

## SBML Model Report

# Model name: “Mol2013 - Immune Signal Transduction in Leishmaniasis”



May 6, 2016

## 1 General Overview

This is a document in SBML Level 2 Version 4 format. This model was created by the following three authors: Nick Juty<sup>1</sup>, Vijayalakshmi Chelliah<sup>2</sup> and Milsee Mol<sup>3</sup> at September tenth 2013 at 2:43 p. m. and last time modified at October tenth 2014 at 11:11 a. m. Table 1 gives an overview of the quantities of all components of this model.

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

Element	Quantity	Element	Quantity
compartment types	0	compartments	2
species types	0	species	43
events	0	constraints	0
reactions	49	function definitions	0
global parameters	0	unit definitions	3
rules	0	initial assignments	0

## Model Notes

Created by The MathWorks, Inc. SimBiology tool, Version 3.3

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## 2 Unit Definitions

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

### 2.1 Unit `MWBUILTINPREFIX_nano_MWBUILTINUNIT_mole`

**Name** nanomole

**Definition**  $10^{-9}$  mol

### 2.2 Unit `MWDERIVEDUNIT_1__second`

**Name** 1/second

**Definition**  $s^{-1}$  · dimensionless

### 2.3 Unit `MWDERIVEDUNIT_nanomole__second`

**Name** nanomole/second

**Definition**  $\text{mol} \cdot s^{-1} \cdot 10^{-9}$  dimensionless

### 2.4 Unit `substance`

**Notes** Mole is the predefined SBML unit for substance.

**Definition** mol

### 2.5 Unit `volume`

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

**Definition** l

### 2.6 Unit `area`

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

**Definition**  $\text{m}^2$

### 2.7 Unit `length`

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

**Definition** m

## 2.8 Unit `time`

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

**Definition** s

## 3 Compartments

This model contains two compartments.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Owned by
mw0cba5a10_f303_4c95_aaf1_b6f942374d31	cytoplasm		3	1	litre	<input checked="" type="checkbox"/>	
mwa5ac95a5_d135_4de0_bce2_093ac2c172db	nucleus		3	1	litre	<input checked="" type="checkbox"/>	mw0cba5a10_f303_4c95_aaf1_b6f942374d31

### 3.1 Compartment [mw0cba5a10\\_f303\\_4c95\\_aaf1\\_b6f942374d31](#)

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

**Name** cytoplasm

### 3.2 Compartment [mwa5ac95a5\\_d135\\_4de0\\_bce2\\_093ac2c172db](#)

This is a three dimensional compartment with a constant size of one litre, which is surrounded by [mw0cba5a10\\_f303\\_4c95\\_aaf1\\_b6f942374d31](#) (cytoplasm).

**Name** nucleus

## 4 Species

This model contains 43 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
mw4d2e70a7-_f499_461d_ae18-_bc53b365b091	TNF	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	$\Xi$	$\Xi$
mw8cc67de0-_64e6_428f_ab09-_4c2825cc172c	TNFR1	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	$\Xi$	$\Xi$
mw6ee00a71-_ab68_454b_b1cd-_60c1ebd19cfa	TRADD.TRAF2.RIP	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	$\Xi$	$\Xi$
mw2dc73059-_a841_48d5_b4bd-_3ac24d94c42e	IkB	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	$\Xi$	$\Xi$
mw136c8391-_14f4_4a28_83a3-_35cc74a2e040	NIK	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	$\Xi$	$\Xi$
mw7204ab72-_2ee5_4b92_b420-_2583dacc4343	IkK_NFkB	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	$\Xi$	$\Xi$
mw6939cefe-_e7ff_4a3f_b45b-_a9234d1b5573	NFkB	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	$\Xi$	$\Xi$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
mwf8cfed1b- _6fcf_4cba.bc30- _b44490814a7a	MEKK1	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mw702be69a- _eb4f_425e_87c7- _ef7d85254536	MKK4/7	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mwbee11634- _55df_4a3f_998a- _634dfaf46fd7	JNK	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mw805b55df- _cc91_4227_bb52- _930e961b682c	ASK	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mw b71eb539- _dca6_47ab_8df5- _430d84af0bfb	p38	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mwa5d6f7e4- _dc4d_4931_91ce- _1e78e7b2f195	LPG	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mw4079e13c- _446e_4aa2_9ec4- _233583833d02	CD14-TLR	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mwe5fade7d- _1715_4bb1_843f- _923da8ecddf1	MyD88	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐
mw262497ec- _3d54_4367_bfe3- _76a9c57497cb	IRAK1/4	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	☐	☐

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
mw8bffd47e- _34de_4738.81bf- _7a39a40b3ae8	TRAF6	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw308b75ec- _28b7_4d97_92e2- _51a8ce04116a	TAB2_TAK1_TAB1	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw75377e12- _e23d_44b3_9823- _5fac9b23edc8	MKK1/2	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw67d0cf04- _d6a7_4725_a869- _098a96a3350d	ERK1/2	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw46ee629a- _dd6b_4163_9da1- _2614bb1d74bc	MKK3/6	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw0be0d193- _fd6b_4824_8928- _dbade8b5c99c	EGF	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw280197c8- _98de_43f0_bf01- _0f332a1ab689	EGFR	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw9a5baf6d- _0285_4ad3_9499- _059c553d9cf6	PLC gamma	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw05469f51- _73f7_4ba1_9f1a- _bce5fea143c2	PIP2	mw0cba5a10_f303_4c95- _aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
mwf20834c8-_a115_460b_859c-_4e3ca1ffd953	DAG	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mwb4633da9-_f9d6_4ad8_a7e5-_da075c830e17	PKC	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw9bb804c9-_3e4e_4684_9f6b-_4e6f6706a58e	PI3K	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw64453fc5-_a275_4bba_84f0-_2af249b31514	Akt	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw323a57b4-_8e59_4116_9ad1-_fe547b89c858	Shc/Grb2/Sos1	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw173d8585-_5817_4b4c_932a-_cf7d673680ac	Ras	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw32c21c39-_237b_4d4c_bb5d-_117cb30ce68a	Raf	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw3832f277-_aef2_4f1d_87af-_abc2a3c1a7d5	JAK	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>
mw13651143-_feb5_49a5_adab-_9105c2647446	STAT1/3	mw0cba5a10_f303_4c95-_aaf1_b6f942374d31	$10^{-9}$ mol	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
mw8a358487- _b18b_42df_a646- _cd75eb5bfcc2	NFkB	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mwd9e7a9b9- _6f1b_4bbc_afa5- _6cb192b62ce8	JNK	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mwfed5a135- _c91b_4d20_91b2- _3a61723544dd	cjun	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mw97345a67- _a8e8_42aa_8e62- _69e9d2b6cf45	p38	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mw5c67812a- _17f5_43cf_8acb- _9bde272c1911	cfos	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mw1f12e5bc- _ebbc_4347_b6b7- _5cd1740ac69a	ERK1/2	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mwda4716f1- _ae00_4149_aec3- _12531380425a	Akt	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mw17ae9adc- _54ab_407b_a34d- _8413a3a10cc6	STAT1/3	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$
mwc844b7c0- _98f5_4d0d_8f0c- _00dfe8b54e6d	TNF	mwa5ac95a5_d135_4de0- _bce2_093ac2c172db	$10^{-9}$ mol	$\Xi$	$\Xi$



Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion

## 5 Reactions

This model contains 49 reactions. All reactions are listed in the following table and are subsequently described in detail. If a reaction is affected by a modifier, the identifier of this species is written above the reaction arrow.

