SBML Model Report

Model name: "Ung2008_EGFR_Endocytosis"

May 6, 2016

1 General Overview

This is a document in SBML Level 2 Version 3 format. This model was created by the following two authors: Harish Dharuri[1] and Chen Yu Zong[2] at November 27$^{\text{th}}$ 2008 at 2:41 p. m. and last time modified at April eighth 2016 at 3:59 p. m. Table 1 provides 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	1
species types	0	species	194
events	0	constraints	0
reactions	205	function definitions	0
global parameters	0	unit definitions	3
rules	0	initial assignments	0

Model Notes

Model reproduces the various plots in the publication for „Control,, concentrations. Model successfully tested on MathSBML.

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2 Unit Definitions

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

2.1 Unit `substance`

Definition μmol

2.2 Unit `uM_1_s_1`

Name uM_1_s_1

Definition $\mu\text{mol}^{-1} \cdot 1 \cdot \text{s}^{-1}$

2.3 Unit `sec_1`

Name sec_1

Definition s^{-1}

2.4 Unit `volume`

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

Definition l

2.5 Unit `area`

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

Definition m^2

2.6 Unit `length`

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

Definition m

2.7 Unit `time`

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

Definition s

3 Compartment

This model contains one compartment.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
compartment_0	Cell		3	1	litre	☑	

3.1 Compartment compartment_0

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

Name Cell

Produced by SBML₂LATEX

4 Species

This model contains 194 species. Section 6 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
species_0	EGF	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_1	EGFR	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_2	EGF-EGFR	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_3	EGF-EGFR-2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_4	EGF-pEGFR-2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_5	SHP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_6	EGF-pEGFR-2-SHP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_7	Shc	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_8	EGF-pEGFR-2-Shc	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_9	EGF-pEGFR-2-pShc	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_10	pShc	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_11	pShc-SHP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_12	Grb2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_13	EGF-pEGFR-2-pShc-Grb2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_14	SOS	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_15	EGF-pEGFR-2-pShc-Grb2-SOS	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_16	Grb2-SOS	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_17	RasGDP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_18	EGF-pEGFR-2-pShc-Grb2-SOS-RasGDP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_19	RasGTP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_20	EGF-pEGFR-2-Grb2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_21	EGF-pEGFR-2-Grb2-SOS	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
species_22	EGF-pEGFR-2-Grb2-SOS-RasGDP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_23	Raf	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_24	Raf-RasGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_25	pRaf	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_26	MEK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_27	pRaf-MEK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_28	pMEK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_29	pRaf-pMEK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_30	ppMEK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_31	ERK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_32	ppMEK-ERK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_33	pERK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_34	ppMEK-pERK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_35	ppERK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_36	Pase	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_37	pRaf-Pase	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_38	PP2A	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_39	ppMEK-PP2A	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_40	pMEK-PP2A	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_41	MKP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_42	ppERK-MKP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_43	pERK-MKP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_44	RasGAP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_45	RasGTP-RasGAP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_46	ppERK-EGF-pEGFR-2-pShc-Grb2-SOS	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_47	pSOS	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_48	ppERK-EGF-pEGFR-2-Grb2-SOS	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_49	PI3K	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_50	EGF-pEGFR-2-PI3K	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_51	EGF-pEGFF-2	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_52	pPI3K	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_53	TP4	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_54	pPI3K-TP4	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_55	PIP2	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_56	pPI3K-PIP2	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_57	PIP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_58	Akt	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_59	Akt-PIP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_60	PDK1	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_61	Akt-PIP3-PDK1	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_62	pAkt-PIP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_63	pAkt	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_64	Takt	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_65	pAkt-PIP3-Takt	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_66	pRaf-pAkt-PIP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_67	ppRaf	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_68	pROK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_69	PTEN	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_70	pROK-PTEN	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_71	pPTEN	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_72	pPTEN-PIP3	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_73	RacGEF	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_74	PIP3-RacGEF	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_75	RacGDP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_76	PIP3-RacGEF-RacGDP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_77	RacGTP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_78	RhoGDI	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_79	RhoGDI-RacGDP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_80	RacGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_81	RacGTP-RacGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_82	RhoGDP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_83	RhoGDP-RhoGDI	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_84	pRhoGEF	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_85	RhoGDP-pRhoGEF	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_86	RhoGTP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_87	EGF-pEGFR-2-RasGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_88	EGF-pEGFR-2-RasGAP-RasGTP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_89	EGF-pEGFR2-RasGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_90	SHP2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_91	EGF-pEGFR-2-pShc-Grb2-SHP2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_92	EGF-pEGFR-2-Grb2-SHP2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_93	EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGEF	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_94	RhoGEF	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_95	pRhoGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_96	EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_97	RhoGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_98	EGF-pEGFR-2-Grb2-SHP2-pRhoGEF	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_99	EGF-pEGFR-2-Grb2-SHP2-pRhoGAP	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟
species_100	EGF-pEGFR-2-RasGAP-SHP2	compartment_0	$\mu\text{mol}\cdot\text{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_101	pSrc	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_102	pSrc-RhoGEF	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_103	pSrc-RhoGAP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_104	pRhoGAP-RhoGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_105	ROK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_106	RhoGTP-ROK	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_107	Src	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_108	EGF-pEGFR-2-Src	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_109	EGF-pEGFR-2-pSrc	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_110	EGF-pEGRF-2	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_111	TP7	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_112	pSrc-TP7	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_113	Src-TP7	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_114	Cbl-CIN85	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_115	EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_116	EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_117	EPn	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_118	EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85-EPn	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_119	EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85-EPn	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_120	EGF-pEGFR-2-degrade	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_121	pShc-Grb2-SOS	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_122	Pro-EGFR	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_123	pROK-EPn	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_124	pEPn	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_125	MPase	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_126	pEPn-MPase	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_127	pEPn-Mpase	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_128	Ras-GTP-RhoGEF	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_129	ppERK-pROK	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_130	MEKK1abcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_131	Grb2-MEKK1abcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_132	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_133	EGF-pEGFR-2-Grb2-MEKK1abcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_134	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_135	EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_136	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_137	EGF-pEGFR-2-Grb2-MEKK1abMEKcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_138	EGF-pEGFR-2-Grb2-MEKK1abpMEKcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_139	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_140	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟
species_141	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdef	compartment_0	μmol$\cdot$l^{-1}	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_142	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbpMEKcdef	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_143	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdef	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_144	EGF-pEGFR-2-Grb2-MEKK1aRafbcdef	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_145	EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdef	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_146	EGF-pEGFR-2-Grb2-MEKK1aRafbpMEKcdef	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_147	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdef	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_148	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_149	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_150	EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_151	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_152	EGF-pEGFR-2-Grb2-MEKK1abcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_153	EGF-pEGFR-2-Grb2-MEKK1abMEKcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_154	EGF-pEGFR-2-Grb2-MEKK1abpMEKcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟
species_155	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdefRasGTP	compartment_0	$\mu\text{mol} \cdot \text{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_156	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdefRasGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_157	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdefRasGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_158	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdefRasGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_159	EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdefRasGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_160	EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdefRasGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_161	EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdefRasGTP	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_162	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_163	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbMEKcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_164	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbpMEKcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_165	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbppMEKcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_166	EGF-pEGFR-2-Grb2-MEKK1apRafbcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_167	EGF-pEGFR-2-Grb2-MEKK1apRafbMEKcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_168	EGF-pEGFR-2-Grb2-MEKK1apRafbpMEKcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_169	EGF-pEGFR-2-Grb2-MEKK1apRafbppMEKcdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_170	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_171	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_172	EGF-pEGFR-2-Grb2-MEKK1abMEKcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_173	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_174	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_175	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_176	EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_177	EGF-pEGFR-2-Grb2-MEKK1aRafbcdRhoGTPef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_178	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_179	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_180	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_181	EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟
species_182	EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdef	compartment_0	$\mu mol \cdot l^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
species_183	EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdef	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_184	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcERKdef	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_185	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcpERKdef	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_186	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcppERKdef	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_187	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcERKdef	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_188	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcpERKdef	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_189	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcppERKdef	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_190	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_191	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_192	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟
species_193	EGF-pEGFR-2-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf	compartment_0	$\mu\text{mol} \cdot l^{-1}$	⊟	⊟

5 Reactions

This model contains 205 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

№	Id	Name	Reaction Equation	SBO
1	reaction_0	R1	$species\_0 + species\_1 \rightleftharpoons species\_2$	
2	reaction_1	R2	$2\,species\_2 \rightleftharpoons species\_3$	
3	reaction_2	R3	$species\_3 \longrightarrow species\_4$	
4	reaction_3	R4	$species\_4 + species\_5 \rightleftharpoons species\_6$	
5	reaction_4	R5	$species\_6 \longrightarrow species\_3 + species\_5$	
6	reaction_5	R6	$species\_4 + species\_7 \rightleftharpoons species\_8$	
7	reaction_6	R7	$species\_8 \longrightarrow species\_9$	
8	reaction_7	R8	$species\_9 \rightleftharpoons species\_4 + species\_10$	
9	reaction_8	R9	$species\_10 + species\_5 \rightleftharpoons species\_11$	
10	reaction_9	R10	$species\_11 \longrightarrow species\_7 + species\_5$	
11	reaction_10	R11	$species\_9 + species\_12 \rightleftharpoons species\_13$	
12	reaction_11	R12	$species\_13 + species\_14 \rightleftharpoons species\_15$	
13	reaction_12	R13	$species\_12 + species\_14 \rightleftharpoons species\_16$	
14	reaction_13	R14	$species\_9 + species\_16 \rightleftharpoons species\_15$	
15	reaction_14	R15	$species\_15 + species\_17 \rightleftharpoons species\_18$	
16	reaction_15	R16	$species\_18 \longrightarrow species\_15 + species\_19$	
17	reaction_16	R17	$species\_4 + species\_12 \rightleftharpoons species\_20$	
18	reaction_17	R18	$species\_20 + species\_14 \rightleftharpoons species\_21$	
19	reaction_18	R19	$species\_4 + species\_16 \rightleftharpoons species\_21$	
20	reaction_19	R20	$species\_21 + species\_17 \rightleftharpoons species\_22$	
21	reaction_20	R21	$species\_22 \longrightarrow species\_21 + species\_19$	
22	reaction_21	R22	$species\_23 + species\_19 \rightleftharpoons species\_24$	
23	reaction_22	R23	$species\_24 \longrightarrow species\_25 + species\_19$	

№	Id	Name	Reaction Equation	SBO
24	reaction_23	R24	species_25 + species_26 $\rightleftharpoons$ species_27	
25	reaction_24	R25	species_27 $\longrightarrow$ species_25 + species_28	
26	reaction_25	R26	species_25 + species_28 $\rightleftharpoons$ species_29	
27	reaction_26	R27	species_29 $\longrightarrow$ species_25 + species_30	
28	reaction_27	R28	species_30 + species_31 $\rightleftharpoons$ species_32	
29	reaction_28	R29	species_32 $\longrightarrow$ species_30 + species_33	
30	reaction_29	R30	species_30 + species_33 $\rightleftharpoons$ species_34	
31	reaction_30	R31	species_34 $\longrightarrow$ species_30 + species_35	
32	reaction_31	R32	species_25 + species_36 $\rightleftharpoons$ species_37	
33	reaction_32	R33	species_37 $\longrightarrow$ species_23 + species_36	
34	reaction_33	R34	species_30 + species_38 $\rightleftharpoons$ species_39	
35	reaction_34	R35	species_39 $\longrightarrow$ species_28 + species_38	
36	reaction_35	R36	species_28 + species_38 $\rightleftharpoons$ species_40	
37	reaction_36	R37	species_40 $\longrightarrow$ species_26 + species_38	
38	reaction_37	R38	species_35 + species_41 $\rightleftharpoons$ species_42	
39	reaction_38	R39	species_42 $\longrightarrow$ species_33 + species_41	
40	reaction_39	R40	species_33 + species_41 $\rightleftharpoons$ species_43	
41	reaction_40	R41	species_43 $\longrightarrow$ species_31 + species_41	
42	reaction_41	R42	species_19 $\longrightarrow$ species_17	
43	reaction_42	R43	species_19 + species_44 $\rightleftharpoons$ species_45	
44	reaction_43	R44	species_45 $\longrightarrow$ species_17 + species_44	
45	reaction_44	R45	species_35 + species_15 $\rightleftharpoons$ species_46	
46	reaction_45	R46	species_46 $\longrightarrow$ species_35 + species_4 + species_10 + species_12 + species_47	
47	reaction_46	R47	species_35 + species_21 $\rightleftharpoons$ species_48	
48	reaction_47	R48	species_48 $\longrightarrow$ species_35 + species_4 + species_12 + species_47	
49	reaction_48	R49	species_47 $\longrightarrow$ species_14	
50	reaction_49	R50	species_4 + species_49 $\rightleftharpoons$ species_50	

№	Id	Name	Reaction Equation	SBO
51	reaction_50	R51	species_50 $\longrightarrow$ species_51 + species_52	
52	reaction_51	R52	species_52 + species_53 $\rightleftharpoons$ species_54	
53	reaction_52	R53	species_54 $\longrightarrow$ species_49 + species_53	
54	reaction_53	R54	species_52 + species_55 $\rightleftharpoons$ species_56	
55	reaction_54	R55	species_56 $\longrightarrow$ species_52 + species_57	
56	reaction_55	R56	species_58 + species_57 $\rightleftharpoons$ species_59	
57	reaction_56	R57	species_59 + species_60 $\rightleftharpoons$ species_61	
58	reaction_57	R58	species_61 $\longrightarrow$ species_62 + species_60	
59	reaction_58	R59	species_62 $\rightleftharpoons$ species_63 + species_57	
60	reaction_59	R60	species_62 + species_64 $\rightleftharpoons$ species_65	
61	reaction_60	R61	species_65 $\longrightarrow$ species_59 + species_64	
62	reaction_61	R62	species_25 + species_62 $\rightleftharpoons$ species_66	
63	reaction_62	R63	species_66 $\longrightarrow$ species_67 + species_62	
64	reaction_63	R64	species_67 $\longrightarrow$ species_25	
65	reaction_64	R65	species_68 + species_69 $\rightleftharpoons$ species_70	
66	reaction_65	R66	species_70 $\longrightarrow$ species_68 + species_71	
67	reaction_66	R67	species_71 + species_57 $\rightleftharpoons$ species_72	
68	reaction_67	R68	species_72 $\longrightarrow$ species_71 + species_55	
69	reaction_68	R69	species_71 $\longrightarrow$ species_69	
70	reaction_69	R70	species_57 $\longrightarrow$ species_55	
71	reaction_70	R71	species_57 + species_73 $\rightleftharpoons$ species_74	
72	reaction_71	R72	species_74 + species_75 $\rightleftharpoons$ species_76	
73	reaction_72	R73	species_76 $\longrightarrow$ species_74 + species_77	
74	reaction_73	R74	species_78 + species_75 $\rightleftharpoons$ species_79	
75	reaction_74	R75	species_77 $\longrightarrow$ species_75	
76	reaction_75	R76	species_77 + species_80 $\rightleftharpoons$ species_81	
77	reaction_76	R77	species_81 $\longrightarrow$ species_75 + species_80	
78	reaction_77	R78	species_82 + species_78 $\rightleftharpoons$ species_83	
79	reaction_78	R79	species_82 + species_84 $\rightleftharpoons$ species_85	

№	Id	Name	Reaction Equation	SBO
80	reaction_79	R80	species_85 $\longrightarrow$ species_86 + species_84	
81	reaction_80	R81	species_86 $\longrightarrow$ species_82	
82	reaction_81	R82	species_4 + species_44 $\rightleftharpoons$ species_87	
83	reaction_82	R83	species_87 + species_19 $\rightleftharpoons$ species_88	
84	reaction_83	R84	species_88 $\longrightarrow$ species_89 + species_17	
85	reaction_84	R85	species_13 + species_90 $\rightleftharpoons$ species_91	
86	reaction_85	R86	species_20 + species_90 $\rightleftharpoons$ species_92	
87	reaction_86	R87	species_91 $\longrightarrow$ species_3 + species_10 + species_12 + species_90	
88	reaction_87	R88	species_92 $\longrightarrow$ species_3 + species_12 + species_90	
89	reaction_88	R89	species_91 + species_84 $\rightleftharpoons$ species_93	
90	reaction_89	R90	species_93 $\longrightarrow$ species_91 + species_94	
91	reaction_90	R91	species_91 + species_95 $\rightleftharpoons$ species_96	
92	reaction_91	R92	species_96 $\longrightarrow$ species_91 + species_97	
93	reaction_92	R93	species_92 + species_84 $\rightleftharpoons$ species_98	
94	reaction_93	R94	species_98 $\longrightarrow$ species_92 + species_94	
95	reaction_94	R95	species_92 + species_95 $\rightleftharpoons$ species_99	
96	reaction_95	R96	species_99 $\longrightarrow$ species_92 + species_97	
97	reaction_96	R97	species_87 + species_90 $\rightleftharpoons$ species_100	
98	reaction_97	R98	species_100 $\longrightarrow$ species_3 + species_44 + species_90	
99	reaction_98	R99	species_101 + species_94 $\rightleftharpoons$ species_102	
100	reaction_99	R100	species_102 $\longrightarrow$ species_101 + species_84	
101	reaction_100	R101	species_84 $\longrightarrow$ species_94	
102	reaction_101	R102	species_101 + species_97 $\rightleftharpoons$ species_103	
103	reaction_102	R103	species_103 $\longrightarrow$ species_101 + species_95	
104	reaction_103	R104	species_95 + species_86 $\rightleftharpoons$ species_104	
105	reaction_104	R105	species_104 $\longrightarrow$ species_95 + species_82	
106	reaction_105	R106	species_86 + species_105 $\rightleftharpoons$ species_106	

№	Id	Name	Reaction Equation	SBO
107	reaction_106	R107	species_106 ⟶ species_86 + species_68	
108	reaction_107	R108	species_4 + species_107 ⇌ species_108	
109	reaction_108	R109	species_108 ⟶ species_109	
110	reaction_109	R110	species_4 ⇌ species_110 + species_101	
111	reaction_110	R111	species_101 + species_111 ⇌ species_112	
112	reaction_111	R112	species_112 ⟶ species_113	
113	reaction_112	R113	species_113 ⇌ species_107 + species_111	
114	reaction_113	R114	species_15 + species_114 ⇌ species_115	
115	reaction_114	R115	species_21 + species_114 ⇌ species_116	
116	reaction_115	R116	species_115 + species_117 ⇌ species_118	
117	reaction_116	R117	species_116 + species_117 ⇌ species_119	
118	reaction_117	R118	species_118 ⟶ species_120 + species_114 + species_117 + species_121	
119	reaction_118	R119	species_119 ⟶ species_120 + species_114 + species_117 + species_16	
120	reaction_119	R120	species_122 ⟶ species_1	
121	reaction_120	R121	species_68 + species_117 ⇌ species_123	
122	reaction_121	R122	species_123 ⟶ species_68 + species_124	
123	reaction_122	R123	species_124 + species_125 ⇌ species_126	
124	reaction_123	R124	species_127 ⟶ species_117 + species_125	
125	reaction_124	R125	species_19 + species_94 ⇌ species_128	
126	reaction_125	R126	species_128 ⟶ species_19 + species_84	
127	reaction_126	R127	species_35 + species_68 ⇌ species_129	
128	reaction_127	R128	species_129 ⟶ species_35 + species_105	
129	reaction_128	R129	species_12 + species_130 ⇌ species_131	
130	reaction_129	R130	species_9 + species_131 ⇌ species_132	
131	reaction_130	R131	species_4 + species_131 ⇌ species_133	
132	reaction_131	R132	species_132 + species_26 ⇌ species_134	
133	reaction_132	R133	species_134 ⟶ species_135	

№	Id	Name	Reaction Equation	SBO
134	reaction_133	R134	species_135 $\longrightarrow$ species_136	
135	reaction_134	R135	species_136 $\rightleftharpoons$ species_132 + species_30	
136	reaction_135	R136	species_133 + species_26 $\rightleftharpoons$ species_137	
137	reaction_136	R137	species_137 $\longrightarrow$ species_138	
138	reaction_137	R138	species_138 $\longrightarrow$ species_139	
139	reaction_138	R139	species_139 $\rightleftharpoons$ species_133 + species_30	
140	reaction_139	R140	species_132 + species_23 $\rightleftharpoons$ species_140	
141	reaction_140	R141	species_140 + species_26 $\rightleftharpoons$ species_141	
142	reaction_141	R142	species_141 $\longrightarrow$ species_142	
143	reaction_142	R143	species_142 $\longrightarrow$ species_143	
144	reaction_143	R144	species_143 $\rightleftharpoons$ species_140 + species_30	
145	reaction_144	R145	species_133 + species_23 $\rightleftharpoons$ species_144	
146	reaction_145	R146	species_144 + species_26 $\rightleftharpoons$ species_145	
147	reaction_146	R147	species_145 $\longrightarrow$ species_146	
148	reaction_147	R148	species_146 $\longrightarrow$ species_147	
149	reaction_148	R149	species_147 $\rightleftharpoons$ species_144 + species_30	
150	reaction_149	R150	species_132 + species_19 $\rightleftharpoons$ species_148	
151	reaction_150	R151	species_148 + species_26 $\rightleftharpoons$ species_149	
152	reaction_151	R152	species_149 $\longrightarrow$ species_150	
153	reaction_152	R153	species_150 $\longrightarrow$ species_151	
154	reaction_153	R154	species_151 $\rightleftharpoons$ species_148 + species_30	
155	reaction_154	R155	species_133 + species_19 $\rightleftharpoons$ species_152	
156	reaction_155	R156	species_152 + species_26 $\rightleftharpoons$ species_153	
157	reaction_156	R157	species_153 $\longrightarrow$ species_154	
158	reaction_157	R158	species_154 $\longrightarrow$ species_155	
159	reaction_158	R159	species_155 $\rightleftharpoons$ species_152 + species_30	
160	reaction_159	R160	species_151 + species_31 $\rightleftharpoons$ species_156	
161	reaction_160	R161	species_156 $\longrightarrow$ species_157	
162	reaction_161	R162	species_157 $\longrightarrow$ species_158	

№	Id	Name	Reaction Equation	SBO
163	reaction_162	R163	species_158 $\longrightarrow$ species_151 + species_35	
164	reaction_163	R164	species_155 + species_31 $\rightleftharpoons$ species_159	
165	reaction_164	R165	species_159 $\longrightarrow$ species_160	
166	reaction_165	R166	species_160 $\longrightarrow$ species_161	
167	reaction_166	R167	species_161 $\longrightarrow$ species_155 + species_35	
168	reaction_167	R168	species_132 + species_25 $\rightleftharpoons$ species_162	
169	reaction_168	R169	species_162 + species_26 $\rightleftharpoons$ species_163	
170	reaction_169	R170	species_163 $\longrightarrow$ species_164	
171	reaction_170	R171	species_164 $\longrightarrow$ species_165	
172	reaction_171	R172	species_165 $\rightleftharpoons$ species_162 + species_30	
173	reaction_172	R173	species_133 + species_25 $\rightleftharpoons$ species_166	
174	reaction_173	R174	species_166 + species_26 $\rightleftharpoons$ species_167	
175	reaction_174	R175	species_167 $\longrightarrow$ species_168	
176	reaction_175	R176	species_168 $\longrightarrow$ species_169	
177	reaction_176	R177	species_169 $\rightleftharpoons$ species_166 + species_30	
178	reaction_177	R178	species_134 + species_86 $\rightleftharpoons$ species_170	
179	reaction_178	R179	species_137 + species_86 $\rightleftharpoons$ species_172	
180	reaction_179	R180	species_141 + species_86 $\rightleftharpoons$ species_174	
181	reaction_180	R181	species_145 + species_86 $\rightleftharpoons$ species_176	
182	reaction_181	R182	species_136 + species_31 $\rightleftharpoons$ species_178	
183	reaction_182	R183	species_178 $\longrightarrow$ species_179	
184	reaction_183	R184	species_179 $\longrightarrow$ species_180	
185	reaction_184	R185	species_180 $\longrightarrow$ species_136 + species_35	
186	reaction_185	R186	species_139 + species_31 $\rightleftharpoons$ species_181	
187	reaction_186	R187	species_181 $\longrightarrow$ species_182	
188	reaction_187	R188	species_182 $\longrightarrow$ species_183	
189	reaction_188	R189	species_183 $\longrightarrow$ species_139 + species_35	
190	reaction_189	R190	species_143 + species_31 $\rightleftharpoons$ species_184	
191	reaction_190	R191	species_184 $\longrightarrow$ species_185	

№	Id	Name	Reaction Equation	SBO
192	reaction_191	R192	species_185 $\longrightarrow$ species_186	
193	reaction_192	R193	species_186 $\longrightarrow$ species_143 + species_35	
194	reaction_193	R194	species_147 + species_31 $\rightleftharpoons$ species_187	
195	reaction_194	R195	species_187 $\longrightarrow$ species_188	
196	reaction_195	R196	species_188 $\longrightarrow$ species_189	
197	reaction_196	R197	species_189 $\longrightarrow$ species_147 + species_35	
198	reaction_197	R198	species_171 + species_95 $\rightleftharpoons$ species_190	
199	reaction_198	R199	species_190 $\longrightarrow$ species_143 + species_82 + species_95	
200	reaction_199	R200	species_173 + species_95 $\rightleftharpoons$ species_191	
201	reaction_200	R201	species_191 $\longrightarrow$ species_147 + species_82 + species_95	
202	reaction_201	R202	species_175 + species_95 $\rightleftharpoons$ species_192	
203	reaction_202	R203	species_192 $\longrightarrow$ species_140 + species_82 + species_95	
204	reaction_203	R204	species_177 + species_95 $\rightleftharpoons$ species_193	
205	reaction_204	R205	species_193 $\longrightarrow$ species_144 + species_82 + species_95	

5.1 Reaction `reaction_0`

This is a reversible reaction of two reactants forming one product.

Name R1

Reaction equation

$$\text{species\_0} + \text{species\_1} \rightleftharpoons \text{species\_2} \tag{1}$$
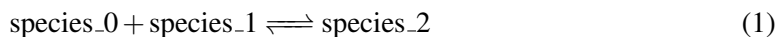
Reactants

Table 5: Properties of each reactant.

Id	Name	SBO
species_0	EGF	
species_1	EGFR	

Product

Table 6: Properties of each product.

Id	Name	SBO
species_2	EGF-EGFR	

Kinetic Law

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

$$v_1 = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(k1 \cdot [\text{species\_0}] \cdot [\text{species\_1}] - k2 \cdot [\text{species\_2}]\right) \tag{2}$$

Table 7: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			100.000	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.004	s^{-1}	☑

5.2 Reaction `reaction_1`

This is a reversible reaction of one reactant forming one product.

Name R2

Reaction equation

$$2 \, \text{species\_2} \rightleftharpoons \text{species\_3} \qquad (3)$$

Reactant

Table 8: Properties of each reactant.

Id	Name	SBO
species_2	EGF-EGFR	

Product

Table 9: Properties of each product.

Id	Name	SBO
species_3	EGF-EGFR-2	

Kinetic Law

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

$$v_2 = \text{vol} \, (\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_2}] \cdot [\text{species\_2}] - \text{k2} \cdot [\text{species\_3}]) \qquad (4)$$

Table 10: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.00	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.02	s^{-1}	☑

5.3 Reaction reaction_2

This is an irreversible reaction of one reactant forming one product.

Name R3

Reaction equation

$$\text{species\_3} \longrightarrow \text{species\_4} \qquad (5)$$

Reactant

Table 11: Properties of each reactant.

Id	Name	SBO
species_3	EGF-EGFR-2	

Product

Table 12: Properties of each product.

Id	Name	SBO
species_4	EGF-pEGFR-2	

Kinetic Law

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

$$v_3 = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot k1 \cdot [\mathrm{species\_3}] \tag{6}$$

Table 13: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.014	s^{-1}	☑

5.4 Reaction `reaction_3`

This is a reversible reaction of two reactants forming one product.

Name R4

Reaction equation

$$\mathrm{species\_4} + \mathrm{species\_5} \rightleftharpoons \mathrm{species\_6} \tag{7}$$

Reactants

Table 14: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_5	SHP	

Product

Table 15: Properties of each product.

Id	Name	SBO
species_6	EGF-pEGFR-2-SHP	

Kinetic Law

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

$$v_4 = vol\,(compartment\_0) \cdot (k1 \cdot [species\_4] \cdot [species\_5] - k2 \cdot [species\_6]) \qquad (8)$$

Table 16: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.14	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.20	s^{-1}	☑

5.5 Reaction reaction_4

This is an irreversible reaction of one reactant forming two products.

