} \right)}{\left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1467}]}{K_{\text{m1467}}} \right) + \left(1 + \frac{[\text{s}_{0298}]}{K_{\text{m0298}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (519)$$

Table 1040: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.034	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.156	dimensionless	✓
KmADP		0000322	1.282	mmol · l ⁻¹	✓
Km1467		0000322	0.100	mmol · l ⁻¹	✓
Km0298		0000323	0.100	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

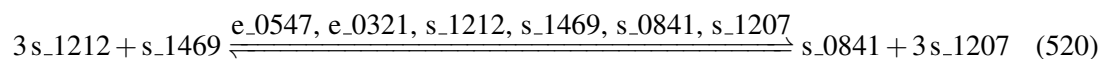
6.260 Reaction r_1027

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 1041: Properties of each reactant.

Id	Name	SBO
s_1212	NADPH	
s_1469	sulphite	

Modifiers

Table 1042: Properties of each modifier.

Id	Name	SBO
e_0547	MET5	0000460
e_0321	MET10	0000460
s_1212	NADPH	
s_1469	sulphite	
s_0841	hydrogen sulfide	
s_1207	NADP(+)	

Products

Table 1043: Properties of each product.

Id	Name	SBO
s_0841	hydrogen sulfide	
s_1207	NADP(+)	

Kinetic Law

Derived unit contains undeclared units

$$v_{260} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_1212]^3 \cdot [\text{s}_1469] - \frac{[\text{s}_0841] \cdot [\text{s}_1207]^3}{K_{\text{eq}}}}{K_{\text{m}1212}^3 \cdot K_{\text{m}1469}} \right)}{\left(1 + \frac{[\text{s}_1212]}{K_{\text{m}1212}} \right)^3 \cdot \left(1 + \frac{[\text{s}_1469]}{K_{\text{m}1469}} \right) + \left(1 + \frac{[\text{s}_0841]}{K_{\text{m}0841}} \right) \cdot \left(1 + \frac{[\text{s}_1207]}{K_{\text{m}1207}} \right)^3 - 1} \quad (521)$$

Table 1044: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	✓
Vmax		0000324	0.153	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓

Id	Name	SBO	Value	Unit	Constant
Km1212		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1469		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0841		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1207		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

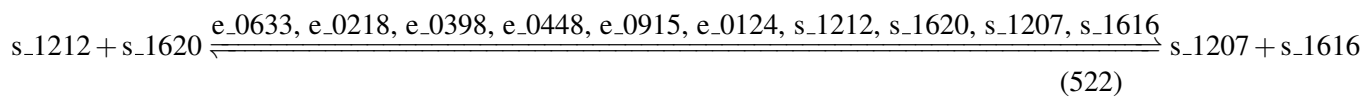
6.261 Reaction r_1038

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

Name thioredoxin reductase (NADPH)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1045: Properties of each reactant.

Id	Name	SBO
s_1212	NADPH	
s_1620	TRX1 disulphide	

Modifiers

Table 1046: Properties of each modifier.

Id	Name	SBO
e_0633	TRX1	0000460
e_0218	TRR1	0000460
e_0398	TRX2	0000460
e_0448	TRR2	0000460
e_0915	GLR1	0000460
e_0124	TRX3	0000460
s_1212	NADPH	
s_1620	TRX1 disulphide	
s_1207	NADP(+)	
s_1616	TRX1	

Products

Table 1047: Properties of each product.

Id	Name	SBO
s_1207	NADP(+)	
s_1616	TRX1	

Kinetic Law

Derived unit contains undeclared units

$$v_{261} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1212}] \cdot [s_{1620}] - \frac{[s_{1207}] \cdot [s_{1616}]}{K_{eq}}}{K_{m1212} \cdot K_{m1620}} \right)}{\left(1 + \frac{[s_{1212}]}{K_{m1212}} \right) \cdot \left(1 + \frac{[s_{1620}]}{K_{m1620}} \right) + \left(1 + \frac{[s_{1207}]}{K_{m1207}} \right) \cdot \left(1 + \frac{[s_{1616}]}{K_{m1616}} \right) - 1} \quad (523)$$

Table 1048: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.042	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km1212		0000322	0.100	mmol · l ⁻¹	✓
Km1620		0000322	0.100	mmol · l ⁻¹	✓
Km1207		0000323	0.100	mmol · l ⁻¹	✓
Km1616		0000323	0.100	mmol · l ⁻¹	✓

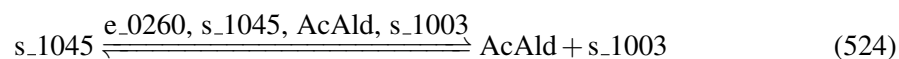
6.262 Reaction r_1040

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

Name threonine aldolase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1049: Properties of each reactant.

Id	Name	SBO
s_1045	L-threonine	

Modifiers

Table 1050: Properties of each modifier.

Id	Name	SBO
e_0260	GLY1	0000460
s_1045	L-threonine	
AcAld	acetaldehyde	
s_1003	L-glycine	

Products

Table 1051: Properties of each product.

Id	Name	SBO
AcAld	acetaldehyde	
s_1003	L-glycine	

Kinetic Law

Derived unit contains undeclared units

$$v_{262} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([s_{1045}] - \frac{[AcAld] \cdot [s_{1003}]}{K_{eq}} \right)}{K_{m1045} + \left(1 + \frac{[s_{1045}]}{K_{m1045}} + \left(1 + \frac{[AcAld]}{K_{mAcAld}} \right) \cdot \left(1 + \frac{[s_{1003}]}{K_{m1003}} \right) - 1 \right)}$$

(525)

Table 1052: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.017	dimensionless	✓
Vmax		0000324	0.172	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.356	mmol · l ⁻¹	✓
Km1045		0000322	0.100	mmol · l ⁻¹	✓
KmAcAld		0000323	0.178	mmol · l ⁻¹	✓
Km1003		0000323	0.100	mmol · l ⁻¹	✓

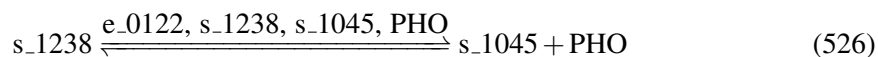
6.263 Reaction r_1041

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 1053: Properties of each reactant.

Id	Name	SBO
s_1238	O-phospho-L-homoserine	

Modifiers

Table 1054: Properties of each modifier.

Id	Name	SBO
e_0122	THR4	0000460
s_1238	O-phospho-L-homoserine	
s_1045	L-threonine	
PH0	phosphate	

Products

Table 1055: Properties of each product.

Id	Name	SBO
s_1045	L-threonine	
PH0	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{263} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_1238] - \frac{[\text{s}_1045] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m1238}}} \right)}{1 + \frac{[\text{s}_1238]}{K_{\text{m1238}}} + \left(1 + \frac{[\text{s}_1045]}{K_{\text{m1045}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (527)$$

Table 1056: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.029	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.294	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1238		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1045		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

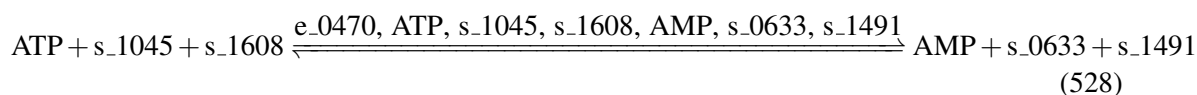
6.264 Reaction r_1042

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

Name threonyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1057: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1045	L-threonine	
s_1608	tRNA(Thr)	

Modifiers

Table 1058: Properties of each modifier.

Id	Name	SBO
e_0470	THS1	0000460
ATP	ATP	
s_1045	L-threonine	
s_1608	tRNA(Thr)	
AMP	AMP	
s_0633	diphosphate	
s_1491	Thr-tRNA(Thr)	

Products

Table 1059: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1491	Thr-tRNA(Thr)	

Kinetic Law

Derived unit contains undeclared units

$$v_{264} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1045}] \cdot [\text{s}_{1608}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{1491}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1045}} \cdot K_{\text{m1608}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1045}]}{K_{\text{m1045}}} \right) \cdot \left(1 + \frac{[\text{s}_{1608}]}{K_{\text{m1608}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{1491}]}{K_{\text{m1491}}} \right) - 1}$$

(529)

Table 1060: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.008	dimensionless	✓
Vmax		0000324	0.247	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1045		0000322	0.100	mmol · l ⁻¹	✓
Km1608		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km1491		0000323	0.100	mmol · l ⁻¹	✓

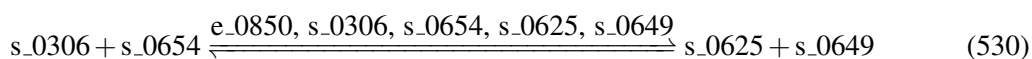
6.265 Reaction r_1045

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 1061: Properties of each reactant.

Id	Name	SBO
s_0306	5,10-methylenetetrahydrofolate	
s_0654	dUMP	

Modifiers

Table 1062: Properties of each modifier.

Id	Name	SBO
e_0850	CDC21	0000460
s_0306	5,10-methylenetetrahydrofolate	
s_0654	dUMP	
s_0625	dihydrofolic acid	
s_0649	dTMP	

Products

Table 1063: Properties of each product.

Id	Name	SBO
s_0625	dihydrofolic acid	
s_0649	dTMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{265} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_0306] \cdot [s_0654] - \frac{[s_0625] \cdot [s_0649]}{K_{\text{eq}}}}{K_{\text{m0306}} \cdot K_{\text{m0654}}} \right)}{\left(1 + \frac{[s_0306]}{K_{\text{m0306}}} \right) \cdot \left(1 + \frac{[s_0654]}{K_{\text{m0654}}} \right) + \left(1 + \frac{[s_0625]}{K_{\text{m0625}}} \right) \cdot \left(1 + \frac{[s_0649]}{K_{\text{m0649}}} \right) - 1} \quad (531)$$

Table 1064: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.54762180106604 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
Km0306		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0654		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0625		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0649		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

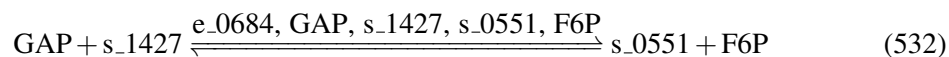
6.266 Reaction r_1048

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

Name transaldolase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1065: Properties of each reactant.

Id	Name	SBO
GAP	glyceraldehyde 3-phosphate	
s_1427	sedoheptulose 7-phosphate	

Modifiers

Table 1066: Properties of each modifier.

Id	Name	SBO
e_0684	TAL1	0000460

Id	Name	SBO
GAP	glyceraldehyde 3-phosphate	
s_1427	sedoheptulose 7-phosphate	
s_0551	D-erythrose 4-phosphate	
F6P	D-fructose 6-phosphate	

Products

Table 1067: Properties of each product.

Id	Name	SBO
s_0551	D-erythrose 4-phosphate	
F6P	D-fructose 6-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{266} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([\text{GAP}] \cdot [\text{s}_1427] - \frac{[\text{s}_0551] \cdot [\text{F6P}]}{K_{\text{eq}}} \right)}{K_{\text{mGAP}} \cdot K_{\text{m1427}} + \left(1 + \frac{[\text{GAP}]}{K_{\text{mGAP}}} \right) \cdot \left(1 + \frac{[\text{s}_1427]}{K_{\text{m1427}}} \right) + \left(1 + \frac{[\text{s}_0551]}{K_{\text{m0551}}} \right) \cdot \left(1 + \frac{[\text{F6P}]}{K_{\text{mF6P}}} \right) - 1} \quad (533)$$

Table 1068: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.027	dimensionless	✓
Vmax		0000324	0.383	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	27.666	dimensionless	✓
KmGAP		0000322	0.045	mmol · l ⁻¹	✓
Km1427		0000322	0.100	mmol · l ⁻¹	✓
Km0551		0000323	0.100	mmol · l ⁻¹	✓
KmF6P		0000323	0.625	mmol · l ⁻¹	✓

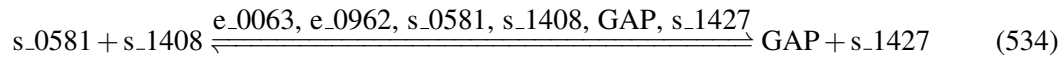
6.267 Reaction r_1049

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

Name transketolase 1

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1069: Properties of each reactant.

Id	Name	SBO
s_0581	D-xylulose 5-phosphate	
s_1408	ribose-5-phosphate	

Modifiers

Table 1070: Properties of each modifier.

Id	Name	SBO
e_0063	TKL2	0000460
e_0962	TKL1	0000460
s_0581	D-xylulose 5-phosphate	
s_1408	ribose-5-phosphate	
GAP	glyceraldehyde 3-phosphate	
s_1427	sedoheptulose 7-phosphate	

Products

Table 1071: Properties of each product.

Id	Name	SBO
GAP	glyceraldehyde 3-phosphate	
s_1427	sedoheptulose 7-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{267} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left([s_0581] \cdot [s_1408] - \frac{[GAP] \cdot [s_1427]}{K_{eq}} \right)}{K_{m0581} \cdot K_{m1408} \cdot \left(\left(1 + \frac{[s_0581]}{K_{m0581}} \right) \cdot \left(1 + \frac{[s_1408]}{K_{m1408}} \right) + \left(1 + \frac{[GAP]}{K_{mGAP}} \right) \cdot \left(1 + \frac{[s_1427]}{K_{m1427}} \right) - 1 \right)} \quad (535)$$

Table 1072: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.019	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.262	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.904	dimensionless	<input checked="" type="checkbox"/>
Km0581		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1408		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmGAP		0000323	0.045	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1427		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

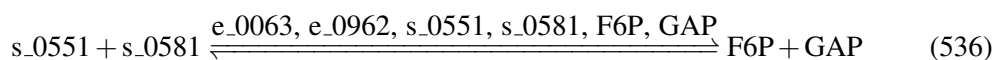
6.268 Reaction r_1050

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

Name transketolase 2

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1073: Properties of each reactant.

Id	Name	SBO
s_0551	D-erythrose 4-phosphate	
s_0581	D-xylulose 5-phosphate	

Modifiers

Table 1074: Properties of each modifier.

Id	Name	SBO
e_0063	TKL2	0000460
e_0962	TKL1	0000460
s_0551	D-erythrose 4-phosphate	
s_0581	D-xylulose 5-phosphate	
F6P	D-fructose 6-phosphate	
GAP	glyceraldehyde 3-phosphate	

Products

Table 1075: Properties of each product.

Id	Name	SBO
F6P	D-fructose 6-phosphate	
GAP	glyceraldehyde 3-phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{268} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0551}] \cdot [s_{0581}] - \frac{[F6P] \cdot [GAP]}{K_{eq}}}{K_{m0551} \cdot K_{m0581}} \right)}{\left(1 + \frac{[s_{0551}]}{K_{m0551}} \right) \cdot \left(1 + \frac{[s_{0581}]}{K_{m0581}} \right) + \left(1 + \frac{[F6P]}{K_{mF6P}} \right) \cdot \left(1 + \frac{[GAP]}{K_{mGAP}} \right) - 1} \quad (537)$$

Table 1076: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.007	dimensionless	✓
Vmax		0000324	0.103	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	5.647	dimensionless	✓
Km0551		0000322	0.100	mmol · l ⁻¹	✓
Km0581		0000322	0.100	mmol · l ⁻¹	✓
KmF6P		0000323	0.625	mmol · l ⁻¹	✓
KmGAP		0000323	0.045	mmol · l ⁻¹	✓

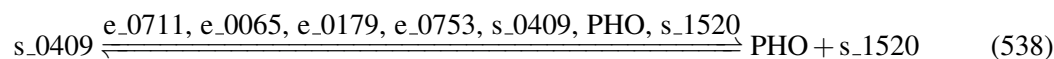
6.269 Reaction r_1051

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

Name trehalose-phosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1077: Properties of each reactant.

Id	Name	SBO
s_0409	alpha,alpha-trehalose 6-phosphate	

Modifiers

Table 1078: Properties of each modifier.

Id	Name	SBO
e_0711	TSL1	0000460
e_0065	TPS1	0000460
e_0179	TPS2	0000460
e_0753	TPS3	0000460
s_0409	alpha,alpha-trehalose 6-phosphate	
PHO	phosphate	
s_1520	trehalose	

Products

Table 1079: Properties of each product.

Id	Name	SBO
PHO	phosphate	
s_1520	trehalose	

Kinetic Law

Derived unit contains undeclared units

$$v_{269} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0409}] \cdot [\text{PHO}] \cdot [s_{1520}]}{K_{\text{eq}}} \right)}{K_{m0409} + \left(1 + \frac{[s_{0409}]}{K_{m0409}} + \left(1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}} \right) \cdot \left(1 + \frac{[s_{1520}]}{K_{m1520}} \right) - 1 \right)} \quad (539)$$

Table 1080: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	☑
Vmax		0000324	0.010	mmol · l ⁻¹ · s ⁻¹	☑
Keq		0000281	0.200	mmol · l ⁻¹	☑

Id	Name	SBO	Value	Unit	Constant
Km0409		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPH0		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1520		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

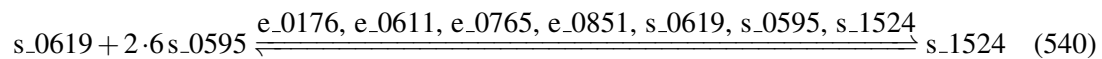
6.270 Reaction r_1052

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

Name triacylglycerol lipase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1081: Properties of each reactant.

Id	Name	SBO
s_0619	diglyceride	
s_0595	decanoate	

Modifiers

Table 1082: Properties of each modifier.

Id	Name	SBO
e_0176	TGL2	0000460
e_0611	TGL4	0000460
e_0765	TGL3	0000460
e_0851	TGL5	0000460
s_0619	diglyceride	
s_0595	decanoate	
s_1524	triglyceride	

Product

Table 1083: Properties of each product.

Id	Name	SBO
s_1524	triglyceride	

Kinetic Law

Derived unit contains undeclared units

$$v_{270} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_{.0619}] \cdot [\text{s}_{.0595}] - \frac{[\text{s}_{.1524}]}{K_{\text{eq}}}}{K_{\text{m0619}} \cdot K_{\text{m0595}}} \right)}{\left(1 + \frac{[\text{s}_{.0619}]}{K_{\text{m0619}}} \right) \cdot \left(1 + \frac{[\text{s}_{.0595}]}{K_{\text{m0595}}} \right) + 1 + \frac{[\text{s}_{.1524}]}{K_{\text{m1524}}} - 1} \quad (541)$$

Table 1084: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$5.77907768859609 \cdot 10^{-4}$	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	20.000	$\text{mmol}^{-1} \cdot \text{l}$	<input checked="" type="checkbox"/>
Km0619		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0595		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km1524		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.271 Reaction TPI

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 1085: Properties of each reactant.

Id	Name	SBO
DHAP	dihydroxyacetone phosphate	

Modifiers

Table 1086: Properties of each modifier.

Id	Name	SBO
e_0175	TPI1	0000460
DHAP	dihydroxyacetone phosphate	
GAP	glyceraldehyde 3-phosphate	

Product

Table 1087: Properties of each product.

Id	Name	SBO
GAP	glyceraldehyde 3-phosphate	

Kinetic Law

Derived unit $\text{s}^{-1} \cdot \text{mmol}$

$$v_{271} = \text{vol}(\text{cell}) \cdot k \cdot \left([\text{DHAP}] - \frac{[\text{GAP}]}{\text{Keq}} \right) \quad (543)$$

Table 1088: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k			7500.000	s^{-1}	<input checked="" type="checkbox"/>
Keq			0.045	dimensionless	<input checked="" type="checkbox"/>
FLUX_VALUE			0.991	dimensionless	<input checked="" type="checkbox"/>

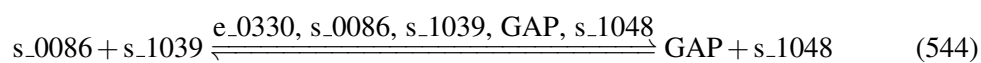
6.272 Reaction r_1055

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

Name tryptophan synthase (indoleglycerol phosphate)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1089: Properties of each reactant.

Id	Name	SBO
s_0086	1-C-(indol-3-yl)glycerol 3-phosphate	
s_1039	L-serine	

Modifiers

Table 1090: Properties of each modifier.

Id	Name	SBO
e_0330	TRP5	0000460
s_0086	1-C-(indol-3-yl)glycerol 3-phosphate	
s_1039	L-serine	
GAP	glyceraldehyde 3-phosphate	
s_1048	L-tryptophan	

Products

Table 1091: Properties of each product.

Id	Name	SBO
GAP	glyceraldehyde 3-phosphate	
s_1048	L-tryptophan	

Kinetic Law

Derived unit contains undeclared units

$$v_{272} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0086}] \cdot [s_{1039}] - \frac{[GAP] \cdot [s_{1048}]}{K_{eq}}}{K_{m0086} \cdot K_{m1039}} \right)}{\left(1 + \frac{[s_{0086}]}{K_{m0086}} \right) \cdot \left(1 + \frac{[s_{1039}]}{K_{m1039}} \right) + \left(1 + \frac{[GAP]}{K_{mGAP}} \right) \cdot \left(1 + \frac{[s_{1048}]}{K_{m1048}} \right) - 1} \quad (545)$$

Table 1092: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.017	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Keq		0000281	0.904	dimensionless	<input checked="" type="checkbox"/>
Km0086		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1039		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmGAP		0000323	0.045	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1048		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

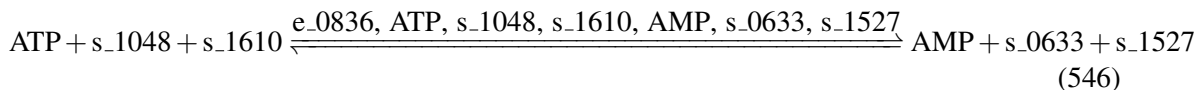
6.273 Reaction r_1057

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

Name tryptophanyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1093: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1048	L-tryptophan	
s_1610	tRNA(Trp)	

Modifiers

Table 1094: Properties of each modifier.

Id	Name	SBO
e_0836	WRS1	0000460
ATP	ATP	
s_1048	L-tryptophan	
s_1610	tRNA(Trp)	
AMP	AMP	
s_0633	diphosphate	
s_1527	Trp-tRNA(Trp)	

Products

Table 1095: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1527	Trp-tRNA(Trp)	

Kinetic Law

Derived unit contains undeclared units

$$v_{273} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1048}] \cdot [\text{s}_{1610}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{1527}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1048}} \cdot K_{\text{m1610}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1048}]}{K_{\text{m1048}}} \right) \cdot \left(1 + \frac{[\text{s}_{1610}]}{K_{\text{m1610}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{1527}]}{K_{\text{m1527}}} \right) - 1} \quad (547)$$

Table 1096: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.001	dimensionless	✓
Vmax		0000324	0.037	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1048		0000322	0.100	mmol · l ⁻¹	✓
Km1610		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km1527		0000323	0.100	mmol · l ⁻¹	✓

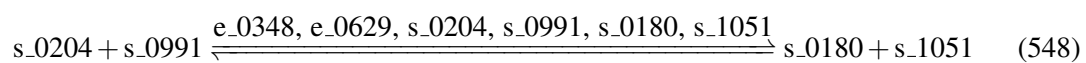
6.274 Reaction r_1063

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 1097: Properties of each reactant.

Id	Name	SBO
s_0204	3-(4-hydroxyphenyl)pyruvate	
s_0991	L-glutamate	

Modifiers

Table 1098: Properties of each modifier.

Id	Name	SBO
e_0348	ARO8	0000460
e_0629	AAT2	0000460
s_0204	3-(4-hydroxyphenyl)pyruvate	
s_0991	L-glutamate	
s_0180	2-oxoglutarate	
s_1051	L-tyrosine	

Products

Table 1099: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1051	L-tyrosine	

Kinetic Law

Derived unit contains undeclared units

$$v_{274} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{0204}] \cdot [s_{0991}] - \frac{[s_{0180}] \cdot [s_{1051}]}{K_{\text{eq}}}}{K_{\text{m0204}} \cdot K_{\text{m0991}}} \right)}{\left(1 + \frac{[s_{0204}]}{K_{\text{m0204}}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{\text{m0991}}} \right) + \left(1 + \frac{[s_{0180}]}{K_{\text{m0180}}} \right) \cdot \left(1 + \frac{[s_{1051}]}{K_{\text{m1051}}} \right) - 1} \quad (549)$$

Table 1100: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
V _{max}		0000324	0.061	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
K _{eq}		0000281	2.000	dimensionless	<input checked="" type="checkbox"/>
K _{m0204}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0991}		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m0180}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
K _{m1051}		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

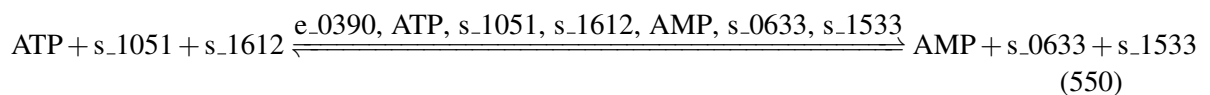
6.275 Reaction r_1066

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

Name tyrosyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1101: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1051	L-tyrosine	
s_1612	tRNA(Tyr)	

Modifiers

Table 1102: Properties of each modifier.

Id	Name	SBO
e_0390	TYS1	0000460
ATP	ATP	
s_1051	L-tyrosine	
s_1612	tRNA(Tyr)	
AMP	AMP	
s_0633	diphosphate	

Id	Name	SBO
s_1533	Tyr-tRNA(Tyr)	

Products

Table 1103: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1533	Tyr-tRNA(Tyr)	

Kinetic Law

Derived unit contains undeclared units

v_{275}

(551)

$$= \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1051}] \cdot [\text{s}_{1612}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{1533}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1051}} \cdot K_{\text{m1612}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1051}]}{K_{\text{m1051}}} \right) \cdot \left(1 + \frac{[\text{s}_{1612}]}{K_{\text{m1612}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{1533}]}{K_{\text{m1533}}} \right) - 1}$$

Table 1104: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.004	dimensionless	✓
V_{\max}		0000324	0.132	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
K_{eq}		0000281	0.232	dimensionless	✓
K_{mATP}		0000322	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
K_{m1051}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
K_{m1612}		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
K_{mAMP}		0000323	0.293	$\text{mmol} \cdot \text{l}^{-1}$	✓
K_{m0633}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
K_{m1533}		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

6.276 Reaction r_1072

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

Name UMP kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1105: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1545	UMP	

Modifiers

Table 1106: Properties of each modifier.

Id	Name	SBO
e_0561	URA6	0000460
ATP	ATP	
s_1545	UMP	
ADP	ADP	
s_1538	UDP	

Products

Table 1107: Properties of each product.

Id	Name	SBO
ADP	ADP	
s_1538	UDP	

Kinetic Law

Derived unit contains undeclared units

$$v_{276} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s_1545}] - \frac{[\text{ADP}] \cdot [\text{s_1538}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1545}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s_1545}]}{K_{\text{m1545}}} \right) + \left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s_1538}]}{K_{\text{m1538}}} \right) - 1} \quad (553)$$

Table 1108: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.002	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.031	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	1.015	dimensionless	<input checked="" type="checkbox"/>
KmATP		0000322	2.525	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1545		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmADP		0000323	1.282	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1538		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

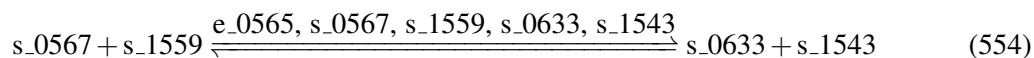
6.277 Reaction r_1084

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

Name UTP-glucose-1-phosphate uridylyltransferase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1109: Properties of each reactant.

Id	Name	SBO
s_0567	D-glucose 1-phosphate	
s_1559	UTP	

Modifiers

Table 1110: Properties of each modifier.

Id	Name	SBO
e_0565	UGP1	0000460
s_0567	D-glucose 1-phosphate	
s_1559	UTP	
s_0633	diphosphate	
s_1543	UDP-D-glucose	

Products

Table 1111: Properties of each product.