Table 4: Overview of all reactions

Nº	Id	Name	Reaction Equation	SBO
1	mw56c6d2a8- _5d66- _4b27_841a- _662ac710fac3	1	mw4d2e70a7_f499_461d_ae18_bc53b365b091	<u>mw4d2e70a7_f499_461d_ae18_bc53b365b091</u>
2	mw2055093c- _9534- _4ee3_999e- _dc4d7e0246cf	2	mw8cc67de0_64e6_428f_ab09_4c2825cc172c	<u>mw8cc67de0_64e6_428f_ab09_4c2825cc172c</u>
3	mw8d01ca0a- _dc27- _461f_a854- _cede0c0697dd	3	mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	<u>mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa</u>
4	mwc021dbe5- _8831- _4239_b280- _9dcfb2ce1101	4	mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	<u>mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa</u>
5	mwc064fbe4- _1c49- _4130_b601- _efefacd114e4	5	mw136c8391_14f4_4a28_83a3_35cc74a2e040	<u>mw136c8391_14f4_4a28_83a3_35cc74a2e040</u>

Nº	Id	Name	Reaction Equation	SBO
6	mw57e0090c- _072b- _4494_bdf6- _a005150e0f42	6	mw7204ab72_2ee5_4b92_b420_2583dacc4343	<u>mw7204ab72_2ee5_4b92_b420_2583dacc4343</u>
7	mwd78707fa- _21d0- _4f82_b3d1- _a74ba6b8f727	7	mw6939cefe_e7ff_4a3f_b45b_a9234d1b5573	<u>mw6939cefe_e7ff_4a3f_b45b_a9234d1b5573</u>
8	mw065ddcfd- _fe93- _45f6_9ad4- _a5aa4529aad4	8	mw2dc73059_a841_48d5_b4bd_3ac24d94c42e	<u>mw2dc73059_a841_48d5_b4bd_3ac24d94c42e</u>
9	mwc23385ec- _434f- _4f84_897b- _fdb26e2fc8c9	9	mwf8cfed1b_6fcf_4cba_bc30_b44490814a7a	<u>mwf8cfed1b_6fcf_4cba_bc30_b44490814a7a</u>
10	mw4dded01e- _6e25- _4d1e_aa54- _62db26069cad	10	mw702be69a_eb4f_425e_87c7_ef7d85254536	<u>mw702be69a_eb4f_425e_87c7_ef7d85254536</u>
11	mwef3506d1- _e875- _48e5_8c0a- _4ffebdcd0f32	11	mwbee11634_55df_4a3f_998a_634dfaf46fd7	<u>mwbee11634_55df_4a3f_998a_634dfaf46fd7</u>

Nº	Id	Name	Reaction Equation	SBO
12	mwc4a3a397- _b069- _48dc_9f2b- _411ca1448d98	12	mwd9e7a9b9_6f1b_4bbc_afa5_6cb192b62ce8	<u>mwd9e7a9b9_6f1b_4bbc_afa5_6cb192b62ce8</u>
13	mwa502f05a- _b689- _4ad9_855e- _90ae77824ba0	13	mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	<u>mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa</u>
14	mw01a7e271- _19c9- _40a0_bb62- _505bad155195	14	mw805b55df_cc91_4227_bb52_930e961b682c	<u>mw805b55df_cc91_4227_bb52_930e961b682c</u>
15	mw7db85cdd- _f1ac- _4e07_9a35- _809b7ab77aec	15	mw71eb539_dca6_47ab_8df5_430d84af0bfb	<u>mw71eb539_dca6_47ab_8df5_430d84af0bfb</u>
16	mw8917d625- _0012- _45c7_aede- _8a528181d93d	16	mw97345a67_a8e8_42aa_8e62_69e9d2b6cf45	<u>mw97345a67_a8e8_42aa_8e62_69e9d2b6cf45</u>
17	mwd67b18a5- _bb79- _4581_8afa- _9bc34a4fe139	17	mwa5d6f7e4_dc4d_4931_91ce_1e78e7b2f195	<u>mwa5d6f7e4_dc4d_4931_91ce_1e78e7b2f195</u>

Nº	Id	Name	Reaction Equation	SBO
18	mwe28d9fcb- _8170- _4cbd_b3cc- _564c18d65fcc	18	mw4079e13c_446e_4aa2_9ec4_233583833d02	<u>mw4079e13c_446e_4aa2_9ec4_233583833d02</u>
19	mw215b36f5- _a3a1- _44bf_b976- _c52cb6daddb8	19	mwe5fade7d_1715_4bb1_843f_923da8ecddf1	<u>mwe5fade7d_1715_4bb1_843f_923da8ecddf1</u>
20	mw15c83962- _bdf0- _43f0_b5df- _9ab227af0595	20	mw262497ec_3d54_4367_bfe3_76a9c57497cb	<u>mw262497ec_3d54_4367_bfe3_76a9c57497cb</u>
21	mwa3c7ed09- _4e90- _417b_a301- _2a0b4ac2e1d5	21	mw8bffd47e_34de_4738_81bf_7a39a40b3ae8	<u>mw8bffd47e_34de_4738_81bf_7a39a40b3ae8</u>
22	mwb6a1c4c1- _677e- _41a0_8608- _c2d1f9037a16	22	mw308b75ec_28b7_4d97_92e2_51a8ce04116a	<u>mw308b75ec_28b7_4d97_92e2_51a8ce04116a</u>
23	mwa23e3682- _2d67- _49cf_913c- _52aa41335371	23	mw308b75ec_28b7_4d97_92e2_51a8ce04116a	<u>mw308b75ec_28b7_4d97_92e2_51a8ce04116a</u>