Name R5

Reaction equation

$$species\_6 \longrightarrow species\_3 + species\_5 \qquad (9)$$
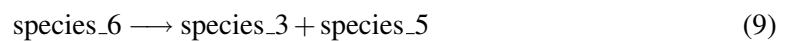
Reactant

Table 17: Properties of each reactant.

Id	Name	SBO
species_6	EGF-pEGFR-2-SHP	

Products

Table 18: Properties of each product.

Id	Name	SBO
species_3	EGF-EGFR-2	
species_5	SHP	

Kinetic Law

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

$$v_5 = \text{vol} \left(\text{compartment\_0} \right) \cdot k1 \cdot [\text{species\_6}] \tag{10}$$

Table 19: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.266	s^{-1}	☑

5.6 Reaction reaction_5

This is a reversible reaction of two reactants forming one product.

Name R6

Reaction equation

$$\text{species\_4} + \text{species\_7} \rightleftharpoons \text{species\_8} \tag{11}$$

Reactants

Table 20: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_7	Shc	

Product

Table 21: Properties of each product.

Id	Name	SBO
species_8	EGF-pEGFR-2-Shc	

Kinetic Law

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

$$v_6 = \text{vol}(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_4}] \cdot [\text{species\_7}] - \text{k2} \cdot [\text{species\_8}]) \qquad (12)$$

Table 22: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			90.0	$\mu mol^{-1} \cdot l \cdot s^{-1}$	✓
k2			0.6	s^{-1}	✓

5.7 Reaction `reaction_6`

This is an irreversible reaction of one reactant forming one product.

Name R7

Reaction equation

$$\text{species\_8} \longrightarrow \text{species\_9} \qquad (13)$$

Reactant

Table 23: Properties of each reactant.

Id	Name	SBO
species_8	EGF-pEGFR-2-Shc	

Product

Table 24: Properties of each product.

Id	Name	SBO
species_9	EGF-pEGFR-2-pShc	

Kinetic Law

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

$$v_7 = \text{vol}(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_8}] \qquad (14)$$

Table 25: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.584	s^{-1}	☑

5.8 Reaction `reaction_7`

This is a reversible reaction of one reactant forming two products.

Name R8

Reaction equation

$$\text{species\_9} \rightleftharpoons \text{species\_4} + \text{species\_10} \tag{15}$$

Reactant

Table 26: Properties of each reactant.

Id	Name	SBO
species_9	EGF-pEGFR-2-pShc	

Products

Table 27: Properties of each product.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_10	pShc	

Kinetic Law

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

$$v_8 = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_9}] - \text{k2} \cdot [\text{species\_4}] \cdot [\text{species\_10}]) \tag{16}$$

Table 28: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			4.481	s^{-1}	☑
k2			0.300	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑

5.9 Reaction `reaction_8`

This is a reversible reaction of two reactants forming one product.

Name R9

Reaction equation

$$\text{species\_10} + \text{species\_5} \rightleftharpoons \text{species\_11} \tag{17}$$
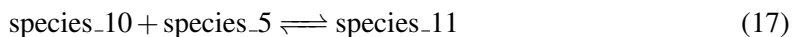
Reactants

Table 29: Properties of each reactant.

Id	Name	SBO
species_10	pShc	
species_5	SHP	

Product

Table 30: Properties of each product.

Id	Name	SBO
species_11	pShc-SHP	

Kinetic Law

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

$$v_9 = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_10}] \cdot [\text{species\_5}] - \text{k2} \cdot [\text{species\_11}]) \tag{18}$$

Table 31: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.114	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.200	s^{-1}	☑

5.10 Reaction `reaction_9`

This is an irreversible reaction of one reactant forming two products.

Name R10

Reaction equation

$$\text{species\_11} \longrightarrow \text{species\_7} + \text{species\_5} \qquad (19)$$
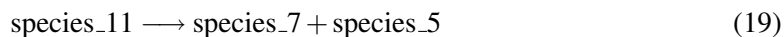
Reactant

Table 32: Properties of each reactant.

Id	Name	SBO
species_11	pShc-SHP	

Products

Table 33: Properties of each product.

Id	Name	SBO
species_7	Shc	
species_5	SHP	

Kinetic Law

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

$$v_{10} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_11}] \qquad (20)$$

Table 34: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.266	s^{-1}	☑

5.11 Reaction `reaction_10`

This is a reversible reaction of two reactants forming one product.

Name R11

Reaction equation

$$\text{species\_9} + \text{species\_12} \rightleftharpoons \text{species\_13} \qquad (21)$$
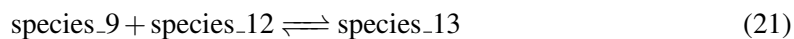
Reactants

Table 35: Properties of each reactant.

Id	Name	SBO
species_9	EGF-pEGFR-2-pShc	
species_12	Grb2	

Product

Table 36: Properties of each product.

Id	Name	SBO
species_13	EGF-pEGFR-2-pShc-Grb2	

Kinetic Law

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

$$v_{11} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_9}] \cdot [\text{species\_12}] - k2 \cdot [\text{species\_13}]) \quad (22)$$

Table 37: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.0	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.1	s^{-1}	☑

5.12 Reaction `reaction_11`

This is a reversible reaction of two reactants forming one product.

Name R12

Reaction equation

$$\text{species\_13} + \text{species\_14} \rightleftharpoons \text{species\_15} \quad (23)$$
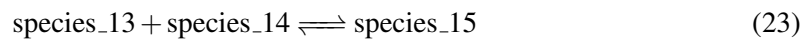
Reactants

Table 38: Properties of each reactant.

Id	Name	SBO
species_13	EGF-pEGFR-2-pShc-Grb2	

Id	Name	SBO
species_14	SOS	

Product

Table 39: Properties of each product.

Id	Name	SBO
species_15	EGF-pEGFR-2-pShc-Grb2-SOS	

Kinetic Law

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

$$v_{12} = \text{vol}(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_13}] \cdot [\text{species\_14}] - k2 \cdot [\text{species\_15}]) \quad (24)$$

Table 40: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.000	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.021	s^{-1}	☑

5.13 Reaction `reaction_12`

This is a reversible reaction of two reactants forming one product.

Name R13

Reaction equation

$$\text{species\_12} + \text{species\_14} \rightleftharpoons \text{species\_16} \quad (25)$$
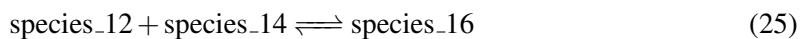
Reactants

Table 41: Properties of each reactant.

Id	Name	SBO
species_12	Grb2	
species_14	SOS	

Product

Table 42: Properties of each product.

Id	Name	SBO
species_16	Grb2-SOS	

Kinetic Law

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

$$v_{13} = \text{vol}(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_12}] \cdot [\text{species\_14}] - \text{k2} \cdot [\text{species\_16}]) \quad (26)$$

Table 43: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.002	s^{-1}	☑

5.14 Reaction `reaction_13`

This is a reversible reaction of two reactants forming one product.

Name R14

Reaction equation

$$\text{species\_9} + \text{species\_16} \rightleftharpoons \text{species\_15} \quad (27)$$
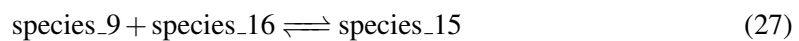
Reactants

Table 44: Properties of each reactant.

Id	Name	SBO
species_9	EGF-pEGFR-2-pShc	
species_16	Grb2-SOS	

Product

Table 45: Properties of each product.

Id	Name	SBO
species_15	EGF-pEGFR-2-pShc-Grb2-SOS	

Kinetic Law

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

$$v_{14} = vol(compartment\_0) \cdot (k1 \cdot [species\_9] \cdot [species\_16] - k2 \cdot [species\_15]) \quad (28)$$

Table 46: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.000	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.045	s^{-1}	☑

5.15 Reaction `reaction_14`

This is a reversible reaction of two reactants forming one product.

Name R15

Reaction equation

$$species\_15 + species\_17 \rightleftharpoons species\_18 \quad (29)$$
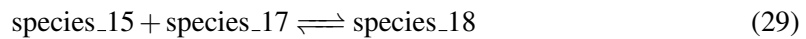
Reactants

Table 47: Properties of each reactant.

Id	Name	SBO
species_15	EGF-pEGFR-2-pShc-Grb2-SOS	
species_17	RasGDP	

Product

Table 48: Properties of each product.

Id	Name	SBO
species_18	EGF-pEGFR-2-pShc-Grb2-SOS-RasGDP	

Kinetic Law

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

$$v_{15} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_15}] \cdot [\text{species\_17}] - \text{k2} \cdot [\text{species\_18}]) \quad (30)$$

Table 49: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			202.90	μmol$^{-1} \cdot 1 \cdot$ s^{-1}	☑
k2			0.18	s^{-1}	☑

5.16 Reaction `reaction_15`

This is an irreversible reaction of one reactant forming two products.

Name R16

Reaction equation

$$\text{species\_18} \longrightarrow \text{species\_15} + \text{species\_19} \quad (31)$$
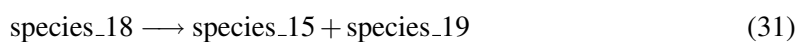
Reactant

Table 50: Properties of each reactant.

Id	Name	SBO
species_18	EGF-pEGFR-2-pShc-Grb2-SOS-RasGDP	

Products

Table 51: Properties of each product.

Id	Name	SBO
species_15	EGF-pEGFR-2-pShc-Grb2-SOS	
species_19	RasGTP	

Kinetic Law

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

$$v_{16} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_18}] \quad (32)$$

Table 52: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.143	s^{-1}	☑

5.17 Reaction `reaction_16`

This is a reversible reaction of two reactants forming one product.

Name R17

Reaction equation

$$\text{species\_4} + \text{species\_12} \rightleftharpoons \text{species\_20} \tag{33}$$
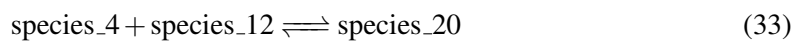
Reactants

Table 53: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_12	Grb2	

Product

Table 54: Properties of each product.

Id	Name	SBO
species_20	EGF-pEGFR-2-Grb2	

Kinetic Law

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

$$v_{17} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_4}] \cdot [\text{species\_12}] - \text{k2} \cdot [\text{species\_20}]) \tag{34}$$

Table 55: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.00	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.05	s^{-1}	☑

5.18 Reaction `reaction_17`

This is a reversible reaction of two reactants forming one product.

Name R18

Reaction equation

$$\text{species\_20} + \text{species\_14} \rightleftharpoons \text{species\_21} \qquad (35)$$
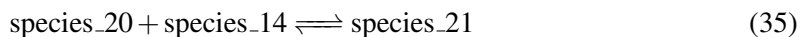
Reactants

Table 56: Properties of each reactant.

Id	Name	SBO
species_20	EGF-pEGFR-2-Grb2	
species_14	SOS	

Product

Table 57: Properties of each product.

Id	Name	SBO
species_21	EGF-pEGFR-2-Grb2-SOS	

Kinetic Law

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

$$v_{18} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_20}] \cdot [\text{species\_14}] - \text{k2} \cdot [\text{species\_21}]) \qquad (36)$$

Table 58: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.00	$\mu\text{mol}^{-1} \cdot 1 \cdot \text{s}^{-1}$	✓
k2			0.06	s^{-1}	✓

5.19 Reaction `reaction_18`

This is a reversible reaction of two reactants forming one product.

Name R19

Reaction equation

$$\text{species\_4} + \text{species\_16} \rightleftharpoons \text{species\_21} \tag{37}$$
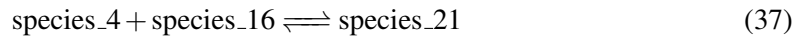
Reactants

Table 59: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_16	Grb2-SOS	

Product

Table 60: Properties of each product.

Id	Name	SBO
species_21	EGF-pEGFR-2-Grb2-SOS	

Kinetic Law

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

$$v_{19} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_4}] \cdot [\text{species\_16}] - \text{k2} \cdot [\text{species\_21}]) \tag{38}$$

Table 61: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.734	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.025	s^{-1}	☑

5.20 Reaction `reaction_19`

This is a reversible reaction of two reactants forming one product.

Name R20

Reaction equation

$$\text{species\_21} + \text{species\_17} \rightleftharpoons \text{species\_22} \tag{39}$$
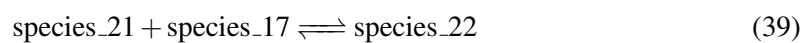
Reactants

Table 62: Properties of each reactant.

Id	Name	SBO
species_21	EGF-pEGFR-2-Grb2-SOS	
species_17	RasGDP	

Product

Table 63: Properties of each product.

Id	Name	SBO
species_22	EGF-pEGFR-2-Grb2-SOS-RasGDP	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{20} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot (\mathrm{k1} \cdot [\mathrm{species\_21}] \cdot [\mathrm{species\_17}] - \mathrm{k2} \cdot [\mathrm{species\_22}]) \quad (40)$$

Table 64: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			202.90	$\mu\mathrm{mol}^{-1} \cdot 1 \cdot \mathrm{s}^{-1}$	☑
k2			0.18	s^{-1}	☑

5.21 Reaction `reaction_20`

This is an irreversible reaction of one reactant forming two products.

Name R21

Reaction equation

$$\mathrm{species\_22} \longrightarrow \mathrm{species\_21} + \mathrm{species\_19} \quad (41)$$
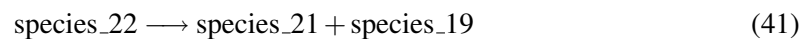
Reactant

Table 65: Properties of each reactant.

Id	Name	SBO
species_22	EGF-pEGFR-2-Grb2-SOS-RasGDP	

Products

Table 66: Properties of each product.

Id	Name	SBO
species_21	EGF-pEGFR-2-Grb2-SOS	
species_19	RasGTP	

Kinetic Law

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

$$v_{21} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_22}] \tag{42}$$

Table 67: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
k1			0.143	s^{-1}	☑

5.22 Reaction reaction_21

This is a reversible reaction of two reactants forming one product.

Name R22

Reaction equation

$$\text{species\_23} + \text{species\_19} \rightleftharpoons \text{species\_24} \tag{43}$$
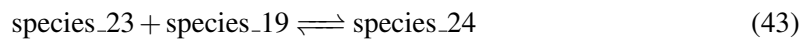
Reactants

Table 68: Properties of each reactant.

Id	Name	SBO
species_23	Raf	
species_19	RasGTP	

Product

<div align="center">

Table 69: Properties of each product.

Id	Name	SBO
species_24	Raf-RasGTP	

</div>

Kinetic Law

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

$$v_{22} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_23}] \cdot [\text{species\_19}] - \text{k2} \cdot [\text{species\_24}]) \quad (44)$$

<div align="center">

Table 70: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.754	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.050	s^{-1}	☑

</div>

5.23 Reaction reaction_22

This is an irreversible reaction of one reactant forming two products.

Name R23

Reaction equation

$$\text{species\_24} \longrightarrow \text{species\_25} + \text{species\_19} \quad (45)$$
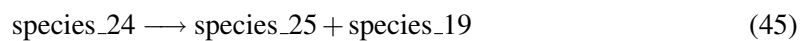
Reactant

<div align="center">

Table 71: Properties of each reactant.

Id	Name	SBO
species_24	Raf-RasGTP	

</div>

Products

Produced by SBML2LATEX

Table 72: Properties of each product.

Id	Name	SBO
species_25	pRaf	
species_19	RasGTP	

Kinetic Law

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

$$v_{23} = \text{vol} \left(\text{compartment\_0} \right) \cdot k1 \cdot \left[\text{species\_24} \right] \tag{46}$$

Table 73: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.762	s^{-1}	☑

5.24 Reaction `reaction_23`

This is a reversible reaction of two reactants forming one product.

Name R24

Reaction equation

$$\text{species\_25} + \text{species\_26} \rightleftharpoons \text{species\_27} \tag{47}$$
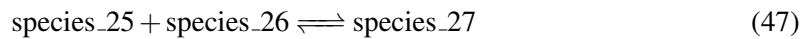
Reactants

Table 74: Properties of each reactant.

Id	Name	SBO
species_25	pRaf	
species_26	MEK	

Product

Table 75: Properties of each product.

Id	Name	SBO
species_27	pRaf-MEK	

Kinetic Law

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

$$v_{24} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_25] \cdot [species\_26] - k2 \cdot [species\_27]) \quad (48)$$

Table 76: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			4.000	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.018	s^{-1}	☑

5.25 Reaction `reaction_24`

This is an irreversible reaction of one reactant forming two products.

Name R25

Reaction equation

$$species\_27 \longrightarrow species\_25 + species\_28 \quad (49)$$
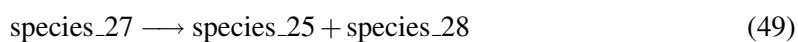
Reactant

Table 77: Properties of each reactant.

Id	Name	SBO
species_27	pRaf-MEK	

Products

Table 78: Properties of each product.

Id	Name	SBO
species_25	pRaf	
species_28	pMEK	

Kinetic Law

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

$$v_{25} = vol\,(compartment\_0) \cdot k1 \cdot [species\_27] \quad (50)$$

Table 79: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.5	s^{-1}	☑

5.26 Reaction `reaction_25`

This is a reversible reaction of two reactants forming one product.

Name R26

Reaction equation

$$\text{species\_25} + \text{species\_28} \rightleftharpoons \text{species\_29} \qquad (51)$$
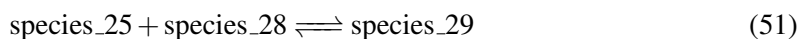
Reactants

Table 80: Properties of each reactant.

Id	Name	SBO
species_25	pRaf	
species_28	pMEK	

Product

Table 81: Properties of each product.

Id	Name	SBO
species_29	pRaf-pMEK	

Kinetic Law

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

$$v_{26} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_25}] \cdot [\text{species\_28}] - \text{k2} \cdot [\text{species\_29}]\right) \qquad (52)$$

Table 82: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			4.000	$\mu\text{mol}^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.018	s^{-1}	☑

5.27 Reaction `reaction_26`

This is an irreversible reaction of one reactant forming two products.

Name R27

Reaction equation

$$\text{species\_29} \longrightarrow \text{species\_25} + \text{species\_30} \tag{53}$$
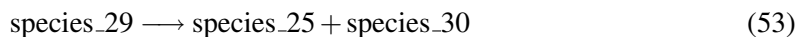
Reactant

Table 83: Properties of each reactant.

Id	Name	SBO
species_29	pRaf-pMEK	

Products

Table 84: Properties of each product.

Id	Name	SBO
species_25	pRaf	
species_30	ppMEK	

Kinetic Law

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

$$v_{27} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_29}] \tag{54}$$

Table 85: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.9	s^{-1}	✓

5.28 Reaction `reaction_27`

This is a reversible reaction of two reactants forming one product.

Name R28

Reaction equation

$$\text{species\_30} + \text{species\_31} \rightleftharpoons \text{species\_32} \tag{55}$$
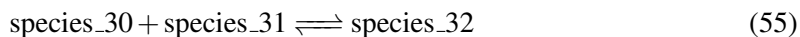
Reactants

Table 86: Properties of each reactant.

Id	Name	SBO
species_30	ppMEK	
species_31	ERK	

Product

Table 87: Properties of each product.

Id	Name	SBO
species_32	ppMEK-ERK	

Kinetic Law

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

$$v_{28} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_30}] \cdot [\text{species\_31}] - \text{k2} \cdot [\text{species\_32}]) \tag{56}$$

Table 88: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.000	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.033	s^{-1}	☑

5.29 Reaction reaction_28

This is an irreversible reaction of one reactant forming two products.

Name R29

Reaction equation

$$\text{species\_32} \longrightarrow \text{species\_30} + \text{species\_33} \tag{57}$$
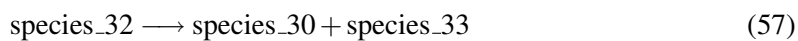
Reactant

Table 89: Properties of each reactant.

Id	Name	SBO
species_32	ppMEK-ERK	

Products

Table 90: Properties of each product.

Id	Name	SBO
species_30	ppMEK	
species_33	pERK	

Kinetic Law

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

$$v_{29} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_32}] \tag{58}$$

Table 91: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			16.0	s^{-1}	☑

5.30 Reaction reaction_29

This is a reversible reaction of two reactants forming one product.

Name R30

Reaction equation

$$\text{species\_30} + \text{species\_33} \rightleftharpoons \text{species\_34} \tag{59}$$
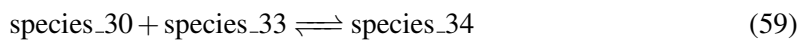
Reactants

Table 92: Properties of each reactant.

Id	Name	SBO
species_30	ppMEK	
species_33	pERK	

Product

Table 93: Properties of each product.

Id	Name	SBO
species_34	ppMEK-pERK	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{30} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot (\mathrm{k1} \cdot [\mathrm{species\_30}] \cdot [\mathrm{species\_33}] - \mathrm{k2} \cdot [\mathrm{species\_34}]) \quad (60)$$

Table 94: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.000	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			0.033	s^{-1}	☑

5.31 Reaction reaction_30

This is an irreversible reaction of one reactant forming two products.

Name R31

Reaction equation

$$\mathrm{species\_34} \longrightarrow \mathrm{species\_30} + \mathrm{species\_35} \quad (61)$$
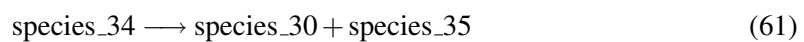
Reactant

Table 95: Properties of each reactant.

Id	Name	SBO
species_34	ppMEK-pERK	

Products

Table 96: Properties of each product.

Id	Name	SBO
species_30	ppMEK	
species_35	ppERK	

Kinetic Law

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

$$v_{31} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_34}] \tag{62}$$

Table 97: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.7	s^{-1}	☑

5.32 Reaction `reaction_31`

This is a reversible reaction of two reactants forming one product.

Name R32

Reaction equation

$$\text{species\_25} + \text{species\_36} \rightleftharpoons \text{species\_37} \tag{63}$$
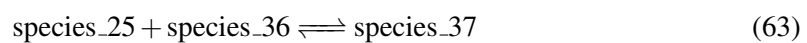
Reactants

Table 98: Properties of each reactant.

Id	Name	SBO
species_25	pRaf	
species_36	Pase	

Product

Produced by SBML2LATEX

Table 99: Properties of each product.

Id	Name	SBO
species_37	pRaf-Pase	

Kinetic Law

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

$$v_{32} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_25}] \cdot [\text{species\_36}] - k2 \cdot [\text{species\_37}]) \quad (64)$$

Table 100: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			71.7	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.2	s^{-1}	☑

5.33 Reaction reaction_32

This is an irreversible reaction of one reactant forming two products.

Name R33

Reaction equation

$$\text{species\_37} \longrightarrow \text{species\_23} + \text{species\_36} \quad (65)$$
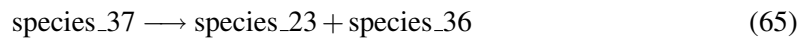
Reactant

Table 101: Properties of each reactant.

Id	Name	SBO
species_37	pRaf-Pase	

Products

Table 102: Properties of each product.

Id	Name	SBO
species_23	Raf	
species_36	Pase	

Kinetic Law

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

$$v_{33} = \text{vol}(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_37}] \tag{66}$$

Table 103: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
k1			1.0	s^{-1}	☑

5.34 Reaction `reaction_33`

This is a reversible reaction of two reactants forming one product.

Name R34

Reaction equation

$$\text{species\_30} + \text{species\_38} \rightleftharpoons \text{species\_39} \tag{67}$$
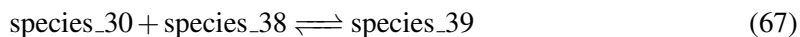
Reactants

Table 104: Properties of each reactant.

Id	Name	SBO
species_30	ppMEK	
species_38	PP2A	

Product

Table 105: Properties of each product.

Id	Name	SBO
species_39	ppMEK-PP2A	

Kinetic Law

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

$$v_{34} = \text{vol}(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_30}] \cdot [\text{species\_38}] - k2 \cdot [\text{species\_39}]) \tag{68}$$

Table 106: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			14.3	$\mu\text{mol}^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.8	s^{-1}	☑

5.35 Reaction `reaction_34`

This is an irreversible reaction of one reactant forming two products.

Name R35

Reaction equation

$$\text{species\_39} \longrightarrow \text{species\_28} + \text{species\_38} \tag{69}$$
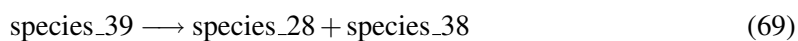
Reactant

Table 107: Properties of each reactant.

Id	Name	SBO
species_39	ppMEK-PP2A	

Products

Table 108: Properties of each product.

Id	Name	SBO
species_28	pMEK	
species_38	PP2A	

Kinetic Law

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

$$v_{35} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_39}] \tag{70}$$

Table 109: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.058	s^{-1}	☑

5.36 Reaction `reaction_35`

This is a reversible reaction of two reactants forming one product.

Name R36

Reaction equation

$$\text{species\_28} + \text{species\_38} \rightleftharpoons \text{species\_40} \tag{71}$$
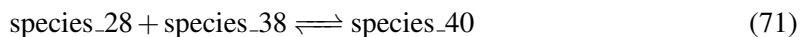
Reactants

Table 110: Properties of each reactant.

Id	Name	SBO
species_28	pMEK	
species_38	PP2A	

Product

Table 111: Properties of each product.

Id	Name	SBO
species_40	pMEK-PP2A	

Kinetic Law

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

$$v_{36} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_28}] \cdot [\text{species\_38}] - \text{k2} \cdot [\text{species\_40}]) \tag{72}$$

Table 112: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.25	$\mu\text{mol}^{-1} \cdot 1 \cdot \text{s}^{-1}$	☑
k2			0.50	s^{-1}	☑

5.37 Reaction `reaction_36`

This is an irreversible reaction of one reactant forming two products.

Name R37

Reaction equation

$$\text{species\_40} \longrightarrow \text{species\_26} + \text{species\_38} \tag{73}$$

Reactant

Table 113: Properties of each reactant.

Id	Name	SBO
species_40	pMEK-PP2A	

Products

Table 114: Properties of each product.

Id	Name	SBO
species_26	MEK	
species_38	PP2A	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{37} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_40}] \tag{74}$$

Table 115: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.058	s^{-1}	☑

5.38 Reaction reaction_37

This is a reversible reaction of two reactants forming one product.

Name R38

Reaction equation

$$\text{species\_35} + \text{species\_41} \rightleftharpoons \text{species\_42} \tag{75}$$

Reactants

Table 116: Properties of each reactant.

Id	Name	SBO
species_35	ppERK	
species_41	MKP3	

Product

Table 117: Properties of each product.

Id	Name	SBO
species_42	ppERK-MKP3	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{38} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot (\mathrm{k1} \cdot [\mathrm{species\_35}] \cdot [\mathrm{species\_41}] - \mathrm{k2} \cdot [\mathrm{species\_42}]) \quad (76)$$

Table 118: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			7.0	$\mu\mathrm{mol}^{-1} \cdot 1 \cdot \mathrm{s}^{-1}$	☑
k2			0.6	s^{-1}	☑

5.39 Reaction `reaction_38`

This is an irreversible reaction of one reactant forming two products.

Name R39

Reaction equation

$$\mathrm{species\_42} \longrightarrow \mathrm{species\_33} + \mathrm{species\_41} \quad (77)$$
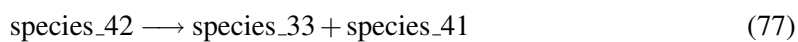
Reactant

Table 119: Properties of each reactant.

Id	Name	SBO
species_42	ppERK-MKP3	

Products

Table 120: Properties of each product.

Id	Name	SBO
species_33	pERK	
species_41	MKP3	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{39} = \mathrm{vol}\left(\mathrm{compartment\_0}\right) \cdot \mathrm{k1} \cdot \left[\mathrm{species\_42}\right] \tag{78}$$

Table 121: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.27	s^{-1}	☑

5.40 Reaction `reaction_39`

This is a reversible reaction of two reactants forming one product.

Name R40

Reaction equation

$$\mathrm{species\_33} + \mathrm{species\_41} \rightleftharpoons \mathrm{species\_43} \tag{79}$$
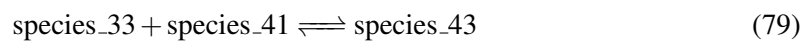
Reactants

Table 122: Properties of each reactant.

Id	Name	SBO
species_33	pERK	
species_41	MKP3	

Product

Table 123: Properties of each product.