Id	Name	SBO
s_0633	diphosphate	
s_1543	UDP-D-glucose	

Kinetic Law

Derived unit contains undeclared units

$$v_{277} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0567}] \cdot [s_{1559}] - \frac{[s_{0633}] \cdot [s_{1543}]}{K_{eq}}}{K_{m0567} \cdot K_{m1559}} \right)}{\left(1 + \frac{[s_{0567}]}{K_{m0567}} \right) \cdot \left(1 + \frac{[s_{1559}]}{K_{m1559}} \right) + \left(1 + \frac{[s_{0633}]}{K_{m0633}} \right) \cdot \left(1 + \frac{[s_{1543}]}{K_{m1543}} \right) - 1} \quad (555)$$

Table 1112: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.121	dimensionless	✓
Vmax		0000324	1.692	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓
Km0567		0000322	0.100	mmol · l ⁻¹	✓
Km1559		0000322	0.100	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km1543		0000323	0.100	mmol · l ⁻¹	✓

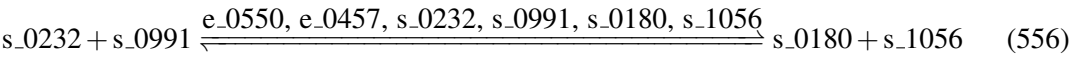
6.278 Reaction r_1087

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

Name valine transaminase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1113: Properties of each reactant.

Id	Name	SBO
s_0232	3-methyl-2-oxobutanoate	
s_0991	L-glutamate	

Modifiers

Table 1114: Properties of each modifier.

Id	Name	SBO
e_0550	BAT2	0000460
e_0457	BAT1	0000460
s_0232	3-methyl-2-oxobutanoate	
s_0991	L-glutamate	
s_0180	2-oxoglutarate	
s_1056	L-valine	

Products

Table 1115: Properties of each product.

Id	Name	SBO
s_0180	2-oxoglutarate	
s_1056	L-valine	

Kinetic Law

Derived unit contains undeclared units

$$v_{278} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{0232}] \cdot [s_{0991}] - \frac{[s_{0180}] \cdot [s_{1056}]}{K_{\text{eq}}}}{K_{\text{m}0232} \cdot K_{\text{m}0991}} \right)}{\left(1 + \frac{[s_{0232}]}{K_{\text{m}0232}} \right) \cdot \left(1 + \frac{[s_{0991}]}{K_{\text{m}0991}} \right) + \left(1 + \frac{[s_{0180}]}{K_{\text{m}0180}} \right) \cdot \left(1 + \frac{[s_{1056}]}{K_{\text{m}1056}} \right) - 1} \quad (557)$$

Table 1116: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.159	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	2.000	dimensionless	✓

Id	Name	SBO	Value	Unit	Constant
Km0232		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0991		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0180		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1056		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

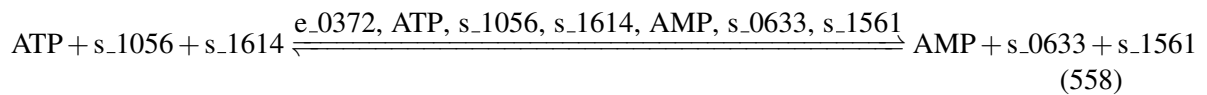
6.279 Reaction r_1089

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

Name valyl-tRNA synthetase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1117: Properties of each reactant.

Id	Name	SBO
ATP	ATP	
s_1056	L-valine	
s_1614	tRNA(Val)	

Modifiers

Table 1118: Properties of each modifier.

Id	Name	SBO
e_0372	VAS1	0000460
ATP	ATP	
s_1056	L-valine	
s_1614	tRNA(Val)	
AMP	AMP	
s_0633	diphosphate	
s_1561	Val-tRNA(Val)	

Products

Table 1119: Properties of each product.

Id	Name	SBO
AMP	AMP	
s_0633	diphosphate	
s_1561	Val-tRNA(Val)	

Kinetic Law

Derived unit contains undeclared units

$$v_{279} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ATP}] \cdot [\text{s}_{1056}] \cdot [\text{s}_{1614}] - \frac{[\text{AMP}] \cdot [\text{s}_{0633}] \cdot [\text{s}_{1561}]}{K_{\text{eq}}}}{K_{\text{mATP}} \cdot K_{\text{m1056}} \cdot K_{\text{m1614}}} \right)}{\left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_{1056}]}{K_{\text{m1056}}} \right) \cdot \left(1 + \frac{[\text{s}_{1614}]}{K_{\text{m1614}}} \right) + \left(1 + \frac{[\text{AMP}]}{K_{\text{mAMP}}} \right) \cdot \left(1 + \frac{[\text{s}_{0633}]}{K_{\text{m0633}}} \right) \cdot \left(1 + \frac{[\text{s}_{1561}]}{K_{\text{m1561}}} \right) - 1}$$

(559)

Table 1120: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.011	dimensionless	✓
Vmax		0000324	0.341	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.232	dimensionless	✓
KmATP		0000322	2.525	mmol · l ⁻¹	✓
Km1056		0000322	0.100	mmol · l ⁻¹	✓
Km1614		0000322	0.100	mmol · l ⁻¹	✓
KmAMP		0000323	0.293	mmol · l ⁻¹	✓
Km0633		0000323	0.100	mmol · l ⁻¹	✓
Km1561		0000323	0.100	mmol · l ⁻¹	✓

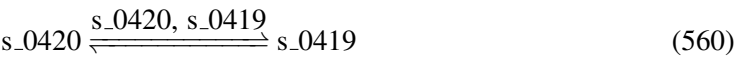
6.280 Reaction r_1115

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

Name ammonia transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1121: Properties of each reactant.

Id	Name	SBO
s_0420	ammonium	

Modifiers

Table 1122: Properties of each modifier.

Id	Name	SBO
s_0420	ammonium	
s_0419	ammonium	

Product

Table 1123: Properties of each product.

Id	Name	SBO
s_0419	ammonium	

Kinetic Law

Derived unit contains undeclared units

$$v_{280} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot ([s_{0420}] - [s_{0419}])}{K_{m0420}}}{1 + \frac{[s_{0420}]}{K_{m0420}} + 1 + \frac{[s_{0419}]}{K_{m0419}} - 1} \quad (561)$$

Table 1124: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.240	dimensionless	✓
Vmax		0000324	0.801	mmol · l ⁻¹ · s ⁻¹	✓
Km0420		0000322	1.000	mmol · l ⁻¹	✓
Km0419		0000323	0.100	mmol · l ⁻¹	✓

6.281 Reaction HXT

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

Name glucose transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1125: Properties of each reactant.

Id	Name	SBO
GLCx	D-glucose	

Modifiers

Table 1126: Properties of each modifier.

Id	Name	SBO
GLCx	D-glucose	
GLC	D-glucose	

Product

Table 1127: Properties of each product.

Id	Name	SBO
GLC	D-glucose	

Kinetic Law

Derived unit contains undeclared units

$$v_{281} = \text{vol}(\text{cell}) \cdot \frac{\frac{V_{\max} \cdot ([\text{GLCx}] - [\text{GLC}])}{K_{\text{glc}}}}{1 + \frac{[\text{GLCx}]}{K_{\text{glc}}} + \frac{[\text{GLC}]}{K_{\text{glc}}} + \frac{\frac{K_i \cdot [\text{GLCx}]}{K_{\text{glc}}} \cdot [\text{GLC}]}{K_{\text{glc}}}} \quad (563)$$

Table 1128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
Vmax			1.621	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
K _{glc}			1.192	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
K _i			0.910	dimensionless	<input checked="" type="checkbox"/>
FLUX_VALUE			1.489	dimensionless	<input checked="" type="checkbox"/>

6.282 Reaction r_1172

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name glycerol transport via channel

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1129: Properties of each reactant.

Id	Name	SBO
GLY	glycerol	

Modifier

Table 1130: Properties of each modifier.

Id	Name	SBO
GLY	glycerol	

Product

Table 1131: Properties of each product.

Id	Name	SBO
s_0766	glycerol	

Kinetic Law

Derived unit contains undeclared units

$$v_{282} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot [\text{GLY}]}{K_{\text{mGLY}} + \frac{[\text{GLY}]^2}{K_{\text{mGLY}}}} \quad (565)$$

Table 1132: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.093	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.186	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
KmGLY		0000322	0.150	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.283 Reaction r_1244

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

Name phosphate transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1133: Properties of each reactant.

Id	Name	SBO
s_1324	phosphate	

Modifiers

Table 1134: Properties of each modifier.

Id	Name	SBO
s_1324	phosphate	
PHO	phosphate	

Product

Table 1135: Properties of each product.

Id	Name	SBO
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{283} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot ([s_{1324}] - [\text{PHO}])}{K_{m1324}}}{1 + \frac{[s_{1324}]}{K_{m1324}} + 1 + \frac{[\text{PHO}]}{K_{m\text{PHO}}}} - 1 \quad (567)$$

Table 1136: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.034	dimensionless	✓
Vmax		0000324	0.113	mmol · l ⁻¹ · s ⁻¹	✓
Km1324		0000322	1.000	mmol · l ⁻¹	✓
KmPHO		0000323	0.100	mmol · l ⁻¹	✓

6.284 Reaction r_1266

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

Name sulfate uniport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1137: Properties of each reactant.

Id	Name	SBO
s_1468	sulphate	

Modifiers

Table 1138: Properties of each modifier.

Id	Name	SBO
s_1468	sulphate	
s_1467	sulphate	

Product

Table 1139: Properties of each product.

Id	Name	SBO
s_1467	sulphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{284} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot ([s_{1468}] - [s_{1467}])}{K_{m1468} \left(1 + \frac{[s_{1468}]}{K_{m1468}} + 1 + \frac{[s_{1467}]}{K_{m1467}} - 1 \right)} \quad (569)$$

Table 1140: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.003	dimensionless	✓
Vmax		0000324	0.011	mmol · l ⁻¹ · s ⁻¹	✓
Km1468		0000322	1.000	mmol · l ⁻¹	✓
Km1467		0000323	0.100	mmol · l ⁻¹	✓

6.285 Reaction r_1633

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name acetaldehyde transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1141: Properties of each reactant.

Id	Name	SBO
AcAld	acetaldehyde	

Modifier

Table 1142: Properties of each modifier.

Id	Name	SBO
AcAld	acetaldehyde	

Product

Table 1143: Properties of each product.

Id	Name	SBO
s_0360	acetaldehyde	

Kinetic Law

Derived unit contains undeclared units

$$v_{285} = \frac{\frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot [\text{AcAld}]}{K_{\text{mAcAld}}}}{1 + \frac{[\text{AcAld}]}{K_{\text{mAcAld}}}} \quad (571)$$

Table 1144: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.029	dimensionless	✓
Vmax		0000324	0.058	mmol · l ⁻¹ · s ⁻¹	✓
KmAcAld		0000322	0.178	mmol · l ⁻¹	✓

6.286 Reaction r_1664

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

Name bicarbonate formation

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1145: Properties of each reactant.

Id	Name	SBO
C02	carbon dioxide	

Modifiers

Table 1146: Properties of each modifier.

Id	Name	SBO
C02	carbon dioxide	
s_0445	bicarbonate	

Product

Table 1147: Properties of each product.

Id	Name	SBO
s_0445	bicarbonate	

Kinetic Law

Derived unit contains undeclared units

$$v_{286} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{CO2}] - \frac{[\text{s_0445}]}{K_{\text{eq}}}}{K_{\text{mCO2}}} \right)}{1 + \frac{[\text{CO2}]}{K_{\text{mCO2}}} + 1 + \frac{[\text{s_0445}]}{K_{\text{m0445}}} - 1}$$

(573)

Table 1148: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.159	dimensionless	<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	0.955	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.200	dimensionless	<input checked="" type="checkbox"/>
KmC02		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km0445		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

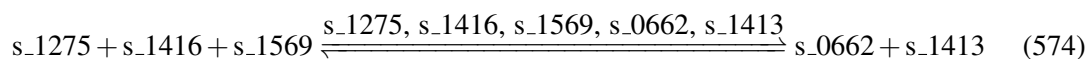
6.287 Reaction r_1682

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

Name cholestenol delta-isomerase, lumped reaction

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1149: Properties of each reactant.

Id	Name	SBO
s_1275	oxygen	
s_1416	S-adenosyl-L-methionine	
s_1569	zymosterol	

Modifiers

Table 1150: Properties of each modifier.

Id	Name	SBO
s_1275	oxygen	
s_1416	S-adenosyl-L-methionine	
s_1569	zymosterol	
s_0662	ergosta-5,7,22,24(28)-tetraen-3beta-ol	
s_1413	S-adenosyl-L-homocysteine	

Products

Table 1151: Properties of each product.

Id	Name	SBO
s_0662	ergosta-5,7,22,24(28)-tetraen-3beta-ol	
s_1413	S-adenosyl-L-homocysteine	

Kinetic Law

Derived unit contains undeclared units

$$v_{287} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_{1275}] \cdot [s_{1416}] \cdot [s_{1569}] - \frac{[s_{0662}] \cdot [s_{1413}]}{K_{\text{eq}}}}{K_{\text{m1275}} \cdot K_{\text{m1416}} \cdot K_{\text{m1569}}} \right)}{\left(1 + \frac{[s_{1275}]}{K_{\text{m1275}}} \right) \cdot \left(1 + \frac{[s_{1416}]}{K_{\text{m1416}}} \right) \cdot \left(1 + \frac{[s_{1569}]}{K_{\text{m1569}}} \right) + \left(1 + \frac{[s_{0662}]}{K_{\text{m0662}}} \right) \cdot \left(1 + \frac{[s_{1413}]}{K_{\text{m1413}}} \right) - 1} \quad (575)$$

Table 1152: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$2.81022322927489 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.006	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	20.000	$\text{mmol}^{-1} \cdot \text{l}$	✓
Km1275		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1416		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1569		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0662		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km1413		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

6.288 Reaction r_1697

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name CO2 transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1153: Properties of each reactant.

Id	Name	SBO
C02	carbon dioxide	

Modifier

Table 1154: Properties of each modifier.

Id	Name	SBO
C02	carbon dioxide	

Product

Table 1155: Properties of each product.

Id	Name	SBO
s_0458	carbon dioxide	

Kinetic Law

Derived unit contains undeclared units

$$v_{288} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot [\text{CO}_2]}{K_{\text{mCO}_2} + [\text{CO}_2]} \quad (577)$$

Table 1156: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			2.368	dimensionless	✓
Vmax		0000324	4.735	mmol · l ⁻¹ · s ⁻¹	✓
KmCO2		0000322	1.000	mmol · l ⁻¹	✓

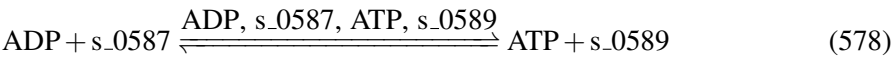
6.289 Reaction r_1704

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

Name cytidylate kinase (dCMP)

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1157: Properties of each reactant.

Id	Name	SBO
ADP	ADP	
s_0587	dCDP	

Modifiers

Table 1158: Properties of each modifier.

Id	Name	SBO
ADP	ADP	
s_0587	dCDP	
ATP	ATP	
s_0589	dCMP	

Products

Table 1159: Properties of each product.

Id	Name	SBO
ATP	ATP	
s_0589	dCMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{289} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{ADP}] \cdot [\text{s_0587}] - \frac{[\text{ATP}] \cdot [\text{s_0589}]}{K_{\text{eq}}}}{K_{\text{mADP}} \cdot K_{\text{m0587}}} \right)}{\left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s_0587}]}{K_{\text{m0587}}} \right) + \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s_0589}]}{K_{\text{m0589}}} \right) - 1}$$

(579)

Table 1160: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.04616918267866 \cdot 10^{-4}$	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	3.939	dimensionless	<input checked="" type="checkbox"/>
KmADP		0000322	1.282	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0587		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmATP		0000323	2.525	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0589		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

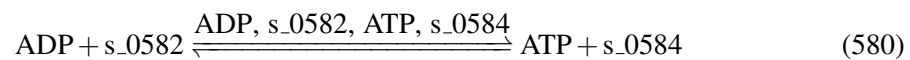
6.290 Reaction r_1729

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

Name deoxyadenylate kinase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1161: Properties of each reactant.

Id	Name	SBO
ADP	ADP	
s_0582	dADP	

Modifiers

Table 1162: Properties of each modifier.

Id	Name	SBO
ADP	ADP	
s_0582	dADP	
ATP	ATP	
s_0584	dAMP	

Products

Table 1163: Properties of each product.

Id	Name	SBO
ATP	ATP	
s_0584	dAMP	

Kinetic Law

Derived unit contains undeclared units

$$v_{290} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[\text{ADP}] \cdot [\text{s}_0582] - \frac{[\text{ATP}] \cdot [\text{s}_0584]}{K_{\text{eq}}}}{K_{\text{mADP}} \cdot K_{\text{m0582}}} \right)}{\left(1 + \frac{[\text{ADP}]}{K_{\text{mADP}}} \right) \cdot \left(1 + \frac{[\text{s}_0582]}{K_{\text{m0582}}} \right) + \left(1 + \frac{[\text{ATP}]}{K_{\text{mATP}}} \right) \cdot \left(1 + \frac{[\text{s}_0584]}{K_{\text{m0584}}} \right) - 1} \quad (581)$$

Table 1164: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			$1.54762173571763 \cdot 10^{-4}$	dimensionless	✓
Vmax		0000324	0.002	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
Keq		0000281	3.939	dimensionless	✓
KmADP		0000322	1.282	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0582		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
KmATP		0000323	2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
Km0584		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

6.291 Reaction r_1762

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name ethanol transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1165: Properties of each reactant.

Id	Name	SBO
EtOH	ethanol	

Modifier

Table 1166: Properties of each modifier.

Id	Name	SBO
EtOH	ethanol	

Product

Table 1167: Properties of each product.

Id	Name	SBO
s_0681	ethanol	

Kinetic Law**Derived unit** contains undeclared units

$$v_{291} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot [\text{EtOH}]}{K_{\text{mEtOH}} + \frac{[\text{EtOH}]^2}{K_{\text{mEtOH}}}} \quad (583)$$

Table 1168: Properties of each parameter.

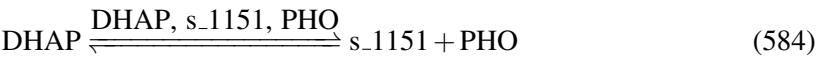
Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			2.173	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	4.346	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
KmEtOH		0000322	50.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>

6.292 Reaction r_1936

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

Name methylglyoxal synthase**SBO:0000176** biochemical reaction

Reaction equation



Reactant

Table 1169: Properties of each reactant.

Id	Name	SBO
DHAP	dihydroxyacetone phosphate	

Modifiers

Table 1170: Properties of each modifier.

Id	Name	SBO
DHAP	dihydroxyacetone phosphate	
s_1151	methylglyoxal	
PHO	phosphate	

Products

Table 1171: Properties of each product.

Id	Name	SBO
s_1151	methylglyoxal	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{292} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left([\text{DHAP}] - \frac{[\text{s_1151}] \cdot [\text{PHO}]}{K_{\text{eq}}} \right)}{1 + \frac{[\text{DHAP}]}{K_{\text{mDHAP}}} + \left(1 + \frac{[\text{s_1151}]}{K_{\text{m1151}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1}$$

(585)

Table 1172: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.216	dimensionless	✓

Id	Name	SBO	Value	Unit	Constant
Vmax		0000324	2.158	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.020	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmDHAP		0000322	1.004	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1151		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

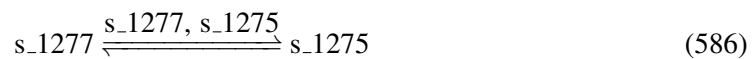
6.293 Reaction r_1979

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

Name O2 transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1173: Properties of each reactant.

Id	Name	SBO
s_1277	oxygen	

Modifiers

Table 1174: Properties of each modifier.

Id	Name	SBO
s_1277	oxygen	
s_1275	oxygen	

Product

Table 1175: Properties of each product.

Id	Name	SBO
s_1275	oxygen	

Kinetic Law

Derived unit contains undeclared units

$$v_{293} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot ([s_{1277}] - [s_{1275}])}{K_{m1277} \left(1 + \frac{[s_{1277}]}{K_{m1277}} + 1 + \frac{[s_{1275}]}{K_{m1275}} - 1 \right)} \quad (587)$$

Table 1176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.119	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.398	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Km1277		0000322	1.000	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1275		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>

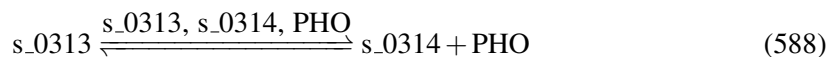
6.294 Reaction r_2030

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 1177: Properties of each reactant.

Id	Name	SBO
s_0313	5-amino-6-(5-phosphoribitylamino)uracil	

Modifiers

Table 1178: Properties of each modifier.

Id	Name	SBO
s_0313	5-amino-6-(5-phosphoribitylamino)uracil	
s_0314	5-amino-6-(D-ribitylamino)uracil	

Id	Name	SBO
PHO	phosphate	

Products

Table 1179: Properties of each product.

Id	Name	SBO
s_0314	5-amino-6-(D-ribitylamino)uracil	
PHO	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{294} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[\text{s}_0313]}{K_{\text{m}0313}} - \frac{[\text{s}_0314] \cdot [\text{PHO}]}{K_{\text{eq}}} \right)}{1 + \frac{[\text{s}_0313]}{K_{\text{m}0313}} + \left(1 + \frac{[\text{s}_0314]}{K_{\text{m}0314}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (589)$$

Table 1180: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX.VALUE			$4.25595995293758 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	$4.25595995293516 \cdot 10^{-4}$	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	<input checked="" type="checkbox"/>
Keq		0000281	0.200	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0313		0000322	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
Km0314		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
KmPHO		0000323	0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>

6.295 Reaction r_2057

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name succinate transport

SBO:0000185 transport reaction

Reaction equation



Reactant

Table 1181: Properties of each reactant.

Id	Name	SBO
s_1458	succinate	

Modifier

Table 1182: Properties of each modifier.

Id	Name	SBO
s_1458	succinate	

Product

Table 1183: Properties of each product.

Id	Name	SBO
s_1459	succinate	

Kinetic Law

Derived unit contains undeclared units

$$v_{295} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot [\text{s_1458}]}{K_{\text{m1458}} + [\text{s_1458}]} \quad (591)$$

Table 1184: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.016	dimensionless	✓
Vmax		0000324	0.033	mmol · l ⁻¹ · s ⁻¹	✓
Km1458		0000322	0.100	mmol · l ⁻¹	✓

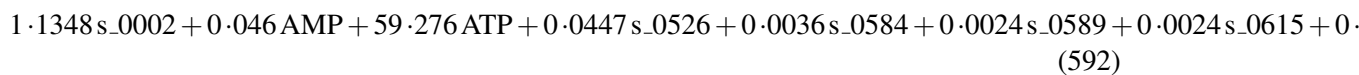
6.296 Reaction r_2111

This is an irreversible reaction of 51 reactants forming 22 products influenced by 51 modifiers.

Name growth

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1185: Properties of each reactant.

Id	Name	SBO
s_0002	(1->3)-beta-D-glucan	
AMP	AMP	
ATP	ATP	
s_0526	CMP	
s_0584	dAMP	
s_0589	dCMP	
s_0615	dGMP	
s_0649	dTMP	
s_0773	glycogen	
s_0782	GMP	
s_1107	mannan	
s_1405	riboflavin	
s_1467	sulphate	
s_1520	trehalose	
s_1545	UMP	
s_0004	(1->6)-beta-D-glucan	
s_0404	Ala-tRNA(Ala)	
s_0428	Arg-tRNA(Arg)	
s_0430	Asn-tRNA(Asn)	
s_0432	Asp-tRNA(Asp)	
s_0542	Cys-tRNA(Cys)	
s_0747	Gln-tRNA(Gln)	
s_0748	Glu-tRNA(Glu)	
s_0757	Gly-tRNA(Gly)	
s_0832	His-tRNA(His)	
s_0847	Ile-tRNA(Ile)	
s_1077	Leu-tRNA(Leu)	
s_1099	Lys-tRNA(Lys)	
s_1148	Met-tRNA(Met)	
s_1314	Phe-tRNA(Phe)	
s_1379	Pro-tRNA(Pro)	

Id	Name	SBO
s_1337	phosphatidyl-L-serine	
s_0089	1-phosphatidyl-1D-myo-inositol	
s_1428	Ser-tRNA(Ser)	
s_1491	Thr-tRNA(Thr)	
s_1527	Trp-tRNA(Trp)	
s_1533	Tyr-tRNA(Tyr)	
s_1561	Val-tRNA(Val)	
s_0122	14-demethyl lanosterol	
s_0897	inositol-P-ceramide A (C26)	
s_0657	episterol	
s_0662	ergosta-5,7,22,24(28)-tetraen-3beta-ol	
s_0666	ergosterol	
s_0672	ergosterol ester	
s_0595	decanoate	
s_0700	fecosterol	
s_1059	lanosterol	
s_1346	phosphatidylcholine	
s_1351	phosphatidylethanolamine	
s_1524	triglyceride	
s_1569	zymosterol	

Modifiers

Table 1186: Properties of each modifier.

Id	Name	SBO
s_0002	(1->3)-beta-D-glucan	
AMP	AMP	
ATP	ATP	
s_0526	CMP	
s_0584	dAMP	
s_0589	dCMP	
s_0615	dGMP	
s_0649	dTMP	
s_0773	glycogen	
s_0782	GMP	
s_1107	mannan	
s_1405	riboflavin	
s_1467	sulphate	
s_1520	trehalose	
s_1545	UMP	

Id	Name	SBO
s_0004	(1->6)-beta-D-glucan	
s_0404	Ala-tRNA(Ala)	
s_0428	Arg-tRNA(Arg)	
s_0430	Asn-tRNA(Asn)	
s_0432	Asp-tRNA(Asp)	
s_0542	Cys-tRNA(Cys)	
s_0747	Gln-tRNA(Gln)	
s_0748	Glu-tRNA(Glu)	
s_0757	Gly-tRNA(Gly)	
s_0832	His-tRNA(His)	
s_0847	Ile-tRNA(Ile)	
s_1077	Leu-tRNA(Leu)	
s_1099	Lys-tRNA(Lys)	
s_1148	Met-tRNA(Met)	
s_1314	Phe-tRNA(Phe)	
s_1379	Pro-tRNA(Pro)	
s_1337	phosphatidyl-L-serine	
s_0089	1-phosphatidyl-1D-myo-inositol	
s_1428	Ser-tRNA(Ser)	
s_1491	Thr-tRNA(Thr)	
s_1527	Trp-tRNA(Trp)	
s_1533	Tyr-tRNA(Tyr)	
s_1561	Val-tRNA(Val)	
s_0122	14-demethyl lanosterol	
s_0897	inositol-P-ceramide A (C26)	
s_0657	episterol	
s_0662	ergosta-5,7,22,24(28)-tetraen-3beta-ol	
s_0666	ergosterol	
s_0672	ergosterol ester	
s_0595	decanoate	
s_0700	fecosterol	
s_1059	lanosterol	
s_1346	phosphatidylcholine	
s_1351	phosphatidylethanolamine	
s_1524	triglyceride	
s_1569	zymosterol	

Products

Table 1187: Properties of each product.