Nº	Id	Name	Reaction Equation	SBO
24	mw49bb8edf- _f533- _4abe_b55e- _468a1f3b296e	24	mw75377e12_e23d_44b3_9823_5fac9b23edc8	<u>mw75377e12_e23d_44b3_9823_5fac9b23edc8</u>
25	mwe2722be2- _db07- _4c1d_879e- _272e1518fb8e	25	mw67d0cf04_d6a7_4725_a869_098a96a3350d	<u>mw67d0cf04_d6a7_4725_a869_098a96a3350d</u>
26	mw573abe13- _d3cc- _4f5a_a886- _029e2d5da8df	26	mw308b75ec_28b7_4d97_92e2_51a8ce04116a	<u>mw308b75ec_28b7_4d97_92e2_51a8ce04116a</u>
27	mw0649b87c- _cb39- _43b6_820a- _0f21572f784e	27	mw308b75ec_28b7_4d97_92e2_51a8ce04116a	<u>mw308b75ec_28b7_4d97_92e2_51a8ce04116a</u>
28	mw17bf22e9- _37fd- _42b6_b648- _d2ae38fbc805	28	mw46ee629a_dd6b_4163_9da1_2614bb1d74bc	<u>mw46ee629a_dd6b_4163_9da1_2614bb1d74bc</u>
29	mw75054b4a- _cf66- _4bfe_bda0- _44b88f715532	29	mw0be0d193_fd6b_4824_8928_dbade8b5c99c	<u>mw0be0d193_fd6b_4824_8928_dbade8b5c99c</u>

Nº	Id	Name	Reaction Equation	SBO
30	mw4e1795dc- _c8de- _4708_ba0d- _52d69fae724e	30	mw280197c8_98de_43f0_bf01_0f332a1ab689	<u>mw280197c8_98de_43f0_bf01_0f332a1a</u>
31	mw51210768- _0597- _4bf6_a013- _49896f03c73d	31	mw9a5baf6d_0285_4ad3_9499_059c553d9cf6	<u>mw9a5baf6d_0285_4ad3_9499_059c553</u>
32	mw05368c46- _8a41- _4609_b904- _25219691464b	32	mw05469f51_73f7_4ba1_9f1a_bce5fea143c2	<u>mw05469f51_73f7_4ba1_9f1a_bce5fea14</u>
33	mwb86f53d9- _af3e- _499e_9c41- _7aaf353919e0	33	mwf20834c8_a115_460b_859c_4e3ca1ffd953	<u>mwf20834c8_a115_460b_859c_4e3ca1ffd</u>
34	mw1a0f986a- _5f18- _4312_bf3a- _9e79ae4e7f36	34	mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	<u>mwb4633da9_f9d6_4ad8_a7e5_da075c8</u>
35	mw17b927e1- _56f3- _4e65_a482- _b8f190af70aa	35	mw280197c8_98de_43f0_bf01_0f332a1ab689	<u>mw280197c8_98de_43f0_bf01_0f332a1a</u>

Nº	Id	Name	Reaction Equation	SBO
36	mw0549a0ba- _63b4- _4a0e_8506- _1c379b878280	36	mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e	<u>mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e</u>
37	mw7ec21bdc- _6e00- _410d_8524- _046f820d0921	37	mw64453fc5_a275_4bba_84f0_2af249b31514	<u>mw64453fc5_a275_4bba_84f0_2af249b31514</u>
38	mwbc35988a- _c061- _4dff_a2b0- _09fa8f45d873	38	mw280197c8_98de_43f0_bf01_0f332a1ab689	<u>mw280197c8_98de_43f0_bf01_0f332a1ab689</u>
39	mwffb70cc8- _3371- _416f_b374- _c518884ba240	39	mw323a57b4_8e59_4116_9ad1_fe547b89c858	<u>mw323a57b4_8e59_4116_9ad1_fe547b89c858</u>
40	mwcf26ace1- _325c- _4287_81d4- _382e2f2beb1c	40	mw173d8585_5817_4b4c_932a_cf7d673680ac	<u>mw173d8585_5817_4b4c_932a_cf7d673680ac</u>
41	mwa52ff158- _9e98- _454a_a98e- _3bc52e4aa39f	41	mw32c21c39_237b_4d4c_bb5d_117cb30ce68a	<u>mw32c21c39_237b_4d4c_bb5d_117cb30ce68a</u>



Nº	Id	Name	Reaction Equation	SBO
42	mw427812f2- _a2ec- _476c_8359- _96749d8910f4	42	mw173d8585_5817_4b4c_932a_cf7d673680ac	<u>mw173d8585_5817_4b4c_932a_cf7d673680ac</u>
43	mw72aabd27- _658a- _45ef_87b2- _cec59e2a548a	43	mw280197c8_98de_43f0_bf01_0f332a1ab689	<u>mw280197c8_98de_43f0_bf01_0f332a1ab689</u>
44	mw1498886c- _3fb6- _44f5_ae32- _7a8948030948	44	mw3832f277_aef2_4f1d_87af_abc2a3c1a7d5	<u>mw3832f277_aef2_4f1d_87af_abc2a3c1a7d5</u>
45	mwdc61085- _a433- _4362_a836- _938c7ae43ded	45	mw13651143_feb5_49a5_adab_9105c2647446	<u>mw13651143_feb5_49a5_adab_9105c2647446</u>
46	mwe820c3d2- _bbc1- _4211_9818- _1e515a583b8a	46	mw8a358487_b18b_42df_a646_cd75eb5bfcc2	<u>mw8a358487_b18b_42df_a646_cd75eb5bfcc2</u>
47	mwd95fbca0- _6234- _4c19_81ea- _5e74b558e2f1	47	mwc844b7c0_98f5_4d0d_8f0c_00dfe8b54e6d	<u>mwc844b7c0_98f5_4d0d_8f0c_00dfe8b54e6d</u>

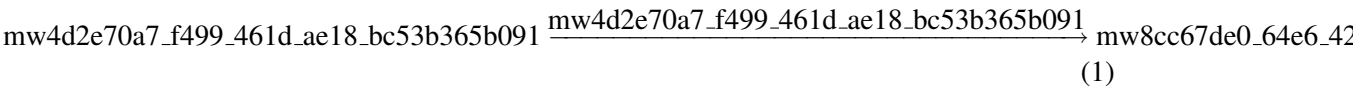
Nº	Id	Name	Reaction Equation	SBO
48	mw36e7aae0- _ea29- _437f_a9c0- _57981e85b29e	48	mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	<u>mwb4633da9_f9d6_4ad8_a7e5_da075c830e17</u>
49	mwe6aec30e- _5e5f- _4427_bda2- _9c7edc4d5547	49	mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	<u>mwb4633da9_f9d6_4ad8_a7e5_da075c830e17</u>

5.1 Reaction mw56c6d2a8\_5d66\_4b27\_841a\_662ac710fac3

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 1

Reaction equation



Reactant

Table 5: Properties of each reactant.

Id	Name	SBO
mw4d2e70a7_f499_461d_ae18_bc53b365b091	TNF	

Modifier

Table 6: Properties of each modifier.

Id	Name	SBO
mw4d2e70a7_f499_461d_ae18_bc53b365b091	TNF	

Product

Table 7: Properties of each product.