Id	Name	SBO
species_43	pERK-MKP3	

Kinetic Law

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

$$v_{40} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_33}] \cdot [\text{species\_41}] - \text{k2} \cdot [\text{species\_43}]) \quad (80)$$

Table 124: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.0	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.5	s^{-1}	☑

5.41 Reaction `reaction_40`

This is an irreversible reaction of one reactant forming two products.

Name R41

Reaction equation

$$\text{species\_43} \longrightarrow \text{species\_31} + \text{species\_41} \quad (81)$$
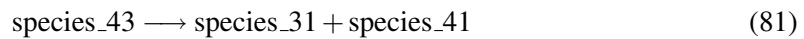
Reactant

Table 125: Properties of each reactant.

Id	Name	SBO
species_43	pERK-MKP3	

Products

Table 126: Properties of each product.

Id	Name	SBO
species_31	ERK	
species_41	MKP3	

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

$$v_{41} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_43}] \tag{82}$$

Table 127: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.3	s^{-1}	☑

5.42 Reaction `reaction_41`

This is an irreversible reaction of one reactant forming one product.

Name R42

Reaction equation

$$\text{species\_19} \longrightarrow \text{species\_17} \tag{83}$$

Reactant

Table 128: Properties of each reactant.

Id	Name	SBO
species_19	RasGTP	

Product

Table 129: Properties of each product.

Id	Name	SBO
species_17	RasGDP	

Kinetic Law

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

$$v_{42} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_19}] \tag{84}$$

Table 130: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
k1			$1.667 \cdot 10^{-5}$	s^{-1}	✓

5.43 Reaction `reaction_42`

This is a reversible reaction of two reactants forming one product.

Name R43

Reaction equation

$$\text{species\_19} + \text{species\_44} \rightleftharpoons \text{species\_45} \tag{85}$$
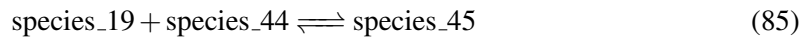
Reactants

Table 131: Properties of each reactant.

Id	Name	SBO
species_19	RasGTP	
species_44	RasGAP	

Product

Table 132: Properties of each product.

Id	Name	SBO
species_45	RasGTP-RasGAP	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{43} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_19}] \cdot [\text{species\_44}] - \text{k2} \cdot [\text{species\_45}]) \tag{86}$$
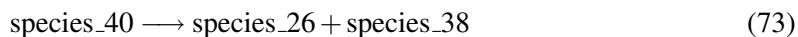
Table 133: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.854	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	✓
k2			0.960	s^{-1}	✓

5.44 Reaction `reaction_43`

This is an irreversible reaction of one reactant forming two products.

Name R44

Reaction equation

$$\text{species\_45} \longrightarrow \text{species\_17} + \text{species\_44} \tag{87}$$

Reactant

Table 134: Properties of each reactant.

Id	Name	SBO
species_45	RasGTP-RasGAP	

Products

Table 135: Properties of each product.

Id	Name	SBO
species_17	RasGDP	
species_44	RasGAP	

Kinetic Law

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

$$v_{44} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_45}] \tag{88}$$
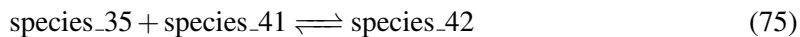
Table 136: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			7.6	s^{-1}	☑

5.45 Reaction `reaction_44`

This is a reversible reaction of two reactants forming one product.

Name R45

Reaction equation

$$\text{species\_35} + \text{species\_15} \rightleftharpoons \text{species\_46} \tag{89}$$

Reactants

Table 137: Properties of each reactant.

Id	Name	SBO
species_35	ppERK	
species_15	EGF-pEGFR-2-pShc-Grb2-SOS	

Product

Table 138: Properties of each product.

Id	Name	SBO
species_46	ppERK-EGF-pEGFR-2-pShc-Grb2-SOS	

Kinetic Law

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

$$v_{45} = \text{vol}(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_35}] \cdot [\text{species\_15}] - \text{k2} \cdot [\text{species\_46}]) \tag{90}$$

Table 139: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			8.898	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.100	s^{-1}	☑

5.46 Reaction `reaction_45`

This is an irreversible reaction of one reactant forming five products.

Name R46

Reaction equation

$$\text{species\_46} \longrightarrow \text{species\_35} + \text{species\_4} + \text{species\_10} + \text{species\_12} + \text{species\_47} \tag{91}$$

Reactant

Table 140: Properties of each reactant.

Id	Name	SBO
species_46	ppERK-EGF-pEGFR-2-pShc-Grb2-SOS	

Products

Table 141: Properties of each product.

Id	Name	SBO
species_35	ppERK	
species_4	EGF-pEGFR-2	
species_10	pShc	
species_12	Grb2	
species_47	pSOS	

Kinetic Law

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

$$v_{46} = vol\,(compartment\_0) \cdot k1 \cdot [species\_46] \tag{92}$$

Table 142: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.426	s^{-1}	☑

5.47 Reaction `reaction_46`

This is a reversible reaction of two reactants forming one product.

Name R47

Reaction equation

$$species\_35 + species\_21 \rightleftharpoons species\_48 \tag{93}$$
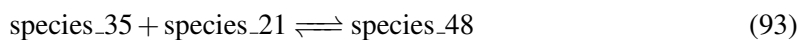
Reactants

Table 143: Properties of each reactant.

Id	Name	SBO
species_35	ppERK	
species_21	EGF-pEGFR-2-Grb2-SOS	

Product

Table 144: Properties of each product.

Id	Name	SBO
species_48	ppERK-EGF-pEGFR-2-Grb2-SOS	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{47} = \mathrm{vol}\left(\mathrm{compartment\_0}\right) \cdot \left(\mathrm{k1} \cdot [\mathrm{species\_35}] \cdot [\mathrm{species\_21}] - \mathrm{k2} \cdot [\mathrm{species\_48}]\right) \quad (94)$$

Table 145: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			8.898	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			0.100	s^{-1}	☑

5.48 Reaction `reaction_47`

This is an irreversible reaction of one reactant forming four products.

Name R48

Reaction equation

$$\mathrm{species\_48} \longrightarrow \mathrm{species\_35} + \mathrm{species\_4} + \mathrm{species\_12} + \mathrm{species\_47} \quad (95)$$
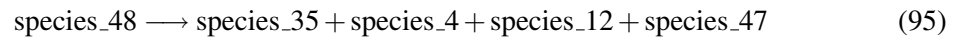
Reactant

Table 146: Properties of each reactant.

Id	Name	SBO
species_48	ppERK-EGF-pEGFR-2-Grb2-SOS	

Products

Table 147: Properties of each product.

Id	Name	SBO
species_35	ppERK	
species_4	EGF-pEGFR-2	
species_12	Grb2	
species_47	pSOS	

Kinetic Law

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

$$v_{48} = \text{vol}(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_48}] \tag{96}$$

Table 148: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.426	s^{-1}	☑

5.49 Reaction `reaction_48`

This is an irreversible reaction of one reactant forming one product.

Name R49

Reaction equation

$$\text{species\_47} \longrightarrow \text{species\_14} \tag{97}$$

Reactant

Table 149: Properties of each reactant.

Id	Name	SBO
species_47	pSOS	

Product

Table 150: Properties of each product.

Id	Name	SBO
species_14	SOS	

Kinetic Law

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

$$v_{49} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_47}] \tag{98}$$

Table 151: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.002	s^{-1}	☑

5.50 Reaction `reaction_49`

This is a reversible reaction of two reactants forming one product.

Name R50

Reaction equation

$$\text{species\_4} + \text{species\_49} \rightleftharpoons \text{species\_50} \tag{99}$$
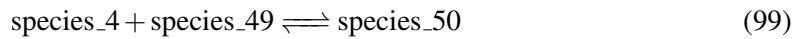
Reactants

Table 152: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_49	PI3K	

Product

Table 153: Properties of each product.

Id	Name	SBO
species_50	EGF-pEGFR-2-PI3K	

Kinetic Law

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

$$v_{50} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_4}] \cdot [\text{species\_49}] - k2 \cdot [\text{species\_50}]) \quad (100)$$

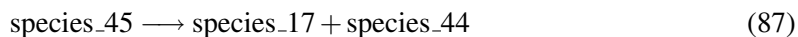Table 154: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			14.000	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.174	s^{-1}	☑

5.51 Reaction `reaction_50`

This is an irreversible reaction of one reactant forming two products.

Name R51

Reaction equation

$$\text{species\_50} \longrightarrow \text{species\_51} + \text{species\_52} \quad (101)$$
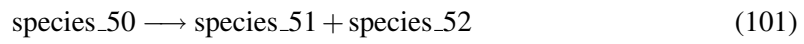
Reactant

Table 155: Properties of each reactant.

Id	Name	SBO
species_50	EGF-pEGFR-2-PI3K	

Products

Table 156: Properties of each product.

Id	Name	SBO
species_51	EGF-pEGFF-2	
species_52	pPI3K	

Kinetic Law

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

$$v_{51} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_50}] \quad (102)$$
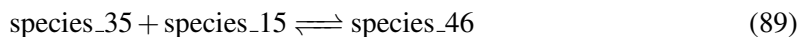
Table 157: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			33.72	s^{-1}	☑

5.52 Reaction reaction_51

This is a reversible reaction of two reactants forming one product.

Name R52

Reaction equation

$$\text{species\_52} + \text{species\_53} \rightleftharpoons \text{species\_54} \tag{103}$$
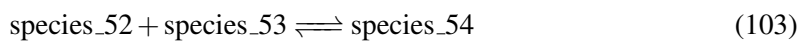
Reactants

Table 158: Properties of each reactant.

Id	Name	SBO
species_52	pPI3K	
species_53	TP4	

Product

Table 159: Properties of each product.

Id	Name	SBO
species_54	pPI3K-TP4	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{52} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_52}] \cdot [\text{species\_53}] - \text{k2} \cdot [\text{species\_54}]) \tag{104}$$

Table 160: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.000	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			0.038	s^{-1}	☑

5.53 Reaction `reaction_52`

This is an irreversible reaction of one reactant forming two products.

Name R53

Reaction equation

$$\text{species\_54} \longrightarrow \text{species\_49} + \text{species\_53} \tag{105}$$

Reactant

Table 161: Properties of each reactant.

Id	Name	SBO
`species_54`	pPI3K-TP4	

Products

Table 162: Properties of each product.

Id	Name	SBO
`species_49`	PI3K	
`species_53`	TP4	

Kinetic Law

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

$$v_{53} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_54}] \tag{106}$$

Table 163: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.595	s^{-1}	☑

5.54 Reaction `reaction_53`

This is a reversible reaction of two reactants forming one product.

Name R54

Reaction equation

$$\text{species\_52} + \text{species\_55} \rightleftharpoons \text{species\_56} \qquad (107)$$
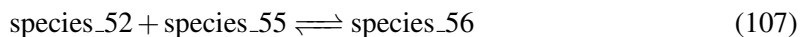
Reactants

Table 164: Properties of each reactant.

Id	Name	SBO
species_52	pPI3K	
species_55	PIP2	

Product

Table 165: Properties of each product.

Id	Name	SBO
species_56	pPI3K-PIP2	

Kinetic Law

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

$$v_{54} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_52}] \cdot [\text{species\_55}] - \text{k2} \cdot [\text{species\_56}]\right) \quad (108)$$

Table 166: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			25.0	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			3.5	s^{-1}	☑

5.55 Reaction reaction_54

This is an irreversible reaction of one reactant forming two products.

Name R55

Reaction equation

$$\text{species\_56} \longrightarrow \text{species\_52} + \text{species\_57} \qquad (109)$$
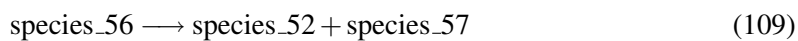
Reactant

Table 167: Properties of each reactant.

Id	Name	SBO
species_56	pPI3K-PIP2	

Products

Table 168: Properties of each product.

Id	Name	SBO
species_52	pPI3K	
species_57	PIP3	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{55} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot \mathrm{k1} \cdot [\mathrm{species\_56}] \tag{110}$$

Table 169: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			25.0	s^{-1}	☑

5.56 Reaction `reaction_55`

This is a reversible reaction of two reactants forming one product.

Name R56

Reaction equation

$$\mathrm{species\_58} + \mathrm{species\_57} \rightleftharpoons \mathrm{species\_59} \tag{111}$$
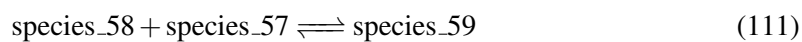
Reactants

Table 170: Properties of each reactant.

Id	Name	SBO
species_58	Akt	
species_57	PIP3	

Product

Table 171: Properties of each product.

Id	Name	SBO
species_59	Akt-PIP3	

Kinetic Law

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

$$v_{56} = \text{vol} \left(\text{compartment\_0} \right) \cdot \left(k1 \cdot [\text{species\_58}] \cdot [\text{species\_57}] - k2 \cdot [\text{species\_59}] \right) \quad (112)$$

Table 172: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.0	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			1.0	s^{-1}	☑

5.57 Reaction reaction_56

This is a reversible reaction of two reactants forming one product.

Name R57

Reaction equation

$$\text{species\_59} + \text{species\_60} \rightleftharpoons \text{species\_61} \quad (113)$$
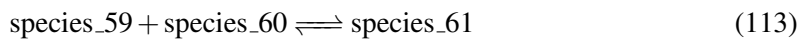
Reactants

Table 173: Properties of each reactant.

Id	Name	SBO
species_59	Akt-PIP3	

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Id	Name	SBO
species_60	PDK1	

Product

Table 174: Properties of each product.

Id	Name	SBO
species_61	Akt-PIP3-PDK1	

Kinetic Law

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

$$v_{57} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_59}] \cdot [\text{species\_60}] - \text{k2} \cdot [\text{species\_61}]) \quad (114)$$

Table 175: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.0	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			1.0	s^{-1}	☑

5.58 Reaction reaction_57

This is an irreversible reaction of one reactant forming two products.

Name R58

Reaction equation

$$\text{species\_61} \longrightarrow \text{species\_62} + \text{species\_60} \quad (115)$$
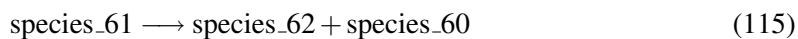
Reactant

Table 176: Properties of each reactant.

Id	Name	SBO
species_61	Akt-PIP3-PDK1	

Products

Table 177: Properties of each product.

Id	Name	SBO
species_62	pAkt-PIP3	
species_60	PDK1	

Kinetic Law

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

$$v_{58} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_61}] \tag{116}$$

Table 178: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
k1			3.0	s^{-1}	☑

5.59 Reaction reaction_58

This is a reversible reaction of one reactant forming two products.

Name R59

Reaction equation

$$\text{species\_62} \rightleftharpoons \text{species\_63} + \text{species\_57} \tag{117}$$
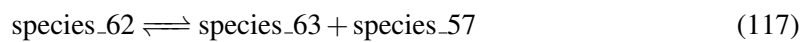
Reactant

Table 179: Properties of each reactant.

Id	Name	SBO
species_62	pAkt-PIP3	

Products

Table 180: Properties of each product.

Id	Name	SBO
species_63	pAkt	
species_57	PIP3	

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

$$v_{59} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_62}] - \text{k2} \cdot [\text{species\_63}] \cdot [\text{species\_57}]) \quad (118)$$
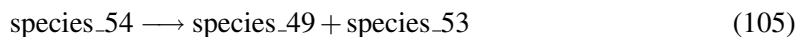
Table 181: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.001	s^{-1}	☑
k2			10.000	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑

5.60 Reaction `reaction_59`

This is a reversible reaction of two reactants forming one product.

Name R60

Reaction equation

$$\text{species\_62} + \text{species\_64} \rightleftharpoons \text{species\_65} \quad (119)$$
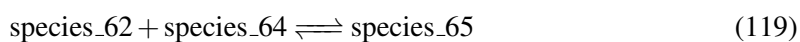
Reactants

Table 182: Properties of each reactant.

Id	Name	SBO
species_62	pAkt-PIP3	
species_64	Takt	

Product

Table 183: Properties of each product.

Id	Name	SBO
species_65	pAkt-PIP3-Takt	

Kinetic Law

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

$$v_{60} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_62}] \cdot [\text{species\_64}] - \text{k2} \cdot [\text{species\_65}]) \quad (120)$$

Table 184: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.0	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.9	s^{-1}	☑

5.61 Reaction `reaction_60`

This is an irreversible reaction of one reactant forming two products.

Name R61

Reaction equation

$$\text{species\_65} \longrightarrow \text{species\_59} + \text{species\_64} \tag{121}$$
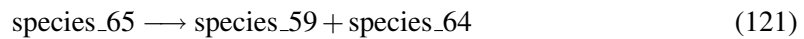
Reactant

Table 185: Properties of each reactant.

Id	Name	SBO
species_65	pAkt-PIP3-Takt	

Products

Table 186: Properties of each product.

Id	Name	SBO
species_59	Akt-PIP3	
species_64	Takt	

Kinetic Law

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

$$v_{61} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_65}] \tag{122}$$

Table 187: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.001	s^{-1}	☑

5.62 Reaction `reaction_61`

This is a reversible reaction of two reactants forming one product.

Name R62

Reaction equation

$$\text{species\_25} + \text{species\_62} \rightleftharpoons \text{species\_66} \tag{123}$$
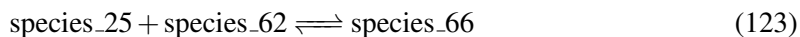
Reactants

Table 188: Properties of each reactant.

Id	Name	SBO
species_25	pRaf	
species_62	pAkt-PIP3	

Product

Table 189: Properties of each product.

Id	Name	SBO
species_66	pRaf-pAkt-PIP3	

Kinetic Law

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

$$v_{62} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_25}] \cdot [\text{species\_62}] - \text{k2} \cdot [\text{species\_66}]\right) \tag{124}$$

Table 190: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.0	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	✓
k2			0.5	s^{-1}	✓

5.63 Reaction `reaction_62`

This is an irreversible reaction of one reactant forming two products.

Name R63

Reaction equation

$$\text{species\_66} \longrightarrow \text{species\_67} + \text{species\_62} \tag{125}$$
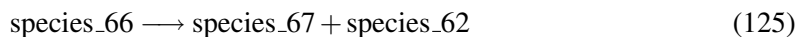
Reactant

Table 191: Properties of each reactant.

Id	Name	SBO
species_66	pRaf-pAkt-PIP3	

Products

Table 192: Properties of each product.

Id	Name	SBO
species_67	ppRaf	
species_62	pAkt-PIP3	

Kinetic Law

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

$$v_{63} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_66}] \tag{126}$$

Table 193: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.0	s^{-1}	☑

5.64 Reaction `reaction_63`

This is an irreversible reaction of one reactant forming one product.

Name R64

Reaction equation

$$\text{species\_67} \longrightarrow \text{species\_25} \tag{127}$$

Reactant

Table 194: Properties of each reactant.

Id	Name	SBO
species_67	ppRaf	

Product

Table 195: Properties of each product.

Id	Name	SBO
species_25	pRaf	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{64} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot \mathrm{k1} \cdot [\mathrm{species\_67}] \tag{128}$$

Table 196: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.001	s^{-1}	☑

5.65 Reaction `reaction_64`

This is a reversible reaction of two reactants forming one product.

Name R65

Reaction equation

$$\mathrm{species\_68} + \mathrm{species\_69} \rightleftharpoons \mathrm{species\_70} \tag{129}$$
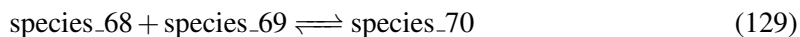
Reactants

Table 197: Properties of each reactant.

Id	Name	SBO
species_68	pROK	
species_69	PTEN	

Product

<div align="center">

Table 198: Properties of each product.

Id	Name	SBO
species_70	pROK-PTEN	

</div>

Kinetic Law

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

$$v_{65} = \text{vol}(\text{compartment}\_0) \cdot (k1 \cdot [\text{species}\_68] \cdot [\text{species}\_69] - k2 \cdot [\text{species}\_70]) \quad (130)$$

<div align="center">

Table 199: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.100	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.033	s^{-1}	☑

</div>

5.66 Reaction reaction_65

This is an irreversible reaction of one reactant forming two products.

Name R66

Reaction equation

$$\text{species}\_70 \longrightarrow \text{species}\_68 + \text{species}\_71 \quad (131)$$
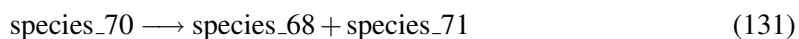
Reactant

<div align="center">

Table 200: Properties of each reactant.

Id	Name	SBO
species_70	pROK-PTEN	

</div>

Products

Table 201: Properties of each product.

Id	Name	SBO
species_68	pROK	
species_71	pPTEN	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{66} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot \mathrm{k1} \cdot [\mathrm{species\_70}] \tag{132}$$

Table 202: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			16.0	s^{-1}	☑

5.67 Reaction reaction_66

This is a reversible reaction of two reactants forming one product.

Name R67

Reaction equation

$$\mathrm{species\_71} + \mathrm{species\_57} \rightleftharpoons \mathrm{species\_72} \tag{133}$$
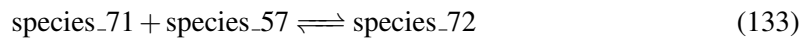
Reactants

Table 203: Properties of each reactant.

Id	Name	SBO
species_71	pPTEN	
species_57	PIP3	

Product

Table 204: Properties of each product.

Id	Name	SBO
species_72	pPTEN-PIP3	

Kinetic Law

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

$$v_{67} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_71}] \cdot [\text{species\_57}] - \text{k2} \cdot [\text{species\_72}]) \quad (134)$$

Table 205: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.0	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.5	s^{-1}	☑

5.68 Reaction `reaction_67`

This is an irreversible reaction of one reactant forming two products.

Name R68

Reaction equation

$$\text{species\_72} \longrightarrow \text{species\_71} + \text{species\_55} \quad (135)$$

Reactant

Table 206: Properties of each reactant.

Id	Name	SBO
species_72	pPTEN-PIP3	

Products

Table 207: Properties of each product.

Id	Name	SBO
species_71	pPTEN	
species_55	PIP2	

Kinetic Law

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

$$v_{68} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_72}] \quad (136)$$

Table 208: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.0	s^{-1}	✓

5.69 Reaction `reaction_68`

This is an irreversible reaction of one reactant forming one product.

Name R69

Reaction equation

$$\text{species\_71} \longrightarrow \text{species\_69} \tag{137}$$

Reactant

Table 209: Properties of each reactant.

Id	Name	SBO
species_71	pPTEN	

Product

Table 210: Properties of each product.

Id	Name	SBO
species_69	PTEN	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{69} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_71}] \tag{138}$$

Table 211: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.130	s^{-1}	✓

5.70 Reaction `reaction_69`

This is an irreversible reaction of one reactant forming one product.

Name R70

Reaction equation

$$\text{species\_57} \longrightarrow \text{species\_55} \tag{139}$$

Reactant

Table 212: Properties of each reactant.

Id	Name	SBO
species_57	PIP3	

Product

Table 213: Properties of each product.

Id	Name	SBO
species_55	PIP2	

Kinetic Law

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

$$v_{70} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_57}] \tag{140}$$

Table 214: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			17.0	s^{-1}	☑

5.71 Reaction `reaction_70`

This is a reversible reaction of two reactants forming one product.

Name R71

Reaction equation

$$\text{species\_57} + \text{species\_73} \rightleftharpoons \text{species\_74} \qquad (141)$$
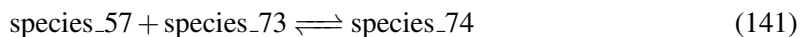
Reactants

Table 215: Properties of each reactant.

Id	Name	SBO
species_57	PIP3	
species_73	RacGEF	

Product

Table 216: Properties of each product.

Id	Name	SBO
species_74	PIP3-RacGEF	

Kinetic Law

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

$$v_{71} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_57}] \cdot [\text{species\_73}] - \text{k2} \cdot [\text{species\_74}]) \quad (142)$$

Table 217: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.000	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.021	s^{-1}	☑

5.72 Reaction `reaction_71`

This is a reversible reaction of two reactants forming one product.

Name R72

Reaction equation

$$\text{species\_74} + \text{species\_75} \rightleftharpoons \text{species\_76} \qquad (143)$$
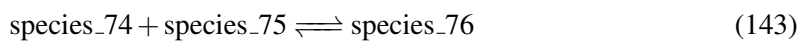
Reactants

Table 218: Properties of each reactant.

Id	Name	SBO
species_74	PIP3-RacGEF	
species_75	RacGDP	

Product

Table 219: Properties of each product.

Id	Name	SBO
species_76	PIP3-RacGEF-RacGDP	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{72} = \mathrm{vol}\left(\mathrm{compartment\_0}\right) \cdot \left(\mathrm{k1} \cdot [\mathrm{species\_74}] \cdot [\mathrm{species\_75}] - \mathrm{k2} \cdot [\mathrm{species\_76}]\right) \quad (144)$$

Table 220: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.029	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			0.180	s^{-1}	☑

5.73 Reaction `reaction_72`

This is an irreversible reaction of one reactant forming two products.

Name R73

Reaction equation

$$\mathrm{species\_76} \longrightarrow \mathrm{species\_74} + \mathrm{species\_77} \quad (145)$$
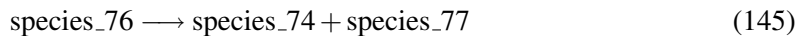
Reactant

Table 221: Properties of each reactant.

Id	Name	SBO
species_76	PIP3-RacGEF-RacGDP	

Products

Table 222: Properties of each product.

Id	Name	SBO
species_74	PIP3-RacGEF	
species_77	RacGTP	

Kinetic Law

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

$$v_{73} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot k1 \cdot [\mathrm{species\_76}] \tag{146}$$

Table 223: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.143	s^{-1}	☑

5.74 Reaction `reaction_73`

This is a reversible reaction of two reactants forming one product.

Name R74

Reaction equation

$$species\_78 + species\_75 \rightleftharpoons species\_79 \tag{147}$$
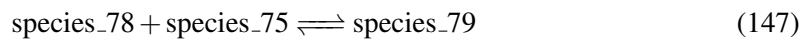
Reactants

Table 224: Properties of each reactant.

Id	Name	SBO
species_78	RhoGDI	
species_75	RacGDP	

Product

Table 225: Properties of each product.

Id	Name	SBO
species_79	RhoGDI-RacGDP	

Kinetic Law

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

$$v_{74} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_78}] \cdot [\text{species\_75}] - \text{k2} \cdot [\text{species\_79}]) \quad (148)$$
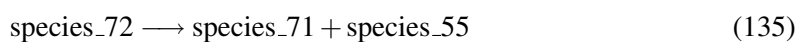
Table 226: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.845	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.960	s^{-1}	☑

5.75 Reaction `reaction_74`

This is an irreversible reaction of one reactant forming one product.

Name R75

Reaction equation

$$\text{species\_77} \longrightarrow \text{species\_75} \quad (149)$$

Reactant

Table 227: Properties of each reactant.

Id	Name	SBO
species_77	RacGTP	

Product

Table 228: Properties of each product.

Id	Name	SBO
species_75	RacGDP	

Kinetic Law

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

$$v_{75} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_77}] \qquad (150)$$
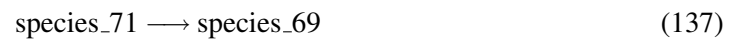
Table 229: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.262	s^{-1}	☑

5.76 Reaction `reaction_75`

This is a reversible reaction of two reactants forming one product.

Name R76

Reaction equation

$$\text{species\_77} + \text{species\_80} \rightleftharpoons \text{species\_81} \qquad (151)$$
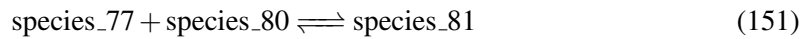
Reactants

Table 230: Properties of each reactant.

Id	Name	SBO
species_77	RacGTP	
species_80	RacGAP	

Product

Table 231: Properties of each product.

Id	Name	SBO
species_81	RacGTP-RacGAP	

Kinetic Law

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

$$v_{76} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_77}] \cdot [\text{species\_80}] - \text{k2} \cdot [\text{species\_81}]) \quad (152)$$

Table 232: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.845	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.960	s^{-1}	☑

5.77 Reaction `reaction_76`

This is an irreversible reaction of one reactant forming two products.

Name R77

Reaction equation

$$\text{species\_81} \longrightarrow \text{species\_75} + \text{species\_80} \quad (153)$$
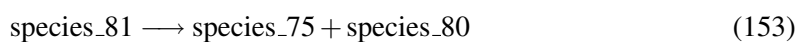
Reactant

Table 233: Properties of each reactant.