Id	Name	SBO
ADP	ADP	
PH0	phosphate	
s_1582	tRNA(Ala)	
s_1583	tRNA(Arg)	
s_1585	tRNA(Asn)	
s_1587	tRNA(Asp)	
s_1589	tRNA(Cys)	
s_1590	tRNA(Gln)	
s_1591	tRNA(Glu)	
s_1593	tRNA(Gly)	
s_1594	tRNA(His)	
s_1596	tRNA(Ile)	
s_1598	tRNA(Leu)	
s_1600	tRNA(Lys)	
s_1602	tRNA(Met)	
s_1604	tRNA(Phe)	
s_1606	tRNA(Pro)	
s_1607	tRNA(Ser)	
s_1608	tRNA(Thr)	
s_1610	tRNA(Trp)	
s_1612	tRNA(Tyr)	
s_1614	tRNA(Val)	

Kinetic Law

Derived unit contains undeclared units

$$v_{296} = \text{vol}(\text{cell}) \quad (593)$$

$$\begin{aligned} & \cdot \max \left(v_0 \cdot \left(1 + \text{ep0002} \cdot \left(\frac{[s_0002]}{ic0002} \right) + \text{epAMP} \cdot \left(\frac{[AMP]}{icAMP} \right) + \text{epATP} \cdot \left(\frac{[ATP]}{icATP} \right) \right. \right. \\ & + \text{ep0526} \cdot \left(\frac{[s_0526]}{ic0526} \right) + \text{ep0584} \cdot \left(\frac{[s_0584]}{ic0584} \right) + \text{ep0589} \cdot \left(\frac{[s_0589]}{ic0589} \right) + \text{ep0615} \\ & \cdot \left(\frac{[s_0615]}{ic0615} \right) + \text{ep0649} \cdot \left(\frac{[s_0649]}{ic0649} \right) + \text{ep0773} \cdot \left(\frac{[s_0773]}{ic0773} \right) + \text{ep0782} \cdot \left(\frac{[s_0782]}{ic0782} \right) \\ & + \text{ep1107} \cdot \left(\frac{[s_1107]}{ic1107} \right) + \text{ep1405} \cdot \left(\frac{[s_1405]}{ic1405} \right) + \text{ep1467} \cdot \left(\frac{[s_1467]}{ic1467} \right) + \text{ep1520} \\ & \cdot \left(\frac{[s_1520]}{ic1520} \right) + \text{ep1545} \cdot \left(\frac{[s_1545]}{ic1545} \right) + \text{ep0004} \cdot \left(\frac{[s_0004]}{ic0004} \right) + \text{ep0404} \cdot \left(\frac{[s_0404]}{ic0404} \right) \\ & + \text{ep0428} \cdot \left(\frac{[s_0428]}{ic0428} \right) + \text{ep0430} \cdot \left(\frac{[s_0430]}{ic0430} \right) + \text{ep0432} \cdot \left(\frac{[s_0432]}{ic0432} \right) + \text{ep0542} \\ & \cdot \left(\frac{[s_0542]}{ic0542} \right) + \text{ep0747} \cdot \left(\frac{[s_0747]}{ic0747} \right) + \text{ep0748} \cdot \left(\frac{[s_0748]}{ic0748} \right) + \text{ep0757} \cdot \left(\frac{[s_0757]}{ic0757} \right) \\ & + \text{ep0832} \cdot \left(\frac{[s_0832]}{ic0832} \right) + \text{ep0847} \cdot \left(\frac{[s_0847]}{ic0847} \right) + \text{ep1077} \cdot \left(\frac{[s_1077]}{ic1077} \right) + \text{ep1099} \\ & \cdot \left(\frac{[s_1099]}{ic1099} \right) + \text{ep1148} \cdot \left(\frac{[s_1148]}{ic1148} \right) + \text{ep1314} \cdot \left(\frac{[s_1314]}{ic1314} \right) + \text{ep1379} \cdot \left(\frac{[s_1379]}{ic1379} \right) \\ & + \text{ep1337} \cdot \left(\frac{[s_1337]}{ic1337} \right) + \text{ep0089} \cdot \left(\frac{[s_0089]}{ic0089} \right) + \text{ep1428} \cdot \left(\frac{[s_1428]}{ic1428} \right) + \text{ep1491} \\ & \cdot \left(\frac{[s_1491]}{ic1491} \right) + \text{ep1527} \cdot \left(\frac{[s_1527]}{ic1527} \right) + \text{ep1533} \cdot \left(\frac{[s_1533]}{ic1533} \right) + \text{ep1561} \cdot \left(\frac{[s_1561]}{ic1561} \right) \\ & + \text{ep0122} \cdot \left(\frac{[s_0122]}{ic0122} \right) + \text{ep0897} \cdot \left(\frac{[s_0897]}{ic0897} \right) + \text{ep0657} \cdot \left(\frac{[s_0657]}{ic0657} \right) + \text{ep0662} \cdot \left(\frac{[s_0662]}{ic0662} \right) \\ & + \text{ep0666} \cdot \left(\frac{[s_0666]}{ic0666} \right) + \text{ep0672} \cdot \left(\frac{[s_0672]}{ic0672} \right) + \text{ep0595} \cdot \left(\frac{[s_0595]}{ic0595} \right) + \text{ep0700} \cdot \left(\frac{[s_0700]}{ic0700} \right) \\ & + \text{ep1059} \cdot \left(\frac{[s_1059]}{ic1059} \right) + \text{ep1346} \cdot \left(\frac{[s_1346]}{ic1346} \right) + \text{ep1351} \cdot \left(\frac{[s_1351]}{ic1351} \right) + \text{ep1524} \cdot \left(\frac{[s_1524]}{ic1524} \right) \\ & \left. + \text{ep1569} \cdot \left(\frac{[s_1569]}{ic1569} \right) \right), \text{zero_flux} \end{aligned}$$

$$\max(x, y) = \frac{x + y + |x - y|}{2} \quad (594)$$

$$\max(x, y) = \frac{x + y + |x - y|}{2} \quad (595)$$

Table 1188: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.043	dimensionless	✓
zero_flux			0.000	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
v0			0.043	$\text{mmol} \cdot \text{l}^{-1} \cdot \text{s}^{-1}$	✓
ic0002			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0002			1.135	dimensionless	✓
icAMP			0.293	$\text{mmol} \cdot \text{l}^{-1}$	✓
epAMP			0.046	dimensionless	✓
icATP			2.525	$\text{mmol} \cdot \text{l}^{-1}$	✓
epATP			59.276	dimensionless	✓
ic0526			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0526			0.045	dimensionless	✓
ic0584			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0584			0.004	dimensionless	✓
ic0589			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0589			0.002	dimensionless	✓
ic0615			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0615			0.002	dimensionless	✓
ic0649			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0649			0.004	dimensionless	✓
ic0773			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0773			0.519	dimensionless	✓
ic0782			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0782			0.046	dimensionless	✓
ic1107			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1107			0.808	dimensionless	✓
ic1405			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1405			$9.9 \cdot 10^{-4}$	dimensionless	✓
ic1467			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1467			0.020	dimensionless	✓
ic1520			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1520			0.023	dimensionless	✓
ic1545			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1545			0.060	dimensionless	✓
ic0004			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0004			1.135	dimensionless	✓
ic0404			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0404			0.459	dimensionless	✓
ic0428			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0428			0.161	dimensionless	✓
ic0430			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

Id	Name	SBO	Value	Unit	Constant
ep0430			0.102	dimensionless	✓
ic0432			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0432			0.298	dimensionless	✓
ic0542			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0542			0.007	dimensionless	✓
ic0747			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0747			0.105	dimensionless	✓
ic0748			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0748			0.302	dimensionless	✓
ic0757			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0757			0.290	dimensionless	✓
ic0832			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0832			0.066	dimensionless	✓
ic0847			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0847			0.193	dimensionless	✓
ic1077			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1077			0.296	dimensionless	✓
ic1099			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1099			0.286	dimensionless	✓
ic1148			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1148			0.051	dimensionless	✓
ic1314			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1314			0.134	dimensionless	✓
ic1379			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1379			0.165	dimensionless	✓
ic1337			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1337			$3.9 \cdot 10^{-4}$	dimensionless	✓
ic0089			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0089			0.002	dimensionless	✓
ic1428			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1428			0.185	dimensionless	✓
ic1491			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1491			0.191	dimensionless	✓
ic1527			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1527			0.028	dimensionless	✓
ic1533			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1533			0.102	dimensionless	✓
ic1561			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep1561			0.265	dimensionless	✓
ic0122			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓
ep0122			$5.6 \cdot 10^{-5}$	dimensionless	✓
ic0897			0.100	$\text{mmol} \cdot \text{l}^{-1}$	✓

Id	Name	SBO	Value	Unit	Constant
ep0897			$5.1708 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0657			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0657			$9.6 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
ic0662			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0662			$1.25 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0666			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0666			0.006	dimensionless	<input checked="" type="checkbox"/>
ic0672			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0672			$8.12 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0595			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0595			$5.355999999999999 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic0700			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep0700			$1.14 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1059			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1059			$3.2 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>
ic1346			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1346			0.003	dimensionless	<input checked="" type="checkbox"/>
ic1351			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1351			$6.97 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1524			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1524			$7.81 \cdot 10^{-4}$	dimensionless	<input checked="" type="checkbox"/>
ic1569			0.100	$\text{mmol} \cdot \text{l}^{-1}$	<input checked="" type="checkbox"/>
ep1569			$1.5 \cdot 10^{-5}$	dimensionless	<input checked="" type="checkbox"/>

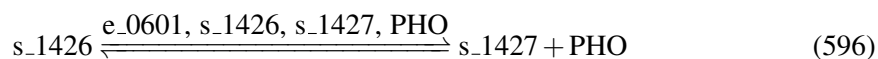
6.297 Reaction r_2126

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

Name sedoheptulose biphosphatase

SBO:0000176 biochemical reaction

Reaction equation



Reactant

Table 1189: Properties of each reactant.

Id	Name	SBO
s_1426	sedoheptulose 1,7-bisphosphate	

Modifiers

Table 1190: Properties of each modifier.

Id	Name	SBO
e_0601	SHB17	0000460
s_1426	sedoheptulose 1,7-bisphosphate	
s_1427	sedoheptulose 7-phosphate	
PH0	phosphate	

Products

Table 1191: Properties of each product.

Id	Name	SBO
s_1427	sedoheptulose 7-phosphate	
PH0	phosphate	

Kinetic Law

Derived unit contains undeclared units

$$v_{297} = \frac{\text{vol}(\text{cell}) \cdot V_{\text{max}} \cdot \left(\frac{[s_{1426}] - \frac{[s_{1427}] \cdot [\text{PHO}]}{K_{\text{eq}}}}{K_{\text{m1426}}} \right)}{1 + \frac{[s_{1426}]}{K_{\text{m1426}}} + \left(1 + \frac{[s_{1427}]}{K_{\text{m1427}}} \right) \cdot \left(1 + \frac{[\text{PHO}]}{K_{\text{mPHO}}} \right) - 1} \quad (597)$$

Table 1192: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.009	dimensionless	✓
Vmax		0000324	0.086	mmol · l ⁻¹ · s ⁻¹	✓
Keq		0000281	0.200	mmol · l ⁻¹	✓
Km1426		0000322	0.100	mmol · l ⁻¹	✓
Km1427		0000323	0.100	mmol · l ⁻¹	✓
KmPH0		0000323	0.100	mmol · l ⁻¹	✓

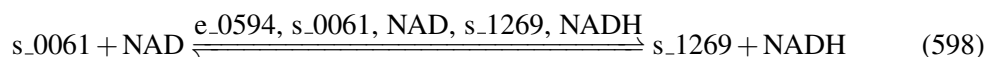
6.298 Reaction r_2127

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

Name dihydroorotate dehydrogenase

SBO:0000176 biochemical reaction

Reaction equation



Reactants

Table 1193: Properties of each reactant.

Id	Name	SBO
s_0061	(S)-dihydroorotate	
NAD	NAD	

Modifiers

Table 1194: Properties of each modifier.

Id	Name	SBO
e_0594	URA1	0000460
s_0061	(S)-dihydroorotate	
NAD	NAD	
s_1269	orotate	
NADH	NADH	

Products

Table 1195: Properties of each product.

Id	Name	SBO
s_1269	orotate	
NADH	NADH	

Kinetic Law

Derived unit contains undeclared units

$$v_{298} = \frac{\text{vol}(\text{cell}) \cdot V_{\max} \cdot \left(\frac{[s_0061] \cdot [\text{NAD}] - \frac{[s_1269] \cdot [\text{NADH}]}{K_{\text{eq}}}}{K_{\text{m0061}} \cdot K_{\text{mNAD}}} \right)}{\left(1 + \frac{[s_0061]}{K_{\text{m0061}}} \right) \cdot \left(1 + \frac{[\text{NAD}]}{K_{\text{mNAD}}} \right) + \left(1 + \frac{[s_1269]}{K_{\text{m1269}}} \right) \cdot \left(1 + \frac{[\text{NADH}]}{K_{\text{mNADH}}} \right) - 1} \quad (599)$$

Table 1196: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
FLUX_VALUE			0.005	dimensionless	<input checked="" type="checkbox"/>
Vmax		0000324	0.067	mmol · l ⁻¹ · s ⁻¹	<input checked="" type="checkbox"/>
Keq		0000281	0.115	dimensionless	<input checked="" type="checkbox"/>
Km0061		0000322	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNAD		0000322	1.503	mmol · l ⁻¹	<input checked="" type="checkbox"/>
Km1269		0000323	0.100	mmol · l ⁻¹	<input checked="" type="checkbox"/>
KmNADH		0000323	0.087	mmol · l ⁻¹	<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_0002*

Name (1->3)-beta-D-glucan

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0005](#) and as a modifier in [r_0005](#), [r_2111](#)).

$$\frac{d}{dt}s_{0002} = v_3 - 1.1348v_{296} \quad (600)$$

7.2 Species *s_0004*

Name (1->6)-beta-D-glucan

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0006](#) and as a modifier in [r_0006](#), [r_2111](#)).

$$\frac{d}{dt}s_{0004} = v_4 - 1.1348v_{296} \quad (601)$$

7.3 Species s_0008

Name (2R,3R)-2,3-dihydroxy-3-methylpentanoate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0353](#) and as a product in [r_0669](#) and as a modifier in [r_0353](#), [r_0669](#)).

$$\frac{d}{dt}s_{0008} = v_{170} - v_{96} \quad (602)$$

7.4 Species s_0009

Name (2R,3S)-3-isopropylmalate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0061](#) and as a product in [r_0060](#) and as a modifier in [r_0060](#), [r_0061](#)).

$$\frac{d}{dt}s_{0009} = v_{22} - v_{23} \quad (603)$$

7.5 Species s_0010

Name (2S)-2-isopropyl-3-oxosuccinate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0029](#) and as a product in [r_0061](#) and as a modifier in [r_0029](#), [r_0061](#)).

$$\frac{d}{dt}s_{0010} = v_{23} - v_{16} \quad (604)$$

7.6 Species s_0015

Name (N(omega)-L-arginino)succinic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0207](#) and as a product in [r_0208](#) and as a modifier in [r_0207](#), [r_0208](#)).

$$\frac{d}{dt}s_{0015} = v_{52} - v_{51} \quad (605)$$

7.7 Species s_0016

Name (R)-2,3-dihydroxy-3-methylbutanoate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0352](#) and as a product in [r_0096](#) and as a modifier in [r_0096](#), [r_0352](#)).

$$\frac{d}{dt}s_{0016} = v_{28} - v_{95} \quad (606)$$

7.8 Species s_0018

Name (R)-5-diphosphomevalonic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0739](#) and as a product in [r_0904](#) and as a modifier in [r_0739](#), [r_0904](#)).

$$\frac{d}{dt}s_{0018} = v_{221} - v_{192} \quad (607)$$

7.9 Species s_0019

Name (R)-5-phosphomevalonic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0904](#) and as a product in [r_0735](#), [r_0736](#) and as a modifier in [r_0735](#), [r_0736](#), [r_0904](#)).

$$\frac{d}{dt}s_{0019} = v_{190} + v_{191} - v_{221} \quad (608)$$

7.10 Species s_0025

Name (R)-lactate

SBO:0000247 simple chemical

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_0553](#) and as a modifier in [r_0001](#), [r_0553](#)).

$$\frac{d}{dt}s_{0025} = v_{154} - v_1 \quad (609)$$

7.11 Species s_0028

Name (R)-mevalonate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0735](#), [r_0736](#) and as a product in [r_0558](#) and as a modifier in [r_0558](#), [r_0735](#), [r_0736](#)).

$$\frac{d}{dt}s_{0028} = v_{155} - v_{190} - v_{191} \quad (610)$$

7.12 Species s_0033

Name (R)-S-lactoylglutathione

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0553](#) and as a product in [r_0697](#) and as a modifier in [r_0553](#), [r_0697](#)).

$$\frac{d}{dt}s_{0033} = v_{176} - v_{154} \quad (611)$$

7.13 Species s_0037

Name (S)-2,3-epoxysqualene

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0698](#) and as a product in [r_1010](#) and as a modifier in [r_0698](#), [r_1010](#)).

$$\frac{d}{dt}s_{0037} = v_{255} - v_{177} \quad (612)$$

7.14 Species s_0039

Name (S)-2-acetyl-2-hydroxybutanoate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0669](#) and as a product in [r_0016](#) and as a modifier in [r_0016](#), [r_0669](#)).

$$\frac{d}{dt}s_{0039} = v_{10} - v_{170} \quad (613)$$

7.15 Species s_0056

Name (S)-3-methyl-2-oxopentanoate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0663](#) and as a product in [r_0353](#) and as a modifier in [r_0353](#), [r_0663](#)).

$$\frac{d}{dt}s_{0056} = v_{96} - v_{167} \quad (614)$$

7.16 Species s_0061

Name (S)-dihydroorotate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2127](#) and as a product in [r_0349](#) and as a modifier in [r_0349](#), [r_2127](#)).

$$\frac{d}{dt}s_{0061} = v_{94} - v_{298} \quad (615)$$

7.17 Species s_0062

Name (S)-lactaldehyde

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0696](#) and as a product in [r_0688](#) and as a modifier in [r_0688](#), [r_0696](#)).

$$\frac{d}{dt}s_{0062} = v_{173} - v_{175} \quad (616)$$

7.18 Species s_0063

Name (S)-lactate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0004](#) and as a product in [r_0696](#) and as a modifier in [r_0004](#), [r_0696](#)).

$$\frac{d}{dt}s_{0063} = v_{175} - v_2 \quad (617)$$

7.19 Species s_0066

Name (S)-malate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0713](#) and as a product in [r_0451](#) and as a modifier in [r_0451](#), [r_0713](#)).

$$\frac{d}{dt}s_{0066} = v_{122} - v_{181} \quad (618)$$

7.20 Species BPG

Name 1,3-bisphospho-D-glycerate

SBO:0000247 simple chemical

Initial concentration $7.36873499865602 \cdot 10^{-4} \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [PGK](#) and as a product in [TDH](#) and as a modifier in [TDH](#), [PGK](#)).

$$\frac{d}{dt}\text{BPG} = v_{130} - v_{216} \quad (619)$$

7.21 Species s_0076

Name 1-(2-carboxyphenylamino)-1-deoxy-D-ribulose 5-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0566](#) and as a product in [r_0913](#) and as a modifier in [r_0566](#), [r_0913](#)).

$$\frac{d}{dt}s_{0076} = v_{227} - v_{160} \quad (620)$$

7.22 Species s_0077

Name 1-(5-phospho-D-ribosyl)-5-[(5-phospho-D-ribosylamino)methylideneamino]imidazole-4-carboxamide

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0007](#) and as a product in [r_0909](#) and as a modifier in [r_0007](#), [r_0909](#)).

$$\frac{d}{dt}s_{0077} = v_{223} - v_5 \quad (621)$$

7.23 Species [s_0078](#)

Name 1-(5-phosphoribosyl)-5'-AMP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0909](#) and as a product in [r_0910](#) and as a modifier in [r_0909](#), [r_0910](#)).

$$\frac{d}{dt}s_{0078} = v_{224} - v_{223} \quad (622)$$

7.24 Species [s_0082](#)

Name 1-acyl-sn-glycerol 3-phosphate

SBO:0000247 simple chemical

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_0495](#) and as a modifier in [r_0008](#), [r_0495](#)).

$$\frac{d}{dt}s_{0082} = v_{133} - v_6 \quad (623)$$

7.25 Species [s_0086](#)

Name 1-C-(indol-3-yl)glycerol 3-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1055](#) and as a product in [r_0566](#) and as a modifier in [r_0566](#), [r_1055](#)).

$$\frac{d}{dt}s_{0086} = v_{160} - v_{272} \quad (624)$$

7.26 Species s_0089

Name 1-phosphatidyl-1D-myo-inositol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0591](#), [r_2111](#) and as a product in [r_0874](#) and as a modifier in [r_0591](#), [r_0874](#), [r_2111](#)).

$$\frac{d}{dt}s_{0089} = v_{208} - v_{163} - 0.001583v_{296} \quad (625)$$

7.27 Species s_0118

Name 1-pyrroline-5-carboxylate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0957](#) and as a product in [r_0012](#) and as a modifier in [r_0012](#), [r_0957](#)).

$$\frac{d}{dt}s_{0118} = v_7 - v_{234} \quad (626)$$

7.28 Species s_0120

Name 10-formyl-THF

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0499](#), [r_0912](#) and as a product in [r_0446](#), [r_0724](#) and as a modifier in [r_0446](#), [r_0499](#), [r_0724](#), [r_0912](#)).

$$\frac{d}{dt}s_{0120} = v_{120} + v_{184} - v_{134} - v_{226} \quad (627)$$

7.29 Species s_0122

Name 14-demethyllanosterol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0241](#), [r_2111](#) and as a product in [r_0231](#) and as a modifier in [r_0231](#), [r_0241](#), [r_2111](#)).

$$\frac{d}{dt}s_{0122} = v_{64} - v_{72} - 5.6 \cdot 10^{-5}v_{296} \quad (628)$$

7.30 Species s_0126

Name 1D-myo-inositol 1-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0757](#) and as a product in [r_0758](#) and as a modifier in [r_0757](#), [r_0758](#)).

$$\frac{d}{dt}s_{0126} = v_{194} - v_{193} \quad (629)$$

7.31 Species s_0141

Name 2,5-diamino-4-hydroxy-6-(5-phosphoribosylamino)pyrimidine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0015](#) and as a product in [r_0525](#) and as a modifier in [r_0015](#), [r_0525](#)).

$$\frac{d}{dt}s_{0141} = v_{140} - v_9 \quad (630)$$

7.32 Species s_0142

Name 2,5-diamino-6-(5-phosphono)ribitylamino-4(3H)-pyrimidinone

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0014](#) and as a product in [r_0015](#) and as a modifier in [r_0014](#), [r_0015](#)).

$$\frac{d}{dt}s_{0142} = v_9 - v_8 \quad (631)$$

7.33 Species s_0145

Name 2-acetamido-5-oxopentanoate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0118](#) and as a product in [r_0759](#) and as a modifier in [r_0118](#), [r_0759](#)).

$$\frac{d}{dt}s_{0145} = v_{195} - v_{34} \quad (632)$$

7.34 Species s_0146

Name 2-acetylactic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0096](#) and as a product in [r_0097](#) and as a modifier in [r_0096](#), [r_0097](#)).

$$\frac{d}{dt}s_{0146} = v_{29} - v_{28} \quad (633)$$

7.35 Species s_0158

Name 2-hydroxy-3-oxobutyl phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0967](#) and as a product in [r_0038](#) and as a modifier in [r_0038](#), [r_0967](#)).

$$\frac{d}{dt}s_{0158} = v_{18} - v_{238} \quad (634)$$

7.36 Species s_0162

Name 2-isopropylmalate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0023](#) and as a product in [r_0024](#) and as a modifier in [r_0023](#), [r_0024](#)).

$$\frac{d}{dt}s_{0162} = v_{14} - v_{13} \quad (635)$$

7.37 Species s_0165

Name 2-isopropylmaleic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0060](#) and as a product in [r_0023](#) and as a modifier in [r_0023](#), [r_0060](#)).

$$\frac{d}{dt}s_{0165} = v_{13} - v_{22} \quad (636)$$

7.38 Species s_0176

Name 2-oxoadipic acid

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0018](#) and as a product in [r_0545](#) and as a modifier in [r_0018](#), [r_0545](#)).

$$\frac{d}{dt}s_{0176} = v_{150} - v_{11} \quad (637)$$

7.39 Species s_0178

Name 2-oxobutanoate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0016](#) and as a product in [r_0310](#), [r_0692](#) and as a modifier in [r_0016](#), [r_0310](#), [r_0692](#)).

$$\frac{d}{dt}s_{0178} = v_{85} + v_{174} - v_{10} \quad (638)$$

7.40 Species s_0180

Name 2-oxoglutarate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 30 reactions (as a reactant in [r_0470](#), [r_0543](#) and as a product in [r_0018](#), [r_0118](#), [r_0216](#), [r_0538](#), [r_0658](#), [r_0661](#), [r_0663](#), [r_0674](#), [r_0699](#), [r_0851](#), [r_0988](#), [r_1063](#), [r_1087](#) and as a modifier in [r_0018](#), [r_0118](#), [r_0216](#), [r_0470](#), [r_0538](#), [r_0543](#), [r_0658](#), [r_0661](#), [r_0663](#), [r_0674](#), [r_0699](#), [r_0851](#), [r_0988](#), [r_1063](#), [r_1087](#)).

$$\begin{aligned} \frac{d}{dt}s_{0180} = & v_{11} + v_{34} + v_{58} + v_{146} + v_{164} + v_{165} + v_{167} + v_{171} \\ & + v_{178} + v_{204} + v_{248} + v_{274} + v_{278} - v_{126} - v_{149} \end{aligned} \quad (639)$$

7.41 Species P2G

Name 2-phospho-D-glyceric acid

SBO:0000247 simple chemical

Initial concentration $0.127695817386632 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [ENO](#) and as a product in [GPM](#) and as a modifier in [ENO](#), [GPM](#)).

$$\frac{d}{dt} \text{P2G} = v_{217} - v_{101} \quad (640)$$

7.42 Species s_0190

Name farnesyl diphosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1012](#) and as a product in [r_0462](#) and as a modifier in [r_0462](#), [r_1012](#)).

$$\frac{d}{dt} \text{s_0190} = v_{123} - 2v_{256} \quad (641)$$

7.43 Species s_0201

Name 3'-phospho-5'-adenylyl sulfate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0883](#) and as a product in [r_0154](#) and as a modifier in [r_0154](#), [r_0883](#)).

$$\frac{d}{dt} \text{s_0201} = v_{42} - v_{211} \quad (642)$$

7.44 Species s_0204

Name 3-(4-hydroxyphenyl)pyruvate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1063](#) and as a product in [r_0939](#) and as a modifier in [r_0939](#), [r_1063](#)).

$$\frac{d}{dt} \text{s_0204} = v_{232} - v_{274} \quad (643)$$

7.45 Species s_0207

Name 3-(imidazol-4-yl)-2-oxopropyl dihydrogen phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0538](#) and as a product in [r_0564](#) and as a modifier in [r_0538](#), [r_0564](#)).

$$\frac{d}{dt}s_{0207} = v_{158} - v_{146} \quad (644)$$

7.46 Species s_0209

Name 3-dehydro-4-methylzymosterol

SBO:0000247 simple chemical

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_0235](#) and as a modifier in [r_0235](#), [r_0236](#)).

$$\frac{d}{dt}s_{0209} = v_{66} - v_{67} \quad (645)$$

7.47 Species s_0210

Name 3-dehydroquinat

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0039](#) and as a product in [r_0040](#) and as a modifier in [r_0039](#), [r_0040](#)).

$$\frac{d}{dt}s_{0210} = v_{20} - v_{19} \quad (646)$$

7.48 Species s_0211

Name 3-dehydroshikimate

SBO:0000247 simple chemical

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_0039](#) and as a modifier in [r_0039](#), [r_0996](#)).

$$\frac{d}{dt}s_{0211} = v_{19} - v_{253} \quad (647)$$

7.49 Species s_0218

Name 3-hydroxy-3-methylglutaryl-CoA

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0558](#) and as a product in [r_0559](#) and as a modifier in [r_0558](#), [r_0559](#)).

$$\frac{d}{dt}s_{0218} = v_{156} - v_{155} \quad (648)$$

7.50 Species s_0231

Name 3-ketosphinganine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0041](#) and as a product in [r_0993](#) and as a modifier in [r_0041](#), [r_0993](#)).

$$\frac{d}{dt}s_{0231} = v_{251} - v_{21} \quad (649)$$

7.51 Species s_0232

Name 3-methyl-2-oxobutanoate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0024](#), [r_1087](#) and as a product in [r_0352](#) and as a modifier in [r_0024](#), [r_0352](#), [r_1087](#)).

$$\frac{d}{dt}s_{0232} = v_{95} - v_{14} - v_{278} \quad (650)$$

7.52 Species P3G

Name 3-phosphoglycerate

SBO:0000247 simple chemical

Initial concentration $0.885688538360659 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [GPM](#) and as a product in [PGK](#) and as a modifier in [PGK](#), [GPM](#)).

$$\frac{d}{dt}P3G = v_{216} - v_{217} \quad (651)$$

7.53 Species s_0261

Name 3-phosphoshikimic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0065](#) and as a product in [r_0997](#) and as a modifier in [r_0065](#), [r_0997](#)).

$$\frac{d}{dt}s_{0261} = v_{254} - v_{24} \quad (652)$$

7.54 Species s_0262

Name 4,4-dimethyl-5alpha-cholesta-8,14,24-trien-3beta-ol

SBO:0000247 simple chemical

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_0317](#) and as a modifier in [r_0231](#), [r_0317](#)).

$$\frac{d}{dt}s_{0262} = v_{88} - v_{64} \quad (653)$$

7.55 Species s_0291

Name 4-methyl-2-oxopentanoate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0699](#) and as a product in [r_0029](#) and as a modifier in [r_0029](#), [r_0699](#)).

$$\frac{d}{dt}s_{0291} = v_{16} - v_{178} \quad (654)$$

7.56 Species s_0295

Name 4-phospho-L-aspartate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0219](#) and as a product in [r_0215](#) and as a modifier in [r_0215](#), [r_0219](#)).