Id	Name	SBO
mw8cc67de0_64e6_428f_ab09_4c2825cc172c	TNFR1	

Kinetic Law

Derived unit  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$v_1 = \text{mw826aae9f_9728_4bbb_a11b_60578912218b} \cdot \text{mw4d2e70a7_f499_461d_ae18_bc53b365b091}$

Table 8: Properties of each parameter.

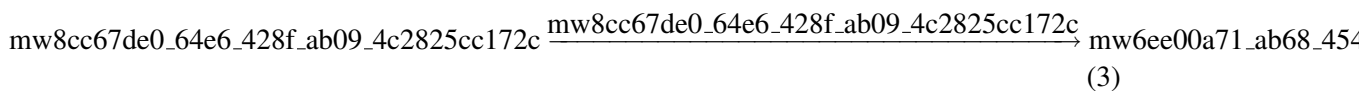
Id	Name	SBO	Value	Unit	Constant
mw826aae9f- _9728- _4bbb_a11b- _60578912218b	k1		1.2	$s^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

## 5.2 Reaction mw2055093c\_9534\_4ee3\_999e\_dc4d7e0246cf

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 2

### Reaction equation



### Reactant

Table 9: Properties of each reactant.

Id	Name	SBO
mw8cc67de0_64e6_428f_ab09_4c2825cc172c	TNFR1	

### Modifier

Table 10: Properties of each modifier.

Id	Name	SBO
mw8cc67de0_64e6_428f_ab09_4c2825cc172c	TNFR1	

### Product

Table 11: Properties of each product.

Id	Name	SBO
mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	TRADD_TRAF2_RIP	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_2 = \text{mw6834a7ac\_63c4\_4741\_b0fc\_069c665f1de2} \cdot \text{mw8cc67de0\_64e6\_428f\_ab09\_4c2825cc172c}$$

Table 12: Properties of each parameter.

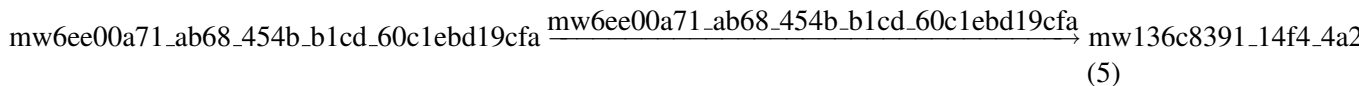
Id	Name	SBO	Value	Unit	Constant
<a href="#">mw6834a7ac\_63c4\_4741\_b0fc\_069c665f1de2</a>	k2		1.18	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

## 5.3 Reaction [mw8d01ca0a\\_dc27\\_461f\\_a854\\_cede0c0697dd](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 3

### Reaction equation



### Reactant

Table 13: Properties of each reactant.

Id	Name	SBO
<a href="#">mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa</a>	TRADD_TRAF2_RIP	

### Modifier

Table 14: Properties of each modifier.

Id	Name	SBO
<a href="#">mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa</a>	TRADD_TRAF2_RIP	

### Product

Table 15: Properties of each product.

Id	Name	SBO
mw136c8391_14f4_4a28_83a3_35cc74a2e040	NIK	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$$v_3 = \frac{\text{mw0733f43b\_b430\_40c4\_8b93\_1555a4bdbaa1} \cdot \text{mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa}}{\text{mw56211dd8\_6a88\_465e\_bed2\_f603bf8c5b52} + \text{mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa}}$$

(6)

Table 16: Properties of each parameter.

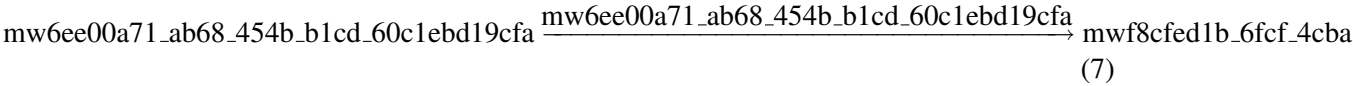
Id	Name	SBO	Value	Unit	Constant
mw56211dd8-_6a88-_465e_bed2-_f603bf8c5b52	k3		0.6	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>
mw0733f43b-_b430-_40c4_8b93-_1555a4bdbaa1	v3		0.6	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>

5.4 Reaction [mw021dbe5\\_8831\\_4239\\_b280\\_9dcfb2ce1101](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 4

Reaction equation



Reactant

Table 17: Properties of each reactant.

Id	Name	SBO
mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	TRADD_TRAF2_RIP	

## Modifier

Table 18: Properties of each modifier.

Id	Name	SBO
mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	TRADD_TRAF2_RIP	

## Product

Table 19: Properties of each product.

Id	Name	SBO
mwf8cfed1b_6fcf_4cba_bc30_b44490814a7a	MEKK1	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$\frac{v_4}{= \frac{\text{mwf89fc9a4\_ad1e\_4e59\_8a06\_4b8dc2cc84a7} \cdot \text{mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa}}{\text{mwaad66a38\_26d2\_41fc\_9261\_79c57500a6d4} + \text{mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa}}} \quad (8)$$

Table 20: Properties of each parameter.

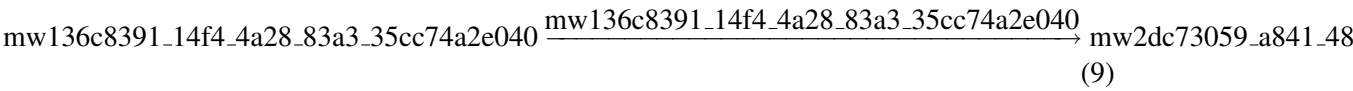
Id	Name	SBO	Value	Unit	Constant
mwf89fc9a4-_ad1e-_4e59_8a06-_4b8dc2cc84a7	v4		0.28	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mwaad66a38-_26d2-_41fc_9261-_79c57500a6d4	k4		1.50	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

## 5.5 Reaction mwc064fbe4\_1c49\_4130\_b601\_efefacd114e4

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 5

Reaction equation



Reactant

Table 21: Properties of each reactant.

Id	Name	SBO
mw136c8391_14f4_4a28_83a3_35cc74a2e040	NIK	

Modifier

Table 22: Properties of each modifier.

Id	Name	SBO
mw136c8391_14f4_4a28_83a3_35cc74a2e040	NIK	

Product

Table 23: Properties of each product.