Id	Name	SBO
species_81	RacGTP-RacGAP	

Products

Table 234: Properties of each product.

Id	Name	SBO
species_75	RacGDP	
species_80	RacGAP	

Kinetic Law

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

$$v_{77} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_81}] \quad (154)$$

Table 235: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.205	s^{-1}	☑

5.78 Reaction `reaction_77`

This is a reversible reaction of two reactants forming one product.

Name R78

Reaction equation

$$\text{species\_82} + \text{species\_78} \rightleftharpoons \text{species\_83} \tag{155}$$

Reactants

Table 236: Properties of each reactant.

Id	Name	SBO
species_82	RhoGDP	
species_78	RhoGDI	

Product

Table 237: Properties of each product.

Id	Name	SBO
species_83	RhoGDP-RhoGDI	

Kinetic Law

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

$$v_{78} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_82}] \cdot [\text{species\_78}] - \text{k2} \cdot [\text{species\_83}]) \tag{156}$$

Table 238: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			20.29	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.18	s^{-1}	☑

5.79 Reaction `reaction_78`

This is a reversible reaction of two reactants forming one product.

Name R79

Reaction equation

$$\text{species\_82} + \text{species\_84} \Longrightarrow \text{species\_85} \qquad (157)$$

Reactants

Table 239: Properties of each reactant.

Id	Name	SBO
species_82	RhoGDP	
species_84	pRhoGEF	

Product

Table 240: Properties of each product.

Id	Name	SBO
species_85	RhoGDP-pRhoGEF	

Kinetic Law

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

$$v_{79} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_82}] \cdot [\text{species\_84}] - \text{k2} \cdot [\text{species\_85}]) \quad (158)$$

Table 241: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			20.29	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	✓
k2			0.18	s^{-1}	✓

5.80 Reaction `reaction_79`

This is an irreversible reaction of one reactant forming two products.

Name R80

Reaction equation

$$\text{species\_85} \longrightarrow \text{species\_86} + \text{species\_84} \tag{159}$$
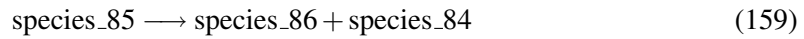
Reactant

Table 242: Properties of each reactant.

Id	Name	SBO
species_85	RhoGDP-pRhoGEF	

Products

Table 243: Properties of each product.

Id	Name	SBO
species_86	RhoGTP	
species_84	pRhoGEF	

Kinetic Law

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

$$v_{80} = \text{vol}\left(\text{compartment\_0}\right) \cdot \text{k1} \cdot \left[\text{species\_85}\right] \tag{160}$$

Table 244: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			4.98	s^{-1}	☑

5.81 Reaction reaction_80

This is an irreversible reaction of one reactant forming one product.

Name R81

Reaction equation

$$\text{species\_86} \longrightarrow \text{species\_82} \tag{161}$$

Reactant

Table 245: Properties of each reactant.

Id	Name	SBO
species_86	RhoGTP	

Product

Table 246: Properties of each product.

Id	Name	SBO
species_82	RhoGDP	

Kinetic Law

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

$$v_{81} = \mathrm{vol}\left(\mathrm{compartment\_0}\right) \cdot k1 \cdot [\mathrm{species\_86}] \tag{162}$$

Table 247: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.262	s^{-1}	☑

5.82 Reaction reaction_81

This is a reversible reaction of two reactants forming one product.

Name R82

Reaction equation

$$\mathrm{species\_4} + \mathrm{species\_44} \rightleftharpoons \mathrm{species\_87} \tag{163}$$
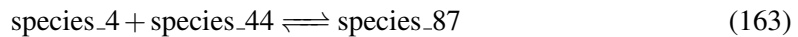
Reactants

Table 248: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_44	RasGAP	

Product

	Table 249: Properties of each product.	
Id	Name	SBO
species_87	EGF-pEGFR-2-RasGAP	

Kinetic Law

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

$$v_{82} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_4] \cdot [species\_44] - k2 \cdot [species\_87]) \quad (164)$$

	Table 250: Properties of each parameter.				
Id	Name	SBO	Value	Unit	Constant
k1			0.10	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.01	s^{-1}	☑

5.83 Reaction `reaction_82`

This is a reversible reaction of two reactants forming one product.

Name R83

Reaction equation

$$species\_87 + species\_19 \rightleftharpoons species\_88 \quad (165)$$
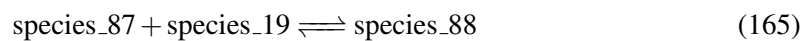
Reactants

	Table 251: Properties of each reactant.	
Id	Name	SBO
species_87	EGF-pEGFR-2-RasGAP	
species_19	RasGTP	

Product

Table 252: Properties of each product.

Id	Name	SBO
species_88	EGF-pEGFR-2-RasGAP-RasGTP	

Kinetic Law

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

$$v_{83} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_87] \cdot [species\_19] - k2 \cdot [species\_88]) \quad (166)$$

Table 253: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.854	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.960	s^{-1}	☑

5.84 Reaction reaction_83

This is an irreversible reaction of one reactant forming two products.

Name R84

Reaction equation

$$species\_88 \longrightarrow species\_89 + species\_17 \quad (167)$$
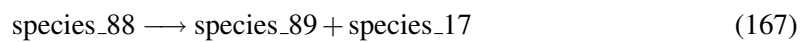
Reactant

Table 254: Properties of each reactant.

Id	Name	SBO
species_88	EGF-pEGFR-2-RasGAP-RasGTP	

Products

Table 255: Properties of each product.

Id	Name	SBO
species_89	EGF-pEGFR2-RasGAP	
species_17	RasGDP	

Kinetic Law

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

$$v_{84} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_88}] \tag{168}$$
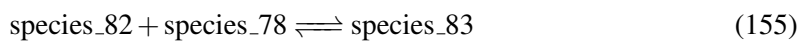
Table 256: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			7.76	s^{-1}	☑

5.85 Reaction `reaction_84`

This is a reversible reaction of two reactants forming one product.

Name R85

Reaction equation

$$\text{species\_13} + \text{species\_90} \rightleftharpoons \text{species\_91} \tag{169}$$
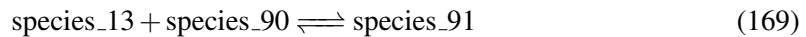
Reactants

Table 257: Properties of each reactant.

Id	Name	SBO
species_13	EGF-pEGFR-2-pShc-Grb2	
species_90	SHP2	

Product

Table 258: Properties of each product.

Id	Name	SBO
species_91	EGF-pEGFR-2-pShc-Grb2-SHP2	

Kinetic Law

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

$$v_{85} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_13}] \cdot [\text{species\_90}] - \text{k2} \cdot [\text{species\_91}]) \tag{170}$$
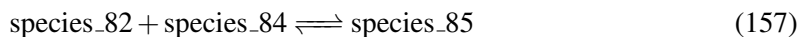
Table 259: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.0	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			1.0	s^{-1}	☑

5.86 Reaction `reaction_85`

This is a reversible reaction of two reactants forming one product.

Name R86

Reaction equation

$$\text{species\_20} + \text{species\_90} \rightleftharpoons \text{species\_92} \tag{171}$$
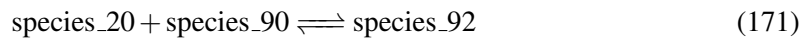
Reactants

Table 260: Properties of each reactant.

Id	Name	SBO
species_20	EGF-pEGFR-2-Grb2	
species_90	SHP2	

Product

Table 261: Properties of each product.

Id	Name	SBO
species_92	EGF-pEGFR-2-Grb2-SHP2	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{86} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_20}] \cdot [\text{species\_90}] - \text{k2} \cdot [\text{species\_92}]\right) \tag{172}$$

Table 262: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.0	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			1.0	s^{-1}	☑

5.87 Reaction `reaction_86`

This is an irreversible reaction of one reactant forming four products.

Name R87

Reaction equation

$$\text{species\_91} \longrightarrow \text{species\_3} + \text{species\_10} + \text{species\_12} + \text{species\_90} \tag{173}$$
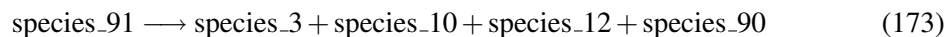
Reactant

Table 263: Properties of each reactant.

Id	Name	SBO
species_91	EGF-pEGFR-2-pShc-Grb2-SHP2	

Products

Table 264: Properties of each product.

Id	Name	SBO
species_3	EGF-EGFR-2	
species_10	pShc	
species_12	Grb2	
species_90	SHP2	

Kinetic Law

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

$$v_{87} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_91}] \tag{174}$$

Table 265: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.661	s^{-1}	☑

5.88 Reaction `reaction_87`

This is an irreversible reaction of one reactant forming three products.

Name R88

Reaction equation

$$\text{species\_92} \longrightarrow \text{species\_3} + \text{species\_12} + \text{species\_90} \qquad (175)$$

Reactant

Table 266: Properties of each reactant.

Id	Name	SBO
species_92	EGF-pEGFR-2-Grb2-SHP2	

Products

Table 267: Properties of each product.

Id	Name	SBO
species_3	EGF-EGFR-2	
species_12	Grb2	
species_90	SHP2	

Kinetic Law

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

$$v_{88} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_92}] \qquad (176)$$

Table 268: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.661	s^{-1}	☑

5.89 Reaction `reaction_88`

This is a reversible reaction of two reactants forming one product.

Name R89

Reaction equation

$$\text{species\_91} + \text{species\_84} \rightleftharpoons \text{species\_93} \qquad (177)$$
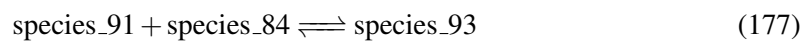
Reactants

Table 269: Properties of each reactant.

Id	Name	SBO
species_91	EGF-pEGFR-2-pShc-Grb2-SHP2	
species_84	pRhoGEF	

Product

Table 270: Properties of each product.

Id	Name	SBO
species_93	EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGEF	

Kinetic Law

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

$$v_{89} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_91}] \cdot [\text{species\_84}] - k2 \cdot [\text{species\_93}]) \quad (178)$$

Table 271: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.114	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.200	s^{-1}	☑

5.90 Reaction reaction_89

This is an irreversible reaction of one reactant forming two products.

Name R90

Reaction equation

$$\text{species\_93} \longrightarrow \text{species\_91} + \text{species\_94} \quad (179)$$
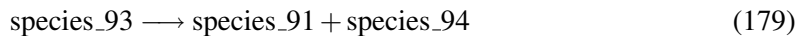
Reactant

Table 272: Properties of each reactant.

Id	Name	SBO
species_93	EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGEF	

Products

Table 273: Properties of each product.

Id	Name	SBO
species_91	EGF-pEGFR-2-pShc-Grb2-SHP2	
species_94	RhoGEF	

Kinetic Law

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

$$v_{90} = \text{vol} \left(\text{compartment\_0} \right) \cdot \text{k1} \cdot [\text{species\_93}] \tag{180}$$

Table 274: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.661	s^{-1}	☑

5.91 Reaction reaction_90

This is a reversible reaction of two reactants forming one product.

Name R91

Reaction equation

$$\text{species\_91} + \text{species\_95} \rightleftharpoons \text{species\_96} \tag{181}$$
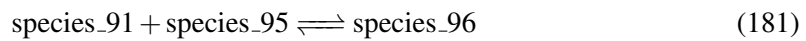
Reactants

Table 275: Properties of each reactant.

Id	Name	SBO
species_91	EGF-pEGFR-2-pShc-Grb2-SHP2	
species_95	pRhoGAP	

Product

Table 276: Properties of each product.

Id	Name	SBO
species_96	EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGAP	

Kinetic Law

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

$$v_{91} = \text{vol}(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_91}] \cdot [\text{species\_95}] - k2 \cdot [\text{species\_96}]) \quad (182)$$

Table 277: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.114	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.200	s^{-1}	☑

5.92 Reaction reaction_91

This is an irreversible reaction of one reactant forming two products.

Name R92

Reaction equation

$$\text{species\_96} \longrightarrow \text{species\_91} + \text{species\_97} \quad (183)$$
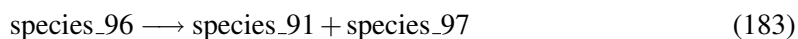
Reactant

Table 278: Properties of each reactant.

Id	Name	SBO
species_96	EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGAP	

Products

Table 279: Properties of each product.

Id	Name	SBO
species_91	EGF-pEGFR-2-pShc-Grb2-SHP2	
species_97	RhoGAP	

Kinetic Law

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

$$v_{92} = \text{vol}(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_96}] \qquad (184)$$

Table 280: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.661	s^{-1}	☑

5.93 Reaction reaction_92

This is a reversible reaction of two reactants forming one product.

Name R93

Reaction equation

$$\text{species\_92} + \text{species\_84} \rightleftharpoons \text{species\_98} \qquad (185)$$
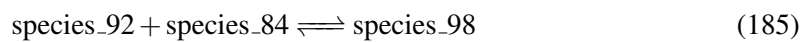
Reactants

Table 281: Properties of each reactant.

Id	Name	SBO
species_92	EGF-pEGFR-2-Grb2-SHP2	
species_84	pRhoGEF	

Product

Table 282: Properties of each product.

Id	Name	SBO
species_98	EGF-pEGFR-2-Grb2-SHP2-pRhoGEF	

Kinetic Law

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

$$v_{93} = vol\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_92}] \cdot [\text{species\_84}] - k2 \cdot [\text{species\_98}]) \quad (186)$$

Table 283: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.114	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.200	s^{-1}	☑

5.94 Reaction `reaction_93`

This is an irreversible reaction of one reactant forming two products.

Name R94

Reaction equation

$$\text{species\_98} \longrightarrow \text{species\_92} + \text{species\_94} \quad (187)$$
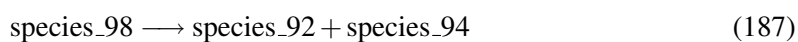
Reactant

Table 284: Properties of each reactant.

Id	Name	SBO
species_98	EGF-pEGFR-2-Grb2-SHP2-pRhoGEF	

Products

Table 285: Properties of each product.

Id	Name	SBO
species_92	EGF-pEGFR-2-Grb2-SHP2	
species_94	RhoGEF	

Kinetic Law

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

$$v_{94} = vol\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_98}] \quad (188)$$
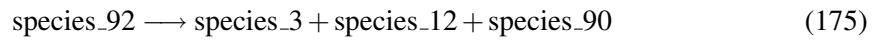
Table 286: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.661	s^{-1}	☑

5.95 Reaction reaction_94

This is a reversible reaction of two reactants forming one product.

Name R95

Reaction equation

$$\mathrm{species\_92 + species\_95 \rightleftharpoons species\_99} \tag{189}$$
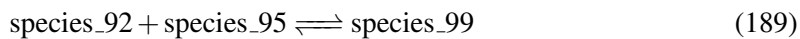
Reactants

Table 287: Properties of each reactant.

Id	Name	SBO
species_92	EGF-pEGFR-2-Grb2-SHP2	
species_95	pRhoGAP	

Product

Table 288: Properties of each product.

Id	Name	SBO
species_99	EGF-pEGFR-2-Grb2-SHP2-pRhoGAP	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{95} = \mathrm{vol}\left(\mathrm{compartment\_0}\right) \cdot \left(\mathrm{k1} \cdot [\mathrm{species\_92}] \cdot [\mathrm{species\_95}] - \mathrm{k2} \cdot [\mathrm{species\_99}]\right) \tag{190}$$

Table 289: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.114	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			0.200	s^{-1}	☑

5.96 Reaction `reaction_95`

This is an irreversible reaction of one reactant forming two products.

Name R96

Reaction equation

$$\text{species\_99} \longrightarrow \text{species\_92} + \text{species\_97} \tag{191}$$
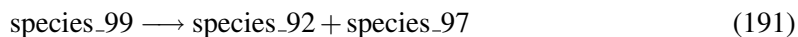
Reactant

Table 290: Properties of each reactant.

Id	Name	SBO
species_99	EGF-pEGFR-2-Grb2-SHP2-pRhoGAP	

Products

Table 291: Properties of each product.

Id	Name	SBO
species_92	EGF-pEGFR-2-Grb2-SHP2	
species_97	RhoGAP	

Kinetic Law

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

$$v_{96} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_99}] \tag{192}$$

Table 292: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.661	s^{-1}	☑

5.97 Reaction `reaction_96`

This is a reversible reaction of two reactants forming one product.

Name R97

Reaction equation

$$species\_87 + species\_90 \Longrightarrow species\_100 \qquad (193)$$
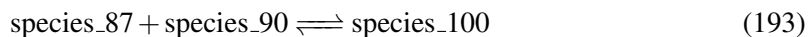
Reactants

Table 293: Properties of each reactant.

Id	Name	SBO
species_87	EGF-pEGFR-2-RasGAP	
species_90	SHP2	

Product

Table 294: Properties of each product.

Id	Name	SBO
species_100	EGF-pEGFR-2-RasGAP-SHP2	

Kinetic Law

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

$$v_{97} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_87] \cdot [species\_90] - k2 \cdot [species\_100]) \quad (194)$$

Table 295: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.114	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.200	s^{-1}	☑

5.98 Reaction reaction_97

This is an irreversible reaction of one reactant forming three products.

Name R98

Reaction equation

$$species\_100 \longrightarrow species\_3 + species\_44 + species\_90 \qquad (195)$$

Produced by SBML2LATEX
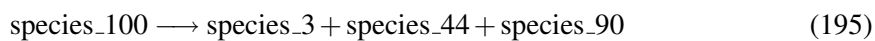
Reactant

Table 296: Properties of each reactant.

Id	Name	SBO
species_100	EGF-pEGFR-2-RasGAP-SHP2	

Products

Table 297: Properties of each product.

Id	Name	SBO
species_3	EGF-EGFR-2	
species_44	RasGAP	
species_90	SHP2	

Kinetic Law

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

$$v_{98} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot k1 \cdot [\mathrm{species\_100}] \tag{196}$$

Table 298: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.661	s^{-1}	☑

5.99 Reaction `reaction_98`

This is a reversible reaction of two reactants forming one product.

Name R99

Reaction equation

$$\mathrm{species\_101} + \mathrm{species\_94} \rightleftharpoons \mathrm{species\_102} \tag{197}$$
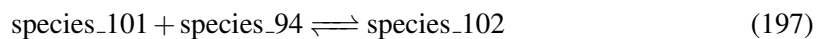
Reactants

Table 299: Properties of each reactant.

Id	Name	SBO
species_101	pSrc	
species_94	RhoGEF	

Product

Table 300: Properties of each product.

Id	Name	SBO
species_102	pSrc-RhoGEF	

Kinetic Law

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

$$v_{99} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_101}] \cdot [\text{species\_94}] - \text{k2} \cdot [\text{species\_102}]) \quad (198)$$

Table 301: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			40.000	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.936	s^{-1}	☑

5.100 Reaction `reaction_99`

This is an irreversible reaction of one reactant forming two products.

Name R100

Reaction equation

$$\text{species\_102} \longrightarrow \text{species\_101} + \text{species\_84} \quad (199)$$

Reactant

Table 302: Properties of each reactant.

Id	Name	SBO
species_102	pSrc-RhoGEF	

Products

Table 303: Properties of each product.

Id	Name	SBO
species_101	pSrc	
species_84	pRhoGEF	

Kinetic Law

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

$$v_{100} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_102}] \qquad (200)$$

Table 304: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.0	s^{-1}	☑

5.101 Reaction `reaction_100`

This is an irreversible reaction of one reactant forming one product.

Name R101

Reaction equation

$$\text{species\_84} \longrightarrow \text{species\_94} \qquad (201)$$

Reactant

Table 305: Properties of each reactant.

Id	Name	SBO
species_84	pRhoGEF	

Product

Table 306: Properties of each product.

Id	Name	SBO
species_94	RhoGEF	

Kinetic Law

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

$$v_{101} = vol\,(compartment\_0) \cdot k1 \cdot [species\_84] \tag{202}$$

Table 307: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.130	s^{-1}	☑

5.102 Reaction `reaction_101`

This is a reversible reaction of two reactants forming one product.

Name R102

Reaction equation

$$species\_101 + species\_97 \rightleftharpoons species\_103 \tag{203}$$
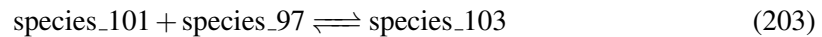
Reactants

Table 308: Properties of each reactant.

Id	Name	SBO
species_101	pSrc	
species_97	RhoGAP	

Product

Table 309: Properties of each product.

Id	Name	SBO
species_103	pSrc-RhoGAP	

Kinetic Law

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

$$v_{102} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_101}] \cdot [\text{species\_97}] - \text{k2} \cdot [\text{species\_103}]) \quad (204)$$

Table 310: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			40.000	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.936	s^{-1}	☑

5.103 Reaction `reaction_102`

This is an irreversible reaction of one reactant forming two products.

Name R103

Reaction equation

$$\text{species\_103} \longrightarrow \text{species\_101} + \text{species\_95} \quad (205)$$

Reactant

Table 311: Properties of each reactant.

Id	Name	SBO
species_103	pSrc-RhoGAP	

Products

Table 312: Properties of each product.

Id	Name	SBO
species_101	pSrc	
species_95	pRhoGAP	

Kinetic Law

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

$$v_{103} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_103}] \quad (206)$$

Table 313: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.0	s^{-1}	☑

5.104 Reaction `reaction_103`

This is a reversible reaction of two reactants forming one product.

Name R104

Reaction equation

$$\text{species\_95} + \text{species\_86} \rightleftharpoons \text{species\_104} \tag{207}$$
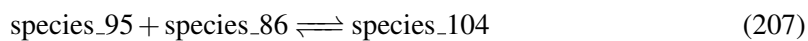
Reactants

Table 314: Properties of each reactant.

Id	Name	SBO
species_95	pRhoGAP	
species_86	RhoGTP	

Product

Table 315: Properties of each product.

Id	Name	SBO
species_104	pRhoGAP-RhoGTP	

Kinetic Law

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

$$v_{104} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_95}] \cdot [\text{species\_86}] - \text{k2} \cdot [\text{species\_104}]\right) \tag{208}$$

Table 316: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			2.845	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.960	s^{-1}	☑

5.105 Reaction `reaction_104`

This is an irreversible reaction of one reactant forming two products.

Name R105

Reaction equation

$$\text{species\_104} \longrightarrow \text{species\_95} + \text{species\_82} \tag{209}$$

Reactant

Table 317: Properties of each reactant.

Id	Name	SBO
species_104	pRhoGAP-RhoGTP	

Products

Table 318: Properties of each product.

Id	Name	SBO
species_95	pRhoGAP	
species_82	RhoGDP	

Kinetic Law

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

$$v_{105} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_104}] \tag{210}$$

Table 319: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.205	s^{-1}	☑

5.106 Reaction `reaction_105`

This is a reversible reaction of two reactants forming one product.

Name R106

Reaction equation

$$\text{species\_86} + \text{species\_105} \rightleftharpoons \text{species\_106} \qquad (211)$$

Reactants

Table 320: Properties of each reactant.

Id	Name	SBO
species_86	RhoGTP	
species_105	ROK	

Product

Table 321: Properties of each product.

Id	Name	SBO
species_106	RhoGTP-ROK	

Kinetic Law

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

$$v_{106} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_86}] \cdot [\text{species\_105}] - \text{k2} \cdot [\text{species\_106}]\right) \quad (212)$$

Table 322: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.754	$\upmu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.500	s^{-1}	☑

5.107 Reaction `reaction_106`

This is an irreversible reaction of one reactant forming two products.

Name R107

Reaction equation

$$\text{species\_106} \longrightarrow \text{species\_86} + \text{species\_68} \qquad (213)$$
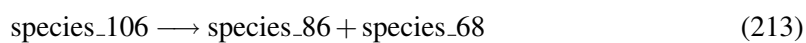
Reactant

Table 323: Properties of each reactant.

Id	Name	SBO
species_106	RhoGTP-ROK	

Products

Table 324: Properties of each product.

Id	Name	SBO
species_86	RhoGTP	
species_68	pROK	

Kinetic Law

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

$$v_{107} = \text{vol}(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_106}] \tag{214}$$

Table 325: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			7.624	s^{-1}	☑

5.108 Reaction `reaction_107`

This is a reversible reaction of two reactants forming one product.

Name R108

Reaction equation

$$\text{species\_4} + \text{species\_107} \rightleftharpoons \text{species\_108} \tag{215}$$
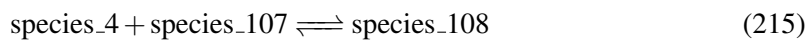
Reactants

Table 326: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_107	Src	

Product

Table 327: Properties of each product.

Id	Name	SBO
species_108	EGF-pEGFR-2-Src	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{108} = \mathrm{vol}\left(\mathrm{compartment\_0}\right) \cdot \left(\mathrm{k1} \cdot [\mathrm{species\_4}] \cdot [\mathrm{species\_107}] - \mathrm{k2} \cdot [\mathrm{species\_108}]\right) \quad (216)$$

Table 328: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			40.000	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			0.936	s^{-1}	☑

5.109 Reaction reaction_108

This is an irreversible reaction of one reactant forming one product.

Name R109

Reaction equation

$$\mathrm{species\_108} \longrightarrow \mathrm{species\_109} \quad (217)$$

Reactant

Table 329: Properties of each reactant.

Id	Name	SBO
species_108	EGF-pEGFR-2-Src	

Product

Table 330: Properties of each product.

Id	Name	SBO
species_109	EGF-pEGFR-2-pSrc	

Kinetic Law

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

$$v_{109} = vol\,(compartment\_0) \cdot k1 \cdot [species\_108] \tag{218}$$

Table 331: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			40.0	s^{-1}	☑

5.110 Reaction `reaction_109`

This is a reversible reaction of one reactant forming two products.

Name R110

Reaction equation

$$species\_4 \rightleftharpoons species\_110 + species\_101 \tag{219}$$
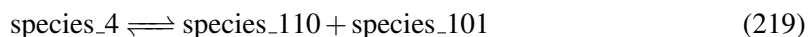
Reactant

Table 332: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	

Products

Table 333: Properties of each product.

Id	Name	SBO
species_110	EGF-pEGRF-2	

Id	Name	SBO
species_101	pSrc	

Kinetic Law

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

$$v_{110} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_4] - k2 \cdot [species\_110] \cdot [species\_101]) \quad (220)$$

Table 334: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.001	s^{-1}	☑
k2			$3.302 \cdot 10^{-4}$	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑

5.111 Reaction reaction_110

This is a reversible reaction of two reactants forming one product.

Name R111

Reaction equation

$$species\_101 + species\_111 \rightleftharpoons species\_112 \quad (221)$$

Reactants

Table 335: Properties of each reactant.

Id	Name	SBO
species_101	pSrc	
species_111	TP7	

Product

Table 336: Properties of each product.

Id	Name	SBO
species_112	pSrc-TP7	

Kinetic Law

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

$$v_{111} = \text{vol} \left(\text{compartment\_0} \right) \cdot \left(\text{k1} \cdot [\text{species\_101}] \cdot [\text{species\_111}] - \text{k2} \cdot [\text{species\_112}] \right) \quad (222)$$

Table 337: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.0	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			1.0	s^{-1}	☑

5.112 Reaction `reaction_111`

This is an irreversible reaction of one reactant forming one product.

Name R112

Reaction equation

$$\text{species\_112} \longrightarrow \text{species\_113} \quad (223)$$

Reactant

Table 338: Properties of each reactant.

Id	Name	SBO
species_112	pSrc-TP7	

Product

Table 339: Properties of each product.

Id	Name	SBO
species_113	Src-TP7	

Kinetic Law

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

$$v_{112} = \text{vol} \left(\text{compartment\_0} \right) \cdot \text{k1} \cdot [\text{species\_112}] \quad (224)$$

Table 340: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.01	s^{-1}	☑

5.113 Reaction `reaction_112`

This is a reversible reaction of one reactant forming two products.

Name R113

Reaction equation

$$\text{species\_113} \rightleftharpoons \text{species\_107} + \text{species\_111} \tag{225}$$

Reactant

Table 341: Properties of each reactant.

Id	Name	SBO
species_113	Src-TP7	

Products

Table 342: Properties of each product.

Id	Name	SBO
species_107	Src	
species_111	TP7	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{113} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_113}] - \text{k2} \cdot [\text{species\_107}] \cdot [\text{species\_111}]) \tag{226}$$

Table 343: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑
k2			1.299	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑

5.114 Reaction `reaction_113`

This is a reversible reaction of two reactants forming one product.

Name R114

Reaction equation

$$\text{species\_15} + \text{species\_114} \rightleftharpoons \text{species\_115} \qquad (227)$$

Reactants

Table 344: Properties of each reactant.