$$\frac{d}{dt}s_{0295} = v_{57} - v_{59} \quad (655)$$

7.57 Species s_0296

Name 4alpha-methylzymosterol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0238](#) and as a product in [r_0236](#) and as a modifier in [r_0236](#), [r_0238](#)).

$$\frac{d}{dt}s_{0296} = v_{67} - v_{69} \quad (656)$$

7.58 Species s_0297

Name 4beta-methylzymosterol-4alpha-carboxylic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0235](#) and as a product in [r_0241](#) and as a modifier in [r_0235](#), [r_0241](#)).

$$\frac{d}{dt}s_{0297} = v_{72} - v_{66} \quad (657)$$

7.59 Species s_0298

Name 5'-adenylyl sulfate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0154](#) and as a product in [r_1026](#) and as a modifier in [r_0154](#), [r_1026](#)).

$$\frac{d}{dt}s_{0298} = v_{259} - v_{42} \quad (658)$$

7.60 Species s_0299

Name 5'-phosphoribosyl-4-(N-succinocarboxamide)-5-aminoimidazole

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0151](#) and as a product in [r_0908](#) and as a modifier in [r_0151](#), [r_0908](#)).

$$\frac{d}{dt}s_{0299} = v_{222} - v_{39} \quad (659)$$

7.61 Species s_0300

Name 5'-phosphoribosyl-5-aminoimidazole

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0911](#) and as a product in [r_0855](#) and as a modifier in [r_0855](#), [r_0911](#)).

$$\frac{d}{dt}s_{0300} = v_{206} - v_{225} \quad (660)$$

7.62 Species s_0301

Name 5'-phosphoribosyl-N-formylglycineamide

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0079](#) and as a product in [r_0499](#) and as a modifier in [r_0079](#), [r_0499](#)).

$$\frac{d}{dt}s_{0301} = v_{134} - v_{25} \quad (661)$$

7.63 Species s_0302

Name 5'-phosphoribosyl-N-formylglycineamidine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0855](#) and as a product in [r_0079](#) and as a modifier in [r_0079](#), [r_0855](#)).

$$\frac{d}{dt}s_{0302} = v_{25} - v_{206} \quad (662)$$

7.64 Species s_0304

Name 5,10-methenyl-THF

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0724](#), [r_0731](#) and as a product in [r_0732](#) and as a modifier in [r_0724](#), [r_0731](#), [r_0732](#)).

$$\frac{d}{dt}s_{0304} = v_{189} - v_{184} - v_{188} \quad (663)$$

7.65 Species s_0306

Name 5,10-methylenetetrahydrofolate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in twelve reactions (as a reactant in [r_0080](#), [r_0502](#), [r_0732](#), [r_1045](#) and as a product in [r_0501](#), [r_0731](#) and as a modifier in [r_0080](#), [r_0501](#), [r_0502](#), [r_0731](#), [r_0732](#), [r_1045](#)).

$$\frac{d}{dt}s_{0306} = v_{135} + v_{188} - v_{26} - v_{136} - v_{189} - v_{265} \quad (664)$$

7.66 Species s_0312

Name 5-[(5-phospho-1-deoxy-D-ribulos-1-ylamino)methylideneamino]-1-(5-phospho-D-ribosyl)imidazole-4-carboxamide

SBO:0000247 simple chemical

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_0007](#) and as a modifier in [r_0007](#), [r_0563](#)).

$$\frac{d}{dt}s_{0312} = v_5 - v_{157} \quad (665)$$

7.67 Species s_0313

Name 5-amino-6-(5-phosphoribitylamino)uracil

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2030](#) and as a product in [r_0014](#) and as a modifier in [r_0014](#), [r_2030](#)).

$$\frac{d}{dt}s_{0313} = v_8 - v_{294} \quad (666)$$

7.68 Species s_0314

Name 5-amino-6-(D-ribitylamino)uracil

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0967](#) and as a product in [r_0968](#), [r_2030](#) and as a modifier in [r_0967](#), [r_0968](#), [r_2030](#)).

$$\frac{d}{dt}s_{0314} = v_{239} + v_{294} - v_{238} \quad (667)$$

7.69 Species s_0322

Name 5-methyltetrahydrofolate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0727](#) and as a product in [r_0080](#) and as a modifier in [r_0080](#), [r_0727](#)).

$$\frac{d}{dt}s_{0322} = v_{26} - v_{186} \quad (668)$$

7.70 Species s_0324

Name 5-O-(1-carboxyvinyl)-3-phosphoshikimic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0279](#) and as a product in [r_0065](#) and as a modifier in [r_0065](#), [r_0279](#)).

$$\frac{d}{dt}s_{0324} = v_{24} - v_{79} \quad (669)$$

7.71 Species s_0325

Name 5-phospho-ribosyl-glycineamide

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0499](#) and as a product in [r_0914](#) and as a modifier in [r_0499](#), [r_0914](#)).

$$\frac{d}{dt}s_{0325} = v_{228} - v_{134} \quad (670)$$

7.72 Species s_0326

Name 5-phosphoribosyl-ATP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0910](#) and as a product in [r_0225](#) and as a modifier in [r_0225](#), [r_0910](#)).

$$\frac{d}{dt}s_{0326} = v_{61} - v_{224} \quad (671)$$

7.73 Species s_0327

Name 5-phosphoribosylamine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0914](#) and as a product in [r_0915](#) and as a modifier in [r_0914](#), [r_0915](#)).

$$\frac{d}{dt}s_{0327} = v_{229} - v_{228} \quad (672)$$

7.74 Species s_0328

Name 6,7-dimethyl-8-(1-D-ribityl)lumazine

SBO:0000247 simple chemical

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_0967](#) and as a modifier in [r_0967](#), [r_0968](#)).

$$\frac{d}{dt}s_{0328} = v_{238} - 2v_{239} \quad (673)$$

7.75 Species s_0335

Name 6-O-phosphono-D-glucono-1,5-lactone

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0091](#) and as a product in [r_0466](#) and as a modifier in [r_0091](#), [r_0466](#)).

$$\frac{d}{dt}s_{0335} = v_{124} - v_{27} \quad (674)$$

7.76 Species s_0340

Name 6-phospho-D-gluconate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0889](#) and as a product in [r_0091](#) and as a modifier in [r_0091](#), [r_0889](#)).

$$\frac{d}{dt}s_{0340} = v_{27} - v_{215} \quad (675)$$

7.77 Species s_0349

Name 7-phospho-2-dehydro-3-deoxy-D-arabino-heptonic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0040](#) and as a product in [r_0020](#) and as a modifier in [r_0020](#), [r_0040](#)).

$$\frac{d}{dt}s_{0349} = v_{12} - v_{20} \quad (676)$$

7.78 Species AcAld

Name acetaldehyde

SBO:0000247 simple chemical

Initial concentration $0.178140579850657 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eleven reactions (as a reactant in [ADH](#), [r_0173](#), [r_0174](#), [r_1633](#) and as a product in [PDC](#), [r_1040](#) and as a modifier in [ADH](#), [r_0173](#), [r_0174](#), [r_1040](#), [r_1633](#)).

$$\frac{d}{dt}\text{AcAld} = v_{236} + v_{262} - v_{45} - v_{46} - v_{47} - v_{285} \quad (677)$$

7.79 Species s_0360

Name acetaldehyde

SBO:0000247 simple chemical

Initial concentration $0 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in [r_1633](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0360} = 0 \quad (678)$$

7.80 Species s_0362

Name acetate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in ten reactions (as a reactant in [r_0110](#) and as a product in [r_0173](#), [r_0174](#), [r_0311](#), [r_0813](#) and as a modifier in [r_0110](#), [r_0173](#), [r_0174](#), [r_0311](#), [r_0813](#)).

$$\frac{d}{dt}s_{0362} = v_{46} + v_{47} + v_{86} + v_{199} - v_{32} \quad (679)$$

7.81 Species s_0367

Name acetoacetyl-CoA

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0559](#) and as a product in [r_0103](#) and as a modifier in [r_0103](#), [r_0559](#)).

$$\frac{d}{dt}s_{0367} = v_{30} - v_{156} \quad (680)$$

7.82 Species s_0373

Name acetyl-CoA

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 18 reactions (as a reactant in [r_0024](#), [r_0103](#), [r_0108](#), [r_0300](#), [r_0398](#), [r_0543](#), [r_0549](#), [r_0559](#) and as a product in [r_0110](#) and as a modifier in [r_0024](#), [r_0103](#), [r_0108](#), [r_0110](#), [r_0300](#), [r_0398](#), [r_0543](#), [r_0549](#), [r_0559](#)).

$$\frac{d}{dt}s_{0373} = v_{32} - v_{14} - 2v_{30} - v_{31} - v_{81} - v_{109} - v_{149} - v_{153} - v_{156} \quad (681)$$

7.83 Species s_0380

Name acyl-CoA

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0008](#), [r_0495](#) and as a product in [r_0336](#) and as a modifier in [r_0008](#), [r_0336](#), [r_0495](#)).

$$\frac{d}{dt}s_{0380} = v_{91} - v_6 - v_{133} \quad (682)$$

7.84 Species s_0386

Name adenosine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0142](#) and as a product in [r_0144](#) and as a modifier in [r_0142](#), [r_0144](#)).

$$\frac{d}{dt}s_{0386} = v_{36} - v_{35} \quad (683)$$

7.85 Species s_0390

Name adenosine 3',5'-bimonophosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0032](#) and as a product in [r_0883](#) and as a modifier in [r_0032](#), [r_0883](#)).

$$\frac{d}{dt}s_{0390} = v_{211} - v_{17} \quad (684)$$

7.86 Species s_0393

Name adenylo-succinate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0152](#) and as a product in [r_0153](#) and as a modifier in [r_0152](#), [r_0153](#)).

$$\frac{d}{dt}s_{0393} = v_{41} - v_{40} \quad (685)$$

7.87 Species ADP

Name ADP

SBO:0000247 simple chemical

Initial concentration 1.28198768168719 mmol · l⁻¹

This species takes part in 75 reactions (as a reactant in [AK](#), [r_0226](#), [r_0330](#), [PGK](#), [PYK](#), [r_0974](#), [r_1026](#), [r_1704](#), [r_1729](#) and as a product in [r_0079](#), [r_0108](#), [r_0115](#), [r_0142](#), [r_0150](#), [r_0154](#), [r_0215](#), [ATPase](#), [r_0250](#), [r_0307](#), [r_0446](#), [r_0476](#), [r_0528](#), [HXK](#), [r_0548](#), [r_0735](#), [r_0739](#), [r_0800](#), [r_0811](#), [r_0855](#), [r_0884](#), [PFK](#), [r_0904](#), [r_0908](#), [r_0911](#), [r_0914](#), [r_0958](#), [r_0997](#), [r_1072](#), [r_2111](#) and as a modifier in [r_0079](#), [r_0108](#), [r_0115](#), [r_0142](#), [AK](#), [r_0150](#), [r_0154](#), [r_0215](#), [r_0226](#), [r_0250](#), [r_0307](#), [r_0330](#), [r_0446](#), [r_0476](#), [r_0528](#), [HXK](#), [r_0548](#), [r_0735](#), [r_0739](#), [r_0800](#), [r_0811](#), [r_0855](#), [r_0884](#), [PGK](#), [r_0904](#), [r_0908](#), [r_0911](#), [r_0914](#), [r_0958](#), [PYK](#), [r_0974](#), [r_0997](#), [r_1026](#), [r_1072](#), [r_1704](#), [r_1729](#)).

$$\begin{aligned} \frac{d}{dt} \text{ADP} = & v_{25} + v_{31} + v_{33} + v_{35} + v_{38} + v_{42} + v_{57} + v_{63} + 2v_{75} + v_{83} + v_{120} + v_{127} + v_{141} + v_{143} \\ & + v_{152} + v_{190} + v_{192} + v_{197} + v_{198} + v_{206} + v_{212} + v_{213} + v_{221} + v_{222} + v_{225} + v_{228} + v_{235} \\ & + v_{254} + v_{276} + 59.276v_{296} - 2v_{37} - v_{62} - v_{90} - v_{216} - v_{237} - v_{242} - v_{259} - v_{289} - v_{290} \end{aligned} \quad (686)$$

7.88 Species s_0403

Name AICAR

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0912](#) and as a product in [r_0151](#), [r_0563](#) and as a modifier in [r_0151](#), [r_0563](#), [r_0912](#)).

$$\frac{d}{dt} \text{s}_0403 = v_{39} + v_{157} - v_{226} \quad (687)$$

7.89 Species s_0404

Name Ala-tRNA(Ala)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0157](#) and as a modifier in [r_0157](#), [r_2111](#)).

$$\frac{d}{dt} \text{s}_0404 = v_{44} - 0.4588v_{296} \quad (688)$$

7.90 Species s_0409

Name alpha,alpha-trehalose 6-phosphate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_1051](#) and as a product in [r_0195](#) and as a modifier in [r_0195](#), [r_1051](#)).

$$\frac{d}{dt}s_{0409} = v_{48} - v_{269} \quad (689)$$

7.91 Species s_0419

Name ammonium

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 18 reactions (as a reactant in [r_0307](#), [r_0470](#), [r_0476](#) and as a product in [r_0014](#), [r_0310](#), [r_0326](#), [r_0501](#), [r_0692](#), [r_1115](#) and as a modifier in [r_0014](#), [r_0307](#), [r_0310](#), [r_0326](#), [r_0470](#), [r_0476](#), [r_0501](#), [r_0692](#), [r_1115](#)).

$$\frac{d}{dt}s_{0419} = v_8 + v_{85} + v_{89} + v_{135} + v_{174} + v_{280} - v_{83} - v_{126} - v_{127} \quad (690)$$

7.92 Species s_0420

Name ammonium

SBO:0000247 simple chemical

Initial concentration 1 mmol · l⁻¹

This species takes part in two reactions (as a reactant in [r_1115](#) and as a modifier in [r_1115](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0420} = 0 \quad (691)$$

7.93 Species AMP

Name AMP

SBO:0000247 simple chemical

Initial concentration 0.292884853320091 mmol·l⁻¹

This species takes part in 70 reactions (as a reactant in [r_0150](#), [r_0399](#), [r_0407](#), [r_2111](#) and as a product in [r_0032](#), [r_0142](#), [AK](#), [r_0152](#), [r_0157](#), [r_0208](#), [r_0209](#), [r_0211](#), [r_0212](#), [r_0220](#), [r_0313](#), [r_0400](#), [r_0406](#), [r_0478](#), [r_0479](#), [r_0512](#), [r_0514](#), [r_0539](#), [r_0665](#), [r_0701](#), [r_0711](#), [r_0729](#), [r_0852](#), [r_0916](#), [r_0941](#), [r_0995](#), [r_1042](#), [r_1057](#), [r_1066](#), [r_1089](#) and as a modifier in [r_0032](#), [r_0142](#), [AK](#), [r_0150](#), [r_0152](#), [r_0157](#), [r_0208](#), [r_0209](#), [r_0211](#), [r_0212](#), [r_0220](#), [r_0313](#), [r_0399](#), [r_0400](#), [r_0406](#), [r_0407](#), [r_0478](#), [r_0479](#), [r_0512](#), [r_0514](#), [r_0539](#), [r_0665](#), [r_0701](#), [r_0711](#), [r_0729](#), [r_0852](#), [PFK](#), [PFK](#), [r_0916](#), [r_0941](#), [r_0995](#), [r_1042](#), [r_1057](#), [r_1066](#), [r_1089](#), [r_2111](#)).

$$\begin{aligned} \frac{d}{dt} \text{AMP} = & v_{17} + v_{35} + v_{37} + v_{40} + v_{44} + v_{52} + v_{53} + v_{54} + v_{55} + v_{60} + v_{87} + v_{111} + v_{112} \\ & + v_{128} + v_{129} + v_{138} + v_{139} + v_{147} + v_{168} + v_{179} + v_{180} + v_{187} + v_{205} + v_{230} \\ & + v_{233} + v_{252} + v_{264} + v_{273} + v_{275} + v_{279} - v_{38} - v_{110} - v_{113} - 0.046v_{296} \end{aligned} \quad (692)$$

7.94 Species s_0427

Name anthranilate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0202](#) and as a product in [r_0203](#) and as a modifier in [r_0202](#), [r_0203](#)).

$$\frac{d}{dt} \text{s}_0427 = v_{50} - v_{49} \quad (693)$$

7.95 Species s_0428

Name Arg-tRNA(Arg)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0209](#) and as a modifier in [r_0209](#), [r_2111](#)).

$$\frac{d}{dt} \text{s}_0428 = v_{53} - 0.1607v_{296} \quad (694)$$

7.96 Species s_0430

Name Asn-tRNA(Asn)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0212](#) and as a modifier in [r_0212](#), [r_2111](#)).

$$\frac{d}{dt}s_{.0430} = v_{55} - 0.1017v_{296} \quad (695)$$

7.97 Species s_0432

Name Asp-tRNA(Asp)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0220](#) and as a modifier in [r_0220](#), [r_2111](#)).

$$\frac{d}{dt}s_{.0432} = v_{60} - 0.2975v_{296} \quad (696)$$

7.98 Species ATP

Name ATP

SBO:0000247 simple chemical

Initial concentration 2.52512746499271 mmol · l⁻¹

This species takes part in 134 reactions (as a reactant in [r_0079](#), [r_0108](#), [r_0115](#), [r_0142](#), [r_0154](#), [r_0157](#), [r_0208](#), [r_0209](#), [r_0211](#), [r_0212](#), [r_0215](#), [r_0220](#), [r_0225](#), [ATPase](#), [r_0250](#), [r_0307](#), [r_0313](#), [r_0400](#), [r_0406](#), [r_0446](#), [r_0476](#), [r_0478](#), [r_0479](#), [r_0512](#), [r_0514](#), [r_0528](#), [HXK](#), [r_0539](#), [r_0548](#), [r_0665](#), [r_0701](#), [r_0711](#), [r_0726](#), [r_0729](#), [r_0735](#), [r_0739](#), [r_0800](#), [r_0811](#), [r_0852](#), [r_0855](#), [r_0884](#), [PFK](#), [r_0904](#), [r_0908](#), [r_0911](#), [r_0914](#), [r_0916](#), [r_0941](#), [r_0958](#), [r_0970](#), [r_0995](#), [r_0997](#), [r_1042](#), [r_1057](#), [r_1066](#), [r_1072](#), [r_1089](#), [r_2111](#) and as a product in [AK](#), [r_0226](#), [r_0330](#), [r_0399](#), [r_0407](#), [PGK](#), [PYK](#), [r_1704](#), [r_1729](#) and as a modifier in [r_0079](#), [r_0108](#), [r_0115](#), [r_0142](#), [AK](#), [r_0154](#), [r_0157](#), [r_0208](#), [r_0209](#), [r_0211](#), [r_0212](#), [r_0215](#), [r_0220](#), [r_0225](#), [r_0226](#), [ATPase](#), [r_0250](#), [r_0307](#), [r_0313](#), [r_0330](#), [r_0399](#), [r_0400](#), [r_0406](#), [r_0407](#), [r_0446](#), [r_0476](#), [r_0478](#), [r_0479](#), [r_0512](#), [r_0514](#), [r_0528](#), [HXK](#), [r_0539](#), [r_0548](#), [r_0665](#), [r_0701](#), [r_0711](#), [r_0726](#), [r_0729](#), [r_0735](#), [r_0739](#), [r_0800](#), [r_0811](#), [r_0852](#), [r_0855](#), [r_0884](#), [PFK](#), [PGK](#), [r_0904](#), [r_0908](#), [r_0911](#), [r_0914](#), [r_0916](#), [r_0941](#), [r_0958](#), [PYK](#), [r_0970](#), [r_0995](#), [r_0997](#), [r_1042](#), [r_1057](#), [r_1066](#), [r_1072](#), [r_1089](#), [r_1704](#), [r_1729](#), [r_2111](#)).

$$\begin{aligned} \frac{d}{dt} \text{ATP} = & v_{37} + v_{62} + v_{90} + v_{110} + v_{113} + v_{216} + v_{237} + v_{289} + v_{290} - v_{25} - v_{31} - v_{33} - v_{35} - v_{42} - v_{44} \\ & - v_{52} - v_{53} - v_{54} - v_{55} - v_{57} - v_{60} - v_{61} - v_{63} - 2v_{75} - v_{83} - v_{87} - v_{111} - v_{112} - v_{120} \\ & - v_{127} - v_{128} - v_{129} - v_{138} - v_{139} - v_{141} - v_{143} - v_{147} - v_{152} - v_{168} - v_{179} - v_{180} - v_{185} \\ & - v_{187} - v_{190} - v_{192} - v_{197} - v_{198} - v_{205} - v_{206} - v_{212} - v_{213} - v_{221} - v_{222} - v_{225} - v_{228} \\ & - v_{230} - v_{233} - v_{235} - v_{240} - v_{252} - v_{254} - v_{264} - v_{273} - v_{275} - v_{276} - v_{279} - 59.276v_{296} \end{aligned} \quad (697)$$

7.99 Species s_0445

Name bicarbonate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in eight reactions (as a reactant in [r_0108](#), [r_0250](#), [r_0958](#) and as a product in [r_1664](#) and as a modifier in [r_0108](#), [r_0250](#), [r_0958](#), [r_1664](#)).

$$\frac{d}{dt} s_{0445} = v_{286} - v_{31} - v_{75} - v_{235} \quad (698)$$

7.100 Species s_0454

Name but-1-ene-1,2,4-tricarboxylic acid

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0542](#) and as a product in [r_0027](#) and as a modifier in [r_0027](#), [r_0542](#)).

$$\frac{d}{dt} s_{0454} = v_{15} - v_{148} \quad (699)$$

7.101 Species s_0455

Name carbamoyl phosphate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0214](#), [r_0816](#) and as a product in [r_0250](#) and as a modifier in [r_0214](#), [r_0250](#), [r_0816](#)).

$$\frac{d}{dt} s_{0455} = v_{75} - v_{56} - v_{200} \quad (700)$$

7.102 Species CO2

Name carbon dioxide

SBO:0000247 simple chemical

Initial concentration 1 mmol · l⁻¹

This species takes part in 67 reactions (as a reactant in [r_0911](#), [r_1664](#), [r_1697](#) and as a product in [r_0016](#), [r_0029](#), [r_0097](#), [r_0234](#), [r_0235](#), [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0393](#), [r_0394](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#), [r_0501](#), [r_0545](#), [r_0566](#), [r_0658](#), [r_0661](#), [r_0739](#), [r_0821](#), [r_0877](#), [r_0884](#), [r_0889](#), [r_0938](#), [r_0939](#), [PDC](#), [r_0993](#) and as a modifier in [r_0016](#), [r_0029](#), [r_0097](#), [r_0234](#), [r_0235](#), [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0393](#), [r_0394](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#), [r_0501](#), [r_0545](#), [r_0566](#), [r_0658](#), [r_0661](#), [r_0739](#), [r_0821](#), [r_0877](#), [r_0884](#), [r_0889](#), [r_0911](#), [r_0938](#), [r_0939](#), [r_0993](#), [r_1664](#), [r_1697](#)).

$$\begin{aligned} \frac{d}{dt} \text{CO}_2 = & v_{10} + v_{16} + v_{29} + v_{65} + v_{66} + v_{102} + v_{103} + v_{104} + v_{105} + 3v_{106} + v_{107} + v_{108} \\ & + 3v_{109} + v_{114} + v_{115} + v_{116} + v_{117} + v_{135} + v_{150} + v_{160} + v_{164} + v_{165} + v_{192} \\ & + v_{203} + v_{209} + v_{212} + v_{215} + v_{231} + v_{232} + v_{236} + v_{251} - v_{225} - v_{286} - v_{288} \end{aligned} \quad (701)$$

7.103 Species s_0458

Name carbon dioxide

SBO:0000247 simple chemical

Initial concentration 0 mmol · l⁻¹

This species takes part in one reaction (as a product in [r_1697](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt} s_{0458} = 0 \quad (702)$$

7.104 Species s_0467

Name CDP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0792](#), [r_0976](#) and as a product in [r_0736](#) and as a modifier in [r_0736](#), [r_0792](#), [r_0976](#)).

$$\frac{d}{dt} s_{0467} = v_{191} - v_{196} - v_{243} \quad (703)$$

7.105 Species s_0471

Name CDP-diacylglycerol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0874](#), [r_0880](#) and as a product in [r_0257](#) and as a modifier in [r_0874](#), [r_0880](#)).

$$\frac{d}{dt}s_{0471} = v_{76} - v_{208} - v_{210} \quad (704)$$

7.106 Species s_0478

Name ceramide-1 (C26)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0591](#) and as a product in [r_0264](#) and as a modifier in [r_0264](#), [r_0591](#)).

$$\frac{d}{dt}s_{0478} = v_{77} - v_{163} \quad (705)$$

7.107 Species s_0505

Name cerotate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0406](#) and as a product in [r_0394](#) and as a modifier in [r_0394](#), [r_0406](#)).

$$\frac{d}{dt}s_{0505} = v_{107} - v_{112} \quad (706)$$

7.108 Species s_0515

Name chorismate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0203](#), [r_0278](#) and as a product in [r_0279](#) and as a modifier in [r_0203](#), [r_0278](#), [r_0279](#)).

$$\frac{d}{dt}s_{0515} = v_{79} - v_{50} - v_{78} \quad (707)$$

7.109 Species s_0516

Name cis-aconitate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0280](#) and as a product in [r_0302](#) and as a modifier in [r_0280](#), [r_0302](#)).

$$\frac{d}{dt}s_{.0516} = v_{82} - v_{80} \quad (708)$$

7.110 Species s_0522

Name citrate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0302](#) and as a product in [r_0300](#) and as a modifier in [r_0300](#), [r_0302](#)).

$$\frac{d}{dt}s_{.0522} = v_{81} - v_{82} \quad (709)$$

7.111 Species s_0526

Name CMP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_2111](#) and as a product in [r_0792](#), [r_0874](#), [r_0880](#) and as a modifier in [r_0792](#), [r_0874](#), [r_0880](#), [r_2111](#)).

$$\frac{d}{dt}s_{.0526} = v_{196} + v_{208} + v_{210} - 0.0447v_{296} \quad (710)$$

7.112 Species s_0529

Name coenzyme A

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 58 reactions (as a reactant in [r_0110](#), [r_0336](#), [r_0400](#), [r_0406](#) and as a product in [r_0008](#), [r_0024](#), [r_0103](#), [r_0264](#), [r_0300](#), [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0393](#), [r_0394](#), [r_0397](#), [r_0398](#), [r_0399](#), [r_0407](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#), [r_0495](#), [r_0543](#), [r_0549](#), [r_0558](#), [r_0559](#), [r_0993](#) and as a modifier in [r_0008](#), [r_0024](#), [r_0103](#), [r_0110](#), [r_0264](#), [r_0300](#), [r_0336](#), [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0393](#), [r_0394](#), [r_0397](#), [r_0398](#), [r_0399](#), [r_0400](#), [r_0406](#), [r_0407](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#), [r_0495](#), [r_0543](#), [r_0549](#), [r_0558](#), [r_0559](#), [r_0993](#)).

$$\begin{aligned} \frac{d}{dt}s_{0529} = & v_6 + v_{14} + v_{30} + v_{77} + v_{81} + v_{102} + v_{103} + v_{104} + v_{105} + 3v_{106} \\ & + v_{107} + v_{108} + 3v_{109} + v_{110} + v_{113} + v_{114} + v_{115} + v_{116} + v_{117} \\ & + v_{133} + v_{149} + v_{153} + v_{155} + v_{156} + v_{251} - v_{32} - v_{91} - v_{111} - v_{112} \end{aligned} \quad (711)$$

7.113 Species [s_0539](#)

Name CTP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0257](#), [r_0736](#) and as a product in [r_0307](#) and as a modifier in [r_0257](#), [r_0307](#), [r_0736](#)).

$$\frac{d}{dt}s_{0539} = v_{83} - v_{76} - v_{191} \quad (712)$$

7.114 Species [s_0542](#)

Name Cys-tRNA(Cys)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0313](#) and as a modifier in [r_0313](#), [r_2111](#)).

$$\frac{d}{dt}s_{0542} = v_{87} - 0.0066v_{296} \quad (713)$$

7.115 Species [s_0550](#)

Name D-erythro-1-(imidazol-4-yl)glycerol 3-phosphate

SBO:0000247 simple chemical

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_0563](#) and as a modifier in [r_0563](#), [r_0564](#)).

$$\frac{d}{dt}s_{0550} = v_{157} - v_{158} \quad (714)$$

7.116 Species [s_0551](#)

Name D-erythrose 4-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0020](#), [r_0990](#), [r_1050](#) and as a product in [r_1048](#) and as a modifier in [r_0020](#), [r_0990](#), [r_1048](#), [r_1050](#)).