Id	Name	SBO
mw2dc73059_a841_48d5_b4bd_3ac24d94c42e	IkB	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>−1</sup>

$$\nu_5 = \frac{\text{mw5fdc2487\_13a9\_449a\_b90c\_95446ddf7f37} \cdot \text{mw136c8391\_14f4\_4a28\_83a3\_35cc74a2e040}}{\text{mwbf5d43e3\_e386\_4b05\_997d\_4e70cbff9498} + \text{mw136c8391\_14f4\_4a28\_83a3\_35cc74a2e040}}$$

(10)

Table 24: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mwbf5d43e3- _e386- _4b05_997d- _4e70cbff9498	k5		0.15	10 <sup>−9</sup> mol	<input checked="" type="checkbox"/>



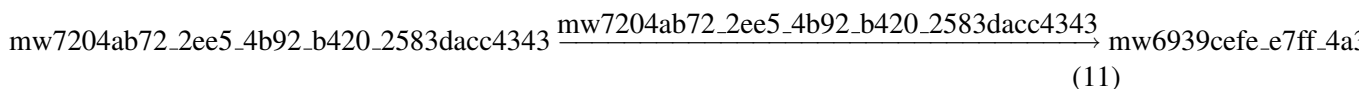
Id	Name	SBO	Value	Unit	Constant
mw5fdc2487- _13a9- _449a_b90c- _95446ddf7f37	v5		1.30	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>

## 5.6 Reaction [mw57e0090c\\_072b\\_4494\\_bdf6\\_a005150e0f42](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 6

### Reaction equation



### Reactant

Table 25: Properties of each reactant.

Id	Name	SBO
mw7204ab72_2ee5_4b92_b420_2583dacc4343	IkK_NFkB	

### Modifier

Table 26: Properties of each modifier.

Id	Name	SBO
mw7204ab72_2ee5_4b92_b420_2583dacc4343	IkK_NFkB	

### Product

Table 27: Properties of each product.

Id	Name	SBO
mw6939cefe_e7ff_4a3f_b45b_a9234d1b5573	NFkB	

### Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_6 = \frac{\text{mwd4bfd4cc\_6fd4\_4b3b\_980d\_547ce2740b7e} \cdot \text{mw7204ab72\_2ee5\_4b92\_b420\_2583dacc4343}}{\text{mw9ac53fed\_0388\_4261\_b457\_030cd631fa0e} + \text{mw7204ab72\_2ee5\_4b92\_b420\_2583dacc4343}} \quad (12)$$

Table 28: Properties of each parameter.

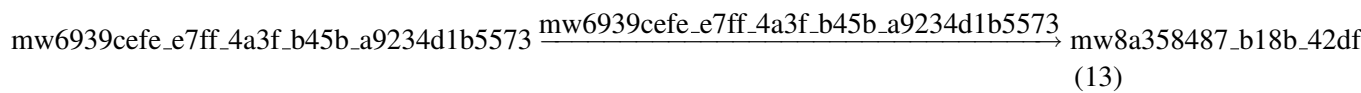
Id	Name	SBO	Value	Unit	Constant
mw9ac53fed- _0388- _4261_b457- _030cd631fa0e	k6		0.1	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>
mwd4bfd4cc- _6fd4- _4b3b_980d- _547ce2740b7e	v6		2.2	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>

## 5.7 Reaction [mwd78707fa\\_21d0\\_4f82\\_b3d1\\_a74ba6b8f727](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 7

### Reaction equation



### Reactant

Table 29: Properties of each reactant.

Id	Name	SBO
mw6939cefe_e7ff_4a3f_b45b_a9234d1b5573	NFkB	

### Modifier

Table 30: Properties of each modifier.

Id	Name	SBO
mw6939cefe_e7ff_4a3f_b45b_a9234d1b5573	NFkB	

## Product

Table 31: Properties of each product.

Id	Name	SBO
mw8a358487_b18b_42df_a646_cd75eb5bfcc2	NFkB	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_7 = \text{mw}a68f7af3\_30af\_4fa0\_9290\_9e005c875763 \cdot \text{mw}6939cefe\_e7ff\_4a3f\_b45b\_a9234d1b5573 \quad (14)$$

Table 32: Properties of each parameter.

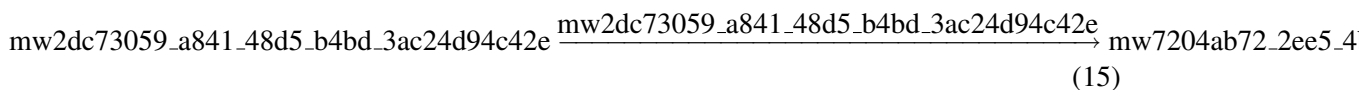
Id	Name	SBO	Value	Unit	Constant
mw a68f7af3- _30af- _4fa0_9290- _9e005c875763	k7		1.4	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

## 5.8 Reaction [mw065ddcfd\\_fe93\\_45f6\\_9ad4\\_a5aa4529aad4](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 8

## Reaction equation



## Reactant

Table 33: Properties of each reactant.

Id	Name	SBO
mw2dc73059_a841_48d5_b4bd_3ac24d94c42e	IkB	

## Modifier

Table 34: Properties of each modifier.

Id	Name	SBO
mw2dc73059_a841_48d5_b4bd_3ac24d94c42e	IkB	

## Product

Table 35: Properties of each product.

Id	Name	SBO
mw7204ab72_2ee5_4b92_b420_2583dacc4343	IkK_NFkB	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_8 = \frac{\text{mw2b6193d2\_d588\_46b7\_8463\_ce7bc30e1575} \cdot \text{mw2dc73059\_a841\_48d5\_b4bd\_3ac24d94c42e}}{\text{mwa7160f91\_3c68\_402a\_b3bd\_acd8490c5d2d} + \text{mw2dc73059\_a841\_48d5\_b4bd\_3ac24d94c42e}} \quad (16)$$

Table 36: Properties of each parameter.

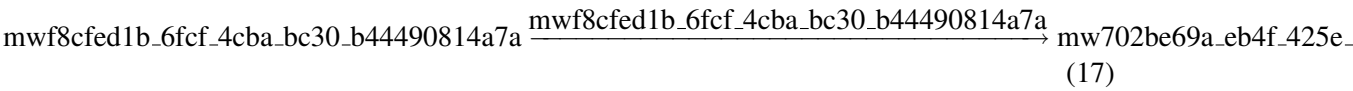
Id	Name	SBO	Value	Unit	Constant
mwa7160f91-_3c68-_402a_b3bd-_acd8490c5d2d	k8		0.56	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>
mw2b6193d2-_d588-_46b7_8463-_ce7bc30e1575	v8		1.30	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>

## 5.9 Reaction mwc23385ec\_434f\_4f84\_897b\_fdb26e2fc8c9

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 9

Reaction equation



Reactant

Table 37: Properties of each reactant.

Id	Name	SBO
mwf8cfed1b_6fcf_4cba_bc30_b44490814a7a	MEKK1	

Modifier

Table 38: Properties of each modifier.

Id	Name	SBO
mwf8cfed1b_6fcf_4cba_bc30_b44490814a7a	MEKK1	

Product

Table 39: Properties of each product.