Id	Name	SBO
species_15	EGF-pEGFR-2-pShc-Grb2-SOS	
species_114	Cbl-CIN85	

Product

Table 345: Properties of each product.

Id	Name	SBO
species_115	EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85	

Kinetic Law

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

$$v_{114} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_15}] \cdot [\text{species\_114}] - \text{k2} \cdot [\text{species\_115}]\right) \quad (228)$$

Table 346: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.500	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	✓
k2			0.005	s^{-1}	✓

5.115 Reaction `reaction_114`

This is a reversible reaction of two reactants forming one product.

Name R115

Reaction equation

$$\text{species\_21} + \text{species\_114} \rightleftharpoons \text{species\_116} \qquad (229)$$

Reactants

Table 347: Properties of each reactant.

Id	Name	SBO
species_21	EGF-pEGFR-2-Grb2-SOS	
species_114	Cbl-CIN85	

Product

Table 348: Properties of each product.

Id	Name	SBO
species_116	EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85	

Kinetic Law

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

$$v_{115} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_21}] \cdot [\text{species\_114}] - \text{k2} \cdot [\text{species\_116}]) \quad (230)$$

Table 349: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.500	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.005	s^{-1}	☑

5.116 Reaction `reaction_115`

This is a reversible reaction of two reactants forming one product.

Name R116

Reaction equation

$$\text{species\_115} + \text{species\_117} \rightleftharpoons \text{species\_118} \qquad (231)$$

Reactants

Table 350: Properties of each reactant.

Id	Name	SBO
species_115	EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85	
species_117	EPn	

Product

Table 351: Properties of each product.

Id	Name	SBO
species_118	EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85-EPn	

Kinetic Law

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

$$v_{116} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_115}] \cdot [\text{species\_117}] - \text{k2} \cdot [\text{species\_118}]) \quad (232)$$

Table 352: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.01	s^{-1}	☑

5.117 Reaction `reaction_116`

This is a reversible reaction of two reactants forming one product.

Name R117

Reaction equation

$$\text{species\_116} + \text{species\_117} \rightleftharpoons \text{species\_119} \quad (233)$$

Reactants

Table 353: Properties of each reactant.

Id	Name	SBO
species_116	EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85	
species_117	EPn	

Product

Table 354: Properties of each product.

Id	Name	SBO
species_119	EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85-EPn	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{117} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot (\mathrm{k1} \cdot [\mathrm{species\_116}] \cdot [\mathrm{species\_117}] - \mathrm{k2} \cdot [\mathrm{species\_119}]) \quad (234)$$

Table 355: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\mathrm{mol}^{-1} \cdot 1 \cdot \mathrm{s}^{-1}$	☑
k2			0.01	s^{-1}	☑

5.118 Reaction `reaction_117`

This is an irreversible reaction of one reactant forming four products.

Name R118

Reaction equation

$$\mathrm{species\_118} \longrightarrow \mathrm{species\_120} + \mathrm{species\_114} + \mathrm{species\_117} + \mathrm{species\_121} \quad (235)$$
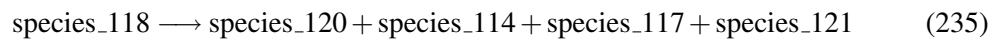
Reactant

Table 356: Properties of each reactant.

Id	Name	SBO
species_118	EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85-EPn	

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Products

Table 357: Properties of each product.

Id	Name	SBO
species_120	EGF-pEGFR-2-degrade	
species_114	Cbl-CIN85	
species_117	EPn	
species_121	pShc-Grb2-SOS	

Kinetic Law

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

$$v_{118} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_118}] \qquad (236)$$

Table 358: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.001	s^{-1}	☑

5.119 Reaction reaction_118

This is an irreversible reaction of one reactant forming four products.

Name R119

Reaction equation

$$\text{species\_119} \longrightarrow \text{species\_120} + \text{species\_114} + \text{species\_117} + \text{species\_16} \qquad (237)$$
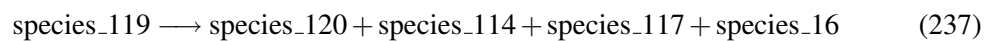
Reactant

Table 359: Properties of each reactant.

Id	Name	SBO
species_119	EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85-EPn	

Products

Table 360: Properties of each product.

Id	Name	SBO
species_120	EGF-pEGFR-2-degrade	
species_114	Cbl-CIN85	
species_117	EPn	
species_16	Grb2-SOS	

Kinetic Law

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

$$v_{119} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_119}] \tag{238}$$

Table 361: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.001	s^{-1}	☑

5.120 Reaction `reaction_119`

This is an irreversible reaction of one reactant forming one product.

Name R120

Reaction equation

$$\text{species\_122} \longrightarrow \text{species\_1} \tag{239}$$

Reactant

Table 362: Properties of each reactant.

Id	Name	SBO
species_122	Pro-EGFR	

Product

Table 363: Properties of each product.

Id	Name	SBO
species_1	EGFR	

Kinetic Law

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

$$v_{120} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_122}] \qquad (240)$$

Table 364: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.005	s^{-1}	☑

5.121 Reaction `reaction_120`

This is a reversible reaction of two reactants forming one product.

Name R121

Reaction equation

$$\text{species\_68} + \text{species\_117} \rightleftharpoons \text{species\_123} \qquad (241)$$
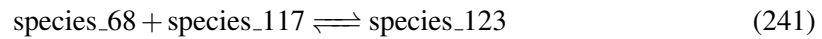
Reactants

Table 365: Properties of each reactant.

Id	Name	SBO
species_68	pROK	
species_117	EPn	

Product

Table 366: Properties of each product.

Id	Name	SBO
species_123	pROK-EPn	

Kinetic Law

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

$$v_{121} = vol\left(compartment\_0\right) \cdot \left(k1 \cdot [species\_68] \cdot [species\_117] - k2 \cdot [species\_123]\right) \quad (242)$$

Table 367: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.100	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.033	s^{-1}	☑

5.122 Reaction `reaction_121`

This is an irreversible reaction of one reactant forming two products.

Name R122

Reaction equation

$$species\_123 \longrightarrow species\_68 + species\_124 \quad (243)$$
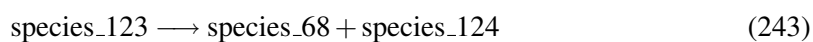
Reactant

Table 368: Properties of each reactant.

Id	Name	SBO
species_123	pROK-EPn	

Products

Table 369: Properties of each product.

Id	Name	SBO
species_68	pROK	
species_124	pEPn	

Kinetic Law

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

$$v_{122} = vol\left(compartment\_0\right) \cdot k1 \cdot [species\_123] \quad (244)$$

Table 370: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			16.0	s^{-1}	☑

5.123 Reaction `reaction_122`

This is a reversible reaction of two reactants forming one product.

Name R123

Reaction equation

$$\text{species\_124} + \text{species\_125} \rightleftharpoons \text{species\_126} \qquad (245)$$

Reactants

Table 371: Properties of each reactant.

Id	Name	SBO
species_124	pEPn	
species_125	MPase	

Product

Table 372: Properties of each product.

Id	Name	SBO
species_126	pEPn-MPase	

Kinetic Law

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

$$v_{123} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_124}] \cdot [\text{species\_125}] - k2 \cdot [\text{species\_126}]) \quad (246)$$

Table 373: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			10.000	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.005	s^{-1}	☑

5.124 Reaction `reaction_123`

This is an irreversible reaction of one reactant forming two products.

Name R124

Reaction equation

$$\text{species\_127} \longrightarrow \text{species\_117} + \text{species\_125} \tag{247}$$

Reactant

Table 374: Properties of each reactant.

Id	Name	SBO
species_127	pEPn-Mpase	

Products

Table 375: Properties of each product.

Id	Name	SBO
species_117	EPn	
species_125	MPase	

Kinetic Law

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

$$v_{124} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_127}] \tag{248}$$

Table 376: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			129.8	s^{-1}	☑

5.125 Reaction `reaction_124`

This is a reversible reaction of two reactants forming one product.

Name R125

Produced by SBML2LATEX

Reaction equation

$$\text{species\_19} + \text{species\_94} \rightleftharpoons \text{species\_128} \tag{249}$$

Reactants

Table 377: Properties of each reactant.

Id	Name	SBO
species_19	RasGTP	
species_94	RhoGEF	

Product

Table 378: Properties of each product.

Id	Name	SBO
species_128	Ras-GTP-RhoGEF	

Kinetic Law

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

$$v_{125} = \text{vol}\left(\text{compartment\_0}\right) \cdot (\text{k1} \cdot [\text{species\_19}] \cdot [\text{species\_94}] - \text{k2} \cdot [\text{species\_128}]) \tag{250}$$

Table 379: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.754	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.050	s^{-1}	☑

5.126 Reaction `reaction_125`

This is an irreversible reaction of one reactant forming two products.

Name R126

Reaction equation

$$\text{species\_128} \longrightarrow \text{species\_19} + \text{species\_84} \tag{251}$$

Reactant

Table 380: Properties of each reactant.

Id	Name	SBO
species_128	Ras-GTP-RhoGEF	

Products

Table 381: Properties of each product.

Id	Name	SBO
species_19	RasGTP	
species_84	pRhoGEF	

Kinetic Law

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

$$v_{126} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_128}] \qquad (252)$$

Table 382: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.076	s^{-1}	☑

5.127 Reaction `reaction_126`

This is a reversible reaction of two reactants forming one product.

Name R127

Reaction equation

$$\text{species\_35} + \text{species\_68} \rightleftharpoons \text{species\_129} \qquad (253)$$
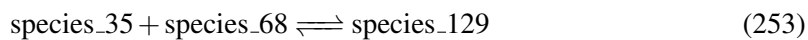
Reactants

Table 383: Properties of each reactant.

Id	Name	SBO
species_35	ppERK	
species_68	pROK	

Product

Table 384: Properties of each product.

Id	Name	SBO
species_129	ppERK-pROK	

Kinetic Law

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

$$v_{127} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_35}] \cdot [\text{species\_68}] - k2 \cdot [\text{species\_129}]) \quad (254)$$

Table 385: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			8.898	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			1.000	s^{-1}	☑

5.128 Reaction `reaction_127`

This is an irreversible reaction of one reactant forming two products.

Name R128

Reaction equation

$$\text{species\_129} \longrightarrow \text{species\_35} + \text{species\_105} \quad (255)$$
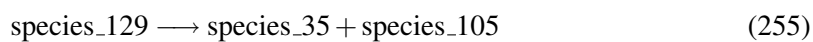
Reactant

Table 386: Properties of each reactant.

Id	Name	SBO
species_129	ppERK-pROK	

Products

Table 387: Properties of each product.

Id	Name	SBO
species_35	ppERK	
species_105	ROK	

Kinetic Law

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

$$v_{128} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_129}] \tag{256}$$
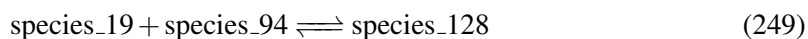
Table 388: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.426	s^{-1}	☑

5.129 Reaction `reaction_128`

This is a reversible reaction of two reactants forming one product.

Name R129

Reaction equation

$$\text{species\_12} + \text{species\_130} \rightleftharpoons \text{species\_131} \tag{257}$$
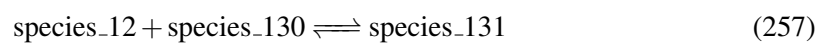
Reactants

Table 389: Properties of each reactant.

Id	Name	SBO
species_12	Grb2	
species_130	MEKK1abcdef	

Product

Table 390: Properties of each product.

Id	Name	SBO
species_131	Grb2-MEKK1abcdef	

Kinetic Law

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

$$v_{129} = vol(compartment\_0) \cdot (k1 \cdot [species\_12] \cdot [species\_130] - k2 \cdot [species\_131]) \quad (258)$$

Table 391: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.05	s^{-1}	☑

5.130 Reaction `reaction_129`

This is a reversible reaction of two reactants forming one product.

Name R130

Reaction equation

$$species\_9 + species\_131 \rightleftharpoons species\_132 \quad (259)$$
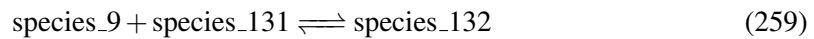
Reactants

Table 392: Properties of each reactant.

Id	Name	SBO
species_9	EGF-pEGFR-2-pShc	
species_131	Grb2-MEKK1abcdef	

Product

Table 393: Properties of each product.

Id	Name	SBO
species_132	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef	

Kinetic Law

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

$$v_{130} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_9}] \cdot [\text{species\_131}] - k2 \cdot [\text{species\_132}]) \quad (260)$$

Table 394: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.0	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.1	s^{-1}	☑

5.131 Reaction `reaction_130`

This is a reversible reaction of two reactants forming one product.

Name R131

Reaction equation

$$\text{species\_4} + \text{species\_131} \rightleftharpoons \text{species\_133} \quad (261)$$

Reactants

Table 395: Properties of each reactant.

Id	Name	SBO
species_4	EGF-pEGFR-2	
species_131	Grb2-MEKK1abcdef	

Product

Table 396: Properties of each product.

Id	Name	SBO
species_133	EGF-pEGFR-2-Grb2-MEKK1abcdef	

Kinetic Law

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

$$v_{131} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_4}] \cdot [\text{species\_131}] - k2 \cdot [\text{species\_133}]) \quad (262)$$

Table 397: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			3.0	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.5	s^{-1}	☑

5.132 Reaction `reaction_131`

This is a reversible reaction of two reactants forming one product.

Name R132

Reaction equation

$$\text{species\_132} + \text{species\_26} \rightleftharpoons \text{species\_134} \tag{263}$$
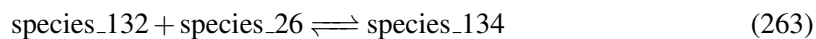
Reactants

Table 398: Properties of each reactant.

Id	Name	SBO
species_132	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef	
species_26	MEK	

Product

Table 399: Properties of each product.

Id	Name	SBO
species_134	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdef	

Kinetic Law

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

$$v_{132} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_132}] \cdot [\text{species\_26}] - \text{k2} \cdot [\text{species\_134}]\right) \tag{264}$$

Table 400: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			1.67	s^{-1}	☑

5.133 Reaction `reaction_132`

This is an irreversible reaction of one reactant forming one product.

Name R133

Reaction equation

$$\text{species\_134} \longrightarrow \text{species\_135} \tag{265}$$

Reactant

Table 401: Properties of each reactant.

Id	Name	SBO
species_134	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdef	

Product

Table 402: Properties of each product.

Id	Name	SBO
species_135	EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdef	

Kinetic Law

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

$$v_{133} = \text{vol}\left(\text{compartment\_0}\right) \cdot \text{k1} \cdot [\text{species\_134}] \tag{266}$$

Table 403: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.134 Reaction `reaction_133`

This is an irreversible reaction of one reactant forming one product.

Name R134

Reaction equation

$$\text{species\_135} \longrightarrow \text{species\_136} \tag{267}$$

Reactant

Table 404: Properties of each reactant.

Id	Name	SBO
species_135	EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdef	

Product

Table 405: Properties of each product.

Id	Name	SBO
species_136	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdef	

Kinetic Law

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

$$v_{134} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_135}] \tag{268}$$

Table 406: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.135 Reaction `reaction_134`

This is a reversible reaction of one reactant forming two products.

Name R135

Reaction equation

$$\text{species\_136} \rightleftharpoons \text{species\_132} + \text{species\_30} \tag{269}$$

Reactant

Table 407: Properties of each reactant.

Id	Name	SBO
species_136	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdef	

Products

Table 408: Properties of each product.

Id	Name	SBO
species_132	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef	
species_30	ppMEK	

Kinetic Law

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

$$v_{135} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_136] - k2 \cdot [species\_132] \cdot [species\_30]) \quad (270)$$

Table 409: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑
k2			5.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑

5.136 Reaction `reaction_135`

This is a reversible reaction of two reactants forming one product.

Name R136

Reaction equation

$$species\_133 + species\_26 \rightleftharpoons species\_137 \quad (271)$$
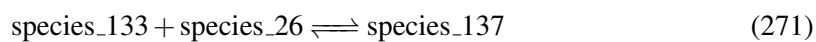
Reactants

Table 410: Properties of each reactant.

Id	Name	SBO
species_133	EGF-pEGFR-2-Grb2-MEKK1abcdef	

Id	Name	SBO
species_26	MEK	

Product

Table 411: Properties of each product.

Id	Name	SBO
species_137	EGF-pEGFR-2-Grb2-MEKK1abMEKcdef	

Kinetic Law

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

$$v_{136} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_133] \cdot [species\_26] - k2 \cdot [species\_137]) \quad (272)$$

Table 412: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			1.67	s^{-1}	☑

5.137 Reaction reaction_136

This is an irreversible reaction of one reactant forming one product.

Name R137

Reaction equation

$$species\_137 \longrightarrow species\_138 \quad (273)$$

Reactant

Table 413: Properties of each reactant.

Id	Name	SBO
species_137	EGF-pEGFR-2-Grb2-MEKK1abMEKcdef	

Product

Table 414: Properties of each product.

Id	Name	SBO
species_138	EGF-pEGFR-2-Grb2-MEKK1abpMEKcdef	

Kinetic Law

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

$$v_{137} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_137}] \tag{274}$$

Table 415: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.138 Reaction reaction_137

This is an irreversible reaction of one reactant forming one product.

Name R138

Reaction equation

$$\text{species\_138} \longrightarrow \text{species\_139} \tag{275}$$

Reactant

Table 416: Properties of each reactant.

Id	Name	SBO
species_138	EGF-pEGFR-2-Grb2-MEKK1abpMEKcdef	

Product

Table 417: Properties of each product.

Id	Name	SBO
species_139	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdef	

Kinetic Law

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

$$v_{138} = vol\,(compartment\_0) \cdot k1 \cdot [species\_138] \tag{276}$$

Table 418: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.139 Reaction `reaction_138`

This is a reversible reaction of one reactant forming two products.

Name R139

Reaction equation

$$species\_139 \rightleftharpoons species\_133 + species\_30 \tag{277}$$

Reactant

Table 419: Properties of each reactant.

Id	Name	SBO
species_139	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdef	

Products

Table 420: Properties of each product.

Id	Name	SBO
species_133	EGF-pEGFR-2-Grb2-MEKK1abcdef	
species_30	ppMEK	

Kinetic Law

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

$$v_{139} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_139] - k2 \cdot [species\_133] \cdot [species\_30]) \tag{278}$$

Table 421: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑
k2			5.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑

5.140 Reaction `reaction_139`

This is a reversible reaction of two reactants forming one product.

Name R140

Reaction equation

$$species\_132 + species\_23 \rightleftharpoons species\_140 \tag{279}$$
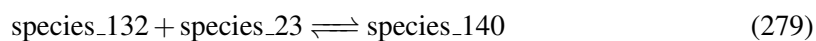
Reactants

Table 422: Properties of each reactant.

Id	Name	SBO
species_132	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef	
species_23	Raf	

Product

Table 423: Properties of each product.

Id	Name	SBO
species_140	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdef	

Kinetic Law

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

$$v_{140} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_132] \cdot [species\_23] - k2 \cdot [species\_140]) \tag{280}$$

Table 424: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.141 Reaction `reaction_140`

This is a reversible reaction of two reactants forming one product.

Name R141

Reaction equation

$$\text{species\_140} + \text{species\_26} \rightleftharpoons \text{species\_141} \tag{281}$$

Reactants

Table 425: Properties of each reactant.

Id	Name	SBO
species_140	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdef	
species_26	MEK	

Product

Table 426: Properties of each product.

Id	Name	SBO
species_141	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdef	

Kinetic Law

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

$$v_{141} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_140}] \cdot [\text{species\_26}] - \text{k2} \cdot [\text{species\_141}]\right) \tag{282}$$

Table 427: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			1.67	s^{-1}	☑

5.142 Reaction `reaction_141`

This is an irreversible reaction of one reactant forming one product.

Name R142

Reaction equation

$$\text{species\_141} \longrightarrow \text{species\_142} \tag{283}$$

Reactant

Table 428: Properties of each reactant.

Id	Name	SBO
species_141	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdef	

Product

Table 429: Properties of each product.

Id	Name	SBO
species_142	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbpMEKcdef	

Kinetic Law

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

$$v_{142} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_141}] \tag{284}$$

Table 430: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.143 Reaction `reaction_142`

This is an irreversible reaction of one reactant forming one product.

Name R143

Reaction equation

$$\text{species\_142} \longrightarrow \text{species\_143} \tag{285}$$

Reactant

Table 431: Properties of each reactant.

Id	Name	SBO
species_142	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbpMEKcdef	

Product

Table 432: Properties of each product.

Id	Name	SBO
species_143	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdef	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{143} = \mathrm{vol}\left(\mathrm{compartment\_0}\right) \cdot \mathrm{k1} \cdot \left[\mathrm{species\_142}\right] \qquad (286)$$

Table 433: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.144 Reaction reaction_143

This is a reversible reaction of one reactant forming two products.

Name R144

Reaction equation

$$\mathrm{species\_143} \rightleftharpoons \mathrm{species\_140} + \mathrm{species\_30} \qquad (287)$$

Reactant

Table 434: Properties of each reactant.

Id	Name	SBO
species_143	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdef	

Products

<p align="center">Table 435: Properties of each product.</p>

Id	Name	SBO
species_140	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdef	
species_30	ppMEK	

Kinetic Law

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

$$v_{144} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_143}] - \text{k2} \cdot [\text{species\_140}] \cdot [\text{species\_30}]\right) \quad (288)$$

<p align="center">Table 436: Properties of each parameter.</p>

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑
k2			5.00	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑

5.145 Reaction `reaction_144`

This is a reversible reaction of two reactants forming one product.

Name R145

Reaction equation

$$\text{species\_133} + \text{species\_23} \rightleftharpoons \text{species\_144} \quad (289)$$
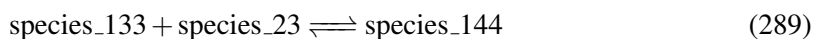
Reactants

<p align="center">Table 437: Properties of each reactant.</p>

Id	Name	SBO
species_133	EGF-pEGFR-2-Grb2-MEKK1abcdef	
species_23	Raf	

Product

Table 438: Properties of each product.

Id	Name	SBO
species_144	EGF-pEGFR-2-Grb2-MEKK1aRafbcdef	

Kinetic Law

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

$$v_{145} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_133] \cdot [species\_23] - k2 \cdot [species\_144]) \quad (290)$$

Table 439: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.146 Reaction `reaction_145`

This is a reversible reaction of two reactants forming one product.

Name R146

Reaction equation

$$species\_144 + species\_26 \rightleftharpoons species\_145 \quad (291)$$
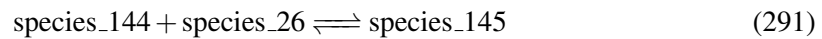
Reactants

Table 440: Properties of each reactant.

Id	Name	SBO
species_144	EGF-pEGFR-2-Grb2-MEKK1aRafbcdef	
species_26	MEK	

Product

Table 441: Properties of each product.

Id	Name	SBO
species_145	EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdef	

Kinetic Law

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

$$v_{146} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_144}] \cdot [\text{species\_26}] - k2 \cdot [\text{species\_145}]) \quad (292)$$

Table 442: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			1.67	s^{-1}	☑

5.147 Reaction `reaction_146`

This is an irreversible reaction of one reactant forming one product.

Name R147

Reaction equation

$$\text{species\_145} \longrightarrow \text{species\_146} \quad (293)$$

Reactant

Table 443: Properties of each reactant.

Id	Name	SBO
species_145	EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdef	

Product

Table 444: Properties of each product.

Id	Name	SBO
species_146	EGF-pEGFR-2-Grb2-MEKK1aRafbpMEKcdef	

Kinetic Law

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

$$v_{147} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_145}] \quad (294)$$

Table 445: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.148 Reaction `reaction_147`

This is an irreversible reaction of one reactant forming one product.

Name R148

Reaction equation

$$\text{species\_146} \longrightarrow \text{species\_147} \tag{295}$$

Reactant

Table 446: Properties of each reactant.

Id	Name	SBO
species_146	EGF-pEGFR-2-Grb2-MEKK1aRafbpMEKcdef	

Product

Table 447: Properties of each product.

Id	Name	SBO
species_147	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdef	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{148} = \mathrm{vol}\left(\text{compartment\_0}\right) \cdot \text{k1} \cdot [\text{species\_146}] \tag{296}$$

Table 448: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.149 Reaction `reaction_148`

This is a reversible reaction of one reactant forming two products.

Name R149

Reaction equation

$$\text{species\_147} \rightleftharpoons \text{species\_144} + \text{species\_30} \tag{297}$$

Reactant

Table 449: Properties of each reactant.

Id	Name	SBO
species_147	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdef	

Products

Table 450: Properties of each product.

Id	Name	SBO
species_144	EGF-pEGFR-2-Grb2-MEKK1aRafbcdef	
species_30	ppMEK	

Kinetic Law

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

$$v_{149} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_147}] - \text{k2} \cdot [\text{species\_144}] \cdot [\text{species\_30}]\right) \tag{298}$$

Table 451: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑
k2			5.00	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑

5.150 Reaction `reaction_149`

This is a reversible reaction of two reactants forming one product.

Name R150

Reaction equation

$$\text{species\_132} + \text{species\_19} \rightleftharpoons \text{species\_148} \qquad (299)$$
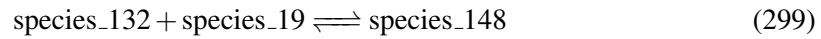
Reactants

Table 452: Properties of each reactant.

Id	Name	SBO
species_132	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef	
species_19	RasGTP	

Product

Table 453: Properties of each product.

Id	Name	SBO
species_148	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdefRasGTP	

Kinetic Law

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

$$v_{150} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_132}] \cdot [\text{species\_19}] - \text{k2} \cdot [\text{species\_148}]) \qquad (300)$$

Table 454: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.151 Reaction reaction_150

This is a reversible reaction of two reactants forming one product.

Name R151

Reaction equation

$$\text{species\_148} + \text{species\_26} \rightleftharpoons \text{species\_149} \qquad (301)$$
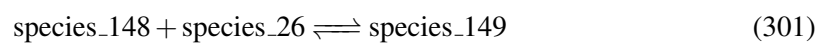
Reactants

Table 455: Properties of each reactant.

Id	Name	SBO
species_148	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdefRasGTP	
species_26	MEK	

Product

Table 456: Properties of each product.

Id	Name	SBO
species_149	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdefRasGTP	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{151} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot (\mathrm{k1} \cdot [\mathrm{species\_148}] \cdot [\mathrm{species\_26}] - \mathrm{k2} \cdot [\mathrm{species\_149}]) \quad (302)$$

Table 457: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			1.67	s^{-1}	☑

5.152 Reaction `reaction_151`

This is an irreversible reaction of one reactant forming one product.

Name R152

Reaction equation

$$\mathrm{species\_149} \longrightarrow \mathrm{species\_150} \quad (303)$$

Reactant

Table 458: Properties of each reactant.

Id	Name	SBO
species_149	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdefRasGTP	

Product

Table 459: Properties of each product.

Id	Name	SBO
species_150	EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdefRasGTP	

Kinetic Law

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

$$v_{152} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_149}] \qquad (304)$$

Table 460: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.153 Reaction reaction_152

This is an irreversible reaction of one reactant forming one product.

Name R153

Reaction equation

$$\text{species\_150} \longrightarrow \text{species\_151} \qquad (305)$$

Reactant

Table 461: Properties of each reactant.

Id	Name	SBO
species_150	EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdefRasGTP	

Product

Table 462: Properties of each product.

Id	Name	SBO
species_151	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdefRasGTP	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{153} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot \mathrm{k1} \cdot [\mathrm{species\_150}] \qquad (306)$$

Table 463: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.154 Reaction `reaction_153`

This is a reversible reaction of one reactant forming two products.

Name R154

Reaction equation

$$\mathrm{species\_151} \rightleftharpoons \mathrm{species\_148} + \mathrm{species\_30} \qquad (307)$$

Reactant

Table 464: Properties of each reactant.

Id	Name	SBO
species_151	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdefRasGTP	

Products

Table 465: Properties of each product.

Id	Name	SBO
species_148	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdefRasGTP	

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Id	Name	SBO
species_30	ppMEK	

Kinetic Law

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

$$v_{154} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_151}] - k2 \cdot [\text{species\_148}] \cdot [\text{species\_30}]) \quad (308)$$

Table 466: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑
k2			5.00	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑

5.155 Reaction `reaction_154`

This is a reversible reaction of two reactants forming one product.