$$\frac{d}{dt}s_{0551} = v_{266} - v_{12} - v_{250} - v_{268} \quad (715)$$

7.117 Species [F16bP](#)

Name D-fructose 1,6-bisphosphate

SBO:0000247 simple chemical

Initial concentration $6.22132076069411 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [FBA](#) and as a product in [PFK](#) and as a modifier in [FBA](#), [PFK](#)).

$$\frac{d}{dt}F16bP = v_{213} - v_{121} \quad (716)$$

7.118 Species [F6P](#)

Name D-fructose 6-phosphate

SBO:0000247 simple chemical

Initial concentration $0.624976405532373 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0723](#), [PFK](#) and as a product in [PGI](#), [r_1048](#), [r_1050](#) and as a modifier in [PGI](#), [r_0723](#), [PFK](#), [r_1048](#), [r_1050](#)).

$$\frac{d}{dt}F6P = v_{125} + v_{266} + v_{268} - v_{183} - v_{213} \quad (717)$$

7.119 Species GLC

Name D-glucose

SBO:0000247 simple chemical

Initial concentration $0.097652231064563 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [HXX](#) and as a product in [HXT](#) and as a modifier in [HXX](#), [HXT](#)).

$$\frac{d}{dt}\text{GLC} = v_{281} - v_{143} \quad (718)$$

7.120 Species GLCx

Name D-glucose

SBO:0000247 simple chemical

Initial concentration $100 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [HXT](#) and as a modifier in [HXT](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}\text{GLCx} = 0 \quad (719)$$

7.121 Species s_0567

Name D-glucose 1-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1084](#) and as a product in [r_0888](#) and as a modifier in [r_0888](#), [r_1084](#)).

$$\frac{d}{dt}s_{0567} = v_{214} - v_{277} \quad (720)$$

7.122 Species G6P

Name D-glucose 6-phosphate

SBO:0000247 simple chemical

Initial concentration $2.67504014044787 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0195](#), [r_0466](#), [PGI](#), [r_0758](#), [r_0888](#) and as a product in [HXX](#) and as a modifier in [r_0195](#), [r_0466](#), [PGI](#), [HXX](#), [r_0758](#), [r_0888](#)).

$$\frac{d}{dt}G6P = v_{143} - v_{48} - v_{124} - v_{125} - v_{194} - v_{214} \quad (721)$$

7.123 Species [s_0573](#)

Name D-mannose 1-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0722](#) and as a product in [r_0902](#) and as a modifier in [r_0722](#), [r_0902](#)).

$$\frac{d}{dt}s_{0573} = v_{220} - v_{182} \quad (722)$$

7.124 Species [s_0574](#)

Name D-mannose 6-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0902](#) and as a product in [r_0723](#) and as a modifier in [r_0723](#), [r_0902](#)).

$$\frac{d}{dt}s_{0574} = v_{183} - v_{220} \quad (723)$$

7.125 Species [s_0577](#)

Name D-ribulose 5-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0038](#), [r_0982](#), [r_0984](#) and as a product in [r_0889](#) and as a modifier in [r_0038](#), [r_0889](#), [r_0982](#), [r_0984](#)).

$$\frac{d}{dt}s_{0577} = v_{215} - v_{18} - v_{245} - v_{246} \quad (724)$$

7.126 Species s_0581

Name D-xylulose 5-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1049](#), [r_1050](#) and as a product in [r_0984](#) and as a modifier in [r_1049](#), [r_1050](#)).

$$\frac{d}{dt}s_{0581} = v_{246} - v_{267} - v_{268} \quad (725)$$

7.127 Species s_0582

Name dADP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1729](#) and as a product in [r_0529](#), [r_0974](#) and as a modifier in [r_0529](#), [r_0974](#), [r_1729](#)).

$$\frac{d}{dt}s_{0582} = v_{142} + v_{242} - v_{290} \quad (726)$$

7.128 Species s_0584

Name dAMP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1729](#) and as a modifier in [r_1729](#), [r_2111](#)).

$$\frac{d}{dt}s_{0584} = v_{290} - 0.0036v_{296} \quad (727)$$

7.129 Species s_0586

Name dATP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0529](#) and as a product in [r_0970](#) and as a modifier in [r_0529](#), [r_0970](#)).

$$\frac{d}{dt}s_{0586} = v_{240} - v_{142} \quad (728)$$

7.130 Species s_0587

Name dCDP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_1704](#) and as a product in [r_0976](#) and as a modifier in [r_0976](#), [r_1704](#)).

$$\frac{d}{dt}s_{0587} = v_{243} - v_{289} \quad (729)$$

7.131 Species s_0589

Name dCMP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0326](#), [r_2111](#) and as a product in [r_1704](#) and as a modifier in [r_0326](#), [r_1704](#), [r_2111](#)).

$$\frac{d}{dt}s_{0589} = v_{289} - v_{89} - 0.0024v_{296} \quad (730)$$

7.132 Species s_0595

Name decanoate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in ten reactions (as a reactant in [r_0386](#), [r_1014](#), [r_1052](#), [r_2111](#) and as a product in [r_0399](#) and as a modifier in [r_0386](#), [r_0399](#), [r_1014](#), [r_1052](#), [r_2111](#)).

$$\frac{d}{dt}s_{0595} = v_{110} - v_{102} - 1.8v_{257} - 2.6v_{270} - 5.355999999999999 \cdot 10^{-4}v_{296} \quad (731)$$

7.133 Species s_0602

Name decanoyl-CoA

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0399](#), [r_0432](#) and as a product in [r_0397](#) and as a modifier in [r_0397](#), [r_0399](#), [r_0432](#)).

$$\frac{d}{dt}s_{0602} = v_{108} - v_{110} - v_{114} \quad (732)$$

7.134 Species s_0613

Name dGDP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0330](#) and as a product in [r_0978](#) and as a modifier in [r_0330](#), [r_0978](#)).

$$\frac{d}{dt}s_{0613} = v_{244} - v_{90} \quad (733)$$

7.135 Species s_0615

Name dGMP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0330](#) and as a modifier in [r_0330](#), [r_2111](#)).

$$\frac{d}{dt}s_{0615} = v_{90} - 0.0024v_{296} \quad (734)$$

7.136 Species s_0619

Name diglyceride

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_1052](#) and as a product in [r_0336](#), [r_0337](#), [r_0591](#) and as a modifier in [r_0336](#), [r_0337](#), [r_0591](#), [r_1052](#)).

$$\frac{d}{dt}s_{0619} = v_{91} + v_{92} + v_{163} - v_{270} \quad (735)$$

7.137 Species s_0625

Name dihydrofolic acid

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0344](#) and as a product in [r_1045](#) and as a modifier in [r_0344](#), [r_1045](#)).

$$\frac{d}{dt}s_{0625} = v_{265} - v_{93} \quad (736)$$

7.138 Species DHAP

Name dihydroxyacetone phosphate

SBO:0000247 simple chemical

Initial concentration 1.00415254899644 mmol · l⁻¹

This species takes part in ten reactions (as a reactant in [r_0491](#), [r_0990](#), [TPI](#), [r_1936](#) and as a product in [FBA](#) and as a modifier in [FBA](#), [r_0491](#), [r_0990](#), [TPI](#), [r_1936](#)).

$$\frac{d}{dt}\text{DHAP} = v_{121} - v_{132} - v_{250} - v_{271} - v_{292} \quad (737)$$

7.139 Species s_0633

Name diphosphate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 84 reactions (as a reactant in [r_0399](#), [r_0407](#), [r_0568](#) and as a product in [r_0157](#), [r_0202](#), [r_0208](#), [r_0209](#), [r_0211](#), [r_0212](#), [r_0220](#), [r_0225](#), [r_0257](#), [r_0313](#), [r_0355](#), [r_0364](#), [r_0400](#), [r_0406](#), [r_0462](#), [r_0478](#), [r_0479](#), [r_0512](#), [r_0514](#), [r_0525](#), [r_0539](#), [r_0665](#), [r_0701](#), [r_0711](#), [r_0722](#), [r_0726](#), [r_0729](#), [r_0820](#), [r_0852](#), [r_0910](#), [r_0915](#), [r_0941](#), [r_0995](#), [r_1012](#), [r_1042](#), [r_1057](#), [r_1066](#), [r_1084](#), [r_1089](#) and as a modifier in [r_0157](#), [r_0202](#), [r_0208](#), [r_0209](#), [r_0211](#), [r_0212](#), [r_0220](#), [r_0225](#), [r_0257](#), [r_0313](#), [r_0355](#), [r_0364](#), [r_0399](#), [r_0400](#), [r_0406](#), [r_0407](#), [r_0462](#), [r_0478](#), [r_0479](#), [r_0512](#), [r_0514](#), [r_0525](#), [r_0539](#), [r_0568](#), [r_0665](#), [r_0701](#), [r_0711](#), [r_0722](#), [r_0726](#), [r_0729](#), [r_0820](#), [r_0852](#), [r_0910](#), [r_0915](#), [r_0941](#), [r_0995](#), [r_1012](#), [r_1042](#), [r_1057](#), [r_1066](#), [r_1084](#), [r_1089](#)).

$$\begin{aligned} \frac{d}{dt}s_{0633} = & v_{44} + v_{49} + v_{52} + v_{53} + v_{54} + v_{55} + v_{60} + v_{61} + v_{76} + v_{87} + v_{97} + v_{100} \\ & + v_{111} + v_{112} + v_{123} + v_{128} + v_{129} + v_{138} + v_{139} + v_{140} + v_{147} + v_{168} \\ & + v_{179} + v_{180} + v_{182} + v_{185} + v_{187} + v_{202} + v_{205} + v_{224} + v_{229} + v_{233} \\ & + v_{252} + 2v_{256} + v_{264} + v_{273} + v_{275} + v_{277} + v_{279} - v_{110} - v_{113} - v_{161} \end{aligned} \quad (738)$$

7.140 Species s_0644

Name dolichyl D-mannosyl phosphate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0362](#) and as a product in [r_0361](#) and as a modifier in [r_0361](#), [r_0362](#)).

$$\frac{d}{dt}s_{0644} = v_{98} - v_{99} \quad (739)$$

7.141 Species s_0645

Name dolichyl phosphate

SBO:0000247 simple chemical

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_0362](#) and as a modifier in [r_0361](#), [r_0362](#)).

$$\frac{d}{dt}s_{0645} = v_{99} - v_{98} \quad (740)$$

7.142 Species s_0649

Name dTMP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1045](#) and as a modifier in [r_1045](#), [r_2111](#)).

$$\frac{d}{dt}s_{0649} = v_{265} - 0.0036v_{296} \quad (741)$$

7.143 Species s_0654

Name dUMP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_1045](#) and as a product in [r_0326](#), [r_0364](#) and as a modifier in [r_0326](#), [r_0364](#), [r_1045](#)).

$$\frac{d}{dt}s_{0654} = v_{89} + v_{100} - v_{265} \quad (742)$$

7.144 Species s_0656

Name dUTP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0364](#) and as a product in [r_0973](#) and as a modifier in [r_0364](#), [r_0973](#)).

$$\frac{d}{dt}s_{0656} = v_{241} - v_{100} \quad (743)$$

7.145 Species s_0657

Name episterol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0243](#) and as a modifier in [r_0243](#), [r_2111](#)).

$$\frac{d}{dt}s_{.0657} = v_{73} - 9.6 \cdot 10^{-5}v_{296} \quad (744)$$

7.146 Species s_0662

Name ergosta-5,7,22,24(28)-tetraen-3beta-ol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0244](#), [r_2111](#) and as a product in [r_1682](#) and as a modifier in [r_0244](#), [r_1682](#), [r_2111](#)).

$$\frac{d}{dt}s_{.0662} = v_{287} - v_{74} - 1.25 \cdot 10^{-4}v_{296} \quad (745)$$

7.147 Species s_0666

Name ergosterol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1014](#), [r_2111](#) and as a product in [r_0244](#) and as a modifier in [r_0244](#), [r_1014](#), [r_2111](#)).

$$\frac{d}{dt}s_{.0666} = v_{74} - v_{257} - 0.0056v_{296} \quad (746)$$

7.148 Species s_0672

Name ergosterol ester

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1014](#) and as a modifier in [r_1014](#), [r_2111](#)).

$$\frac{d}{dt}s_{.0672} = v_{257} - 8.12 \cdot 10^{-4}v_{296} \quad (747)$$

7.149 Species EtOH

Name ethanol

SBO:0000247 simple chemical

Initial concentration 50 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_1762](#) and as a product in [ADH](#) and as a modifier in [ADH](#), [r_1762](#)).

$$\frac{d}{dt}\text{EtOH} = v_{45} - v_{291} \quad (748)$$

7.150 Species s_0681

Name ethanol

SBO:0000247 simple chemical

Initial concentration 0 mmol · l⁻¹

This species takes part in one reaction (as a product in [r_1762](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0681} = 0 \quad (749)$$

7.151 Species s_0700

Name fecosterol

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0243](#), [r_2111](#) and as a product in [r_0986](#) and as a modifier in [r_0243](#), [r_0986](#), [r_2111](#)).

$$\frac{d}{dt}s_{0700} = v_{247} - v_{73} - 1.14 \cdot 10^{-4}v_{296} \quad (750)$$

7.152 Species s_0709

Name ferricytochrome c

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in eight reactions (as a reactant in [r_0001](#), [r_0004](#), [r_0439](#) and as a product in [r_0438](#) and as a modifier in [r_0001](#), [r_0004](#), [r_0438](#), [r_0439](#)).

$$\frac{d}{dt}s_{0709} = 4v_{118} - 2v_1 - 2v_2 - 2v_{119} \quad (751)$$

7.153 Species s_0710

Name ferrocytochrome c

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_0438](#) and as a product in [r_0001](#), [r_0004](#), [r_0439](#) and as a modifier in [r_0001](#), [r_0004](#), [r_0438](#), [r_0439](#)).

$$\frac{d}{dt}s_{0710} = 2v_1 + 2v_2 + 2v_{119} - 4v_{118} \quad (752)$$

7.154 Species s_0722

Name formate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in eight reactions (as a reactant in [r_0446](#) and as a product in [r_0038](#), [r_0317](#), [r_0525](#) and as a modifier in [r_0038](#), [r_0317](#), [r_0446](#), [r_0525](#)).

$$\frac{d}{dt}s_{0722} = v_{18} + v_{88} + v_{140} - v_{120} \quad (753)$$

7.155 Species s_0725

Name fumarate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in ten reactions (as a reactant in [r_0451](#) and as a product in [r_0151](#), [r_0152](#), [r_0207](#), [r_1021](#) and as a modifier in [r_0151](#), [r_0152](#), [r_0207](#), [r_0451](#), [r_1021](#)).

$$\frac{d}{dt}s_{0725} = v_{39} + v_{40} + v_{51} + v_{258} - v_{122} \quad (754)$$

7.156 Species s_0739

Name GDP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 14 reactions (as a reactant in [r_0800](#), [r_0978](#) and as a product in [r_0150](#), [r_0153](#), [r_0361](#), [r_0528](#), [r_0529](#) and as a modifier in [r_0150](#), [r_0153](#), [r_0361](#), [r_0528](#), [r_0529](#), [r_0800](#), [r_0978](#)).

$$\frac{d}{dt}s_{0739} = v_{38} + v_{41} + v_{98} + v_{141} + v_{142} - v_{197} - v_{244} \quad (755)$$

7.157 Species [s_0743](#)

Name GDP-alpha-D-mannose

SBO:0000247 simple chemical

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_0722](#) and as a modifier in [r_0361](#), [r_0722](#)).

$$\frac{d}{dt}s_{0743} = v_{182} - v_{98} \quad (756)$$

7.158 Species [s_0745](#)

Name geranyl diphosphate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0462](#) and as a product in [r_0355](#) and as a modifier in [r_0355](#), [r_0462](#)).

$$\frac{d}{dt}s_{0745} = v_{97} - v_{123} \quad (757)$$

7.159 Species [s_0747](#)

Name Gln-tRNA(Gln)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0478](#) and as a modifier in [r_0478](#), [r_2111](#)).

$$\frac{d}{dt}s_{0747} = v_{128} - 0.1054v_{296} \quad (758)$$

7.160 Species s_0748

Name Glu-tRNA(Glu)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0479](#) and as a modifier in [r_0479](#), [r_2111](#)).

$$\frac{d}{dt}s_{0748} = v_{129} - 0.3018v_{296} \quad (759)$$

7.161 Species s_0750

Name glutathione

SBO:0000247 simple chemical

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_0553](#) and as a modifier in [r_0553](#), [r_0697](#)).

$$\frac{d}{dt}s_{0750} = v_{154} - v_{176} \quad (760)$$

7.162 Species s_0757

Name Gly-tRNA(Gly)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0512](#) and as a modifier in [r_0512](#), [r_2111](#)).

$$\frac{d}{dt}s_{0757} = v_{138} - 0.2904v_{296} \quad (761)$$

7.163 Species GAP

Name glyceraldehyde 3-phosphate

SBO:0000247 simple chemical

Initial concentration 0.0451809175780963 mmol · l⁻¹

This species takes part in 14 reactions (as a reactant in [TDH](#), [r_1048](#) and as a product in [FBA](#), [r_1049](#), [r_1050](#), [TPI](#), [r_1055](#) and as a modifier in [FBA](#), [TDH](#), [r_1048](#), [r_1049](#), [r_1050](#), [TPI](#), [r_1055](#)).

$$\frac{d}{dt}\text{GAP} = v_{121} + v_{267} + v_{268} + v_{271} + v_{272} - v_{130} - v_{266} \quad (762)$$

7.164 Species [GLY](#)

Name glycerol

SBO:0000247 simple chemical

Initial concentration $0.15 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1172](#) and as a product in [r_0489](#) and as a modifier in [r_0489](#), [r_1172](#)).

$$\frac{d}{dt}\text{GLY} = v_{131} - v_{282} \quad (763)$$

7.165 Species [s_0766](#)

Name glycerol

SBO:0000247 simple chemical

Initial concentration $0 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in [r_1172](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{0766} = 0 \quad (764)$$

7.166 Species [s_0767](#)

Name glycerol 3-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0489](#), [r_0495](#) and as a product in [r_0491](#) and as a modifier in [r_0489](#), [r_0491](#), [r_0495](#)).

$$\frac{d}{dt}s_{0767} = v_{132} - v_{131} - v_{133} \quad (765)$$

7.167 Species s_0773

Name glycogen

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0510](#) and as a modifier in [r_0510](#), [r_2111](#)).

$$\frac{d}{dt}s_{0773} = v_{137} - 0.5185v_{296} \quad (766)$$

7.168 Species s_0779

Name glyoxylate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0156](#) and as a product in [r_0662](#) and as a modifier in [r_0156](#), [r_0662](#)).

$$\frac{d}{dt}s_{0779} = v_{166} - v_{43} \quad (767)$$

7.169 Species s_0782

Name GMP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0528](#), [r_0529](#), [r_2111](#) and as a product in [r_0514](#) and as a modifier in [r_0514](#), [r_0528](#), [r_0529](#), [r_2111](#)).

$$\frac{d}{dt}s_{0782} = v_{139} - v_{141} - v_{142} - 0.046v_{296} \quad (768)$$

7.170 Species s_0785

Name GTP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0150](#), [r_0153](#), [r_0525](#), [r_0722](#) and as a product in [r_0800](#) and as a modifier in [r_0150](#), [r_0153](#), [r_0525](#), [r_0722](#), [r_0800](#)).

$$\frac{d}{dt}s_{0785} = v_{197} - v_{38} - v_{41} - v_{140} - v_{182} \quad (769)$$

7.171 Species s_0816

Name hexacosanoyl-CoA

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0264](#) and as a product in [r_0406](#) and as a modifier in [r_0264](#), [r_0406](#)).

$$\frac{d}{dt}s_{0816} = v_{112} - v_{77} \quad (770)$$

7.172 Species s_0832

Name His-tRNA(His)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0539](#) and as a modifier in [r_0539](#), [r_2111](#)).

$$\frac{d}{dt}s_{0832} = v_{147} - 0.0663v_{296} \quad (771)$$

7.173 Species s_0835

Name homocitrate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0027](#) and as a product in [r_0543](#) and as a modifier in [r_0027](#), [r_0543](#)).

$$\frac{d}{dt}s_{0835} = v_{149} - v_{15} \quad (772)$$

7.174 Species s_0836

Name homoisocitrate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0545](#) and as a product in [r_0542](#) and as a modifier in [r_0542](#), [r_0545](#)).

$$\frac{d}{dt}s_{0836} = v_{148} - v_{150} \quad (773)$$

7.175 Species s_0841

Name hydrogen sulfide

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0813](#) and as a product in [r_1027](#) and as a modifier in [r_0813](#), [r_1027](#)).

$$\frac{d}{dt}s_{0841} = v_{260} - v_{199} \quad (774)$$

7.176 Species s_0847

Name Ile-tRNA(Ile)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0665](#) and as a modifier in [r_0665](#), [r_2111](#)).

$$\frac{d}{dt}s_{0847} = v_{168} - 0.1927v_{296} \quad (775)$$

7.177 Species s_0849

Name IMP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0153](#), [r_0565](#) and as a product in [r_0570](#) and as a modifier in [r_0153](#), [r_0565](#), [r_0570](#)).

$$\frac{d}{dt}s_{0849} = v_{162} - v_{41} - v_{159} \quad (776)$$

7.178 Species s_0897

Name inositol-P-ceramide A (C26)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0591](#) and as a modifier in [r_0591](#), [r_2111](#)).

$$\frac{d}{dt}s_{0897} = v_{163} - 5.1708 \cdot 10^{-4}v_{296} \quad (777)$$

7.179 Species s_0940

Name isocitrate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in eight reactions (as a reactant in [r_0658](#), [r_0661](#), [r_0662](#) and as a product in [r_0280](#) and as a modifier in [r_0280](#), [r_0658](#), [r_0661](#), [r_0662](#)).

$$\frac{d}{dt}s_{0940} = v_{80} - v_{164} - v_{165} - v_{166} \quad (778)$$

7.180 Species s_0943

Name isopentenyl diphosphate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in eight reactions (as a reactant in [r_0355](#), [r_0462](#), [r_0667](#) and as a product in [r_0739](#) and as a modifier in [r_0355](#), [r_0462](#), [r_0667](#), [r_0739](#)).

$$\frac{d}{dt}s_{0943} = v_{192} - v_{97} - v_{123} - v_{169} \quad (779)$$

7.181 Species s_0951

Name keto-phenylpyruvate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0851](#) and as a product in [r_0938](#) and as a modifier in [r_0851](#), [r_0938](#)).

$$\frac{d}{dt}s_{0951} = v_{231} - v_{204} \quad (780)$$

7.182 Species s_0953

Name L-2-aminoadipate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0678](#) and as a product in [r_0018](#) and as a modifier in [r_0018](#), [r_0678](#)).

$$\frac{d}{dt}s_{0953} = v_{11} - v_{172} \quad (781)$$

7.183 Species s_0955

Name L-alanine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0156](#), [r_0157](#) and as a product in [r_0674](#) and as a modifier in [r_0156](#), [r_0157](#), [r_0674](#)).

$$\frac{d}{dt}s_{0955} = v_{171} - v_{43} - v_{44} \quad (782)$$

7.184 Species s_0959

Name L-allysine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0989](#) and as a product in [r_0678](#) and as a modifier in [r_0678](#), [r_0989](#)).

$$\frac{d}{dt}s_{0959} = v_{172} - v_{249} \quad (783)$$

7.185 Species s_0965

Name L-arginine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0209](#) and as a product in [r_0207](#) and as a modifier in [r_0207](#), [r_0209](#)).

$$\frac{d}{dt}s_{0965} = v_{51} - v_{53} \quad (784)$$

7.186 Species s_0969

Name L-asparagine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0212](#) and as a product in [r_0211](#) and as a modifier in [r_0211](#), [r_0212](#)).

$$\frac{d}{dt}s_{0969} = v_{54} - v_{55} \quad (785)$$

7.187 Species s_0973

Name L-aspartate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 16 reactions (as a reactant in [r_0153](#), [r_0208](#), [r_0211](#), [r_0214](#), [r_0215](#), [r_0220](#), [r_0908](#) and as a product in [r_0216](#) and as a modifier in [r_0153](#), [r_0208](#), [r_0211](#), [r_0214](#), [r_0215](#), [r_0216](#), [r_0220](#), [r_0908](#)).

$$\frac{d}{dt}s_{0973} = v_{58} - v_{41} - v_{52} - v_{54} - v_{56} - v_{57} - v_{60} - v_{222} \quad (786)$$

7.188 Species s_0978

Name L-aspartate 4-semialdehyde

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0547](#) and as a product in [r_0219](#) and as a modifier in [r_0219](#), [r_0547](#)).

$$\frac{d}{dt}s_{0978} = v_{59} - v_{151} \quad (787)$$

7.189 Species s_0979

Name L-citrulline

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_0208](#) and as a product in [r_0816](#) and as a modifier in [r_0208](#), [r_0816](#)).

$$\frac{d}{dt}s_{0979} = v_{200} - v_{52} \quad (788)$$

7.190 Species s_0980

Name L-cystathionine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0310](#) and as a product in [r_0309](#), [r_0311](#) and as a modifier in [r_0309](#), [r_0310](#), [r_0311](#)).

$$\frac{d}{dt}s_{0980} = v_{84} + v_{86} - v_{85} \quad (789)$$

7.191 Species s_0981

Name L-cysteine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0311](#), [r_0313](#) and as a product in [r_0310](#) and as a modifier in [r_0310](#), [r_0311](#), [r_0313](#)).

$$\frac{d}{dt}s_{0981} = v_{85} - v_{86} - v_{87} \quad (790)$$

7.192 Species s_0991

Name L-glutamate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 46 reactions (as a reactant in [r_0012](#), [r_0018](#), [r_0118](#), [r_0216](#), [r_0476](#), [r_0479](#), [r_0538](#), [r_0663](#), [r_0674](#), [r_0699](#), [r_0818](#), [r_0851](#), [r_0989](#), [r_1063](#), [r_1087](#) and as a product in [r_0079](#), [r_0203](#), [r_0211](#), [r_0250](#), [r_0470](#), [r_0514](#), [r_0563](#), [r_0915](#) and as a modifier in [r_0012](#), [r_0018](#), [r_0079](#), [r_0118](#), [r_0203](#), [r_0211](#), [r_0216](#), [r_0250](#), [r_0470](#), [r_0476](#), [r_0479](#), [r_0514](#), [r_0538](#), [r_0563](#), [r_0663](#), [r_0674](#), [r_0699](#), [r_0818](#), [r_0851](#), [r_0915](#), [r_0989](#), [r_1063](#), [r_1087](#)).

$$\begin{aligned} \frac{d}{dt}s_{0991} = & v_{25} + v_{50} + v_{54} + v_{75} + v_{126} + v_{139} + v_{157} + v_{229} - v_7 - v_{11} - v_{34} - v_{58} \\ & - v_{127} - v_{129} - v_{146} - v_{167} - v_{171} - v_{178} - v_{201} - v_{204} - v_{249} - v_{274} - v_{278} \end{aligned} \quad (791)$$

7.193 Species s_0999

Name L-glutamine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 18 reactions (as a reactant in [r_0079](#), [r_0203](#), [r_0211](#), [r_0250](#), [r_0478](#), [r_0514](#), [r_0563](#), [r_0915](#) and as a product in [r_0476](#) and as a modifier in [r_0079](#), [r_0203](#), [r_0211](#), [r_0250](#), [r_0476](#), [r_0478](#), [r_0514](#), [r_0563](#), [r_0915](#)).

$$\frac{d}{dt}s_{0999} = v_{127} - v_{25} - v_{50} - v_{54} - v_{75} - v_{128} - v_{139} - v_{157} - v_{229} \quad (792)$$

7.194 Species s_1003

Name L-glycine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in twelve reactions (as a reactant in [r_0501](#), [r_0502](#), [r_0512](#), [r_0914](#) and as a product in [r_0156](#), [r_1040](#) and as a modifier in [r_0156](#), [r_0501](#), [r_0502](#), [r_0512](#), [r_0914](#), [r_1040](#)).

$$\frac{d}{dt}s_{1003} = v_{43} + v_{262} - v_{135} - v_{136} - v_{138} - v_{228} \quad (793)$$

7.195 Species s_1006

Name L-histidine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0539](#) and as a product in [r_0536](#) and as a modifier in [r_0536](#), [r_0539](#)).

$$\frac{d}{dt}s_{1006} = v_{144} - v_{147} \quad (794)$$

7.196 Species s_1010

Name L-histidinol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0536](#) and as a product in [r_0537](#) and as a modifier in [r_0536](#), [r_0537](#)).