Id	Name	SBO
mw702be69a_eb4f_425e_87c7_ef7d85254536	MKK4/7	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

mw31c3bf7d\_10cd\_412a\_9a76\_0fb66845c18d

mwf8cfed1b\_6fcf\_4cba\_bc30\_b44490814a7a

mw37ac6d2c\_1be9\_4998\_a9c5\_8761d3e0ba0f

mw31c3bf7d\_10cd\_412a\_9a76\_0fb66845c18d

mwf8cfed1b\_6fcf\_4cba\_bc30\_b44490814a7a

mw37ac6d2c\_1be9\_4998\_a9c5\_8761d3e0ba0f

(18)

Table 40: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mw31c3bf7d_10cd_412a_9a76_0fb66845c18d	v9		0.6	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>

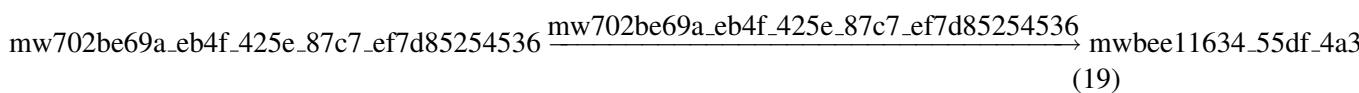
Id	Name	SBO	Value	Unit	Constant
mw37ac6d2c- _1be9- _4998_a9c5- _8761d3e0ba0f	k9		0.2	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

## 5.10 Reaction mw4dded01e\_6e25\_4d1e\_aa54\_62db26069cad

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 10

### Reaction equation



### Reactant

Table 41: Properties of each reactant.

Id	Name	SBO
mw702be69a\_eb4f\_425e\_87c7\_ef7d85254536	MKK4/7	

### Modifier

Table 42: Properties of each modifier.

Id	Name	SBO
mw702be69a\_eb4f\_425e\_87c7\_ef7d85254536	MKK4/7	

### Product

Table 43: Properties of each product.

Id	Name	SBO
mwbee11634\_55df\_4a3f\_998a\_634dfaf46fd7	JNK	

### Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{10} = \frac{mw8adff9cb\_4657\_413f\_a2bd\_100d4aa53076 \cdot mw702be69a\_eb4f\_425e\_87c7\_ef7d85254536}{mwc9cf88fa\_c525\_4372\_80e1\_c72b1cc758f1 + mw702be69a\_eb4f\_425e\_87c7\_ef7d85254536} \quad (20)$$

Table 44: Properties of each parameter.

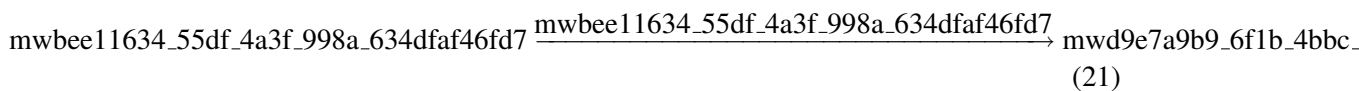
Id	Name	SBO	Value	Unit	Constant
mw8adff9cb- _4657- _413f_a2bd- _100d4aa53076	v10		0.98	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mwc9cf88fa- _c525- _4372_80e1- _c72b1cc758f1	k10		0.15	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.11 Reaction mwef3506d1\_e875\_48e5\_8c0a\_4ffebdcd0f32

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 11

#### Reaction equation



#### Reactant

Table 45: Properties of each reactant.

Id	Name	SBO
mwbee11634_55df_4a3f_998a_634dfaf46fd7	JNK	

#### Modifier

Table 46: Properties of each modifier.

Id	Name	SBO
mwbee11634_55df_4a3f_998a_634dfaf46fd7	JNK	

## Product

Table 47: Properties of each product.

Id	Name	SBO
mwd9e7a9b9_6f1b_4bbc_afa5_6cb192b62ce8	JNK	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{11} = \text{mwafa60fbe\_9272\_468d\_94e7\_b82b985f938c} \cdot \text{mwbee11634\_55df\_4a3f\_998a\_634dfaf46fd7} \quad (22)$$

Table 48: Properties of each parameter.

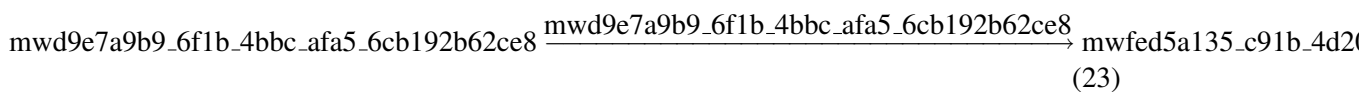
Id	Name	SBO	Value	Unit	Constant
mwafa60fbe- _9272- _468d_94e7- _b82b985f938c	k11		0.61	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

## 5.12 Reaction [mwc4a3a397\\_b069\\_48dc\\_9f2b\\_411ca1448d98](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 12

## Reaction equation



## Reactant

Table 49: Properties of each reactant.

Id	Name	SBO
mwd9e7a9b9_6f1b_4bbc_afa5_6cb192b62ce8	JNK	



## Modifier

Table 50: Properties of each modifier.

Id	Name	SBO
mwd9e7a9b9_6f1b_4bbc_afa5_6cb192b62ce8	JNK	

## Product

Table 51: Properties of each product.

Id	Name	SBO
mwfed5a135_c91b_4d20_91b2_3a61723544dd	cjun	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$\begin{aligned} & v_{12} \\ = & \frac{\text{mw1a1570ff\_e786\_473f\_860b\_2e7694acfcc2} \cdot \text{mwd9e7a9b9\_6f1b\_4bbc\_afa5\_6cb192b62ce8}}{\text{mwf88d190e\_a505\_4f7e\_ac8d\_e43997c74b9c} + \text{mwd9e7a9b9\_6f1b\_4bbc\_afa5\_6cb192b62ce8}} \end{aligned} \quad (24)$$

Table 52: Properties of each parameter.

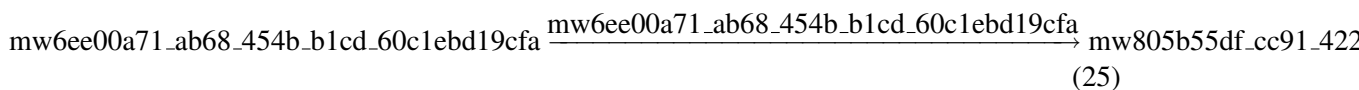
Id	Name	SBO	Value	Unit	Constant
mw1a1570ff- _e786- _473f_860b- _2e7694acfcc2	v12		1.14	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mwf88d190e- _a505- _4f7e_ac8d- _e43997c74b9c	k12		0.62	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.13 Reaction mwa502f05a\_b689\_4ad9\_855e\_90ae77824ba0

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 13

## Reaction equation



## Reactant

Table 53: Properties of each reactant.