Name R155

Reaction equation

$$\text{species\_133} + \text{species\_19} \rightleftharpoons \text{species\_152} \quad (309)$$
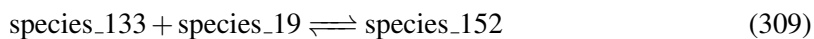
Reactants

Table 467: Properties of each reactant.

Id	Name	SBO
species_133	EGF-pEGFR-2-Grb2-MEKK1abcdef	
species_19	RasGTP	

Product

Table 468: Properties of each product.

Id	Name	SBO
species_152	EGF-pEGFR-2-Grb2-MEKK1abcdefRasGTP	

Kinetic Law

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

$$v_{155} = \text{vol} \left(\text{compartment\_0} \right) \cdot \left(k1 \cdot [\text{species\_133}] \cdot [\text{species\_19}] - k2 \cdot [\text{species\_152}] \right) \quad (310)$$

Table 469: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.156 Reaction `reaction_155`

This is a reversible reaction of two reactants forming one product.

Name R156

Reaction equation

$$\text{species\_152} + \text{species\_26} \rightleftharpoons \text{species\_153} \quad (311)$$

Reactants

Table 470: Properties of each reactant.

Id	Name	SBO
species_152	EGF-pEGFR-2-Grb2-MEKK1abcdefRasGTP	
species_26	MEK	

Product

Table 471: Properties of each product.

Id	Name	SBO
species_153	EGF-pEGFR-2-Grb2-MEKK1abMEKcdefRasGTP	

Kinetic Law

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

$$v_{156} = \text{vol} \left(\text{compartment\_0} \right) \cdot \left(k1 \cdot [\text{species\_152}] \cdot [\text{species\_26}] - k2 \cdot [\text{species\_153}] \right) \quad (312)$$
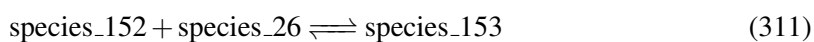
Table 472: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			1.67	s^{-1}	☑

5.157 Reaction `reaction_156`

This is an irreversible reaction of one reactant forming one product.

Name R157

Reaction equation

$$\text{species\_153} \longrightarrow \text{species\_154} \tag{313}$$

Reactant

Table 473: Properties of each reactant.

Id	Name	SBO
species_153	EGF-pEGFR-2-Grb2-MEKK1abMEKcdefRasGTP	

Product

Table 474: Properties of each product.

Id	Name	SBO
species_154	EGF-pEGFR-2-Grb2-MEKK1abpMEKcdefRasGTP	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{157} = \text{vol}\left(\text{compartment\_0}\right) \cdot \text{k1} \cdot [\text{species\_153}] \tag{314}$$

Table 475: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.158 Reaction `reaction_157`

This is an irreversible reaction of one reactant forming one product.

Name R158

Reaction equation

$$\text{species\_154} \longrightarrow \text{species\_155} \tag{315}$$

Reactant

Table 476: Properties of each reactant.

Id	Name	SBO
species_154	EGF-pEGFR-2-Grb2-MEKK1abpMEKcdefRasGTP	

Product

Table 477: Properties of each product.

Id	Name	SBO
species_155	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdefRasGTP	

Kinetic Law

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

$$v_{158} = \text{vol}\left(\text{compartment\_0}\right) \cdot \text{k1} \cdot [\text{species\_154}] \tag{316}$$

Table 478: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.159 Reaction `reaction_158`

This is a reversible reaction of one reactant forming two products.

Name R159

Reaction equation

$$\text{species\_155} \rightleftharpoons \text{species\_152} + \text{species\_30} \qquad (317)$$

Reactant

Table 479: Properties of each reactant.

Id	Name	SBO
species_155	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdefRasGTP	

Products

Table 480: Properties of each product.

Id	Name	SBO
species_152	EGF-pEGFR-2-Grb2-MEKK1abcdefRasGTP	
species_30	ppMEK	

Kinetic Law

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

$$v_{159} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_155}] - \text{k2} \cdot [\text{species\_152}] \cdot [\text{species\_30}]) \quad (318)$$

Table 481: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑
k2			5.00	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑

5.160 Reaction reaction_159

This is a reversible reaction of two reactants forming one product.

Name R160

Reaction equation

$$\text{species\_151} + \text{species\_31} \rightleftharpoons \text{species\_156} \qquad (319)$$
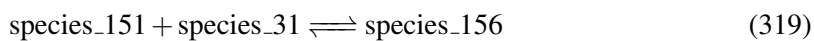
Reactants

Table 482: Properties of each reactant.

Id	Name	SBO
species_151	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdefRasGTP	
species_31	ERK	

Product

Table 483: Properties of each product.

Id	Name	SBO
species_156	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdefRasGTP	

Kinetic Law

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

$$v_{160} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_151] \cdot [species\_31] - k2 \cdot [species\_156]) \quad (320)$$

Table 484: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			1.67	s^{-1}	☑

5.161 Reaction `reaction_160`

This is an irreversible reaction of one reactant forming one product.

Name R161

Reaction equation

$$species\_156 \longrightarrow species\_157 \quad (321)$$

Reactant

Table 485: Properties of each reactant.

Id	Name	SBO
species_156	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdefRasGTP	

Product

Table 486: Properties of each product.

Id	Name	SBO
species_157	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdefRasGTP	

Kinetic Law

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

$$v_{161} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_156}] \tag{322}$$

Table 487: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.162 Reaction reaction_161

This is an irreversible reaction of one reactant forming one product.

Name R162

Reaction equation

$$\text{species\_157} \longrightarrow \text{species\_158} \tag{323}$$

Reactant

Table 488: Properties of each reactant.

Id	Name	SBO
species_157	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdefRasGTP	

Product

Table 489: Properties of each product.

Id	Name	SBO
species_158	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdefRasGTP	

Kinetic Law

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

$$v_{162} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_157}] \tag{324}$$

Table 490: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.163 Reaction reaction_162

This is an irreversible reaction of one reactant forming two products.

Name R163

Reaction equation

$$\text{species\_158} \longrightarrow \text{species\_151} + \text{species\_35} \tag{325}$$

Reactant

Table 491: Properties of each reactant.

Id	Name	SBO
species_158	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdefRasGTP	

Products

Table 492: Properties of each product.

Id	Name	SBO
species_151	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdefRasGTP	

Id	Name	SBO
species_35	ppERK	

Kinetic Law

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

$$v_{163} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_158}] \tag{326}$$

Table 493: Properties of each parameter.
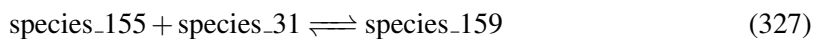
Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑

5.164 Reaction `reaction_163`

This is a reversible reaction of two reactants forming one product.

Name R164

Reaction equation

$$\text{species\_155} + \text{species\_31} \rightleftharpoons \text{species\_159} \tag{327}$$

Reactants

Table 494: Properties of each reactant.

Id	Name	SBO
species_155	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdefRasGTP	
species_31	ERK	

Product

Table 495: Properties of each product.

Id	Name	SBO
species_159	EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdefRasGTP	

Kinetic Law

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

$$v_{164} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_155}] \cdot [\text{species\_31}] - \text{k2} \cdot [\text{species\_159}]) \quad (328)$$

Table 496: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\text{mol}^{-1} \cdot l \cdot s^{-1}$	✓
k2			1.67	s^{-1}	✓

5.165 Reaction `reaction_164`

This is an irreversible reaction of one reactant forming one product.

Name R165

Reaction equation

$$\text{species\_159} \longrightarrow \text{species\_160} \quad (329)$$

Reactant

Table 497: Properties of each reactant.

Id	Name	SBO
species_159	EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdefRasGTP	

Product

Table 498: Properties of each product.

Id	Name	SBO
species_160	EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdefRasGTP	

Kinetic Law

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

$$v_{165} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_159}] \quad (330)$$

Table 499: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	✓

5.166 Reaction `reaction_165`

This is an irreversible reaction of one reactant forming one product.

Name R166

Reaction equation

$$\text{species\_160} \longrightarrow \text{species\_161} \tag{331}$$

Reactant

Table 500: Properties of each reactant.

Id	Name	SBO
species_160	EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdefRasGTP	

Product

Table 501: Properties of each product.

Id	Name	SBO
species_161	EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdefRasGTP	

Kinetic Law

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

$$v_{166} = \text{vol}\left(\text{compartment\_0}\right) \cdot k1 \cdot [\text{species\_160}] \tag{332}$$

Table 502: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	✓

5.167 Reaction `reaction_166`

This is an irreversible reaction of one reactant forming two products.

Name R167

Reaction equation

$$\text{species\_161} \longrightarrow \text{species\_155} + \text{species\_35} \tag{333}$$

Reactant

Table 503: Properties of each reactant.

Id	Name	SBO
species_161	EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdefRasGTP	

Products

Table 504: Properties of each product.

Id	Name	SBO
species_155	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdefRasGTP	
species_35	ppERK	

Kinetic Law

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

$$v_{167} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_161}] \tag{334}$$

Table 505: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑

5.168 Reaction `reaction_167`

This is a reversible reaction of two reactants forming one product.

Name R168

Reaction equation

$$\text{species\_132} + \text{species\_25} \rightleftharpoons \text{species\_162} \qquad (335)$$

Reactants

Table 506: Properties of each reactant.

Id	Name	SBO
species_132	EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef	
species_25	pRaf	

Product

Table 507: Properties of each product.

Id	Name	SBO
species_162	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbcdef	

Kinetic Law

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

$$v_{168} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_132}] \cdot [\text{species\_25}] - \text{k2} \cdot [\text{species\_162}]) \qquad (336)$$
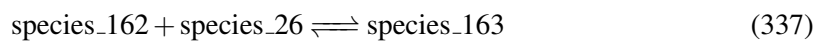
Table 508: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			0.500	s^{-1}	☑

5.169 Reaction reaction_168

This is a reversible reaction of two reactants forming one product.

Name R169

Reaction equation

$$\text{species\_162} + \text{species\_26} \rightleftharpoons \text{species\_163} \qquad (337)$$

Reactants

Table 509: Properties of each reactant.

Id	Name	SBO
species_162	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbcdef	
species_26	MEK	

Product

Table 510: Properties of each product.

Id	Name	SBO
species_163	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbMEKcdef	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mathrm{\mu mol}$

$$v_{169} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot (\mathrm{k1} \cdot [\mathrm{species\_162}] \cdot [\mathrm{species\_26}] - \mathrm{k2} \cdot [\mathrm{species\_163}]) \quad (338)$$

Table 511: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mathrm{\mu mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			1.67	s^{-1}	☑

5.170 Reaction `reaction_169`

This is an irreversible reaction of one reactant forming one product.

Name R170

Reaction equation

$$\mathrm{species\_163} \longrightarrow \mathrm{species\_164} \quad (339)$$

Reactant

Table 512: Properties of each reactant.

Id	Name	SBO
species_163	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbMEKcdef	

Product

Table 513: Properties of each product.

Id	Name	SBO
species_164	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbpMEKcdef	

Kinetic Law

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

$$v_{170} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_163}] \tag{340}$$

Table 514: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.171 Reaction reaction_170

This is an irreversible reaction of one reactant forming one product.

Name R171

Reaction equation

$$\text{species\_164} \longrightarrow \text{species\_165} \tag{341}$$

Reactant

Table 515: Properties of each reactant.

Id	Name	SBO
species_164	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbpMEKcdef	

Product

Table 516: Properties of each product.

Id	Name	SBO
species_165	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbppMEKcdef	

Kinetic Law

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

$$v_{171} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot k1 \cdot [\mathrm{species\_164}] \tag{342}$$

Table 517: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.172 Reaction `reaction_171`

This is a reversible reaction of one reactant forming two products.

Name R172

Reaction equation

$$\mathrm{species\_165} \Longrightarrow \mathrm{species\_162} + \mathrm{species\_30} \tag{343}$$

Reactant

Table 518: Properties of each reactant.

Id	Name	SBO
species_165	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbppMEKcdef	

Products

Table 519: Properties of each product.

Id	Name	SBO
species_162	EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbcdef	

Id	Name	SBO
species_30	ppMEK	

Kinetic Law

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

$$v_{172} = \text{vol} \left(\text{compartment\_0} \right) \cdot \left(k1 \cdot [\text{species\_165}] - k2 \cdot [\text{species\_162}] \cdot [\text{species\_30}] \right) \quad (344)$$
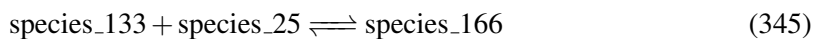
Table 520: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	✓
k2			5.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	✓

5.173 Reaction reaction_172

This is a reversible reaction of two reactants forming one product.

Name R173

Reaction equation

$$\text{species\_133} + \text{species\_25} \rightleftharpoons \text{species\_166} \quad (345)$$

Reactants

Table 521: Properties of each reactant.

Id	Name	SBO
species_133	EGF-pEGFR-2-Grb2-MEKK1abcdef	
species_25	pRaf	

Product

Table 522: Properties of each product.

Id	Name	SBO
species_166	EGF-pEGFR-2-Grb2-MEKK1apRafbcdef	

Kinetic Law

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

$$v_{173} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_133}] \cdot [\text{species\_25}] - \text{k2} \cdot [\text{species\_166}]) \quad (346)$$
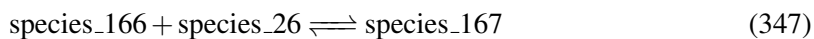
Table 523: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.174 Reaction `reaction_173`

This is a reversible reaction of two reactants forming one product.

Name R174

Reaction equation

$$\text{species\_166} + \text{species\_26} \rightleftharpoons \text{species\_167} \quad (347)$$

Reactants

Table 524: Properties of each reactant.

Id	Name	SBO
species_166	EGF-pEGFR-2-Grb2-MEKK1apRafbcdef	
species_26	MEK	

Product

Table 525: Properties of each product.

Id	Name	SBO
species_167	EGF-pEGFR-2-Grb2-MEKK1apRafbMEKcdef	

Kinetic Law

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

$$v_{174} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_166}] \cdot [\text{species\_26}] - \text{k2} \cdot [\text{species\_167}]) \quad (348)$$

Table 526: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\text{mol}^{-1} \cdot \text{l} \cdot \text{s}^{-1}$	☑
k2			1.67	s^{-1}	☑

5.175 Reaction `reaction_174`

This is an irreversible reaction of one reactant forming one product.

Name R175

Reaction equation

$$\text{species\_167} \longrightarrow \text{species\_168} \tag{349}$$

Reactant

Table 527: Properties of each reactant.

Id	Name	SBO
species_167	EGF-pEGFR-2-Grb2-MEKK1apRafbMEKcdef	

Product

Table 528: Properties of each product.

Id	Name	SBO
species_168	EGF-pEGFR-2-Grb2-MEKK1apRafbpMEKcdef	

Kinetic Law

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

$$v_{175} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_167}] \tag{350}$$

Table 529: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.176 Reaction `reaction_175`

This is an irreversible reaction of one reactant forming one product.

Name R176

Reaction equation

$$\text{species\_168} \longrightarrow \text{species\_169} \tag{351}$$

Reactant

Table 530: Properties of each reactant.

Id	Name	SBO
species_168	EGF-pEGFR-2-Grb2-MEKK1apRafbpMEKcdef	

Product

Table 531: Properties of each product.

Id	Name	SBO
species_169	EGF-pEGFR-2-Grb2-MEKK1apRafbppMEKcdef	

Kinetic Law

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

$$v_{176} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_168}] \tag{352}$$

Table 532: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.693	s^{-1}	☑

5.177 Reaction `reaction_176`

This is a reversible reaction of one reactant forming two products.

Name R177

Reaction equation

$$\text{species\_169} \rightleftharpoons \text{species\_166} + \text{species\_30} \tag{353}$$

Reactant

Table 533: Properties of each reactant.

Id	Name	SBO
species_169	EGF-pEGFR-2-Grb2-MEKK1apRafbppMEKcdef	

Products

Table 534: Properties of each product.

Id	Name	SBO
species_166	EGF-pEGFR-2-Grb2-MEKK1apRafbcdef	
species_30	ppMEK	

Kinetic Law

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

$$v_{177} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_169}] - \text{k2} \cdot [\text{species\_166}] \cdot [\text{species\_30}]) \tag{354}$$

Table 535: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑
k2			5.00	$\mu\text{mol}^{-1} \cdot 1 \cdot s^{-1}$	☑

5.178 Reaction reaction_177

This is a reversible reaction of two reactants forming one product.

Name R178

Reaction equation

$$\text{species\_134} + \text{species\_86} \rightleftharpoons \text{species\_170} \tag{355}$$
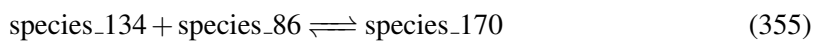
Reactants

Table 536: Properties of each reactant.

Id	Name	SBO
species_134	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdef	
species_86	RhoGTP	

Product

Table 537: Properties of each product.

Id	Name	SBO
species_170	EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdRhoGTPef	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{178} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot (\mathrm{k1} \cdot [\mathrm{species\_134}] \cdot [\mathrm{species\_86}] - \mathrm{k2} \cdot [\mathrm{species\_170}]) \quad (356)$$

Table 538: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			16.67	$\mu\mathrm{mol}^{-1} \cdot \mathrm{l} \cdot \mathrm{s}^{-1}$	☑
k2			0.05	s^{-1}	☑

5.179 Reaction `reaction_178`

This is a reversible reaction of two reactants forming one product.

Name R179

Reaction equation

$$\mathrm{species\_137} + \mathrm{species\_86} \rightleftharpoons \mathrm{species\_172} \quad (357)$$

Reactants

Produced by SBML2LATEX
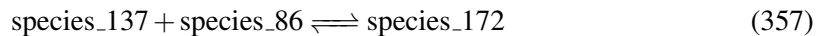
Table 539: Properties of each reactant.

Id	Name	SBO
species_137	EGF-pEGFR-2-Grb2-MEKK1abMEKcdef	
species_86	RhoGTP	

Product

Table 540: Properties of each product.

Id	Name	SBO
species_172	EGF-pEGFR-2-Grb2-MEKK1abMEKcdRhoGTPef	

Kinetic Law

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

$$v_{179} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(k1 \cdot [\text{species\_137}] \cdot [\text{species\_86}] - k2 \cdot [\text{species\_172}]\right) \quad (358)$$
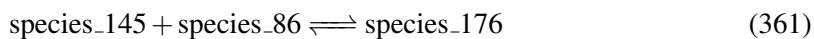
Table 541: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			16.67	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.05	s^{-1}	☑

5.180 Reaction `reaction_179`

This is a reversible reaction of two reactants forming one product.

Name R180

Reaction equation

$$\text{species\_141} + \text{species\_86} \rightleftharpoons \text{species\_174} \quad (359)$$

Reactants

Table 542: Properties of each reactant.

Id	Name	SBO
species_141	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdef	

Id	Name	SBO
species_86	RhoGTP	

Product

Table 543: Properties of each product.

Id	Name	SBO
species_174	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdRhoGTPef	

Kinetic Law

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

$$v_{180} = vol\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_141}] \cdot [\text{species\_86}] - k2 \cdot [\text{species\_174}]) \quad (360)$$
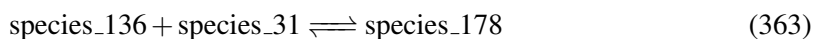
Table 544: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			16.67	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.05	s^{-1}	☑

5.181 Reaction reaction_180

This is a reversible reaction of two reactants forming one product.

Name R181

Reaction equation

$$\text{species\_145} + \text{species\_86} \rightleftharpoons \text{species\_176} \quad (361)$$

Reactants

Table 545: Properties of each reactant.

Id	Name	SBO
species_145	EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdef	
species_86	RhoGTP	

Product

Table 546: Properties of each product.

Id	Name	SBO
species_176	EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdRhoGTPef	

Kinetic Law

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

$$v_{181} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_145}] \cdot [\text{species\_86}] - \text{k2} \cdot [\text{species\_176}]) \quad (362)$$

Table 547: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			16.67	$\mu mol^{-1} \cdot l \cdot s^{-1}$	✓
k2			0.05	s^{-1}	✓

5.182 Reaction reaction_181

This is a reversible reaction of two reactants forming one product.

Name R182

Reaction equation

$$\text{species\_136} + \text{species\_31} \rightleftharpoons \text{species\_178} \quad (363)$$

Reactants

Table 548: Properties of each reactant.

Id	Name	SBO
species_136	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdef	
species_31	ERK	

Product

Table 549: Properties of each product.

Id	Name	SBO
species_178	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdef	

Kinetic Law

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

$$v_{182} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_136] \cdot [species\_31] - k2 \cdot [species\_178]) \quad (364)$$

Table 550: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			1.67	s^{-1}	☑

5.183 Reaction `reaction_182`

This is an irreversible reaction of one reactant forming one product.

Name R183

Reaction equation

$$species\_178 \longrightarrow species\_179 \quad (365)$$

Reactant

Table 551: Properties of each reactant.

Id	Name	SBO
species_178	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdef	

Product

Table 552: Properties of each product.

Id	Name	SBO
species_179	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdef	

Kinetic Law

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

$$v_{183} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_178}] \tag{366}$$
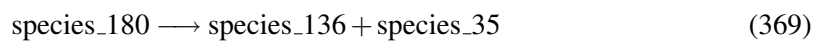
Table 553: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.184 Reaction `reaction_183`

This is an irreversible reaction of one reactant forming one product.

Name R184

Reaction equation

$$\text{species\_179} \longrightarrow \text{species\_180} \tag{367}$$

Reactant

Table 554: Properties of each reactant.

Id	Name	SBO
species_179	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdef	

Product

Table 555: Properties of each product.

Id	Name	SBO
species_180	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdef	

Kinetic Law

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

$$v_{184} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_179}] \tag{368}$$

Table 556: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	✔

5.185 Reaction `reaction_184`

This is an irreversible reaction of one reactant forming two products.

Name R185

Reaction equation

$$\text{species\_180} \longrightarrow \text{species\_136} + \text{species\_35} \tag{369}$$

Reactant

Table 557: Properties of each reactant.

Id	Name	SBO
species_180	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdef	

Products

Table 558: Properties of each product.

Id	Name	SBO
species_136	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdef	
species_35	ppERK	

Kinetic Law

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

$$v_{185} = \text{vol}(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_180}] \tag{370}$$

Table 559: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	✔

5.186 Reaction `reaction_185`

This is a reversible reaction of two reactants forming one product.

Name R186

Reaction equation

$$\text{species\_139} + \text{species\_31} \rightleftharpoons \text{species\_181} \qquad (371)$$

Reactants

Table 560: Properties of each reactant.

Id	Name	SBO
species_139	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdef	
species_31	ERK	

Product

Table 561: Properties of each product.

Id	Name	SBO
species_181	EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdef	

Kinetic Law

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

$$v_{186} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_139}] \cdot [\text{species\_31}] - \text{k2} \cdot [\text{species\_181}]\right) \quad (372)$$

Table 562: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\text{mol}^{-1} \cdot l \cdot s^{-1}$	☑
k2			1.67	s^{-1}	☑

5.187 Reaction `reaction_186`

This is an irreversible reaction of one reactant forming one product.

Name R187

Reaction equation

$$\text{species\_181} \longrightarrow \text{species\_182} \tag{373}$$

Reactant

Table 563: Properties of each reactant.

Id	Name	SBO
species_181	EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdef	

Product

Table 564: Properties of each product.

Id	Name	SBO
species_182	EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdef	

Kinetic Law

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

$$v_{187} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_181}] \tag{374}$$

Table 565: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.188 Reaction `reaction_187`

This is an irreversible reaction of one reactant forming one product.

Name R188

Reaction equation

$$\text{species\_182} \longrightarrow \text{species\_183} \tag{375}$$

Reactant

Table 566: Properties of each reactant.

Id	Name	SBO
species_182	EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdef	

Product

Table 567: Properties of each product.

Id	Name	SBO
species_183	EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdef	

Kinetic Law

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

$$v_{188} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_182}] \tag{376}$$

Table 568: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.189 Reaction reaction_188

This is an irreversible reaction of one reactant forming two products.

Name R189

Reaction equation

$$\text{species\_183} \longrightarrow \text{species\_139} + \text{species\_35} \tag{377}$$

Reactant

Table 569: Properties of each reactant.

Id	Name	SBO
species_183	EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdef	

Products

Table 570: Properties of each product.

Id	Name	SBO
species_139	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdef	
species_35	ppERK	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{189} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot \mathrm{k1} \cdot [\mathrm{species\_183}] \tag{378}$$

Table 571: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑

5.190 Reaction `reaction_189`

This is a reversible reaction of two reactants forming one product.

Name R190

Reaction equation

$$\mathrm{species\_143} + \mathrm{species\_31} \rightleftharpoons \mathrm{species\_184} \tag{379}$$
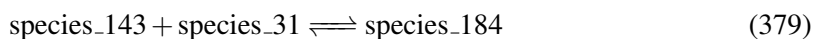
Reactants

Table 572: Properties of each reactant.

Id	Name	SBO
species_143	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdef	
species_31	ERK	

Product

Table 573: Properties of each product.

Id	Name	SBO
species_184	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcERKdef	

Kinetic Law

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

$$v_{190} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_143] \cdot [species\_31] - k2 \cdot [species\_184]) \quad (380)$$

Table 574: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			1.67	s^{-1}	☑

5.191 Reaction reaction_190

This is an irreversible reaction of one reactant forming one product.

Name R191

Reaction equation

$$species\_184 \longrightarrow species\_185 \quad (381)$$

Reactant

Table 575: Properties of each reactant.

Id	Name	SBO
species_184	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcERKdef	

Product

Table 576: Properties of each product.

Id	Name	SBO
species_185	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcpERKdef	

Kinetic Law

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

$$v_{191} = \text{vol} \, (\text{compartment\_0}) \cdot k1 \cdot [\text{species\_184}] \tag{382}$$

Table 577: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.192 Reaction `reaction_191`

This is an irreversible reaction of one reactant forming one product.

Name R192

Reaction equation

$$\text{species\_185} \longrightarrow \text{species\_186} \tag{383}$$

Reactant

Table 578: Properties of each reactant.

Id	Name	SBO
species_185	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcpERKdef	

Product

Table 579: Properties of each product.

Id	Name	SBO
species_186	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcppERKdef	

Kinetic Law

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

$$v_{192} = \text{vol} \, (\text{compartment\_0}) \cdot k1 \cdot [\text{species\_185}] \tag{384}$$

Table 580: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.193 Reaction `reaction_192`

This is an irreversible reaction of one reactant forming two products.

Name R193

Reaction equation

$$\text{species\_186} \longrightarrow \text{species\_143} + \text{species\_35} \tag{385}$$

Reactant

Table 581: Properties of each reactant.

Id	Name	SBO
species_186	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcppERKdef	

Products

Table 582: Properties of each product.

Id	Name	SBO
species_143	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdef	
species_35	ppERK	

Kinetic Law

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

$$v_{193} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_186}] \tag{386}$$

Table 583: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	☑

5.194 Reaction `reaction_193`

This is a reversible reaction of two reactants forming one product.

Name R194

Reaction equation

$$\text{species\_147} + \text{species\_31} \rightleftharpoons \text{species\_187} \tag{387}$$

Reactants

Table 584: Properties of each reactant.

Id	Name	SBO
species_147	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdef	
species_31	ERK	

Product

Table 585: Properties of each product.

Id	Name	SBO
species_187	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcERKdef	

Kinetic Law

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

$$v_{194} = \text{vol}\left(\text{compartment\_0}\right) \cdot \left(\text{k1} \cdot [\text{species\_147}] \cdot [\text{species\_31}] - \text{k2} \cdot [\text{species\_187}]\right) \tag{388}$$

Table 586: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			5.00	$\mu\text{mol}^{-1} \cdot 1 \cdot \text{s}^{-1}$	☑
k2			1.67	s^{-1}	☑

5.195 Reaction `reaction_194`

This is an irreversible reaction of one reactant forming one product.

Name R195

Reaction equation

$$\text{species\_187} \longrightarrow \text{species\_188} \tag{389}$$
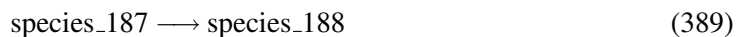
Reactant

Table 587: Properties of each reactant.

Id	Name	SBO
species_187	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcERKdef	

Product

Table 588: Properties of each product.

Id	Name	SBO
species_188	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcpERKdef	

Kinetic Law

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

$$v_{195} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_187}] \tag{390}$$

Table 589: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.196 Reaction `reaction_195`

This is an irreversible reaction of one reactant forming one product.

Name R196

Reaction equation

$$\text{species\_188} \longrightarrow \text{species\_189} \tag{391}$$

Reactant

Table 590: Properties of each reactant.

Id	Name	SBO
species_188	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcpERKdef	

Product

Table 591: Properties of each product.