$$\frac{d}{dt}s_{1010} = v_{145} - v_{144} \quad (795)$$

7.197 Species s_1011

Name L-histidinol phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0537](#) and as a product in [r_0538](#) and as a modifier in [r_0537](#), [r_0538](#)).

$$\frac{d}{dt}s_{1011} = v_{146} - v_{145} \quad (796)$$

7.198 Species s_1012

Name L-homocysteine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0309](#), [r_0727](#) and as a product in [r_0144](#), [r_0813](#) and as a modifier in [r_0144](#), [r_0309](#), [r_0727](#), [r_0813](#)).

$$\frac{d}{dt}s_{1012} = v_{36} + v_{199} - v_{84} - v_{186} \quad (797)$$

7.199 Species s_1014

Name L-homoserine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0548](#), [r_0549](#) and as a product in [r_0547](#) and as a modifier in [r_0547](#), [r_0548](#), [r_0549](#)).

$$\frac{d}{dt}s_{1014} = v_{151} - v_{152} - v_{153} \quad (798)$$

7.200 Species s_1016

Name L-isoleucine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0665](#) and as a product in [r_0663](#) and as a modifier in [r_0663](#), [r_0665](#)).

$$\frac{d}{dt}s_{1016} = v_{167} - v_{168} \quad (799)$$

7.201 Species s_1021

Name L-leucine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0701](#) and as a product in [r_0699](#) and as a modifier in [r_0699](#), [r_0701](#)).

$$\frac{d}{dt}s_{1021} = v_{178} - v_{179} \quad (800)$$

7.202 Species s_1025

Name L-lysine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0711](#) and as a product in [r_0988](#) and as a modifier in [r_0711](#), [r_0988](#)).

$$\frac{d}{dt}s_{1025} = v_{248} - v_{180} \quad (801)$$

7.203 Species s_1029

Name L-methionine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0726](#), [r_0729](#) and as a product in [r_0727](#) and as a modifier in [r_0726](#), [r_0727](#), [r_0729](#)).

$$\frac{d}{dt}s_{1029} = v_{186} - v_{185} - v_{187} \quad (802)$$

7.204 Species s_1032

Name L-phenylalanine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0852](#) and as a product in [r_0851](#) and as a modifier in [r_0851](#), [r_0852](#)).

$$\frac{d}{dt}s_{1032} = v_{204} - v_{205} \quad (803)$$

7.205 Species s_1035

Name L-proline

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0941](#) and as a product in [r_0957](#) and as a modifier in [r_0941](#), [r_0957](#)).

$$\frac{d}{dt}s_{1035} = v_{234} - v_{233} \quad (804)$$

7.206 Species s_1038

Name L-saccharopine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0988](#) and as a product in [r_0989](#) and as a modifier in [r_0988](#), [r_0989](#)).

$$\frac{d}{dt}s_{1038} = v_{249} - v_{248} \quad (805)$$

7.207 Species s_1039

Name L-serine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in twelve reactions (as a reactant in [r_0309](#), [r_0880](#), [r_0993](#), [r_0995](#), [r_1055](#) and as a product in [r_0502](#) and as a modifier in [r_0309](#), [r_0502](#), [r_0880](#), [r_0993](#), [r_0995](#), [r_1055](#)).

$$\frac{d}{dt}s_{1039} = v_{136} - v_{84} - v_{210} - v_{251} - v_{252} - v_{272} \quad (806)$$

7.208 Species [s_1045](#)

Name L-threonine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0692](#), [r_1040](#), [r_1042](#) and as a product in [r_1041](#) and as a modifier in [r_0692](#), [r_1040](#), [r_1041](#), [r_1042](#)).

$$\frac{d}{dt}s_{1045} = v_{263} - v_{174} - v_{262} - v_{264} \quad (807)$$

7.209 Species [s_1048](#)

Name L-tryptophan

SBO:0000247 simple chemical

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_1055](#) and as a modifier in [r_1055](#), [r_1057](#)).

$$\frac{d}{dt}s_{1048} = v_{272} - v_{273} \quad (808)$$

7.210 Species [s_1051](#)

Name L-tyrosine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1066](#) and as a product in [r_1063](#) and as a modifier in [r_1063](#), [r_1066](#)).

$$\frac{d}{dt}s_{1051} = v_{274} - v_{275} \quad (809)$$

7.211 Species s_1056

Name L-valine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1089](#) and as a product in [r_1087](#) and as a modifier in [r_1087](#), [r_1089](#)).

$$\frac{d}{dt}s_{1056} = v_{278} - v_{279} \quad (810)$$

7.212 Species s_1059

Name lanosterol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0317](#), [r_2111](#) and as a product in [r_0698](#) and as a modifier in [r_0317](#), [r_0698](#), [r_2111](#)).

$$\frac{d}{dt}s_{1059} = v_{177} - v_{88} - 3.2 \cdot 10^{-5}v_{296} \quad (811)$$

7.213 Species s_1065

Name laurate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0387](#), [r_0400](#) and as a product in [r_0386](#) and as a modifier in [r_0386](#), [r_0387](#), [r_0400](#)).

$$\frac{d}{dt}s_{1065} = v_{102} - v_{103} - v_{111} \quad (812)$$

7.214 Species s_1073

Name lauroyl-CoA

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0433](#) and as a product in [r_0400](#), [r_0432](#) and as a modifier in [r_0400](#), [r_0432](#), [r_0433](#)).

$$\frac{d}{dt}s_{1073} = v_{111} + v_{114} - v_{115} \quad (813)$$

7.215 Species s_1077

Name Leu-tRNA(Leu)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0701](#) and as a modifier in [r_0701](#), [r_2111](#)).

$$\frac{d}{dt}s_{1077} = v_{179} - 0.2964v_{296} \quad (814)$$

7.216 Species s_1084

Name lignoceric acid

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0394](#) and as a product in [r_0393](#) and as a modifier in [r_0393](#), [r_0394](#)).

$$\frac{d}{dt}s_{1084} = v_{106} - v_{107} \quad (815)$$

7.217 Species s_1099

Name Lys-tRNA(Lys)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0711](#) and as a modifier in [r_0711](#), [r_2111](#)).

$$\frac{d}{dt}s_{1099} = v_{180} - 0.2862v_{296} \quad (816)$$

7.218 Species s_1101

Name malonyl-CoA

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 26 reactions (as a reactant in [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0393](#), [r_0394](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#) and as a product in [r_0108](#) and as a modifier in [r_0108](#), [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0393](#), [r_0394](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#)).

$$\begin{aligned} \frac{d}{dt}s_{1101} = & v_{31} - v_{102} - v_{103} - v_{104} - v_{105} - 3v_{106} - v_{107} \\ & - v_{108} - 3v_{109} - v_{114} - v_{115} - v_{116} - v_{117} \end{aligned} \quad (817)$$

7.219 Species [s_1107](#)

Name mannan

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0362](#) and as a modifier in [r_0362](#), [r_2111](#)).

$$\frac{d}{dt}s_{1107} = v_{99} - 0.8079v_{296} \quad (818)$$

7.220 Species [s_1148](#)

Name Met-tRNA(Met)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0729](#) and as a modifier in [r_0729](#), [r_2111](#)).

$$\frac{d}{dt}s_{1148} = v_{187} - 0.0507v_{296} \quad (819)$$

7.221 Species [s_1151](#)

Name methylglyoxal

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0688](#), [r_0697](#) and as a product in [r_1936](#) and as a modifier in [r_0688](#), [r_0697](#), [r_1936](#)).

$$\frac{d}{dt}s_{1151} = v_{292} - v_{173} - v_{176} \quad (820)$$

7.222 Species s_1153

Name myo-inositol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0874](#) and as a product in [r_0757](#) and as a modifier in [r_0757](#), [r_0874](#)).

$$\frac{d}{dt}s_{1153} = v_{193} - v_{208} \quad (821)$$

7.223 Species s_1161

Name myristate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0389](#) and as a product in [r_0387](#) and as a modifier in [r_0387](#), [r_0389](#)).

$$\frac{d}{dt}s_{1161} = v_{103} - v_{104} \quad (822)$$

7.224 Species s_1176

Name myristoyl-CoA

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0434](#) and as a product in [r_0433](#) and as a modifier in [r_0433](#), [r_0434](#)).

$$\frac{d}{dt}s_{1176} = v_{115} - v_{116} \quad (823)$$

7.225 Species s_1182

Name N(2)-acetyl-L-ornithine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0818](#) and as a product in [r_0118](#) and as a modifier in [r_0118](#), [r_0818](#)).

$$\frac{d}{dt}s_{1182} = v_{34} - v_{201} \quad (824)$$

7.226 Species [s_1187](#)

Name N-(5-phospho-beta-D-ribosyl)anthranilate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0913](#) and as a product in [r_0202](#) and as a modifier in [r_0202](#), [r_0913](#)).

$$\frac{d}{dt}s_{1187} = v_{49} - v_{227} \quad (825)$$

7.227 Species [s_1191](#)

Name N-acetyl-L-gamma-glutamyl phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0759](#) and as a product in [r_0115](#) and as a modifier in [r_0115](#), [r_0759](#)).

$$\frac{d}{dt}s_{1191} = v_{33} - v_{195} \quad (826)$$

7.228 Species [s_1192](#)

Name N-acetyl-L-glutamate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0115](#) and as a product in [r_0818](#) and as a modifier in [r_0115](#), [r_0818](#)).

$$\frac{d}{dt}s_{1192} = v_{201} - v_{33} \quad (827)$$

7.229 Species [s_1194](#)

Name N-carbamoyl-L-aspartate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0349](#) and as a product in [r_0214](#) and as a modifier in [r_0214](#), [r_0349](#)).

$$\frac{d}{dt}s_{1194} = v_{56} - v_{94} \quad (828)$$

7.230 Species NAD

Name NAD

SBO:0000247 simple chemical

Initial concentration 1.50329030201531 mmol · l⁻¹

This species takes part in 38 reactions (as a reactant in [r_0061](#), [r_0174](#), [r_0235](#), [TDH](#), [r_0501](#), [r_0536](#), [r_0545](#), [r_0565](#), [r_0658](#), [r_0696](#), [r_0713](#), [r_0988](#), [r_2127](#) and as a product in [r_0012](#), [ADH](#), [r_0470](#), [r_0491](#), [r_0731](#), [r_1010](#) and as a modifier in [r_0012](#), [r_0061](#), [ADH](#), [r_0174](#), [r_0235](#), [r_0470](#), [TDH](#), [r_0491](#), [r_0501](#), [r_0536](#), [r_0545](#), [r_0565](#), [r_0658](#), [r_0696](#), [r_0713](#), [r_0731](#), [r_0988](#), [r_1010](#), [r_2127](#)).

$$\frac{d}{dt}\text{NAD} = v_7 + v_{45} + v_{126} + v_{132} + v_{188} + v_{255} - v_{23} - v_{47} - v_{66} - v_{130} - v_{135} - 2v_{144} - v_{150} - v_{159} - v_{164} - v_{175} - v_{181} - v_{248} - v_{298} \quad (829)$$

7.231 Species NADH

Name NADH

SBO:0000247 simple chemical

Initial concentration 0.0867096979846952 mmol · l⁻¹

This species takes part in 38 reactions (as a reactant in [r_0012](#), [ADH](#), [r_0470](#), [r_0491](#), [r_0731](#), [r_1010](#) and as a product in [r_0061](#), [r_0174](#), [r_0235](#), [TDH](#), [r_0501](#), [r_0536](#), [r_0545](#), [r_0565](#), [r_0658](#), [r_0696](#), [r_0713](#), [r_0988](#), [r_2127](#) and as a modifier in [r_0012](#), [r_0061](#), [ADH](#), [r_0174](#), [r_0235](#), [r_0470](#), [TDH](#), [r_0491](#), [r_0501](#), [r_0536](#), [r_0545](#), [r_0565](#), [r_0658](#), [r_0696](#), [r_0713](#), [r_0731](#), [r_0988](#), [r_1010](#), [r_2127](#)).

$$\frac{d}{dt}\text{NADH} = v_{23} + v_{47} + v_{66} + v_{130} + v_{135} + 2v_{144} + v_{150} + v_{159} + v_{164} + v_{175} + v_{181} + v_{248} + v_{298} - v_7 - v_{45} - v_{126} - v_{132} - v_{188} - v_{255} \quad (830)$$

7.232 Species s_1207

Name NADP(+)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 92 reactions (as a reactant in [r_0173](#), [r_0234](#), [r_0466](#), [r_0661](#), [r_0732](#), [r_0889](#), [r_0939](#) and as a product in [r_0015](#), [r_0041](#), [r_0080](#), [r_0096](#), [r_0219](#), [r_0231](#), [r_0236](#), [r_0237](#), [r_0238](#), [r_0239](#), [r_0240](#), [r_0241](#), [r_0244](#), [r_0317](#), [r_0344](#), [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0393](#), [r_0394](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#), [r_0547](#),

r_0558, r_0669, r_0678, r_0688, r_0759, r_0957, r_0989, r_0996, r_1012, r_1027, r_1038 and as a modifier in r_0015, r_0041, r_0080, r_0096, r_0173, r_0219, r_0231, r_0234, r_0236, r_0237, r_0238, r_0239, r_0240, r_0241, r_0244, r_0317, r_0344, r_0386, r_0387, r_0389, r_0391, r_0393, r_0394, r_0397, r_0398, r_0432, r_0433, r_0434, r_0435, r_0466, r_0547, r_0558, r_0661, r_0669, r_0678, r_0688, r_0732, r_0759, r_0889, r_0939, r_0957, r_0989, r_0996, r_1012, r_1027, r_1038).

$$\begin{aligned} \frac{d}{dt}s_{1207} = & v_9 + v_{21} + v_{26} + v_{28} + v_{59} + v_{64} + v_{67} + v_{68} + v_{69} + v_{70} + v_{71} + 3v_{72} + v_{74} \\ & + 3v_{88} + v_{93} + 2v_{102} + 2v_{103} + 2v_{104} + 2v_{105} + 6v_{106} + 2v_{107} + 2v_{108} + 6v_{109} \\ & + 2v_{114} + 2v_{115} + 2v_{116} + 2v_{117} + v_{151} + 2v_{155} + v_{170} + v_{172} + v_{173} + v_{195} + v_{234} \\ & + v_{249} + v_{253} + v_{256} + 3v_{260} + v_{261} - v_{46} - v_{65} - v_{124} - v_{165} - v_{189} - v_{215} - v_{232} \end{aligned} \quad (831)$$

7.233 Species s_1212

Name NADPH

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in 92 reactions (as a reactant in r_0015, r_0041, r_0080, r_0096, r_0219, r_0231, r_0236, r_0237, r_0238, r_0239, r_0240, r_0241, r_0244, r_0317, r_0344, r_0386, r_0387, r_0389, r_0391, r_0393, r_0394, r_0397, r_0398, r_0432, r_0433, r_0434, r_0435, r_0547, r_0558, r_0669, r_0678, r_0688, r_0759, r_0957, r_0989, r_0996, r_1012, r_1027, r_1038 and as a product in r_0173, r_0234, r_0466, r_0661, r_0732, r_0889, r_0939 and as a modifier in r_0015, r_0041, r_0080, r_0096, r_0173, r_0219, r_0231, r_0234, r_0236, r_0237, r_0238, r_0239, r_0240, r_0241, r_0244, r_0317, r_0344, r_0386, r_0387, r_0389, r_0391, r_0393, r_0394, r_0397, r_0398, r_0432, r_0433, r_0434, r_0435, r_0466, r_0547, r_0558, r_0661, r_0669, r_0678, r_0688, r_0732, r_0759, r_0889, r_0939, r_0957, r_0989, r_0996, r_1012, r_1027, r_1038).

$$\begin{aligned} \frac{d}{dt}s_{1212} = & v_{46} + v_{65} + v_{124} + v_{165} + v_{189} + v_{215} + v_{232} - v_9 - v_{21} - v_{26} - v_{28} - v_{59} - v_{64} \\ & - v_{67} - v_{68} - v_{69} - v_{70} - v_{71} - 3v_{72} - v_{74} - 3v_{88} - v_{93} - 2v_{102} - 2v_{103} - 2v_{104} \\ & - 2v_{105} - 6v_{106} - 2v_{107} - 2v_{108} - 6v_{109} - 2v_{114} - 2v_{115} - 2v_{116} - 2v_{117} - v_{151} \\ & - 2v_{155} - v_{170} - v_{172} - v_{173} - v_{195} - v_{234} - v_{249} - v_{253} - v_{256} - 3v_{260} - v_{261} \end{aligned} \quad (832)$$

7.234 Species s_1233

Name O-acetyl-L-homoserine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0311](#), [r_0813](#) and as a product in [r_0549](#) and as a modifier in [r_0311](#), [r_0549](#), [r_0813](#)).

$$\frac{d}{dt}s_{1233} = v_{153} - v_{86} - v_{199} \quad (833)$$

7.235 Species [s_1238](#)

Name O-phospho-L-homoserine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1041](#) and as a product in [r_0548](#) and as a modifier in [r_0548](#), [r_1041](#)).

$$\frac{d}{dt}s_{1238} = v_{152} - v_{263} \quad (834)$$

7.236 Species [s_1255](#)

Name octanoyl-CoA

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0397](#) and as a product in [r_0398](#) and as a modifier in [r_0397](#), [r_0398](#)).

$$\frac{d}{dt}s_{1255} = v_{109} - v_{108} \quad (835)$$

7.237 Species [s_1266](#)

Name ornithine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0816](#) and as a product in [r_0818](#) and as a modifier in [r_0816](#), [r_0818](#)).

$$\frac{d}{dt}s_{1266} = v_{201} - v_{200} \quad (836)$$

7.238 Species s_1269

Name orotate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0820](#) and as a product in [r_2127](#) and as a modifier in [r_0820](#), [r_2127](#)).

$$\frac{d}{dt}s_{1269} = v_{298} - v_{202} \quad (837)$$

7.239 Species s_1270

Name orotidine 5'-(dihydrogen phosphate)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0821](#) and as a product in [r_0820](#) and as a modifier in [r_0820](#), [r_0821](#)).

$$\frac{d}{dt}s_{1270} = v_{202} - v_{203} \quad (838)$$

7.240 Species s_1271

Name oxaloacetate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0216](#), [r_0300](#), [r_0884](#) and as a product in [r_0713](#), [r_0958](#) and as a modifier in [r_0216](#), [r_0300](#), [r_0713](#), [r_0884](#), [r_0958](#)).

$$\frac{d}{dt}s_{1271} = v_{181} + v_{235} - v_{58} - v_{81} - v_{212} \quad (839)$$

7.241 Species s_1275

Name oxygen

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 18 reactions (as a reactant in [r_0238](#), [r_0239](#), [r_0240](#), [r_0241](#), [r_0317](#), [r_0438](#), [r_1010](#), [r_1682](#) and as a product in [r_1979](#) and as a modifier in [r_0238](#), [r_0239](#), [r_0240](#), [r_0241](#), [r_0317](#), [r_0438](#), [r_1010](#), [r_1682](#), [r_1979](#)).

$$\frac{d}{dt}s_{1275} = v_{293} - v_{69} - v_{70} - v_{71} - 3v_{72} - 3v_{88} - v_{118} - v_{255} - v_{287} \quad (840)$$

7.242 Species [s_1277](#)

Name oxygen

SBO:0000247 simple chemical

Initial concentration 1 mmol · l⁻¹

This species takes part in two reactions (as a reactant in [r_1979](#) and as a modifier in [r_1979](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1277} = 0 \quad (841)$$

7.243 Species [s_1286](#)

Name palmitate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0391](#) and as a product in [r_0389](#) and as a modifier in [r_0389](#), [r_0391](#)).

$$\frac{d}{dt}s_{1286} = v_{104} - v_{105} \quad (842)$$

7.244 Species [s_1302](#)

Name palmitoyl-CoA

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0435](#), [r_0993](#) and as a product in [r_0434](#) and as a modifier in [r_0434](#), [r_0435](#), [r_0993](#)).

$$\frac{d}{dt}s_{1302} = v_{116} - v_{117} - v_{251} \quad (843)$$

7.245 Species s_{1314}

Name Phe-tRNA(Phe)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0852](#) and as a modifier in [r_0852](#), [r_2111](#)).

$$\frac{d}{dt}s_{1314} = v_{205} - 0.1339v_{296} \quad (844)$$

7.246 Species PHO

Name phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 80 reactions (as a reactant in [r_0226](#), [TDH](#) and as a product in [r_0020](#), [r_0032](#), [r_0040](#), [r_0065](#), [r_0079](#), [r_0108](#), [r_0153](#), [r_0214](#), [r_0219](#), [ATPase](#), [r_0250](#), [r_0279](#), [r_0307](#), [r_0337](#), [r_0446](#), [r_0476](#), [r_0489](#), [r_0537](#), [r_0568](#), [r_0726](#), [r_0739](#), [r_0757](#), [r_0759](#), [r_0792](#), [r_0816](#), [r_0855](#), [r_0908](#), [r_0911](#), [r_0914](#), [r_0958](#), [r_0967](#), [r_1026](#), [r_1041](#), [r_1051](#), [r_1244](#), [r_1936](#), [r_2030](#), [r_2111](#), [r_2126](#) and as a modifier in [r_0020](#), [r_0032](#), [r_0040](#), [r_0065](#), [r_0079](#), [r_0108](#), [r_0153](#), [r_0214](#), [r_0219](#), [r_0226](#), [r_0250](#), [r_0279](#), [r_0307](#), [r_0337](#), [r_0446](#), [r_0476](#), [TDH](#), [r_0489](#), [r_0537](#), [r_0568](#), [r_0726](#), [r_0739](#), [r_0757](#), [r_0759](#), [r_0792](#), [r_0816](#), [r_0855](#), [r_0908](#), [r_0911](#), [r_0914](#), [r_0958](#), [r_0967](#), [r_1026](#), [r_1041](#), [r_1051](#), [r_1244](#), [r_1936](#), [r_2030](#), [r_2126](#)).

$$\begin{aligned} \frac{d}{dt}\text{PHO} = & v_{12} + v_{17} + v_{20} + v_{24} + v_{25} + v_{31} + v_{41} + v_{56} + v_{59} + v_{63} + v_{75} + v_{79} + v_{83} + v_{92} + v_{120} + v_{127} \\ & + v_{131} + v_{145} + 2v_{161} + v_{185} + v_{192} + v_{193} + v_{195} + v_{196} + v_{200} + v_{206} + v_{222} + v_{225} + v_{228} \\ & + v_{235} + v_{238} + v_{259} + v_{263} + v_{269} + v_{283} + v_{292} + v_{294} + 58.70001v_{296} + v_{297} - v_{62} - v_{130} \end{aligned} \quad (845)$$

7.247 Species s_{1324}

Name phosphate

SBO:0000247 simple chemical

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1244](#) and as a modifier in [r_1244](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1324} = 0 \quad (846)$$

7.248 Species s_1331

Name phosphatidate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0257](#), [r_0337](#) and as a product in [r_0008](#) and as a modifier in [r_0008](#), [r_0257](#), [r_0337](#)).

$$\frac{d}{dt}s_{1331} = v_6 - v_{76} - v_{92} \quad (847)$$

7.249 Species s_1337

Name phosphatidyl-L-serine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0877](#), [r_2111](#) and as a product in [r_0880](#) and as a modifier in [r_0877](#), [r_0880](#), [r_2111](#)).

$$\frac{d}{dt}s_{1337} = v_{210} - v_{209} - 3.9 \cdot 10^{-4}v_{296} \quad (848)$$

7.250 Species s_1342

Name phosphatidyl-N,N-dimethylethanolamine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0900](#) and as a product in [r_0901](#) and as a modifier in [r_0900](#), [r_0901](#)).

$$\frac{d}{dt}s_{1342} = v_{219} - v_{218} \quad (849)$$

7.251 Species s_1343

Name phosphatidyl-N-methylethanolamine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0901](#) and as a product in [r_0858](#) and as a modifier in [r_0858](#), [r_0901](#)).

$$\frac{d}{dt}s_{1343} = v_{207} - v_{219} \quad (850)$$

7.252 Species s_1346

Name phosphatidylcholine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0900](#) and as a modifier in [r_0900](#), [r_2111](#)).

$$\frac{d}{dt}s_{1346} = v_{218} - 0.00288v_{296} \quad (851)$$

7.253 Species s_1351

Name phosphatidylethanolamine

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0858](#), [r_2111](#) and as a product in [r_0877](#) and as a modifier in [r_0858](#), [r_0877](#), [r_2111](#)).

$$\frac{d}{dt}s_{1351} = v_{209} - v_{207} - 6.97 \cdot 10^{-4}v_{296} \quad (852)$$

7.254 Species PEP

Name phosphoenolpyruvate

SBO:0000247 simple chemical

Initial concentration $0.0632352144936527 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0020](#), [r_0065](#), [PYK](#) and as a product in [ENO](#), [r_0884](#) and as a modifier in [r_0020](#), [r_0065](#), [ENO](#), [r_0884](#), [PYK](#)).

$$\frac{d}{dt}PEP = v_{101} + v_{212} - v_{12} - v_{24} - v_{237} \quad (853)$$

7.255 Species s_1364

Name phosphoribosyl-carboxy-aminoimidazole

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0908](#) and as a product in [r_0911](#) and as a modifier in [r_0908](#), [r_0911](#)).

$$\frac{d}{dt}s_{1364} = v_{225} - v_{222} \quad (854)$$

7.256 Species s_1365

Name phosphoribosyl-formamido-carboxamide

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0570](#) and as a product in [r_0912](#) and as a modifier in [r_0570](#), [r_0912](#)).

$$\frac{d}{dt}s_{1365} = v_{226} - v_{162} \quad (855)$$

7.257 Species s_1376

Name prenyl diphosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0355](#) and as a product in [r_0667](#) and as a modifier in [r_0355](#), [r_0667](#)).

$$\frac{d}{dt}s_{1376} = v_{169} - v_{97} \quad (856)$$

7.258 Species s_1377

Name prephenate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_0938](#), [r_0939](#) and as a product in [r_0278](#) and as a modifier in [r_0278](#), [r_0938](#), [r_0939](#)).

$$\frac{d}{dt}s_{1377} = v_{78} - v_{231} - v_{232} \quad (857)$$

7.259 Species s_1379

Name Pro-tRNA(Pro)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0941](#) and as a modifier in [r_0941](#), [r_2111](#)).

$$\frac{d}{dt}s_{1379} = v_{233} - 0.1647v_{296} \quad (858)$$

7.260 Species [s_1386](#)

Name PRPP

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in ten reactions (as a reactant in [r_0202](#), [r_0225](#), [r_0820](#), [r_0915](#) and as a product in [r_0916](#) and as a modifier in [r_0202](#), [r_0225](#), [r_0820](#), [r_0915](#), [r_0916](#)).

$$\frac{d}{dt}s_{1386} = v_{230} - v_{49} - v_{61} - v_{202} - v_{229} \quad (859)$$

7.261 Species [PYR](#)

Name pyruvate

SBO:0000247 simple chemical

Initial concentration $1.81531251192736 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 20 reactions (as a reactant in [r_0016](#), [r_0097](#), [r_0674](#), [r_0958](#), [PDC](#) and as a product in [r_0001](#), [r_0004](#), [r_0156](#), [r_0203](#), [PYK](#) and as a modifier in [r_0001](#), [r_0004](#), [r_0016](#), [r_0097](#), [r_0156](#), [r_0203](#), [r_0674](#), [r_0958](#), [PDC](#), [PYK](#)).

$$\frac{d}{dt}\text{PYR} = v_1 + v_2 + v_{43} + v_{50} + v_{237} - v_{10} - 2v_{29} - v_{171} - v_{235} - v_{236} \quad (860)$$

7.262 Species [s_1405](#)

Name riboflavin

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0968](#) and as a modifier in [r_0968](#), [r_2111](#)).

$$\frac{d}{dt}s_{1405} = v_{239} - 9.9 \cdot 10^{-4} v_{296} \quad (861)$$

7.263 Species s_1408

Name ribose-5-phosphate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in six reactions (as a reactant in [r_0916](#), [r_1049](#) and as a product in [r_0982](#) and as a modifier in [r_0916](#), [r_0982](#), [r_1049](#)).

$$\frac{d}{dt}s_{1408} = v_{245} - v_{230} - v_{267} \quad (862)$$

7.264 Species s_1413

Name S-adenosyl-L-homocysteine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in twelve reactions (as a reactant in [r_0144](#) and as a product in [r_0858](#), [r_0900](#), [r_0901](#), [r_0986](#), [r_1682](#) and as a modifier in [r_0144](#), [r_0858](#), [r_0900](#), [r_0901](#), [r_0986](#), [r_1682](#)).