Id	Name	SBO
mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	TRADD_TRAF2_RIP	

## Modifier

Table 54: Properties of each modifier.

Id	Name	SBO
mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa	TRADD_TRAF2_RIP	

## Product

Table 55: Properties of each product.

Id	Name	SBO
mw805b55df_cc91_4227_bb52_930e961b682c	ASK	

## Kinetic Law

**Derived unit**  $0.9999999999999999 \text{ mol} \cdot \text{s}^{-1}$

$$v_{13} = \frac{\text{mw9d622ba3\_b43b\_4101\_bef8\_c964c2f158a0} \cdot \text{mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa}}{\text{mw2b1ea101\_d4a1\_42e9\_a70f\_cb8026911ed5} + \text{mw6ee00a71\_ab68\_454b\_b1cd\_60c1ebd19cfa}} \quad (26)$$

Table 56: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mw2b1ea101-d4a1-42e9_a70f-cb8026911ed5	k13		0.08	$10^{-9} \text{ mol}$	<input checked="" type="checkbox"/>

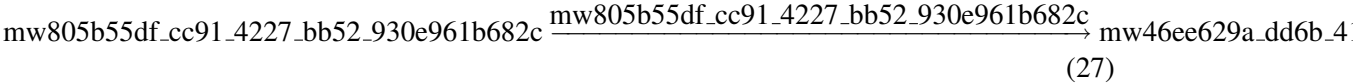
Id	Name	SBO	Value	Unit	Constant
mw9d622ba3-b43b-4101_bef8-c964c2f158a0	v13		0.99	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>

5.14 Reaction
mw01a7e271\_19c9\_40a0\_bb62\_505bad155195

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 14

Reaction equation



Reactant

Table 57: Properties of each reactant.

Id	Name	SBO
mw805b55df_cc91_4227_bb52_930e961b682c	ASK	

Modifier

Table 58: Properties of each modifier.

Id	Name	SBO
mw805b55df_cc91_4227_bb52_930e961b682c	ASK	

Product

Table 59: Properties of each product.

Id	Name	SBO
mw46ee629a_dd6b_4163_9da1_2614bb1d74bc	MKK3/6	

Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{14} = \frac{mw107b07de\_5145\_436d\_9fd7\_e4e2103106d7 \cdot mw805b55df\_cc91\_4227\_bb52\_930e961b682c}{mwd51a525a\_5fea\_42c6\_a8fd\_40429ee627cf + mw805b55df\_cc91\_4227\_bb52\_930e961b682c} \quad (28)$$

Table 60: Properties of each parameter.

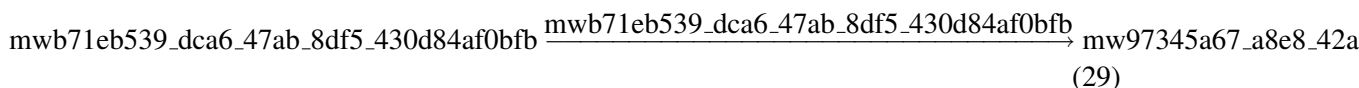
Id	Name	SBO	Value	Unit	Constant
mw107b07de- _5145- _436d_9fd7- _e4e2103106d7	v14		1.20	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mwd51a525a- _5fea- _42c6_a8fd- _40429ee627cf	k14		0.02	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.15 Reaction mw7db85cdd\_f1ac\_4e07\_9a35\_809b7ab77aec

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 15

#### Reaction equation



#### Reactant

Table 61: Properties of each reactant.

Id	Name	SBO
mw b71eb539\_dca6\_47ab\_8df5\_430d84af0bfb	p38	

#### Modifier

Table 62: Properties of each modifier.

Id	Name	SBO
mw b71eb539\_dca6\_47ab\_8df5\_430d84af0bfb	p38	

## Product

Table 63: Properties of each product.

Id	Name	SBO
mw97345a67_a8e8_42aa_8e62_69e9d2b6cf45	p38	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{15} = \text{mw286a7792\_09c4\_443e\_98f4\_a68f66a1f380} \cdot \text{mw b71eb539\_dca6\_47ab\_8df5\_430d844f00fb}$$

Table 64: Properties of each parameter.

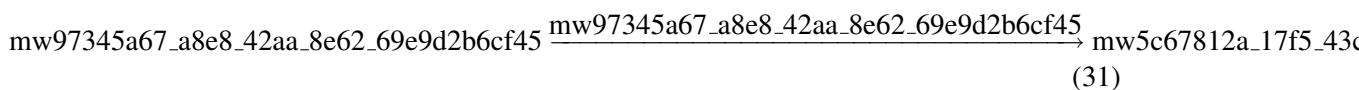
Id	Name	SBO	Value	Unit	Constant
mw286a7792- _09c4- _443e_98f4- _a68f66a1f380	k15		1.0	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.16 Reaction [mw8917d625\\_0012\\_45c7\\_aede\\_8a528181d93d](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 16

## Reaction equation



## Reactant

Table 65: Properties of each reactant.

Id	Name	SBO
mw97345a67_a8e8_42aa_8e62_69e9d2b6cf45	p38	

## Modifier

Table 66: Properties of each modifier.

Id	Name	SBO
mw97345a67_a8e8_42aa_8e62_69e9d2b6cf45	p38	

## Product

Table 67: Properties of each product.

Id	Name	SBO
mw5c67812a_17f5_43cf_8acb_9bde272c1911	cfos	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{16} = \frac{\text{mw2a0659f9\_eab8\_4ada\_8f82\_23068b9986eb} \cdot \text{mw97345a67\_a8e8\_42aa\_8e62\_69e9d2b6cf45}}{\text{mw13b39522\_0751\_4041\_a78e\_871cd5d81592} + \text{mw97345a67\_a8e8\_42aa\_8e62\_69e9d2b6cf45}} \quad (32)$$

Table 68: Properties of each parameter.

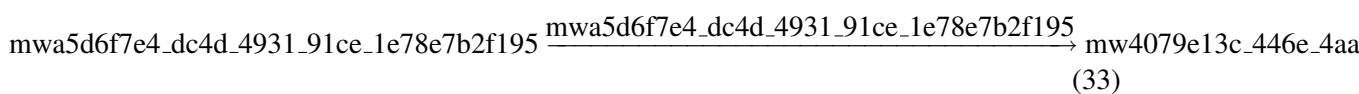
Id	Name	SBO	Value	Unit	Constant
mw2a0659f9\_eab8\_4ada\_8f82\_23068b9986eb	v16		1.5	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw13b39522\_0751\_4041\_a78e\_871cd5d81592	k16		0.2	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.17 Reaction mwd67b18a5\_bb79\_4581\_8afa\_9bc34a4fe139

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 17

#### Reaction equation



## Reactant

Table 69: Properties of each reactant.