Id	Name	SBO
species_189	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcppERKdef	

Kinetic Law

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

$$v_{196} = \text{vol}\left(\text{compartment\_0}\right) \cdot k1 \cdot [\text{species\_188}] \tag{392}$$

Table 592: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			0.100	s^{-1}	☑

5.197 Reaction reaction_196

This is an irreversible reaction of one reactant forming two products.

Name R197

Reaction equation

$$\text{species\_189} \longrightarrow \text{species\_147} + \text{species\_35} \tag{393}$$

Reactant

Table 593: Properties of each reactant.

Id	Name	SBO
species_189	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcppERKdef	

Products

Table 594: Properties of each product.

Id	Name	SBO
species_147	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdef	
species_35	ppERK	

Kinetic Law

Derived unit $\mathrm{s}^{-1} \cdot \mu\mathrm{mol}$

$$v_{197} = \mathrm{vol}\,(\mathrm{compartment\_0}) \cdot \mathrm{k1} \cdot [\mathrm{species\_189}] \tag{394}$$

Table 595: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.67	s^{-1}	✓

5.198 Reaction `reaction_197`

This is a reversible reaction of two reactants forming one product.

Name R198

Reaction equation

$$\mathrm{species\_171} + \mathrm{species\_95} \rightleftharpoons \mathrm{species\_190} \tag{395}$$
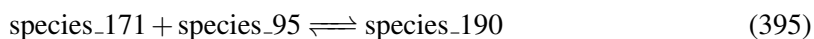
Reactants

Table 596: Properties of each reactant.

Id	Name	SBO
species_171	EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdRhoGTPef	
species_95	pRhoGAP	

Product

Table 597: Properties of each product.

Id	Name	SBO
species_190	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf	

Kinetic Law

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

$$v_{198} = vol\,(compartment\_0) \cdot (k1 \cdot [species\_171] \cdot [species\_95] - k2 \cdot [species\_190]) \quad (396)$$

Table 598: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu mol^{-1} \cdot 1 \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.199 Reaction reaction_198

This is an irreversible reaction of one reactant forming three products.

Name R199

Reaction equation

$$species\_190 \longrightarrow species\_143 + species\_82 + species\_95 \quad (397)$$

Reactant

Table 599: Properties of each reactant.

Id	Name	SBO
species_190	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf	

Products

Table 600: Properties of each product.

Id	Name	SBO
species_143	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdef	
species_82	RhoGDP	

Id	Name	SBO
species_95	pRhoGAP	

Kinetic Law

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

$$v_{199} = \text{vol}\,(\text{compartment\_0}) \cdot k1 \cdot [\text{species\_190}] \tag{398}$$

Table 601: Properties of each parameter.

| Id	Name	SBO	Value	Unit	Constant
k1			1.205	s^{-1}	☑

5.200 Reaction `reaction_199`

This is a reversible reaction of two reactants forming one product.

Name R200

Reaction equation

$$\text{species\_173} + \text{species\_95} \rightleftharpoons \text{species\_191} \tag{399}$$

Reactants

Table 602: Properties of each reactant.

Id	Name	SBO
species_173	EGF-pEGFR-2-Grb2-MEKK1abppMEKcdRhoGTPef	
species_95	pRhoGAP	

Product

Table 603: Properties of each product.

Id	Name	SBO
species_191	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf	

Kinetic Law

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

$$v_{200} = \text{vol}(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_173}] \cdot [\text{species\_95}] - k2 \cdot [\text{species\_191}]) \quad (400)$$

Table 604: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.201 Reaction `reaction_200`

This is an irreversible reaction of one reactant forming three products.

Name R201

Reaction equation

$$\text{species\_191} \longrightarrow \text{species\_147} + \text{species\_82} + \text{species\_95} \quad (401)$$
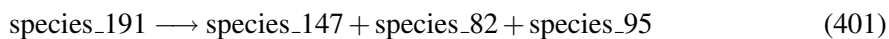
Reactant

Table 605: Properties of each reactant.

Id	Name	SBO
species_191	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf	

Products

Table 606: Properties of each product.

Id	Name	SBO
species_147	EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdef	
species_82	RhoGDP	
species_95	pRhoGAP	

Kinetic Law

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

$$v_{201} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_191}] \tag{402}$$

Table 607: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.205	s^{-1}	☑

5.202 Reaction `reaction_201`

This is a reversible reaction of two reactants forming one product.

Name R202

Reaction equation

$$\text{species\_175} + \text{species\_95} \rightleftharpoons \text{species\_192} \tag{403}$$
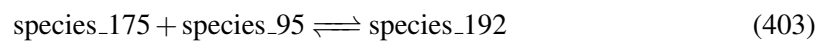
Reactants

Table 608: Properties of each reactant.

Id	Name	SBO
species_175	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdRhoGTPef	
species_95	pRhoGAP	

Product

Table 609: Properties of each product.

Id	Name	SBO
species_192	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf	

Kinetic Law

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

$$v_{202} = \text{vol}\,(\text{compartment\_0}) \cdot (\text{k1} \cdot [\text{species\_175}] \cdot [\text{species\_95}] - \text{k2} \cdot [\text{species\_192}]) \tag{404}$$
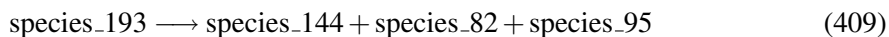
Table 610: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu\text{mol}^{-1} \cdot 1 \cdot \text{s}^{-1}$	☑
k2			0.500	s^{-1}	☑

5.203 Reaction `reaction_202`

This is an irreversible reaction of one reactant forming three products.

Name R203

Reaction equation

$$\text{species\_192} \longrightarrow \text{species\_140} + \text{species\_82} + \text{species\_95} \tag{405}$$
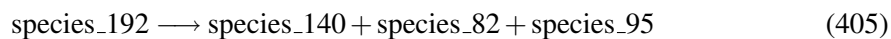
Reactant

Table 611: Properties of each reactant.

Id	Name	SBO
species_192	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf	

Products

Table 612: Properties of each product.

Id	Name	SBO
species_140	EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdef	
species_82	RhoGDP	
species_95	pRhoGAP	

Kinetic Law

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

$$v_{203} = \text{vol}\,(\text{compartment\_0}) \cdot \text{k1} \cdot [\text{species\_192}] \tag{406}$$

Table 613: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.205	s^{-1}	☑

5.204 Reaction `reaction_203`

This is a reversible reaction of two reactants forming one product.

Name R204

Reaction equation

$$\text{species\_177} + \text{species\_95} \rightleftharpoons \text{species\_193} \tag{407}$$

Reactants

Table 614: Properties of each reactant.

Id	Name	SBO
species_177	EGF-pEGFR-2-Grb2-MEKK1aRafbcdRhoGTPef	
species_95	pRhoGAP	

Product

Table 615: Properties of each product.

Id	Name	SBO
species_193	EGF-pEGFR-2-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf	

Kinetic Law

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

$$v_{204} = \text{vol}\,(\text{compartment\_0}) \cdot (k1 \cdot [\text{species\_177}] \cdot [\text{species\_95}] - k2 \cdot [\text{species\_193}]) \tag{408}$$

Table 616: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.667	$\mu mol^{-1} \cdot l \cdot s^{-1}$	☑
k2			0.500	s^{-1}	☑

5.205 Reaction `reaction_204`

This is an irreversible reaction of one reactant forming three products.

Name R205

Reaction equation

$$\text{species\_193} \longrightarrow \text{species\_144} + \text{species\_82} + \text{species\_95} \tag{409}$$

Reactant

Table 617: Properties of each reactant.

Id	Name	SBO
species_193	EGF-pEGFR-2-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf	

Products

Table 618: Properties of each product.

Id	Name	SBO
species_144	EGF-pEGFR-2-Grb2-MEKK1aRafbcdef	
species_82	RhoGDP	
species_95	pRhoGAP	

Kinetic Law

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

$$v_{205} = \text{vol}\left(\text{compartment\_0}\right) \cdot \text{k1} \cdot [\text{species\_193}] \tag{410}$$

Table 619: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
k1			1.205	s^{-1}	☑

6 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.

6.1 Species `species_0`

Name EGF

Initial concentration $0.0081967 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in one reaction (as a reactant in `reaction_0`).

$$\frac{d}{dt}\text{species\_0} = -v_1 \tag{411}$$

6.2 Species `species_1`

Name EGFR

Initial concentration $0.3 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_0` and as a product in `reaction_119`).

$$\frac{d}{dt}\text{species\_1} = v_{120} - v_1 \tag{412}$$

6.3 Species `species_2`

Name EGF-EGFR

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_1` and as a product in `reaction_0`).

$$\frac{d}{dt}\text{species\_2} = v_1 - 2v_2 \tag{413}$$

6.4 Species `species_3`

Name EGF-EGFR-2

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in six reactions (as a reactant in `reaction_2` and as a product in `reaction_1`, `reaction_4`, `reaction_86`, `reaction_87`, `reaction_97`).

$$\frac{d}{dt}\text{species\_3} = v_2 + v_5 + v_{87} + v_{88} + v_{98} - v_3 \tag{414}$$

6.5 Species `species_4`

Name EGF-pEGFR-2

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in 13 reactions (as a reactant in `reaction_3`, `reaction_5`, `reaction-_16`, `reaction_18`, `reaction_49`, `reaction_81`, `reaction_107`, `reaction_109`, `reaction-_130` and as a product in `reaction_2`, `reaction_7`, `reaction_45`, `reaction_47`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_4} = v_3 + v_8 + v_{46} + v_{48} - v_4 - v_6 - v_{17} - v_{19} - v_{50} - v_{82} - v_{108} - v_{110} - v_{131} \quad (415)$$

6.6 Species `species_5`

Name SHP

Initial concentration $0.1\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_3`, `reaction_8` and as a product in `reaction_4`, `reaction_9`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_5} = v_5 + v_{10} - v_4 - v_9 \quad (416)$$

6.7 Species `species_6`

Name EGF-pEGFR-2-SHP

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_4` and as a product in `reaction_3`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_6} = v_4 - v_5 \quad (417)$$

6.8 Species `species_7`

Name Shc

Initial concentration $1\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_5` and as a product in `reaction_9`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_7} = v_{10} - v_6 \quad (418)$$

6.9 Species `species_8`

Name EGF-pEGFR-2-Shc

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_6` and as a product in `reaction_5`).

$$\frac{d}{dt}\text{species\_8} = v_6 - v_7 \tag{419}$$

6.10 Species `species_9`

Name EGF-pEGFR-2-pShc

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in five reactions (as a reactant in `reaction_7`, `reaction_10`, `reaction_13`, `reaction_129` and as a product in `reaction_6`).

$$\frac{d}{dt}\text{species\_9} = v_7 - v_8 - v_{11} - v_{14} - v_{130} \tag{420}$$

6.11 Species `species_10`

Name pShc

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_8` and as a product in `reaction_7`, `reaction_45`, `reaction_86`).

$$\frac{d}{dt}\text{species\_10} = v_8 + v_{46} + v_{87} - v_9 \tag{421}$$

6.12 Species `species_11`

Name pShc-SHP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_9` and as a product in `reaction_8`).

$$\frac{d}{dt}\text{species\_11} = v_9 - v_{10} \tag{422}$$

6.13 Species `species_12`

Name Grb2

Initial concentration $1 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in `reaction_10`, `reaction_12`, `reaction_16`, `reaction_128` and as a product in `reaction_45`, `reaction_47`, `reaction_86`, `reaction_87`).

$$\frac{\text{d}}{\text{d}t}\text{species\_12} = v_{46} + v_{48} + v_{87} + v_{88} - v_{11} - v_{13} - v_{17} - v_{129} \tag{423}$$

6.14 Species `species_13`

Name EGF-pEGFR-2-pShc-Grb2

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_11`, `reaction_84` and as a product in `reaction_10`).

$$\frac{\text{d}}{\text{d}t}\text{species\_13} = v_{11} - v_{12} - v_{85} \tag{424}$$

6.15 Species `species_14`

Name SOS

Initial concentration $0.3 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_11`, `reaction_12`, `reaction_17` and as a product in `reaction_48`).

$$\frac{\text{d}}{\text{d}t}\text{species\_14} = v_{49} - v_{12} - v_{13} - v_{18} \tag{425}$$

6.16 Species `species_15`

Name EGF-pEGFR-2-pShc-Grb2-SOS

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in `reaction_14`, `reaction_44`, `reaction_113` and as a product in `reaction_11`, `reaction_13`, `reaction_15`).

$$\frac{\text{d}}{\text{d}t}\text{species\_15} = v_{12} + v_{14} + v_{16} - v_{15} - v_{45} - v_{114} \tag{426}$$

6.17 Species `species_16`

Name Grb2-SOS

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_13`, `reaction_18` and as a product in `reaction_12`, `reaction_118`).

$$\frac{d}{dt}\text{species\_16} = v_{13} + v_{119} - v_{14} - v_{19} \tag{427}$$

6.18 Species `species_17`

Name RasGDP

Initial concentration $0.15 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in five reactions (as a reactant in `reaction_14`, `reaction_19` and as a product in `reaction_41`, `reaction_43`, `reaction_83`).

$$\frac{d}{dt}\text{species\_17} = v_{42} + v_{44} + v_{84} - v_{15} - v_{20} \tag{428}$$

6.19 Species `species_18`

Name EGF-pEGFR-2-pShc-Grb2-SOS-RasGDP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_15` and as a product in `reaction_14`).

$$\frac{d}{dt}\text{species\_18} = v_{15} - v_{16} \tag{429}$$

6.20 Species `species_19`

Name RasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in eleven reactions (as a reactant in `reaction_21`, `reaction_41`, `reaction_42`, `reaction_82`, `reaction_124`, `reaction_149`, `reaction_154` and as a product in `reaction_15`, `reaction_20`, `reaction_22`, `reaction_125`).

$$\frac{d}{dt}\text{species\_19} = v_{16} + v_{21} + v_{23} + v_{126} - v_{22} - v_{42} - v_{43} - v_{83} - v_{125} - v_{150} - v_{155} \tag{430}$$

6.21 Species `species_20`

Name EGF-pEGFR-2-Grb2

Initial concentration $0 \ \mu\text{mol} \cdot 1^{-1}$

This species takes part in three reactions (as a reactant in `reaction_17`, `reaction_85` and as a product in `reaction_16`).

$$\frac{\text{d}}{\text{d}t}\text{species\_20} = v_{17} - v_{18} - v_{86} \tag{431}$$

6.22 Species `species_21`

Name EGF-pEGFR-2-Grb2-SOS

Initial concentration $0 \ \mu\text{mol} \cdot 1^{-1}$

This species takes part in six reactions (as a reactant in `reaction_19`, `reaction_46`, `reaction-_114` and as a product in `reaction_17`, `reaction_18`, `reaction_20`).

$$\frac{\text{d}}{\text{d}t}\text{species\_21} = v_{18} + v_{19} + v_{21} - v_{20} - v_{47} - v_{115} \tag{432}$$

6.23 Species `species_22`

Name EGF-pEGFR-2-Grb2-SOS-RasGDP

Initial concentration $0 \ \mu\text{mol} \cdot 1^{-1}$

This species takes part in two reactions (as a reactant in `reaction_20` and as a product in `reaction_19`).

$$\frac{\text{d}}{\text{d}t}\text{species\_22} = v_{20} - v_{21} \tag{433}$$

6.24 Species `species_23`

Name Raf

Initial concentration $0.5 \ \mu\text{mol} \cdot 1^{-1}$

This species takes part in four reactions (as a reactant in `reaction_21`, `reaction_139`, `reaction-_144` and as a product in `reaction_32`).

$$\frac{\text{d}}{\text{d}t}\text{species\_23} = v_{33} - v_{22} - v_{140} - v_{145} \tag{434}$$

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6.25 Species `species_24`

Name Raf-RasGTP

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_22` and as a product in `reaction_21`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_24} = v_{22} - v_{23} \tag{435}$$

6.26 Species `species_25`

Name pRaf

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in ten reactions (as a reactant in `reaction_23`, `reaction_25`, `reaction_31`, `reaction_61`, `reaction_167`, `reaction_172` and as a product in `reaction_22`, `reaction_24`, `reaction_26`, `reaction_63`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_25} = v_{23} + v_{25} + v_{27} + v_{64} - v_{24} - v_{26} - v_{32} - v_{62} - v_{168} - v_{173} \tag{436}$$

6.27 Species `species_26`

Name MEK

Initial concentration $0.68\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in ten reactions (as a reactant in `reaction_23`, `reaction_131`, `reaction_135`, `reaction_140`, `reaction_145`, `reaction_150`, `reaction_155`, `reaction_168`, `reaction_173` and as a product in `reaction_36`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_26} = v_{37} - v_{24} - v_{132} - v_{136} - v_{141} - v_{146} - v_{151} - v_{156} - v_{169} - v_{174} \tag{437}$$

6.28 Species `species_27`

Name pRaf-MEK

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_24` and as a product in `reaction_23`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_27} = v_{24} - v_{25} \tag{438}$$

6.29 Species `species_28`

Name pMEK

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_25`, `reaction_35` and as a product in `reaction_24`, `reaction_34`).

$$\frac{\text{d}}{\text{d}t}\text{species\_28} = v_{25} + v_{35} - v_{26} - v_{36} \tag{439}$$

6.30 Species `species_29`

Name pRaf-pMEK

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_26` and as a product in `reaction_25`).

$$\frac{\text{d}}{\text{d}t}\text{species\_29} = v_{26} - v_{27} \tag{440}$$

6.31 Species `species_30`

Name ppMEK

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in 14 reactions (as a reactant in `reaction_27`, `reaction_29`, `reaction_33` and as a product in `reaction_26`, `reaction_28`, `reaction_30`, `reaction_134`, `reaction_138`, `reaction_143`, `reaction_148`, `reaction_153`, `reaction_158`, `reaction_171`, `reaction_176`).

$$\frac{\text{d}}{\text{d}t}\text{species\_30} = v_{27} + v_{29} + v_{31} + v_{135} + v_{139} + v_{144} + v_{149}$$
$$+ v_{154} + v_{159} + v_{172} + v_{177} - v_{28} - v_{30} - v_{34} \tag{441}$$

6.32 Species `species_31`

Name ERK

Initial concentration $0.4 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in eight reactions (as a reactant in `reaction_27`, `reaction_159`, `reaction_163`, `reaction_181`, `reaction_185`, `reaction_189`, `reaction_193` and as a product in `reaction_40`).

$$\frac{\text{d}}{\text{d}t}\text{species\_31} = v_{41} - v_{28} - v_{160} - v_{164} - v_{182} - v_{186} - v_{190} - v_{194} \tag{442}$$

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6.33 Species `species_32`

Name ppMEK-ERK

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_28` and as a product in `reaction_27`).

$$\frac{d}{dt}\text{species\_32} = v_{28} - v_{29} \tag{443}$$

6.34 Species `species_33`

Name pERK

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in four reactions (as a reactant in `reaction_29`, `reaction_39` and as a product in `reaction_28`, `reaction_38`).

$$\frac{d}{dt}\text{species\_33} = v_{29} + v_{39} - v_{30} - v_{40} \tag{444}$$

6.35 Species `species_34`

Name ppMEK-pERK

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_30` and as a product in `reaction_29`).

$$\frac{d}{dt}\text{species\_34} = v_{30} - v_{31} \tag{445}$$

6.36 Species `species_35`

Name ppERK

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in 14 reactions (as a reactant in `reaction_37`, `reaction_44`, `reaction_46`, `reaction_126` and as a product in `reaction_30`, `reaction_45`, `reaction_47`, `reaction_127`, `reaction_162`, `reaction_166`, `reaction_184`, `reaction_188`, `reaction_192`, `reaction_196`).

$$\frac{d}{dt}\text{species\_35} = v_{31} + v_{46} + v_{48} + v_{128} + v_{163} + v_{167} + v_{185}$$
$$+ v_{189} + v_{193} + v_{197} - v_{38} - v_{45} - v_{47} - v_{127} \tag{446}$$

6.37 Species `species_36`

Name Pase

Initial concentration $0.5 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_31` and as a product in `reaction_32`).

$$\frac{\text{d}}{\text{d}t}\text{species\_36} = v_{33} - v_{32} \tag{447}$$

6.38 Species `species_37`

Name pRaf-Pase

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_32` and as a product in `reaction_31`).

$$\frac{\text{d}}{\text{d}t}\text{species\_37} = v_{32} - v_{33} \tag{448}$$

6.39 Species `species_38`

Name PP2A

Initial concentration $0.02 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_33`, `reaction_35` and as a product in `reaction_34`, `reaction_36`).

$$\frac{\text{d}}{\text{d}t}\text{species\_38} = v_{35} + v_{37} - v_{34} - v_{36} \tag{449}$$

6.40 Species `species_39`

Name ppMEK-PP2A

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_34` and as a product in `reaction_33`).

$$\frac{\text{d}}{\text{d}t}\text{species\_39} = v_{34} - v_{35} \tag{450}$$

6.41 Species `species_40`

Name pMEK-PP2A

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_36` and as a product in `reaction_35`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_40} = v_{36} - v_{37} \tag{451}$$

6.42 Species `species_41`

Name MKP3

Initial concentration $0.0020\,\mu\text{mol}\cdot l^{-1}$

This species takes part in four reactions (as a reactant in `reaction_37`, `reaction_39` and as a product in `reaction_38`, `reaction_40`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_41} = v_{39} + v_{41} - v_{38} - v_{40} \tag{452}$$

6.43 Species `species_42`

Name ppERK-MKP3

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_38` and as a product in `reaction_37`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_42} = v_{38} - v_{39} \tag{453}$$

6.44 Species `species_43`

Name pERK-MKP3

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_40` and as a product in `reaction_39`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_43} = v_{40} - v_{41} \tag{454}$$

6.45 Species `species_44`

Name RasGAP

Initial concentration $0.1 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_42`, `reaction_81` and as a product in `reaction_43`, `reaction_97`).

$$\frac{\text{d}}{\text{d}t}\text{species\_44} = v_{44} + v_{98} - v_{43} - v_{82} \tag{455}$$

6.46 Species `species_45`

Name RasGTP-RasGAP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_43` and as a product in `reaction_42`).

$$\frac{\text{d}}{\text{d}t}\text{species\_45} = v_{43} - v_{44} \tag{456}$$

6.47 Species `species_46`

Name ppERK-EGF-pEGFR-2-pShc-Grb2-SOS

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_45` and as a product in `reaction_44`).

$$\frac{\text{d}}{\text{d}t}\text{species\_46} = v_{45} - v_{46} \tag{457}$$

6.48 Species `species_47`

Name pSOS

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_48` and as a product in `reaction_45`, `reaction_47`).

$$\frac{\text{d}}{\text{d}t}\text{species\_47} = v_{46} + v_{48} - v_{49} \tag{458}$$

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6.49 Species `species_48`

Name ppERK-EGF-pEGFR-2-Grb2-SOS

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_47` and as a product in `reaction_46`).

$$\frac{\text{d}}{\text{d}t}\text{species\_48} = v_{47} - v_{48} \tag{459}$$

6.50 Species `species_49`

Name PI3K

Initial concentration $0.01\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_49` and as a product in `reaction_52`).

$$\frac{\text{d}}{\text{d}t}\text{species\_49} = v_{53} - v_{50} \tag{460}$$

6.51 Species `species_50`

Name EGF-pEGFR-2-PI3K

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_50` and as a product in `reaction_49`).

$$\frac{\text{d}}{\text{d}t}\text{species\_50} = v_{50} - v_{51} \tag{461}$$

6.52 Species `species_51`

Name EGF-pEGFF-2

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_50`).

$$\frac{\text{d}}{\text{d}t}\text{species\_51} = v_{51} \tag{462}$$

6.53 Species `species_52`

Name pPI3K

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_51`, `reaction_53` and as a product in `reaction_50`, `reaction_54`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_52} = v_{51} + v_{55} - v_{52} - v_{54} \tag{463}$$

6.54 Species `species_53`

Name TP4

Initial concentration $0.2\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_51` and as a product in `reaction_52`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_53} = v_{53} - v_{52} \tag{464}$$

6.55 Species `species_54`

Name pPI3K-TP4

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_52` and as a product in `reaction_51`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_54} = v_{52} - v_{53} \tag{465}$$

6.56 Species `species_55`

Name PIP2

Initial concentration $0.5\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_53` and as a product in `reaction_67`, `reaction_69`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_55} = v_{68} + v_{70} - v_{54} \tag{466}$$

6.57 Species `species_56`

Name pPI3K-PIP2

Initial concentration $0\,\mu\text{mol}\cdot 1^{-1}$

This species takes part in two reactions (as a reactant in `reaction_54` and as a product in `reaction_53`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_56} = v_{54} - v_{55} \tag{467}$$

6.58 Species `species_57`

Name PIP3

Initial concentration $0.5\,\mu\text{mol}\cdot 1^{-1}$

This species takes part in six reactions (as a reactant in `reaction_55`, `reaction_66`, `reaction-_69`, `reaction_70` and as a product in `reaction_54`, `reaction_58`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_57} = v_{55} + v_{59} - v_{56} - v_{67} - v_{70} - v_{71} \tag{468}$$

6.59 Species `species_58`

Name Akt

Initial concentration $0.1\,\mu\text{mol}\cdot 1^{-1}$

This species takes part in one reaction (as a reactant in `reaction_55`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_58} = -v_{56} \tag{469}$$

6.60 Species `species_59`

Name Akt-PIP3

Initial concentration $0\,\mu\text{mol}\cdot 1^{-1}$

This species takes part in three reactions (as a reactant in `reaction_56` and as a product in `reaction_55`, `reaction_60`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_59} = v_{56} + v_{61} - v_{57} \tag{470}$$

6.61 Species `species_60`

Name PDK1

Initial concentration $0.1 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_56` and as a product in `reaction_57`).

$$\frac{\text{d}}{\text{d}t}\text{species\_60} = v_{58} - v_{57} \tag{471}$$

6.62 Species `species_61`

Name Akt-PIP3-PDK1

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_57` and as a product in `reaction_56`).

$$\frac{\text{d}}{\text{d}t}\text{species\_61} = v_{57} - v_{58} \tag{472}$$

6.63 Species `species_62`

Name pAkt-PIP3

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in five reactions (as a reactant in `reaction_58`, `reaction_59`, `reaction_61` and as a product in `reaction_57`, `reaction_62`).

$$\frac{\text{d}}{\text{d}t}\text{species\_62} = v_{58} + v_{63} - v_{59} - v_{60} - v_{62} \tag{473}$$

6.64 Species `species_63`

Name pAkt

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_58`).

$$\frac{\text{d}}{\text{d}t}\text{species\_63} = v_{59} \tag{474}$$

6.65 Species `species_64`

Name Takt

Initial concentration $0.1\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_59` and as a product in `reaction_60`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_64} = v_{61} - v_{60} \tag{475}$$

6.66 Species `species_65`

Name pAkt-PIP3-Takt

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_60` and as a product in `reaction_59`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_65} = v_{60} - v_{61} \tag{476}$$

6.67 Species `species_66`

Name pRaf-pAkt-PIP3

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_62` and as a product in `reaction_61`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_66} = v_{62} - v_{63} \tag{477}$$

6.68 Species `species_67`

Name ppRaf

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_63` and as a product in `reaction_62`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_67} = v_{63} - v_{64} \tag{478}$$

6.69 Species `species_68`

Name pROK

Initial concentration $0\ \mu\text{mol}\cdot l^{-1}$

This species takes part in six reactions (as a reactant in `reaction_64`, `reaction_120`, `reaction-_126` and as a product in `reaction_65`, `reaction_106`, `reaction_121`).

$$\frac{d}{dt}\text{species\_68} = v_{66} + v_{107} + v_{122} - v_{65} - v_{121} - v_{127} \tag{479}$$

6.70 Species `species_69`

Name PTEN

Initial concentration $0.1\ \mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_64` and as a product in `reaction_68`).

$$\frac{d}{dt}\text{species\_69} = v_{69} - v_{65} \tag{480}$$

6.71 Species `species_70`

Name pROK-PTEN

Initial concentration $0\ \mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_65` and as a product in `reaction_64`).

$$\frac{d}{dt}\text{species\_70} = v_{65} - v_{66} \tag{481}$$

6.72 Species `species_71`

Name pPTEN

Initial concentration $0\ \mu\text{mol}\cdot l^{-1}$

This species takes part in four reactions (as a reactant in `reaction_66`, `reaction_68` and as a product in `reaction_65`, `reaction_67`).

$$\frac{d}{dt}\text{species\_71} = v_{66} + v_{68} - v_{67} - v_{69} \tag{482}$$

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6.73 Species `species_72`

Name pPTEN-PIP3

Initial concentration $0 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_67` and as a product in `reaction_66`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_72} = v_{67} - v_{68} \tag{483}$$