$$\frac{d}{dt}s_{1413} = v_{207} + v_{218} + v_{219} + v_{247} + v_{287} - v_{36} \quad (863)$$

7.265 Species s_1416

Name S-adenosyl-L-methionine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol·l⁻¹

This species takes part in twelve reactions (as a reactant in [r_0858](#), [r_0900](#), [r_0901](#), [r_0986](#), [r_1682](#) and as a product in [r_0726](#) and as a modifier in [r_0726](#), [r_0858](#), [r_0900](#), [r_0901](#), [r_0986](#), [r_1682](#)).

$$\frac{d}{dt}s_{1416} = v_{185} - v_{207} - v_{218} - v_{219} - v_{247} - v_{287} \quad (864)$$

7.266 Species s_1426

Name sedoheptulose 1,7-bisphosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2126](#) and as a product in [r_0990](#) and as a modifier in [r_0990](#), [r_2126](#)).

$$\frac{d}{dt}s_{1426} = v_{250} - v_{297} \quad (865)$$

7.267 Species s_1427

Name sedoheptulose 7-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1048](#) and as a product in [r_1049](#), [r_2126](#) and as a modifier in [r_1048](#), [r_1049](#), [r_2126](#)).

$$\frac{d}{dt}s_{1427} = v_{267} + v_{297} - v_{266} \quad (866)$$

7.268 Species s_1428

Name Ser-tRNA(Ser)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_0995](#) and as a modifier in [r_0995](#), [r_2111](#)).

$$\frac{d}{dt}s_{1428} = v_{252} - 0.1854v_{296} \quad (867)$$

7.269 Species s_1429

Name shikimate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0997](#) and as a product in [r_0996](#) and as a modifier in [r_0996](#), [r_0997](#)).

$$\frac{d}{dt}s_{1429} = v_{253} - v_{254} \quad (868)$$

7.270 Species s_1445

Name sphinganine

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0264](#) and as a product in [r_0041](#) and as a modifier in [r_0041](#), [r_0264](#)).

$$\frac{d}{dt}s_{1445} = v_{21} - v_{77} \quad (869)$$

7.271 Species s_1447

Name squalene

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_1010](#) and as a product in [r_1012](#) and as a modifier in [r_1010](#), [r_1012](#)).

$$\frac{d}{dt}s_{1447} = v_{256} - v_{255} \quad (870)$$

7.272 Species s_1449

Name stearate

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0393](#) and as a product in [r_0391](#), [r_0407](#) and as a modifier in [r_0391](#), [r_0393](#), [r_0407](#)).

$$\frac{d}{dt}s_{1449} = v_{105} + v_{113} - v_{106} \quad (871)$$

7.273 Species s_1454

Name stearyl-CoA

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0407](#) and as a product in [r_0435](#) and as a modifier in [r_0407](#), [r_0435](#)).

$$\frac{d}{dt}s_{1454} = v_{117} - v_{113} \quad (872)$$

7.274 Species s_1458

Name succinate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1021](#), [r_2057](#) and as a product in [r_0662](#) and as a modifier in [r_0662](#), [r_1021](#), [r_2057](#)).

$$\frac{d}{dt}s_{1458} = v_{166} - v_{258} - v_{295} \quad (873)$$

7.275 Species s_1459

Name succinate

SBO:0000247 simple chemical

Initial concentration $0 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in [r_2057](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1459} = 0 \quad (874)$$

7.276 Species s_1467

Name sulphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [r_1026](#), [r_2111](#) and as a product in [r_1266](#) and as a modifier in [r_1026](#), [r_1266](#), [r_2111](#)).

$$\frac{d}{dt}s_{1467} = v_{284} - v_{259} - 0.02v_{296} \quad (875)$$

7.277 Species s_1468

Name sulphate

SBO:0000247 simple chemical

Initial concentration $1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in [r_1266](#) and as a modifier in [r_1266](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}s_{1468} = 0 \quad (876)$$

7.278 Species [s_1469](#)

Name sulphite

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_1027](#) and as a product in [r_0883](#) and as a modifier in [r_0883](#), [r_1027](#)).

$$\frac{d}{dt}s_{1469} = v_{211} - v_{260} \quad (877)$$

7.279 Species [s_1487](#)

Name THF

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in [r_0446](#), [r_0501](#) and as a product in [r_0344](#), [r_0499](#), [r_0502](#), [r_0727](#), [r_0912](#) and as a modifier in [r_0344](#), [r_0446](#), [r_0499](#), [r_0501](#), [r_0502](#), [r_0727](#), [r_0912](#)).

$$\frac{d}{dt}s_{1487} = v_{93} + v_{134} + v_{136} + v_{186} + v_{226} - v_{120} - v_{135} \quad (878)$$

7.280 Species [s_1491](#)

Name Thr-tRNA(Thr)

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1042](#) and as a modifier in [r_1042](#), [r_2111](#)).

$$\frac{d}{dt}s_{1491} = v_{264} - 0.1914v_{296} \quad (879)$$

7.281 Species s_1520

Name trehalose

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1051](#) and as a modifier in [r_1051](#), [r_2111](#)).

$$\frac{d}{dt}s_{1520} = v_{269} - 0.0234v_{296} \quad (880)$$

7.282 Species s_1524

Name triglyceride

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_0336](#), [r_2111](#) and as a product in [r_1052](#) and as a modifier in [r_0336](#), [r_1052](#), [r_2111](#)).

$$\frac{d}{dt}s_{1524} = v_{270} - v_{91} - 7.81 \cdot 10^{-4}v_{296} \quad (881)$$

7.283 Species s_1527

Name Trp-tRNA(Trp)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1057](#) and as a modifier in [r_1057](#), [r_2111](#)).

$$\frac{d}{dt}s_{1527} = v_{273} - 0.0284v_{296} \quad (882)$$

7.284 Species s_1533

Name Tyr-tRNA(Tyr)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1066](#) and as a modifier in [r_1066](#), [r_2111](#)).

$$\frac{d}{dt}s_{1533} = v_{275} - 0.102v_{296} \quad (883)$$

7.285 Species s_1535

Name ubiquinol-6

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0439](#) and as a product in [r_1021](#) and as a modifier in [r_0439](#), [r_1021](#)).

$$\frac{d}{dt}s_{1535} = v_{258} - v_{119} \quad (884)$$

7.286 Species s_1537

Name ubiquinone-6

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_1021](#) and as a product in [r_0439](#) and as a modifier in [r_0439](#), [r_1021](#)).

$$\frac{d}{dt}s_{1537} = v_{119} - v_{258} \quad (885)$$

7.287 Species s_1538

Name UDP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in twelve reactions (as a reactant in [r_0811](#) and as a product in [r_0005](#), [r_0006](#), [r_0195](#), [r_0510](#), [r_1072](#) and as a modifier in [r_0005](#), [r_0006](#), [r_0195](#), [r_0510](#), [r_0811](#), [r_1072](#)).

$$\frac{d}{dt}s_{1538} = v_3 + v_4 + v_{48} + v_{137} + v_{276} - v_{198} \quad (886)$$

7.288 Species [s_1543](#)

Name UDP-D-glucose

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in ten reactions (as a reactant in [r_0005](#), [r_0006](#), [r_0195](#), [r_0510](#) and as a product in [r_1084](#) and as a modifier in [r_0005](#), [r_0006](#), [r_0195](#), [r_0510](#), [r_1084](#)).

$$\frac{d}{dt}s_{1543} = v_{277} - v_3 - v_4 - v_{48} - v_{137} \quad (887)$$

7.289 Species [s_1545](#)

Name UMP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in six reactions (as a reactant in [r_1072](#), [r_2111](#) and as a product in [r_0821](#) and as a modifier in [r_0821](#), [r_1072](#), [r_2111](#)).

$$\frac{d}{dt}s_{1545} = v_{203} - v_{276} - 0.0599v_{296} \quad (888)$$

7.290 Species [s_1559](#)

Name UTP

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in eight reactions (as a reactant in [r_0307](#), [r_0973](#), [r_1084](#) and as a product in [r_0811](#) and as a modifier in [r_0307](#), [r_0811](#), [r_0973](#), [r_1084](#)).

$$\frac{d}{dt}s_{1559} = v_{198} - v_{83} - v_{241} - v_{277} \quad (889)$$

7.291 Species [s_1561](#)

Name Val-tRNA(Val)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_2111](#) and as a product in [r_1089](#) and as a modifier in [r_1089](#), [r_2111](#)).

$$\frac{d}{dt}s_{1561} = v_{279} - 0.2646v_{296} \quad (890)$$

7.292 Species s_1565

Name xanthosine-5-phosphate

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0514](#) and as a product in [r_0565](#) and as a modifier in [r_0514](#), [r_0565](#)).

$$\frac{d}{dt}s_{1565} = v_{159} - v_{139} \quad (891)$$

7.293 Species s_1569

Name zymosterol

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in [r_0986](#), [r_1682](#), [r_2111](#) and as a product in [r_0237](#) and as a modifier in [r_0237](#), [r_0986](#), [r_1682](#), [r_2111](#)).

$$\frac{d}{dt}s_{1569} = v_{68} - v_{247} - v_{287} - 1.5 \cdot 10^{-5} v_{296} \quad (892)$$

7.294 Species s_1576

Name zymosterol intermediate 1a

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0239](#) and as a product in [r_0238](#) and as a modifier in [r_0238](#), [r_0239](#)).

$$\frac{d}{dt}s_{1576} = v_{69} - v_{70} \quad (893)$$

7.295 Species s_1577

Name zymosterol intermediate 1b

SBO:0000247 simple chemical

Initial concentration $0.1 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in [r_0240](#) and as a product in [r_0239](#) and as a modifier in [r_0239](#), [r_0240](#)).

$$\frac{d}{dt}s_{1577} = v_{70} - v_{71} \quad (894)$$

7.296 Species s_1578

Name zymosterol intermediate 1c

SBO:0000247 simple chemical

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_0240](#) and as a modifier in [r_0234](#), [r_0240](#)).

$$\frac{d}{dt}s_{1578} = v_{71} - v_{65} \quad (895)$$

7.297 Species s_1579

Name zymosterol intermediate 2

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in four reactions (as a reactant in [r_0237](#) and as a product in [r_0234](#) and as a modifier in [r_0234](#), [r_0237](#)).

$$\frac{d}{dt}s_{1579} = v_{65} - v_{68} \quad (896)$$

7.298 Species s_1582

Name tRNA(Ala)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0157](#) and as a product in [r_2111](#) and as a modifier in [r_0157](#)).

$$\frac{d}{dt}s_{1582} = 0.4588v_{296} - v_{44} \quad (897)$$

7.299 Species s_1583

Name tRNA(Arg)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0209](#) and as a product in [r_2111](#) and as a modifier in [r_0209](#)).

$$\frac{d}{dt}s_{1583} = 0.1607v_{296} - v_{53} \quad (898)$$

7.300 Species s_1585

Name tRNA(Asn)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0212](#) and as a product in [r_2111](#) and as a modifier in [r_0212](#)).

$$\frac{d}{dt}s_{1585} = 0.1017v_{296} - v_{55} \quad (899)$$

7.301 Species s_1587

Name tRNA(Asp)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0220](#) and as a product in [r_2111](#) and as a modifier in [r_0220](#)).

$$\frac{d}{dt}s_{1587} = 0.2975v_{296} - v_{60} \quad (900)$$

7.302 Species s_1589

Name tRNA(Cys)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0313](#) and as a product in [r_2111](#) and as a modifier in [r_0313](#)).

$$\frac{d}{dt}s_{1589} = 0.0066v_{296} - v_{87} \quad (901)$$

7.303 Species s_1590

Name tRNA(Gln)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0478](#) and as a product in [r_2111](#) and as a modifier in [r_0478](#)).

$$\frac{d}{dt}s_{1590} = 0.1054v_{296} - v_{128} \quad (902)$$

7.304 Species s_1591

Name tRNA(Glu)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0479](#) and as a product in [r_2111](#) and as a modifier in [r_0479](#)).

$$\frac{d}{dt}s_{1591} = 0.3018v_{296} - v_{129} \quad (903)$$

7.305 Species s_1593

Name tRNA(Gly)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0512](#) and as a product in [r_2111](#) and as a modifier in [r_0512](#)).

$$\frac{d}{dt}s_{1593} = 0.2904v_{296} - v_{138} \quad (904)$$

7.306 Species s_1594

Name tRNA(His)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0539](#) and as a product in [r_2111](#) and as a modifier in [r_0539](#)).

$$\frac{d}{dt}s_{1594} = 0.0663v_{296} - v_{147} \quad (905)$$

7.307 Species s_1596

Name tRNA(Ile)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0665](#) and as a product in [r_2111](#) and as a modifier in [r_0665](#)).

$$\frac{d}{dt}s_{1596} = 0.1927v_{296} - v_{168} \quad (906)$$

7.308 Species s_1598

Name tRNA(Leu)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0701](#) and as a product in [r_2111](#) and as a modifier in [r_0701](#)).

$$\frac{d}{dt}s_{1598} = 0.2964v_{296} - v_{179} \quad (907)$$

7.309 Species s_1600

Name tRNA(Lys)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0711](#) and as a product in [r_2111](#) and as a modifier in [r_0711](#)).

$$\frac{d}{dt}s_{1600} = 0.2862v_{296} - v_{180} \quad (908)$$

7.310 Species s_1602

Name tRNA(Met)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0729](#) and as a product in [r_2111](#) and as a modifier in [r_0729](#)).

$$\frac{d}{dt}s_{1602} = 0.0507v_{296} - v_{187} \quad (909)$$

7.311 Species s_1604

Name tRNA(Phe)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0852](#) and as a product in [r_2111](#) and as a modifier in [r_0852](#)).

$$\frac{d}{dt}s_{1604} = 0.1339v_{296} - v_{205} \quad (910)$$

7.312 Species s_1606

Name tRNA(Pro)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0941](#) and as a product in [r_2111](#) and as a modifier in [r_0941](#)).

$$\frac{d}{dt}s_{1606} = 0.1647v_{296} - v_{233} \quad (911)$$

7.313 Species s_1607

Name tRNA(Ser)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_0995](#) and as a product in [r_2111](#) and as a modifier in [r_0995](#)).

$$\frac{d}{dt}s_{1607} = 0.1854v_{296} - v_{252} \quad (912)$$

7.314 Species s_1608

Name tRNA(Thr)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_1042](#) and as a product in [r_2111](#) and as a modifier in [r_1042](#)).

$$\frac{d}{dt}s_{1608} = 0.1914v_{296} - v_{264} \quad (913)$$

7.315 Species s_1610

Name tRNA(Trp)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_1057](#) and as a product in [r_2111](#) and as a modifier in [r_1057](#)).

$$\frac{d}{dt}s_{1610} = 0.0284v_{296} - v_{273} \quad (914)$$

7.316 Species s_1612

Name tRNA(Tyr)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_1066](#) and as a product in [r_2111](#) and as a modifier in [r_1066](#)).

$$\frac{d}{dt}s_{1612} = 0.102v_{296} - v_{275} \quad (915)$$

7.317 Species s_1614

Name tRNA(Val)

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in three reactions (as a reactant in [r_1089](#) and as a product in [r_2111](#) and as a modifier in [r_1089](#)).

$$\frac{d}{dt}s_{1614} = 0.2646v_{296} - v_{279} \quad (916)$$

7.318 Species s_1616

Name TRX1

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 14 reactions (as a reactant in [r_0883](#), [r_0970](#), [r_0973](#), [r_0974](#), [r_0976](#), [r_0978](#) and as a product in [r_1038](#) and as a modifier in [r_0883](#), [r_0970](#), [r_0973](#), [r_0974](#), [r_0976](#), [r_0978](#), [r_1038](#)).

$$\frac{d}{dt}s_{1616} = v_{261} - v_{211} - v_{240} - v_{241} - v_{242} - v_{243} - v_{244} \quad (917)$$

7.319 Species [s_1620](#)

Name TRX1 disulphide

SBO:0000247 simple chemical

Initial concentration 0.1 mmol · l⁻¹

This species takes part in 14 reactions (as a reactant in [r_1038](#) and as a product in [r_0883](#), [r_0970](#), [r_0973](#), [r_0974](#), [r_0976](#), [r_0978](#) and as a modifier in [r_0883](#), [r_0970](#), [r_0973](#), [r_0974](#), [r_0976](#), [r_0978](#), [r_1038](#)).

$$\frac{d}{dt}s_{1620} = v_{211} + v_{240} + v_{241} + v_{242} + v_{243} + v_{244} - v_{261} \quad (918)$$

7.320 Species [e_0001](#)

Name COX1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0001} = 0 \quad (919)$$

7.321 Species [e_0002](#)

Name ATP8

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0002} = 0 \quad (920)$$

7.322 Species e_0003

Name ATP6

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_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0003} = 0 \quad (921)$$

7.323 Species e_0004

Name COB

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_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0004} = 0 \quad (922)$$

7.324 Species e_0005

Name OLI1

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_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0005} = 0 \quad (923)$$

7.325 Species e_0006

Name COX2

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_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0006} = 0 \quad (924)$$

7.326 Species e_0007

Name COX3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0007} = 0 \quad (925)$$

7.327 Species e_0008

Name CYS3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0008} = 0 \quad (926)$$

7.328 Species e_0010

Name PMT2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0362](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0010} = 0 \quad (927)$$

7.329 Species e_0011

Name CDC19

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [PYK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0011} = 0 \quad (928)$$

7.330 Species e_0012

Name GCV3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0501](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0012} = 0 \quad (929)$$

7.331 Species e_0017

Name ADE1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0908](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0017} = 0 \quad (930)$$

7.332 Species e_0020

Name SCT1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0495](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0020} = 0 \quad (931)$$

7.333 Species e_0022

Name ACH1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0110](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0022} = 0 \quad (932)$$

7.334 Species e_0025

Name RIB1

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_0525](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0025} = 0 \quad (933)$$

7.335 Species e_0026

Name URA7

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_0307](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0026} = 0 \quad (934)$$

7.336 Species e_0028

Name COR1

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_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0028} = 0 \quad (935)$$

7.337 Species e_0030

Name PRS4

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_0916](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0030} = 0 \quad (936)$$

7.338 Species e_0031

Name ILS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0665](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0031} = 0 \quad (937)$$

7.339 Species e_0033

Name ATP1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0033} = 0 \quad (938)$$

7.340 Species e_0038

Name IPP1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0568](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0038} = 0 \quad (939)$$

7.341 Species e_0045

Name CDS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0257](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0045} = 0 \quad (940)$$

7.342 Species e_0051

Name ATP3

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_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0051} = 0 \quad (941)$$

7.343 Species e_0053

Name FAT1

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_0406](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0053} = 0 \quad (942)$$

7.344 Species e_0054

Name TSC3

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_0993](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0054} = 0 \quad (943)$$

7.345 Species e_0057

Name MIS1

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_0446](#), [r_0724](#), [r_0732](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0057} = 0 \quad (944)$$

7.346 Species [e_0062](#)

Name LYS2

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:

$$\frac{d}{dt}e_{0062} = 0 \quad (945)$$

7.347 Species [e_0063](#)

Name TKL2

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_1049](#), [r_1050](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0063} = 0 \quad (946)$$

7.348 Species [e_0064](#)

Name GRS1

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_0512](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0064} = 0 \quad (947)$$

7.349 Species e_0065

Name TPS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0195](#), [r_1051](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0065} = 0 \quad (948)$$

7.350 Species e_0066

Name VMA2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0066} = 0 \quad (949)$$

7.351 Species e_0069

Name ADH5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [ADH](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0069} = 0 \quad (950)$$

7.352 Species e_0071

Name RIB7

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0015](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0071} = 0 \quad (951)$$

7.353 Species e_0074

Name TYR1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0939](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0074} = 0 \quad (952)$$

7.354 Species e_0079

Name PGI1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [PGI](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0079} = 0 \quad (953)$$

7.355 Species e_0084

Name PYC2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0958](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0084} = 0 \quad (954)$$

7.356 Species e_0087

Name HIS7

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0563](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0087} = 0 \quad (955)$$

7.357 Species e_0088

Name ARO4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0020](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0088} = 0 \quad (956)$$

7.358 Species e_0089

Name DUT1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0364](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0089} = 0 \quad (957)$$

7.359 Species e_0090

Name RIB5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0090} = 0 \quad (958)$$

7.360 Species e_0091

Name SHM1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0091} = 0 \quad (959)$$

7.361 Species e_0092

Name TSC10

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_0041](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0092} = 0 \quad (960)$$

7.362 Species e_0100

Name ILV6

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_0016](#), [r_0097](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0100} = 0 \quad (961)$$

7.363 Species e_0101

Name LEU2

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_0061](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0101} = 0 \quad (962)$$

7.364 Species e_0103

Name HIS4

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_0536](#), [r_0909](#), [r_0910](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0103} = 0 \quad (963)$$

7.365 Species [e_0106](#)

Name GLK1

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 [HXX](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0106} = 0 \quad (964)$$

7.366 Species [e_0107](#)

Name APA1

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_1026](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0107} = 0 \quad (965)$$

7.367 Species [e_0109](#)

Name CHA1

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_0692](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0109} = 0 \quad (966)$$

7.368 Species e_0111

Name CIT2

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_0300](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0111} = 0 \quad (967)$$

7.369 Species e_0113

Name PGK1

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 [PGK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0113} = 0 \quad (968)$$

7.370 Species e_0117

Name FEN1

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_0008](#), [r_0393](#), [r_0394](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0117} = 0 \quad (969)$$

7.371 Species e_0122

Name THR4

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_1041](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0122} = 0 \quad (970)$$

7.372 Species [e_0124](#)

Name TRX3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1038](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0124} = 0 \quad (971)$$

7.373 Species [e_0127](#)

Name ATP16

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0127} = 0 \quad (972)$$

7.374 Species [e_0128](#)

Name TSC13

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0393](#), [r_0394](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0128} = 0 \quad (973)$$

7.375 Species e_0129

Name GPD1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0491](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0129} = 0 \quad (974)$$

7.376 Species e_0133

Name SLC1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0133} = 0 \quad (975)$$

7.377 Species e_0134

Name PSA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0722](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0134} = 0 \quad (976)$$

7.378 Species e_0135

Name IDP1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0661](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0135} = 0 \quad (977)$$

7.379 Species e_0136

Name COX9

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0136} = 0 \quad (978)$$

7.380 Species e_0137

Name MDH3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0713](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0137} = 0 \quad (979)$$

7.381 Species e_0141

Name PMT5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0362](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0141} = 0 \quad (980)$$

7.382 Species e_0142

Name PMT1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0362](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0142} = 0 \quad (981)$$

7.383 Species e_0146

Name LYS21

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0543](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0146} = 0 \quad (982)$$

7.384 Species e_0151

Name DLD1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0001](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0151} = 0 \quad (983)$$

7.385 Species e_0152

Name DLD2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0001](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0152} = 0 \quad (984)$$

7.386 Species e_0154

Name LYS20

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0543](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0154} = 0 \quad (985)$$

7.387 Species e_0155

Name VMA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0155} = 0 \quad (986)$$

7.388 Species e_0160

Name GDH2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0470](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0160} = 0 \quad (987)$$

7.389 Species e_0165

Name TRP1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0913](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0165} = 0 \quad (988)$$

7.390 Species e_0167

Name GCV1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0501](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0167} = 0 \quad (989)$$

7.391 Species e_0168

Name SES1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0995](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0168} = 0 \quad (990)$$

7.392 Species e_0169

Name ARO3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0020](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0169} = 0 \quad (991)$$

7.393 Species e_0171

Name KRS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0711](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0171} = 0 \quad (992)$$

7.394 Species e_0175

Name TPI1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [TPI](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0175} = 0 \quad (993)$$

7.395 Species e_0176

Name TGL2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1052](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0176} = 0 \quad (994)$$

7.396 Species e_0177

Name LCB2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0993](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0177} = 0 \quad (995)$$

7.397 Species e_0179

Name TPS2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0195](#), [r_1051](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0179} = 0 \quad (996)$$

7.398 Species e_0182

Name ARO1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in five reactions (as a modifier in [r_0039](#), [r_0040](#), [r_0065](#), [r_0996](#), [r_0997](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0182} = 0 \quad (997)$$

7.399 Species [e_0183](#)

Name YCF1

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 [ATPase](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0183} = 0 \quad (998)$$

7.400 Species [e_0186](#)

Name HOM2

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_0219](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0186} = 0 \quad (999)$$

7.401 Species [e_0188](#)

Name SDH4

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:

$$\frac{d}{dt}e_{0188} = 0 \quad (1000)$$

7.402 Species e_0194

Name ADK1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [AK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0194} = 0 \quad (1001)$$

7.403 Species e_0196

Name LYS4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0027](#), [r_0542](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0196} = 0 \quad (1002)$$

7.404 Species e_0202

Name GLO2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0553](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0202} = 0 \quad (1003)$$

7.405 Species e_0203

Name DPP1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0337](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0203} = 0 \quad (1004)$$

7.406 Species e_0204

Name INM2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0757](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0204} = 0 \quad (1005)$$

7.407 Species e_0207

Name ATP5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0207} = 0 \quad (1006)$$

7.408 Species e_0213

Name TIM11

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0213} = 0 \quad (1007)$$

7.409 Species e_0214

Name YDR341C

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0209](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0214} = 0 \quad (1008)$$

7.410 Species e_0218

Name TRR1

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_1038](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0218} = 0 \quad (1009)$$

7.411 Species e_0219

Name TRP4

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_0202](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0219} = 0 \quad (1010)$$

7.412 Species e_0220

Name KEI1

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_0591](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0220} = 0 \quad (1011)$$

7.413 Species e_0223

Name ATP17

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_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0223} = 0 \quad (1012)$$

7.414 Species e_0231

Name ADE8

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:

$$\frac{d}{dt}e_{0231} = 0 \quad (1013)$$

7.415 Species e_0234

Name GUK1

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_0330](#), [r_0528](#), [r_0529](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0234} = 0 \quad (1014)$$

7.416 Species e_0237

Name RIB3

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_0038](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0237} = 0 \quad (1015)$$

7.417 Species e_0239

Name SAM2

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_0726](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0239} = 0 \quad (1016)$$

7.418 Species [e_0243](#)

Name QCR7

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_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0243} = 0 \quad (1017)$$

7.419 Species [e_0249](#)

Name URA3

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_0821](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0249} = 0 \quad (1018)$$

7.420 Species [e_0250](#)

Name RIP1

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_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0250} = 0 \quad (1019)$$

7.421 Species e_0251

Name VMA3

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 [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0251} = 0 \quad (1020)$$

7.422 Species e_0255

Name CYC7

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_0001](#), [r_0004](#), [r_0438](#), [r_0439](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0255} = 0 \quad (1021)$$

7.423 Species e_0260

Name GLY1

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_1040](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0260} = 0 \quad (1022)$$

7.424 Species e_0263

Name VMA8

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 [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0263} = 0 \quad (1023)$$

7.425 Species [e_0268](#)

Name DLD3

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_0001](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0268} = 0 \quad (1024)$$

7.426 Species [e_0269](#)

Name PMI40

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_0723](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0269} = 0 \quad (1025)$$

7.427 Species [e_0271](#)

Name YND1

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_0792](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0271} = 0 \quad (1026)$$

7.428 Species e_0273

Name FAA2

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_0399](#), [r_0400](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0273} = 0 \quad (1027)$$

7.429 Species e_0276

Name PRO3

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_0957](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0276} = 0 \quad (1028)$$

7.430 Species e_0278

Name CHO1

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_0880](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0278} = 0 \quad (1029)$$

7.431 Species e_0280

Name SAH1

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_0144](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0280} = 0 \quad (1030)$$

7.432 Species e_0281

Name HOM3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0215](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0281} = 0 \quad (1031)$$

7.433 Species e_0283

Name HIS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0283} = 0 \quad (1032)$$

7.434 Species e_0288

Name HOR2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0288} = 0 \quad (1033)$$

7.435 Species e_0289

Name ICL1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0662](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0289} = 0 \quad (1034)$$

7.436 Species e_0290

Name ARG5,6

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_0115](#), [r_0759](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0290} = 0 \quad (1035)$$

7.437 Species e_0291

Name RNR1

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_0974](#), [r_0976](#), [r_0978](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0291} = 0 \quad (1036)$$

7.438 Species e_0293

Name ALD5

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_0173](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0293} = 0 \quad (1037)$$

7.439 Species e_0295

Name ILV1

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_0692](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0295} = 0 \quad (1038)$$

7.440 Species [e_0296](#)

Name AIM10

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_0941](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0296} = 0 \quad (1039)$$

7.441 Species [e_0297](#)

Name TRP2

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_0203](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0297} = 0 \quad (1040)$$

7.442 Species [e_0298](#)

Name MET6

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_0727](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0298} = 0 \quad (1041)$$

7.443 Species e_0299

Name PRS2

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_0916](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0299} = 0 \quad (1042)$$

7.444 Species e_0303

Name ADK2

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 [AK](#), [r_0150](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0303} = 0 \quad (1043)$$

7.445 Species e_0311

Name LPD1

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_0501](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0311} = 0 \quad (1044)$$

7.446 Species e_0312

Name FRS2

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_0852](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0312} = 0 \quad (1045)$$

7.447 Species e_0313

Name AGX1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0156](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0313} = 0 \quad (1046)$$

7.448 Species e_0314

Name SEC53

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0902](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0314} = 0 \quad (1047)$$

7.449 Species e_0317

Name GSY1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0317} = 0 \quad (1048)$$

7.450 Species e_0320

Name HIS2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0537](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0320} = 0 \quad (1049)$$

7.451 Species e_0321

Name MET10

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1027](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0321} = 0 \quad (1050)$$

7.452 Species e_0322

Name QCR6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0322} = 0 \quad (1051)$$

7.453 Species e_0325

Name HXK1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [HXK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0325} = 0 \quad (1052)$$

7.454 Species e_0326

Name ERG26

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0234](#), [r_0235](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0326} = 0 \quad (1053)$$

7.455 Species e_0328

Name LEU1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0023](#), [r_0060](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0328} = 0 \quad (1054)$$

7.456 Species e_0329

Name ERG4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0329} = 0 \quad (1055)$$

7.457 Species e_0330

Name TRP5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1055](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0330} = 0 \quad (1056)$$

7.458 Species e_0334

Name PYC1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0958](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0334} = 0 \quad (1057)$$

7.459 Species e_0340

Name MET13

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0080](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0340} = 0 \quad (1058)$$

7.460 Species e_0342

Name ARO2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0279](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0342} = 0 \quad (1059)$$

7.461 Species e_0343

Name LYS5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0343} = 0 \quad (1060)$$

7.462 Species e_0346

Name COX4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0346} = 0 \quad (1061)$$

7.463 Species e_0347

Name COX13

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_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0347} = 0 \quad (1062)$$

7.464 Species e_0348

Name ARO8

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_0018](#), [r_0851](#), [r_1063](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0348} = 0 \quad (1063)$$

7.465 Species e_0352

Name ADE5,7

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_0855](#), [r_0914](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0352} = 0 \quad (1064)$$

7.466 Species e_0353

Name GUS1

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_0479](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0353} = 0 \quad (1065)$$

7.467 Species [e_0355](#)

Name HXK2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [HXK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0355} = 0 \quad (1066)$$

7.468 Species [e_0356](#)

Name ADH4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [ADH](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0356} = 0 \quad (1067)$$

7.469 Species [e_0362](#)

Name VMA7

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0362} = 0 \quad (1068)$$

7.470 Species [e_0364](#)

Name GSC2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0005](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0364} = 0 \quad (1069)$$

7.471 Species [e_0365](#)

Name ACB1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in ten reactions (as a modifier in [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0365} = 0 \quad (1070)$$

7.472 Species [e_0367](#)

Name ERG25

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in four reactions (as a modifier in [r_0238](#), [r_0239](#), [r_0240](#), [r_0241](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0367} = 0 \quad (1071)$$

7.473 Species e_0368

Name ADE6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0079](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0368} = 0 \quad (1072)$$

7.474 Species e_0370

Name PDC6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [PDC](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0370} = 0 \quad (1073)$$

7.475 Species e_0372

Name VAS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1089](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0372} = 0 \quad (1074)$$

7.476 Species e_0376

Name ASN2

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:

$$\frac{d}{dt}e_{0376} = 0 \quad (1075)$$

7.477 Species e_0379

Name SKN1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0006](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0379} = 0 \quad (1076)$$

7.478 Species e_0380

Name CYS4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0309](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0380} = 0 \quad (1077)$$

7.479 Species e_0381

Name CHO2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0858](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0381} = 0 \quad (1078)$$

7.480 Species e_0382

Name PSD2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0877](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0382} = 0 \quad (1079)$$

7.481 Species [e_0385](#)

Name ERG1

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_1010](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0385} = 0 \quad (1080)$$

7.482 Species [e_0387](#)

Name RNR4

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_0974](#), [r_0976](#), [r_0978](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0387} = 0 \quad (1081)$$

7.483 Species [e_0389](#)

Name QCR9

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_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0389} = 0 \quad (1082)$$

7.484 Species [e_0390](#)

Name TYS1

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_1066](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0390} = 0 \quad (1083)$$

7.485 Species [e_0392](#)

Name TDH3

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 [TDH](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0392} = 0 \quad (1084)$$

7.486 Species [e_0396](#)

Name ADE3

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_0446](#), [r_0724](#), [r_0732](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0396} = 0 \quad (1085)$$

7.487 Species [e_0398](#)

Name TRX2

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_0883](#), [r_0970](#), [r_0973](#), [r_1038](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0398} = 0 \quad (1086)$$

7.488 Species e_0401

Name PFK1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [PFK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0401} = 0 \quad (1087)$$

7.489 Species e_0404

Name SOL4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0091](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0404} = 0 \quad (1088)$$

7.490 Species e_0405

Name ENO1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [ENO](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0405} = 0 \quad (1089)$$

7.491 Species e_0407

Name GND2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0889](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0407} = 0 \quad (1090)$$

7.492 Species e_0409

Name MES1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0729](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0409} = 0 \quad (1091)$$

7.493 Species e_0417

Name LAG1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0264](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0417} = 0 \quad (1092)$$

7.494 Species e_0418

Name PRS3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0916](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0418} = 0 \quad (1093)$$

7.495 Species e_0422

Name QCR10

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0422} = 0 \quad (1094)$$

7.496 Species e_0424

Name ERG11

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0317](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0424} = 0 \quad (1095)$$

7.497 Species e_0425

Name DIA4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0995](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0425} = 0 \quad (1096)$$

7.498 Species e_0426

Name ARG4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0207](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0426} = 0 \quad (1097)$$

7.499 Species e_0427

Name DED81

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0212](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0427} = 0 \quad (1098)$$

7.500 Species e_0428

Name THR1

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_0548](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0428} = 0 \quad (1099)$$

7.501 Species e_0429

Name VMA16

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 [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0429} = 0 \quad (1100)$$

7.502 Species e_0431

Name PUT2

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_0012](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0431} = 0 \quad (1101)$$

7.503 Species e_0432

Name VMA10

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 [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0432} = 0 \quad (1102)$$

7.504 Species e_0434

Name NCP1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0317](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0434} = 0 \quad (1103)$$

7.505 Species e_0435

Name INM1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0757](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0435} = 0 \quad (1104)$$

7.506 Species e_0436

Name COX6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0436} = 0 \quad (1105)$$

7.507 Species e_0440

Name ERG7

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0698](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0440} = 0 \quad (1106)$$

7.508 Species e_0447

Name GRE3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0688](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0447} = 0 \quad (1107)$$

7.509 Species e_0448

Name TRR2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1038](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0448} = 0 \quad (1108)$$

7.510 Species e_0452

Name DCD1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0326](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0452} = 0 \quad (1109)$$

7.511 Species e_0453

Name SOL3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0091](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0453} = 0 \quad (1110)$$

7.512 Species e_0454

Name ENO2

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 [ENO](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0454} = 0 \quad (1111)$$

7.513 Species e_0455

Name GND1

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_0889](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0455} = 0 \quad (1112)$$

7.514 Species e_0456

Name ERG9

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_1012](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0456} = 0 \quad (1113)$$

7.515 Species e_0457

Name BAT1

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_0029](#), [r_0663](#), [r_0699](#), [r_1087](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0457} = 0 \quad (1114)$$

7.516 Species [e_0458](#)

Name IMD2

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_0565](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0458} = 0 \quad (1115)$$

7.517 Species [e_0462](#)

Name FAA3

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_0407](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0462} = 0 \quad (1116)$$

7.518 Species [e_0465](#)

Name HIS6

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_0007](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0465} = 0 \quad (1117)$$

7.519 Species e_0466

Name RHR2

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:

$$\frac{d}{dt}e_{0466} = 0 \quad (1118)$$

7.520 Species e_0467

Name RNR3

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_0974](#), [r_0976](#), [r_0978](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0467} = 0 \quad (1119)$$

7.521 Species e_0470

Name THS1

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_1042](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0470} = 0 \quad (1120)$$

7.522 Species e_0472

Name LYS12

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_0545](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0472} = 0 \quad (1121)$$

7.523 Species [e_0475](#)

Name COX5B

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_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0475} = 0 \quad (1122)$$

7.524 Species [e_0476](#)

Name HIS5

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:

$$\frac{d}{dt}e_{.0476} = 0 \quad (1123)$$

7.525 Species [e_0489](#)

Name LYS1

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_0988](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0489} = 0 \quad (1124)$$

7.526 Species e_0492

Name RNR2

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_0974](#), [r_0976](#), [r_0978](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0492} = 0 \quad (1125)$$

7.527 Species e_0494

Name YJL045W

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:

$$\frac{d}{dt}e_{.0494} = 0 \quad (1126)$$

7.528 Species e_0495

Name TDH1

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 [TDH](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0495} = 0 \quad (1127)$$

7.529 Species e_0496

Name BNA3

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_0018](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0496} = 0 \quad (1128)$$

7.530 Species [e_0499](#)

Name ARG3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0816](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0499} = 0 \quad (1129)$$

7.531 Species [e_0506](#)

Name RPE1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0984](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0506} = 0 \quad (1130)$$

7.532 Species [e_0508](#)

Name URA2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0214](#), [r_0250](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0508} = 0 \quad (1131)$$

7.533 Species e_0510

Name GLG2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0510} = 0 \quad (1132)$$

7.534 Species e_0512

Name INO1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0758](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0512} = 0 \quad (1133)$$

7.535 Species e_0514

Name QCR8

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0514} = 0 \quad (1134)$$

7.536 Species e_0515

Name ERG20

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0355](#), [r_0462](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0515} = 0 \quad (1135)$$

7.537 Species e_0525

Name TDH2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [TDH](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0525} = 0 \quad (1136)$$

7.538 Species e_0528

Name ILV3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0352](#), [r_0353](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0528} = 0 \quad (1137)$$

7.539 Species e_0531

Name CYC1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in four reactions (as a modifier in [r_0001](#), [r_0004](#), [r_0438](#), [r_0439](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0531} = 0 \quad (1138)$$

7.540 Species e_0536

Name OPI3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in three reactions (as a modifier in [r_0858](#), [r_0900](#), [r_0901](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0536} = 0 \quad (1139)$$

7.541 Species [e_0540](#)

Name URA8

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_0307](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0540} = 0 \quad (1140)$$

7.542 Species [e_0541](#)

Name ADO1

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_0142](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0541} = 0 \quad (1141)$$

7.543 Species [e_0542](#)

Name CPA2

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_0250](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0542} = 0 \quad (1142)$$

7.544 Species e_0544

Name ATP2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0544} = 0 \quad (1143)$$

7.545 Species e_0545

Name STR2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0311](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0545} = 0 \quad (1144)$$

7.546 Species e_0547

Name MET5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1027](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0547} = 0 \quad (1145)$$

7.547 Species e_0548

Name HOM6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0547](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0548} = 0 \quad (1146)$$

7.548 Species e_0549

Name PMT4

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_0362](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0549} = 0 \quad (1147)$$

7.549 Species e_0550

Name BAT2

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_0029](#), [r_0663](#), [r_0699](#), [r_1087](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0550} = 0 \quad (1148)$$

7.550 Species e_0556

Name MET14

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_0154](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0556} = 0 \quad (1149)$$

7.551 Species e_0557

Name AUR1

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_0591](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0557} = 0 \quad (1150)$$

7.552 Species [e_0558](#)

Name LAC1

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_0264](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0558} = 0 \quad (1151)$$

7.553 Species [e_0559](#)

Name ATP7

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_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0559} = 0 \quad (1152)$$

7.554 Species [e_0561](#)

Name URA6

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_1072](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0561} = 0 \quad (1153)$$

7.555 Species e_0565

Name UGP1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1084](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0565} = 0 \quad (1154)$$

7.556 Species e_0567

Name FBA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [FBA](#), [r_0990](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0567} = 0 \quad (1155)$$

7.557 Species e_0568

Name YNK1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0800](#), [r_0811](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0568} = 0 \quad (1156)$$

7.558 Species e_0569

Name VMA5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0569} = 0 \quad (1157)$$

7.559 Species [e_0571](#)

Name MDH1

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_0713](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0571} = 0 \quad (1158)$$

7.560 Species [e_0574](#)

Name AAT1

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:

$$\frac{d}{dt}e_{.0574} = 0 \quad (1159)$$

7.561 Species [e_0576](#)

Name PGM1

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_0888](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0576} = 0 \quad (1160)$$

7.562 Species [e_0578](#)

Name TGL1

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_1014](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0578} = 0 \quad (1161)$$

7.563 Species e_0579

Name SDH3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0579} = 0 \quad (1162)$$

7.564 Species e_0581

Name SDH1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0581} = 0 \quad (1163)$$

7.565 Species e_0582

Name GPM1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [GPM](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0582} = 0 \quad (1164)$$

7.566 Species e_0585

Name PRS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0916](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0585} = 0 \quad (1165)$$

7.567 Species e_0586

Name FAS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in ten reactions (as a modifier in [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0586} = 0 \quad (1166)$$

7.568 Species e_0588

Name PXA2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [ATPase](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0588} = 0 \quad (1167)$$

7.569 Species e_0591

Name TRP3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0203](#), [r_0566](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0591} = 0 \quad (1168)$$

7.570 Species e_0594

Name URA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_2127](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0594} = 0 \quad (1169)$$

7.571 Species e_0601

Name SHB17

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_2126](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0601} = 0 \quad (1170)$$

7.572 Species e_0603

Name GLG1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0603} = 0 \quad (1171)$$

7.573 Species e_0607

Name GPT2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0495](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0607} = 0 \quad (1172)$$

7.574 Species e_0610

Name MTD1

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:

$$\frac{d}{dt}e_{.0610} = 0 \quad (1173)$$

7.575 Species e_0611

Name TGL4

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_1052](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0611} = 0 \quad (1174)$$

7.576 Species e_0612

Name PCK1

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_0884](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0612} = 0 \quad (1175)$$

7.577 Species e_0613

Name YEH1

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_1014](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0613} = 0 \quad (1176)$$

7.578 Species e_0615

Name DPS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0220](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0615} = 0 \quad (1177)$$

7.579 Species e_0619

Name SDH2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0619} = 0 \quad (1178)$$

7.580 Species e_0621

Name YBT1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [ATPase](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0621} = 0 \quad (1179)$$

7.581 Species e_0629

Name AAT2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0216](#), [r_1063](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0629} = 0 \quad (1180)$$

7.582 Species e_0631

Name ADE16

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0570](#), [r_0912](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0631} = 0 \quad (1181)$$

7.583 Species e_0632

Name COX12

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0632} = 0 \quad (1182)$$

7.584 Species e_0633

Name TRX1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0883](#), [r_1038](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0633} = 0 \quad (1183)$$

7.585 Species e_0636

Name PDC1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [PDC](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0636} = 0 \quad (1184)$$

7.586 Species e_0638

Name SHM2

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:

$$\frac{d}{dt}e_{.0638} = 0 \quad (1185)$$

7.587 Species e_0639

Name FRS1

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_0852](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0639} = 0 \quad (1186)$$

7.588 Species e_0642

Name ALT1

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_0674](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0642} = 0 \quad (1187)$$

7.589 Species e_0644

Name ERG27

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_0236](#), [r_0237](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0644} = 0 \quad (1188)$$

7.590 Species e_0647

Name PDC5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [PDC](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0647} = 0 \quad (1189)$$

7.591 Species e_0658

Name SAM1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0726](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0658} = 0 \quad (1190)$$

7.592 Species e_0667

Name GSY2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0667} = 0 \quad (1191)$$

7.593 Species e_0671

Name ATP14

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0671} = 0 \quad (1192)$$

7.594 Species e_0674

Name MET17

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0813](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0674} = 0 \quad (1193)$$

7.595 Species e_0675

Name ACO1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0280](#), [r_0302](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0675} = 0 \quad (1194)$$

7.596 Species e_0682

Name FKS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0005](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0682} = 0 \quad (1195)$$

7.597 Species e_0684

Name TAL1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1048](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0684} = 0 \quad (1196)$$

7.598 Species e_0685

Name ILV5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0096](#), [r_0669](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0685} = 0 \quad (1197)$$

7.599 Species e_0686

Name ADE13

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0151](#), [r_0152](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0686} = 0 \quad (1198)$$

7.600 Species e_0687

Name SUR4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0393](#), [r_0394](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0687} = 0 \quad (1199)$$

7.601 Species e_0690

Name COX8

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0690} = 0 \quad (1200)$$

7.602 Species e_0692

Name URA4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0692} = 0 \quad (1201)$$

7.603 Species e_0693

Name IMD3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0565](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0693} = 0 \quad (1202)$$

7.604 Species e_0695

Name VMA6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0695} = 0 \quad (1203)$$

7.605 Species e_0697

Name HMG2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0558](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0697} = 0 \quad (1204)$$

7.606 Species e_0698

Name GLO1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{.0698} = 0 \quad (1205)$$

7.607 Species e_0699

Name ERG6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0986](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0699} = 0 \quad (1206)$$

7.608 Species e_0704

Name CYB2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0004](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0704} = 0 \quad (1207)$$

7.609 Species e_0705

Name IMD4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0565](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0705} = 0 \quad (1208)$$

7.610 Species e_0708

Name HMG1

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_0558](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0708} = 0 \quad (1209)$$

7.611 Species e_0709

Name ATP18

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_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0709} = 0 \quad (1210)$$

7.612 Species e_0711

Name TSL1

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_0195](#), [r_1051](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0711} = 0 \quad (1211)$$

7.613 Species e_0712

Name URA5

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_0820](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0712} = 0 \quad (1212)$$

7.614 Species e_0716

Name ERG13

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_0559](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0716} = 0 \quad (1213)$$

7.615 Species e_0727

Name STV1

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 [ATPase](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0727} = 0 \quad (1214)$$

7.616 Species e_0729

Name ARG7

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_0818](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0729} = 0 \quad (1215)$$

7.617 Species e_0730

Name ADH3

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 [ADH](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0730} = 0 \quad (1216)$$

7.618 Species e_0733

Name PGM2

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_0888](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0733} = 0 \quad (1217)$$

7.619 Species e_0734

Name ILV2

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_0016](#), [r_0097](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0734} = 0 \quad (1218)$$

7.620 Species e_0736

Name ADE17

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_0570](#), [r_0912](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0736} = 0 \quad (1219)$$

7.621 Species e_0740

Name ALD2

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_0174](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0740} = 0 \quad (1220)$$

7.622 Species e_0741

Name GCV2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0501](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0741} = 0 \quad (1221)$$

7.623 Species e_0742

Name ERG2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0742} = 0 \quad (1222)$$

7.624 Species e_0743

Name PFK2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [PFK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0743} = 0 \quad (1223)$$

7.625 Species e_0744

Name HFA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0108](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0744} = 0 \quad (1224)$$

7.626 Species e_0745

Name ERG12

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_0735](#), [r_0736](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0745} = 0 \quad (1225)$$

7.627 Species e_0746

Name GUA1

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_0514](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0746} = 0 \quad (1226)$$

7.628 Species e_0747

Name ERG8

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_0904](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0747} = 0 \quad (1227)$$

7.629 Species e_0750

Name FAA4

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_0407](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0750} = 0 \quad (1228)$$

7.630 Species e_0752

Name COX7

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0752} = 0 \quad (1229)$$

7.631 Species e_0753

Name TPS3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0195](#), [r_1051](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0753} = 0 \quad (1230)$$

7.632 Species e_0754

Name PPA2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0568](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0754} = 0 \quad (1231)$$

7.633 Species e_0755

Name URA10

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0820](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0755} = 0 \quad (1232)$$

7.634 Species e_0757

Name PGM3

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_0888](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0757} = 0 \quad (1233)$$

7.635 Species e_0761

Name LCB1

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_0993](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0761} = 0 \quad (1234)$$

7.636 Species e_0762

Name LIP1

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_0264](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0762} = 0 \quad (1235)$$

7.637 Species e_0763

Name ADE4

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_0915](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0763} = 0 \quad (1236)$$

7.638 Species e_0765

Name TGL3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1052](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0765} = 0 \quad (1237)$$

7.639 Species e_0769

Name IDP3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0661](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0769} = 0 \quad (1238)$$

7.640 Species e_0771

Name IDH1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0658](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0771} = 0 \quad (1239)$$

7.641 Species e_0774

Name COX5A

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0438](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0774} = 0 \quad (1240)$$

7.642 Species e_0778

Name LEU4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0024](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0778} = 0 \quad (1241)$$

7.643 Species e_0788

Name PSD1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0877](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0788} = 0 \quad (1242)$$

7.644 Species e_0791

Name ADE12

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0153](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0791} = 0 \quad (1243)$$

7.645 Species e_0792

Name ZWF1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0466](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0792} = 0 \quad (1244)$$

7.646 Species e_0793

Name YNL247W

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0313](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0793} = 0 \quad (1245)$$

7.647 Species e_0799

Name MET2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0549](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0799} = 0 \quad (1246)$$

7.648 Species e_0800

Name ERG24

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0231](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0800} = 0 \quad (1247)$$

7.649 Species e_0802

Name PHA2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0938](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{.0802} = 0 \quad (1248)$$

7.650 Species e_0805

Name CIT1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0300](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0805} = 0 \quad (1249)$$

7.651 Species e_0808

Name ACC1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in eleven reactions (as a modifier in [r_0108](#), [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0808} = 0 \quad (1250)$$

7.652 Species e_0812

Name MVD1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0812} = 0 \quad (1251)$$

7.653 Species e_0813

Name LYS9

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0989](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0813} = 0 \quad (1252)$$

7.654 Species e_0826

Name ARG1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0208](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0826} = 0 \quad (1253)$$

7.655 Species e_0827

Name GPD2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0491](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0827} = 0 \quad (1254)$$

7.656 Species e_0829

Name PRS5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0916](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0829} = 0 \quad (1255)$$

7.657 Species e_0830

Name MET22

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0032](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0830} = 0 \quad (1256)$$

7.658 Species e_0832

Name RIB2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0014](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0832} = 0 \quad (1257)$$

7.659 Species e_0834

Name ADH1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [ADH](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0834} = 0 \quad (1258)$$

7.660 Species e_0836

Name WRS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · 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:

$$\frac{d}{dt}e_{0836} = 0 \quad (1259)$$

7.661 Species [e_0838](#)

Name MDH2

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_0713](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0838} = 0 \quad (1260)$$

7.662 Species [e_0840](#)

Name ARG8

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_0118](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0840} = 0 \quad (1261)$$

7.663 Species [e_0841](#)

Name RIB4

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_0967](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0841} = 0 \quad (1262)$$

7.664 Species [e_0842](#)

Name GRE2

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_0688](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0842} = 0 \quad (1263)$$

7.665 Species e_0846

Name GLO4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0553](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0846} = 0 \quad (1264)$$

7.666 Species e_0848

Name CYT1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0848} = 0 \quad (1265)$$

7.667 Species e_0850

Name CDC21

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1045](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0850} = 0 \quad (1266)$$

7.668 Species e_0851

Name TGL5

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_1052](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0851} = 0 \quad (1267)$$

7.669 Species e_0852

Name RKI1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0982](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0852} = 0 \quad (1268)$$

7.670 Species e_0855

Name LEU9

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0024](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0855} = 0 \quad (1269)$$

7.671 Species e_0860

Name ADE2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0911](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0860} = 0 \quad (1270)$$

7.672 Species e_0862

Name IDH2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0658](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0862} = 0 \quad (1271)$$

7.673 Species e_0867

Name GLN4

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_0478](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0867} = 0 \quad (1272)$$

7.674 Species e_0869

Name ALE1

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:

$$\frac{d}{dt}e_{0869} = 0 \quad (1273)$$

7.675 Species e_0875

Name HIS3

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_0564](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0875} = 0 \quad (1274)$$

7.676 Species e_0880

Name DFR1

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_0344](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0880} = 0 \quad (1275)$$

7.677 Species e_0883

Name DGA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0336](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0883} = 0 \quad (1276)$$

7.678 Species e_0884

Name VPH1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [ATPase](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0884} = 0 \quad (1277)$$

7.679 Species e_0888

Name CPA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0250](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0888} = 0 \quad (1278)$$

7.680 Species e_0889

Name FAA1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0407](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0889} = 0 \quad (1279)$$

7.681 Species e_0890

Name PMT3

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_0362](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0890} = 0 \quad (1280)$$

7.682 Species e_0892

Name VMA4

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 [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0892} = 0 \quad (1281)$$

7.683 Species e_0894

Name ALA1

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_0157](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0894} = 0 \quad (1282)$$

7.684 Species e_0895

Name PYK2

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 [PYK](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0895} = 0 \quad (1283)$$

7.685 Species e_0898

Name ALD4

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [r_0173](#), [r_0174](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0898} = 0 \quad (1284)$$

7.686 Species e_0903

Name MET12

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0080](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0903} = 0 \quad (1285)$$

7.687 Species e_0904

Name ERG10

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0103](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0904} = 0 \quad (1286)$$

7.688 Species e_0911

Name ALD6

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0173](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0911} = 0 \quad (1287)$$

7.689 Species [e_0913](#)

Name ATP4

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_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0913} = 0 \quad (1288)$$

7.690 Species [e_0915](#)

Name GLR1

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_1038](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0915} = 0 \quad (1289)$$

7.691 Species [e_0922](#)

Name IDI1

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_0667](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0922} = 0 \quad (1290)$$

7.692 Species [e_0924](#)

Name PXA1

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 [ATPase](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0924} = 0 \quad (1291)$$

7.693 Species e_0926

Name CDC60

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0701](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0926} = 0 \quad (1292)$$

7.694 Species e_0934

Name FAS2

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in ten reactions (as a modifier in [r_0386](#), [r_0387](#), [r_0389](#), [r_0391](#), [r_0397](#), [r_0398](#), [r_0432](#), [r_0433](#), [r_0434](#), [r_0435](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0934} = 0 \quad (1293)$$

7.695 Species e_0935

Name VMA11

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0935} = 0 \quad (1294)$$

7.696 Species e_0940

Name FUM1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0451](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0940} = 0 \quad (1295)$$

7.697 Species e_0944

Name ATP15

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0944} = 0 \quad (1296)$$

7.698 Species e_0947

Name CIT3

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0300](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0947} = 0 \quad (1297)$$

7.699 Species e_0950

Name ATP20

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0226](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0950} = 0 \quad (1298)$$

7.700 Species e_0953

Name HTS1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0539](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0953} = 0 \quad (1299)$$

7.701 Species e_0955

Name GLN1

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0476](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0955} = 0 \quad (1300)$$

7.702 Species e_0956

Name VMA13

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in two reactions (as a modifier in [ATPase](#), [ATPase](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0956} = 0 \quad (1301)$$

7.703 Species e_0959

Name ARO7

SBO:0000252 polypeptide chain

Initial concentration 0.0010 mmol · l⁻¹

This species takes part in one reaction (as a modifier in [r_0278](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0959} = 0 \quad (1302)$$

7.704 Species e_0962

Name TKL1

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_1049](#), [r_1050](#)), which do not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0962} = 0 \quad (1303)$$

7.705 Species e_0963

Name GRS2

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_0512](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0963} = 0 \quad (1304)$$

7.706 Species e_0964

Name PIS1

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_0874](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0964} = 0 \quad (1305)$$

7.707 Species e_0970

Name ASN1

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_0211](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0970} = 0 \quad (1306)$$

7.708 Species e_0973

Name KRE6

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_0006](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0973} = 0 \quad (1307)$$

7.709 Species e_0975

Name MET16

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_0883](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0975} = 0 \quad (1308)$$

7.710 Species e_0976

Name DPM1

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:

$$\frac{d}{dt}e_{0976} = 0 \quad (1309)$$

7.711 Species e_0978

Name QCR2

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_0439](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0978} = 0 \quad (1310)$$

7.712 Species [e_0980](#)

Name YER152C

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_0018](#)), which does not influence its rate of change because this constant species is on the boundary of the reaction system:

$$\frac{d}{dt}e_{0980} = 0 \quad (1311)$$

7.713 Species [F26bP](#)

Name beta-D-fructose 2,6-bisphosphate

SBO:0000247 simple chemical

Initial concentration $0.02 \text{ mmol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a modifier in [PFK](#), [PFK](#)).

$$\frac{d}{dt}F26bP = 0 \quad (1312)$$

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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