6.74 Species `species_73`

Name RacGEF

Initial concentration $0.1 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in one reaction (as a reactant in `reaction_70`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_73} = -v_{71} \tag{484}$$

6.75 Species `species_74`

Name PIP3-RacGEF

Initial concentration $0 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_71` and as a product in `reaction_70`, `reaction_72`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_74} = v_{71} + v_{73} - v_{72} \tag{485}$$

6.76 Species `species_75`

Name RacGDP

Initial concentration $0.2 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_71`, `reaction_73` and as a product in `reaction_74`, `reaction_76`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_75} = v_{75} + v_{77} - v_{72} - v_{74} \tag{486}$$

6.77 Species `species_76`

Name PIP3-RacGEF-RacGDP

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_72` and as a product in `reaction_71`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_76} = v_{72} - v_{73} \tag{487}$$

6.78 Species `species_77`

Name RacGTP

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_74`, `reaction_75` and as a product in `reaction_72`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_77} = v_{73} - v_{75} - v_{76} \tag{488}$$

6.79 Species `species_78`

Name RhoGDI

Initial concentration $0.1\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_73`, `reaction_77`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_78} = -v_{74} - v_{78} \tag{489}$$

6.80 Species `species_79`

Name RhoGDI-RacGDP

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_73`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_79} = v_{74} \tag{490}$$

6.81 Species species_80

Name RacGAP

Initial concentration $0.1\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_75` and as a product in `reaction_76`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_80} = v_{77} - v_{76} \tag{491}$$

6.82 Species species_81

Name RacGTP-RacGAP

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_76` and as a product in `reaction_75`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_81} = v_{76} - v_{77} \tag{492}$$

6.83 Species species_82

Name RhoGDP

Initial concentration $0.15\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in eight reactions (as a reactant in `reaction_77`, `reaction_78` and as a product in `reaction_80`, `reaction_104`, `reaction_198`, `reaction_200`, `reaction_202`, `reaction_204`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_82} = v_{81} + v_{105} + v_{199} + v_{201} + v_{203} + v_{205} - v_{78} - v_{79} \tag{493}$$

6.84 Species species_83

Name RhoGDP-RhoGDI

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_77`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_83} = v_{78} \tag{494}$$

6.85 Species `species_84`

Name pRhoGEF

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in seven reactions (as a reactant in `reaction_78`, `reaction_88`, `reaction_92`, `reaction_100` and as a product in `reaction_79`, `reaction_99`, `reaction_125`).

$$\frac{\text{d}}{\text{d}t}\text{species\_84} = v_{80} + v_{100} + v_{126} - v_{79} - v_{89} - v_{93} - v_{101} \tag{495}$$

6.86 Species `species_85`

Name RhoGDP-pRhoGEF

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_79` and as a product in `reaction_78`).

$$\frac{\text{d}}{\text{d}t}\text{species\_85} = v_{79} - v_{80} \tag{496}$$

6.87 Species `species_86`

Name RhoGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in nine reactions (as a reactant in `reaction_80`, `reaction_103`, `reaction_105`, `reaction_177`, `reaction_178`, `reaction_179`, `reaction_180` and as a product in `reaction_79`, `reaction_106`).

$$\frac{\text{d}}{\text{d}t}\text{species\_86} = v_{80} + v_{107} - v_{81} - v_{104} - v_{106} - v_{178} - v_{179} - v_{180} - v_{181} \tag{497}$$

6.88 Species `species_87`

Name EGF-pEGFR-2-RasGAP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_82`, `reaction_96` and as a product in `reaction_81`).

$$\frac{\text{d}}{\text{d}t}\text{species\_87} = v_{82} - v_{83} - v_{97} \tag{498}$$

6.89 Species `species_88`

Name EGF-pEGFR-2-RasGAP-RasGTP

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_83` and as a product in `reaction_82`).

$$\frac{\text{d}}{\text{d}t}\text{species\_88} = v_{83} - v_{84} \tag{499}$$

6.90 Species `species_89`

Name EGF-pEGFR2-RasGAP

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_83`).

$$\frac{\text{d}}{\text{d}t}\text{species\_89} = v_{84} \tag{500}$$

6.91 Species `species_90`

Name SHP2

Initial concentration $0.1\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in six reactions (as a reactant in `reaction_84`, `reaction_85`, `reaction-_96` and as a product in `reaction_86`, `reaction_87`, `reaction_97`).

$$\frac{\text{d}}{\text{d}t}\text{species\_90} = v_{87} + v_{88} + v_{98} - v_{85} - v_{86} - v_{97} \tag{501}$$

6.92 Species `species_91`

Name EGF-pEGFR-2-pShc-Grb2-SHP2

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in six reactions (as a reactant in `reaction_86`, `reaction_88`, `reaction-_90` and as a product in `reaction_84`, `reaction_89`, `reaction_91`).

$$\frac{\text{d}}{\text{d}t}\text{species\_91} = v_{85} + v_{90} + v_{92} - v_{87} - v_{89} - v_{91} \tag{502}$$

6.93 Species `species_92`

Name EGF-pEGFR-2-Grb2-SHP2

Initial concentration $0\ \mu\text{mol} \cdot 1^{-1}$

This species takes part in six reactions (as a reactant in `reaction_87`, `reaction_92`, `reaction-_94` and as a product in `reaction_85`, `reaction_93`, `reaction_95`).

$$\frac{\text{d}}{\text{d}t}\text{species\_92} = v_{86} + v_{94} + v_{96} - v_{88} - v_{93} - v_{95} \tag{503}$$

6.94 Species `species_93`

Name EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGEF

Initial concentration $0\ \mu\text{mol} \cdot 1^{-1}$

This species takes part in two reactions (as a reactant in `reaction_89` and as a product in `reaction_88`).

$$\frac{\text{d}}{\text{d}t}\text{species\_93} = v_{89} - v_{90} \tag{504}$$

6.95 Species `species_94`

Name RhoGEF

Initial concentration $0.1\ \mu\text{mol} \cdot 1^{-1}$

This species takes part in five reactions (as a reactant in `reaction_98`, `reaction_124` and as a product in `reaction_89`, `reaction_93`, `reaction_100`).

$$\frac{\text{d}}{\text{d}t}\text{species\_94} = v_{90} + v_{94} + v_{101} - v_{99} - v_{125} \tag{505}$$

6.96 Species `species_95`

Name pRhoGAP

Initial concentration $0\ \mu\text{mol} \cdot 1^{-1}$

This species takes part in 13 reactions (as a reactant in `reaction_90`, `reaction_94`, `reaction-_103`, `reaction_197`, `reaction_199`, `reaction_201`, `reaction_203` and as a product in `reaction_102`, `reaction_104`, `reaction_198`, `reaction_200`, `reaction_202`, `reaction-_204`).

$$\frac{\text{d}}{\text{d}t}\text{species\_95} = v_{103} + v_{105} + v_{199} + v_{201} + v_{203} + v_{205} - v_{91} \tag{506}$$
$$- v_{95} - v_{104} - v_{198} - v_{200} - v_{202} - v_{204}$$

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6.97 Species `species_96`

Name EGF-pEGFR-2-pShc-Grb2-SHP2-pRhoGAP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_91` and as a product in `reaction_90`).

$$\frac{\text{d}}{\text{d}t}\text{species\_96} = v_{91} - v_{92} \tag{507}$$

6.98 Species `species_97`

Name RhoGAP

Initial concentration $0.5 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_101` and as a product in `reaction_91`, `reaction_95`).

$$\frac{\text{d}}{\text{d}t}\text{species\_97} = v_{92} + v_{96} - v_{102} \tag{508}$$

6.99 Species `species_98`

Name EGF-pEGFR-2-Grb2-SHP2-pRhoGEF

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_93` and as a product in `reaction_92`).

$$\frac{\text{d}}{\text{d}t}\text{species\_98} = v_{93} - v_{94} \tag{509}$$

6.100 Species `species_99`

Name EGF-pEGFR-2-Grb2-SHP2-pRhoGAP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_95` and as a product in `reaction_94`).

$$\frac{\text{d}}{\text{d}t}\text{species\_99} = v_{95} - v_{96} \tag{510}$$

6.101 Species `species_100`

Name EGF-pEGFR-2-RasGAP-SHP2

Initial concentration $0\ \mu\mathrm{mol}\cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_97` and as a product in `reaction_96`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_100} = v_{97} - v_{98} \tag{511}$$

6.102 Species `species_101`

Name pSrc

Initial concentration $0\ \mu\mathrm{mol}\cdot \mathrm{l}^{-1}$

This species takes part in six reactions (as a reactant in `reaction_98`, `reaction_101`, `reaction-_110` and as a product in `reaction_99`, `reaction_102`, `reaction_109`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_101} = v_{100} + v_{103} + v_{110} - v_{99} - v_{102} - v_{111} \tag{512}$$

6.103 Species `species_102`

Name pSrc-RhoGEF

Initial concentration $0\ \mu\mathrm{mol}\cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_99` and as a product in `reaction_98`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_102} = v_{99} - v_{100} \tag{513}$$

6.104 Species `species_103`

Name pSrc-RhoGAP

Initial concentration $0\ \mu\mathrm{mol}\cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_102` and as a product in `reaction_101`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_103} = v_{102} - v_{103} \tag{514}$$

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6.105 Species `species_104`

Name pRhoGAP-RhoGTP

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_104` and as a product in `reaction_103`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_104} = v_{104} - v_{105} \tag{515}$$

6.106 Species `species_105`

Name ROK

Initial concentration $0.68\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_105` and as a product in `reaction_127`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_105} = v_{128} - v_{106} \tag{516}$$

6.107 Species `species_106`

Name RhoGTP-ROK

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_106` and as a product in `reaction_105`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_106} = v_{106} - v_{107} \tag{517}$$

6.108 Species `species_107`

Name Src

Initial concentration $0.518\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_107` and as a product in `reaction_112`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_107} = v_{113} - v_{108} \tag{518}$$

6.109 Species `species_108`

Name EGF-pEGFR-2-Src

Initial concentration $0\,\mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_108` and as a product in `reaction_107`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_108} = v_{108} - v_{109} \tag{519}$$

6.110 Species `species_109`

Name EGF-pEGFR-2-pSrc

Initial concentration $0\,\mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_108`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_109} = v_{109} \tag{520}$$

6.111 Species `species_110`

Name EGF-pEGRF-2

Initial concentration $0\,\mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_109`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_110} = v_{110} \tag{521}$$

6.112 Species `species_111`

Name TP7

Initial concentration $0.518\,\mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_110` and as a product in `reaction_112`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_111} = v_{113} - v_{111} \tag{522}$$

6.113 Species `species_112`

Name pSrc-TP7

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_111` and as a product in `reaction_110`).

$$\frac{\text{d}}{\text{d}t}\text{species\_112} = v_{111} - v_{112} \tag{523}$$

6.114 Species `species_113`

Name Src-TP7

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_112` and as a product in `reaction_111`).

$$\frac{\text{d}}{\text{d}t}\text{species\_113} = v_{112} - v_{113} \tag{524}$$

6.115 Species `species_114`

Name Cbl-CIN85

Initial concentration $0.8\,\mu\text{mol}\cdot l^{-1}$

This species takes part in four reactions (as a reactant in `reaction_113`, `reaction_114` and as a product in `reaction_117`, `reaction_118`).

$$\frac{\text{d}}{\text{d}t}\text{species\_114} = v_{118} + v_{119} - v_{114} - v_{115} \tag{525}$$

6.116 Species `species_115`

Name EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85

Initial concentration $0\,\mu\text{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_115` and as a product in `reaction_113`).

$$\frac{\text{d}}{\text{d}t}\text{species\_115} = v_{114} - v_{116} \tag{526}$$

6.117 Species `species_116`

Name EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_116` and as a product in `reaction_114`).

$$\frac{d}{dt}\text{species\_116} = v_{115} - v_{117} \tag{527}$$

6.118 Species `species_117`

Name EPn

Initial concentration $0.5 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in six reactions (as a reactant in `reaction_115`, `reaction_116`, `reaction_120` and as a product in `reaction_117`, `reaction_118`, `reaction_123`).

$$\frac{d}{dt}\text{species\_117} = v_{118} + v_{119} + v_{124} - v_{116} - v_{117} - v_{121} \tag{528}$$

6.119 Species `species_118`

Name EGF-pEGFR-2-pShc-Grb2-SOS-Cbl-CIN85-EPn

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_117` and as a product in `reaction_115`).

$$\frac{d}{dt}\text{species\_118} = v_{116} - v_{118} \tag{529}$$

6.120 Species `species_119`

Name EGF-pEGFR-2-Grb2-SOS-Cbl-CIN85-EPn

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_118` and as a product in `reaction_116`).

$$\frac{d}{dt}\text{species\_119} = v_{117} - v_{119} \tag{530}$$

6.121 Species `species_120`

Name EGF-pEGFR-2-degrade

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a product in `reaction_117`, `reaction_118`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_120} = v_{118} + v_{119} \tag{531}$$

6.122 Species `species_121`

Name pShc-Grb2-SOS

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_117`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_121} = v_{118} \tag{532}$$

6.123 Species `species_122`

Name Pro-EGFR

Initial concentration $3000\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in one reaction (as a reactant in `reaction_119`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_122} = -v_{120} \tag{533}$$

6.124 Species `species_123`

Name pROK-EPn

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_121` and as a product in `reaction_120`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_123} = v_{121} - v_{122} \tag{534}$$

6.125 Species `species_124`

Name pEPn

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_122` and as a product in `reaction_121`).

$$\frac{\text{d}}{\text{d}t}\text{species\_124} = v_{122} - v_{123} \tag{535}$$

6.126 Species `species_125`

Name MPase

Initial concentration $1\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_122` and as a product in `reaction_123`).

$$\frac{\text{d}}{\text{d}t}\text{species\_125} = v_{124} - v_{123} \tag{536}$$

6.127 Species `species_126`

Name pEPn-MPase

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_122`).

$$\frac{\text{d}}{\text{d}t}\text{species\_126} = v_{123} \tag{537}$$

6.128 Species `species_127`

Name pEPn-Mpase

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in one reaction (as a reactant in `reaction_123`).

$$\frac{\text{d}}{\text{d}t}\text{species\_127} = -v_{124} \tag{538}$$

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6.129 Species `species_128`

Name Ras-GTP-RhoGEF

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_125` and as a product in `reaction_124`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_128} = v_{125} - v_{126} \tag{539}$$

6.130 Species `species_129`

Name ppERK-pROK

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_127` and as a product in `reaction_126`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_129} = v_{127} - v_{128} \tag{540}$$

6.131 Species `species_130`

Name MEKK1abcdef

Initial concentration $0.5 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a reactant in `reaction_128`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_130} = -v_{129} \tag{541}$$

6.132 Species `species_131`

Name Grb2-MEKK1abcdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_129`, `reaction_130` and as a product in `reaction_128`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_131} = v_{129} - v_{130} - v_{131} \tag{542}$$

6.133 Species `species_132`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abcdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in `reaction_131`, `reaction_139`, `reaction-_149`, `reaction_167` and as a product in `reaction_129`, `reaction_134`).

$$\frac{\text{d}}{\text{d}t}\text{species\_132} = v_{130} + v_{135} - v_{132} - v_{140} - v_{150} - v_{168} \tag{543}$$

6.134 Species `species_133`

Name EGF-pEGFR-2-Grb2-MEKK1abcdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in `reaction_135`, `reaction_144`, `reaction-_154`, `reaction_172` and as a product in `reaction_130`, `reaction_138`).

$$\frac{\text{d}}{\text{d}t}\text{species\_133} = v_{131} + v_{139} - v_{136} - v_{145} - v_{155} - v_{173} \tag{544}$$

6.135 Species `species_134`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_132`, `reaction_177` and as a product in `reaction_131`).

$$\frac{\text{d}}{\text{d}t}\text{species\_134} = v_{132} - v_{133} - v_{178} \tag{545}$$

6.136 Species `species_135`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_133` and as a product in `reaction_132`).

$$\frac{\text{d}}{\text{d}t}\text{species\_135} = v_{133} - v_{134} \tag{546}$$

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6.137 Species `species_136`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdef

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_134`, `reaction_181` and as a product in `reaction_133`, `reaction_184`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_136} = v_{134} + v_{185} - v_{135} - v_{182} \tag{547}$$

6.138 Species `species_137`

Name EGF-pEGFR-2-Grb2-MEKK1abMEKcdef

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_136`, `reaction_178` and as a product in `reaction_135`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_137} = v_{136} - v_{137} - v_{179} \tag{548}$$

6.139 Species `species_138`

Name EGF-pEGFR-2-Grb2-MEKK1abpMEKcdef

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_137` and as a product in `reaction_136`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_138} = v_{137} - v_{138} \tag{549}$$

6.140 Species `species_139`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcdef

Initial concentration $0\ \mu\mathrm{mol}\cdot\mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_138`, `reaction_185` and as a product in `reaction_137`, `reaction_188`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_139} = v_{138} + v_{189} - v_{139} - v_{186} \tag{550}$$

6.141 Species `species_140`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdef

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_140` and as a product in `reaction_139`, `reaction_143`, `reaction_202`).

$$\frac{\text{d}}{\text{d}t}\text{species\_140} = v_{140} + v_{144} + v_{203} - v_{141} \tag{551}$$

6.142 Species `species_141`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdef

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_141`, `reaction_179` and as a product in `reaction_140`).

$$\frac{\text{d}}{\text{d}t}\text{species\_141} = v_{141} - v_{142} - v_{180} \tag{552}$$

6.143 Species `species_142`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbpMEKcdef

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_142` and as a product in `reaction_141`).

$$\frac{\text{d}}{\text{d}t}\text{species\_142} = v_{142} - v_{143} \tag{553}$$

6.144 Species `species_143`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdef

Initial concentration $0\,\mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in five reactions (as a reactant in `reaction_143`, `reaction_189` and as a product in `reaction_142`, `reaction_192`, `reaction_198`).

$$\frac{\text{d}}{\text{d}t}\text{species\_143} = v_{143} + v_{193} + v_{199} - v_{144} - v_{190} \tag{554}$$

6.145 Species `species_144`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbcdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in four reactions (as a reactant in `reaction_145` and as a product in `reaction_144`, `reaction_148`, `reaction_204`).

$$\frac{d}{dt}\text{species\_144} = v_{145} + v_{149} + v_{205} - v_{146} \tag{555}$$

6.146 Species `species_145`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in three reactions (as a reactant in `reaction_146`, `reaction_180` and as a product in `reaction_145`).

$$\frac{d}{dt}\text{species\_145} = v_{146} - v_{147} - v_{181} \tag{556}$$

6.147 Species `species_146`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbpMEKcdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_147` and as a product in `reaction_146`).

$$\frac{d}{dt}\text{species\_146} = v_{147} - v_{148} \tag{557}$$

6.148 Species `species_147`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in five reactions (as a reactant in `reaction_148`, `reaction_193` and as a product in `reaction_147`, `reaction_196`, `reaction_200`).

$$\frac{d}{dt}\text{species\_147} = v_{148} + v_{197} + v_{201} - v_{149} - v_{194} \tag{558}$$

6.149 Species `species_148`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abcdefRasGTP

Initial concentration $0 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_150` and as a product in `reaction_149`, `reaction_153`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_148} = v_{150} + v_{154} - v_{151} \tag{559}$$

6.150 Species `species_149`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdefRasGTP

Initial concentration $0 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_151` and as a product in `reaction_150`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_149} = v_{151} - v_{152} \tag{560}$$

6.151 Species `species_150`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abpMEKcdefRasGTP

Initial concentration $0 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_152` and as a product in `reaction_151`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_150} = v_{152} - v_{153} \tag{561}$$

6.152 Species `species_151`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdefRasGTP

Initial concentration $0 \, \mu\mathrm{mol} \cdot \mathrm{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_153`, `reaction_159` and as a product in `reaction_152`, `reaction_162`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_151} = v_{153} + v_{163} - v_{154} - v_{160} \tag{562}$$

6.153 Species `species_152`

Name EGF-pEGFR-2-Grb2-MEKK1abcdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_155` and as a product in `reaction_154`, `reaction_158`).

$$\frac{\text{d}}{\text{d}t}\text{species\_152} = v_{155} + v_{159} - v_{156} \tag{563}$$

6.154 Species `species_153`

Name EGF-pEGFR-2-Grb2-MEKK1abMEKcdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_156` and as a product in `reaction_155`).

$$\frac{\text{d}}{\text{d}t}\text{species\_153} = v_{156} - v_{157} \tag{564}$$

6.155 Species `species_154`

Name EGF-pEGFR-2-Grb2-MEKK1abpMEKcdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_157` and as a product in `reaction_156`).

$$\frac{\text{d}}{\text{d}t}\text{species\_154} = v_{157} - v_{158} \tag{565}$$

6.156 Species `species_155`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in four reactions (as a reactant in `reaction_158`, `reaction_163` and as a product in `reaction_157`, `reaction_166`).

$$\frac{\text{d}}{\text{d}t}\text{species\_155} = v_{158} + v_{167} - v_{159} - v_{164} \tag{566}$$

6.157 Species `species_156`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_160` and as a product in `reaction_159`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_156} = v_{160} - v_{161} \tag{567}$$

6.158 Species `species_157`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_161` and as a product in `reaction_160`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_157} = v_{161} - v_{162} \tag{568}$$

6.159 Species `species_158`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_162` and as a product in `reaction_161`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_158} = v_{162} - v_{163} \tag{569}$$

6.160 Species `species_159`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_164` and as a product in `reaction_163`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_159} = v_{164} - v_{165} \tag{570}$$

6.161 Species `species_160`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_165` and as a product in `reaction_164`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_160} = v_{165} - v_{166} \tag{571}$$

6.162 Species `species_161`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdefRasGTP

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_166` and as a product in `reaction_165`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_161} = v_{166} - v_{167} \tag{572}$$

6.163 Species `species_162`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbcdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_168` and as a product in `reaction_167`, `reaction_171`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_162} = v_{168} + v_{172} - v_{169} \tag{573}$$

6.164 Species `species_163`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbMEKcdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_169` and as a product in `reaction_168`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_163} = v_{169} - v_{170} \tag{574}$$

6.165 Species `species_164`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbpMEKcdef

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_170` and as a product in `reaction_169`).

$$\frac{\text{d}}{\text{d}t}\text{species\_164} = v_{170} - v_{171} \tag{575}$$

6.166 Species `species_165`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1apRafbppMEKcdef

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_171` and as a product in `reaction_170`).

$$\frac{\text{d}}{\text{d}t}\text{species\_165} = v_{171} - v_{172} \tag{576}$$

6.167 Species `species_166`

Name EGF-pEGFR-2-Grb2-MEKK1apRafbcdef

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in three reactions (as a reactant in `reaction_173` and as a product in `reaction_172`, `reaction_176`).

$$\frac{\text{d}}{\text{d}t}\text{species\_166} = v_{173} + v_{177} - v_{174} \tag{577}$$

6.168 Species `species_167`

Name EGF-pEGFR-2-Grb2-MEKK1apRafbMEKcdef

Initial concentration $0\ \mu\text{mol}\cdot\text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_174` and as a product in `reaction_173`).

$$\frac{\text{d}}{\text{d}t}\text{species\_167} = v_{174} - v_{175} \tag{578}$$

6.169 Species `species_168`

Name EGF-pEGFR-2-Grb2-MEKK1apRafbpMEKcdef

Initial concentration $0\,\mu\mathrm{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_175` and as a product in `reaction_174`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_168} = v_{175} - v_{176} \tag{579}$$

6.170 Species `species_169`

Name EGF-pEGFR-2-Grb2-MEKK1apRafbppMEKcdef

Initial concentration $0\,\mu\mathrm{mol}\cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_176` and as a product in `reaction_175`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_169} = v_{176} - v_{177} \tag{580}$$

6.171 Species `species_170`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abMEKcdRhoGTPef

Initial concentration $0\,\mu\mathrm{mol}\cdot l^{-1}$

This species takes part in one reaction (as a product in `reaction_177`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_170} = v_{178} \tag{581}$$

6.172 Species `species_171`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcdRhoGTPef

Initial concentration $0\,\mu\mathrm{mol}\cdot l^{-1}$

This species takes part in one reaction (as a reactant in `reaction_197`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{species\_171} = -v_{198} \tag{582}$$

6.173 Species `species_172`

Name EGF-pEGFR-2-Grb2-MEKK1abMEKcdRhoGTPef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_178`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_172} = v_{179} \tag{583}$$

6.174 Species `species_173`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcdRhoGTPef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a reactant in `reaction_199`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_173} = -v_{200} \tag{584}$$

6.175 Species `species_174`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbMEKcdRhoGTPef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_179`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_174} = v_{180} \tag{585}$$

6.176 Species `species_175`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdRhoGTPef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a reactant in `reaction_201`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_175} = -v_{202} \tag{586}$$

6.177 Species `species_176`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbMEKcdRhoGTPef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a product in `reaction_180`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_176} = v_{181} \tag{587}$$

6.178 Species `species_177`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbcdRhoGTPef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in one reaction (as a reactant in `reaction_203`).

$$\frac{\text{d}}{\text{d}t} \text{species\_177} = -v_{204} \tag{588}$$

6.179 Species `species_178`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcERKdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_182` and as a product in `reaction_181`).

$$\frac{\text{d}}{\text{d}t} \text{species\_178} = v_{182} - v_{183} \tag{589}$$

6.180 Species `species_179`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcpERKdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_183` and as a product in `reaction_182`).

$$\frac{\text{d}}{\text{d}t} \text{species\_179} = v_{183} - v_{184} \tag{590}$$

6.181 Species `species_180`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1abppMEKcppERKdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_184` and as a product in `reaction_183`).

$$\frac{\text{d}}{\text{d}t} \text{species\_180} = v_{184} - v_{185} \tag{591}$$

6.182 Species `species_181`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcERKdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_186` and as a product in `reaction_185`).

$$\frac{d}{dt}\text{species\_181} = v_{186} - v_{187} \tag{592}$$

6.183 Species `species_182`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcpERKdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_187` and as a product in `reaction_186`).

$$\frac{d}{dt}\text{species\_182} = v_{187} - v_{188} \tag{593}$$

6.184 Species `species_183`

Name EGF-pEGFR-2-Grb2-MEKK1abppMEKcppERKdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_188` and as a product in `reaction_187`).

$$\frac{d}{dt}\text{species\_183} = v_{188} - v_{189} \tag{594}$$

6.185 Species `species_184`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcERKdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_190` and as a product in `reaction_189`).

$$\frac{d}{dt}\text{species\_184} = v_{190} - v_{191} \tag{595}$$

6.186 Species `species_185`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcpERKdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_191` and as a product in `reaction_190`).

$$\frac{\text{d}}{\text{d}t}\text{species\_185} = v_{191} - v_{192} \tag{596}$$

6.187 Species `species_186`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcppERKdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_192` and as a product in `reaction_191`).

$$\frac{\text{d}}{\text{d}t}\text{species\_186} = v_{192} - v_{193} \tag{597}$$

6.188 Species `species_187`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcERKdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_194` and as a product in `reaction_193`).

$$\frac{\text{d}}{\text{d}t}\text{species\_187} = v_{194} - v_{195} \tag{598}$$

6.189 Species `species_188`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcpERKdef

Initial concentration $0 \, \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_195` and as a product in `reaction_194`).

$$\frac{\text{d}}{\text{d}t}\text{species\_188} = v_{195} - v_{196} \tag{599}$$

6.190 Species `species_189`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcppERKdef

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_196` and as a product in `reaction_195`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_189} = v_{196} - v_{197} \tag{600}$$

6.191 Species `species_190`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_198` and as a product in `reaction_197`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_190} = v_{198} - v_{199} \tag{601}$$

6.192 Species `species_191`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbppMEKcdRhoGTPepRhoGAPf

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_200` and as a product in `reaction_199`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_191} = v_{200} - v_{201} \tag{602}$$

6.193 Species `species_192`

Name EGF-pEGFR-2-pShc-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf

Initial concentration $0 \, \mu\text{mol} \cdot l^{-1}$

This species takes part in two reactions (as a reactant in `reaction_202` and as a product in `reaction_201`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_192} = v_{202} - v_{203} \tag{603}$$

6.194 Species `species_193`

Name EGF-pEGFR-2-Grb2-MEKK1aRafbcdRhoGTPepRhoGAPf

Initial concentration $0 \ \mu\text{mol} \cdot \text{l}^{-1}$

This species takes part in two reactions (as a reactant in `reaction_204` and as a product in `reaction_203`).

$$\frac{\mathrm{d}}{\mathrm{d}t}\text{species\_193} = v_{204} - v_{205} \tag{604}$$