Id	Name	SBO
mwa5d6f7e4_dc4d_4931_91ce_1e78e7b2f195	LPG	

## Modifier

Table 70: Properties of each modifier.

Id	Name	SBO
mwa5d6f7e4_dc4d_4931_91ce_1e78e7b2f195	LPG	

## Product

Table 71: Properties of each product.

Id	Name	SBO
mw4079e13c_446e_4aa2_9ec4_233583833d02	CD14-TLR	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{17} = \text{mw6e048357\_d06d\_4522\_bb79\_a91c4f53bda7} \cdot \text{mwa5d6f7e4\_dc4d\_4931\_91ce\_1e78e7b2f195} \quad (24)$$

Table 72: Properties of each parameter.

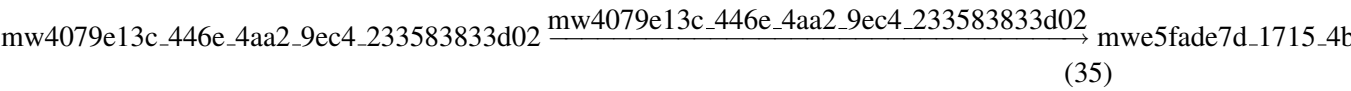
Id	Name	SBO	Value	Unit	Constant
mw6e048357- _d06d- _4522_bb79- _a91c4f53bda7	k17		0.6	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.18 Reaction [mwe28d9fcb\\_8170\\_4cbd\\_b3cc\\_564c18d65fcc](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 18

Reaction equation



Reactant

Table 73: Properties of each reactant.

Id	Name	SBO
mw4079e13c_446e_4aa2_9ec4_233583833d02	CD14-TLR	

Modifier

Table 74: Properties of each modifier.

Id	Name	SBO
mw4079e13c_446e_4aa2_9ec4_233583833d02	CD14-TLR	

Product

Table 75: Properties of each product.

Id	Name	SBO
mwe5fade7d_1715_4bb1_843f_923da8ecddf1	MyD88	

Kinetic Law

Derived unit  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$v_{18}$

=

mw4c0ee457\_fb1c\_48fa\_a0b7\_ff10d632d1e0 · mw4079e13c\_446e\_4aa2\_9ec4\_233583833d02

Table 76: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mw4c0ee457_fb1c_48fa_a0b7_ff10d632d1e0	k18		2.0	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

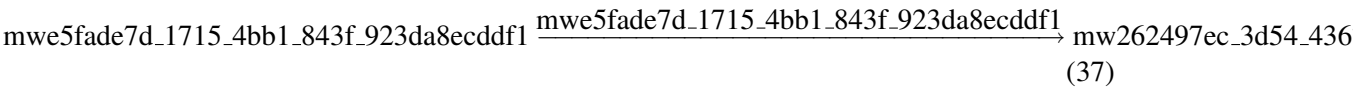


5.19 Reaction mw215b36f5\_a3a1\_44bf\_b976\_c52cb6daddb8

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 19

Reaction equation



Reactant

Table 77: Properties of each reactant.

Id	Name	SBO
mwe5fade7d_1715_4bb1_843f_923da8ecddf1	MyD88	

Modifier

Table 78: Properties of each modifier.

Id	Name	SBO
mwe5fade7d_1715_4bb1_843f_923da8ecddf1	MyD88	

Product

Table 79: Properties of each product.

Id	Name	SBO
mw262497ec_3d54_4367_bfe3_76a9c57497cb	IRAK1/4	

Kinetic Law

Derived unit  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$v_{19} = \text{mw5aa11378_86b4_45f6_aea1_27208e47e559} \cdot \text{mwe5fade7d_1715_4bb1_843f_923da8ecddf1}$

Table 80: Properties of each parameter.

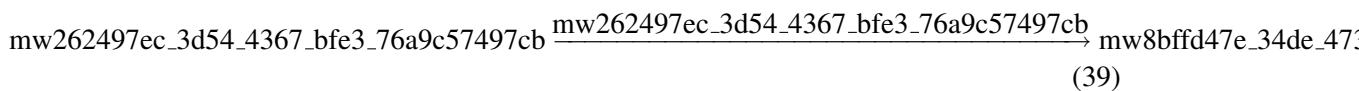
Id	Name	SBO	Value	Unit	Constant
mw5aa11378- _86b4- _45f6_aea1- _27208e47e559	k19		0.72	$s^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

## 5.20 Reaction [mw15c83962\\_bdf0\\_43f0\\_b5df\\_9ab227af0595](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 20

### Reaction equation



### Reactant

Table 81: Properties of each reactant.

Id	Name	SBO
mw262497ec\_3d54\_4367\_bfe3\_76a9c57497cb	IRAK1/4	

### Modifier

Table 82: Properties of each modifier.

Id	Name	SBO
mw262497ec\_3d54\_4367\_bfe3\_76a9c57497cb	IRAK1/4	

### Product

Table 83: Properties of each product.

Id	Name	SBO
mw8bffd47e\_34de\_4738\_81bf\_7a39a40b3ae8	TRAF6	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{20} = \text{mw36ee8f87\_d06f\_4d16\_ac13\_f4075b56c6f4} \cdot \text{mw262497ec\_3d54\_4367\_bfe3\_76a9c57497cb}$$

Table 84: Properties of each parameter.

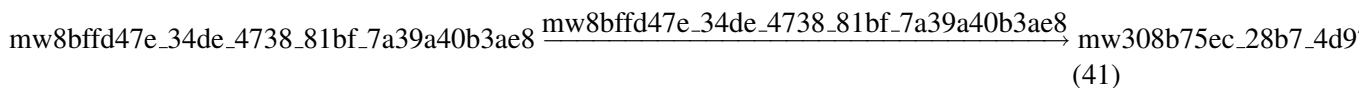
Id	Name	SBO	Value	Unit	Constant
mw36ee8f87- _d06f- _4d16_ac13- _f4075b56c6f4	k20		0.55	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.21 Reaction mw3c7ed09\_4e90\_417b\_a301\_2a0b4ac2e1d5

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 21

#### Reaction equation



#### Reactant

Table 85: Properties of each reactant.

Id	Name	SBO
mw8bfd47e_34de_4738_81bf_7a39a40b3ae8	TRAF6	

#### Modifier

Table 86: Properties of each modifier.

Id	Name	SBO
mw8bfd47e_34de_4738_81bf_7a39a40b3ae8	TRAF6	

#### Product

Table 87: Properties of each product.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

### Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$\begin{aligned}
 v_{21} &= \text{mwf0b9efb6\_f0e9\_4704\_b5b1\_dec2a68c3321} \\
 &\quad \cdot \text{mw8bfd47e\_34de\_4738\_81bf\_7a39a40b3ae8}
 \end{aligned}
 \tag{42}$$

Table 88: Properties of each parameter.

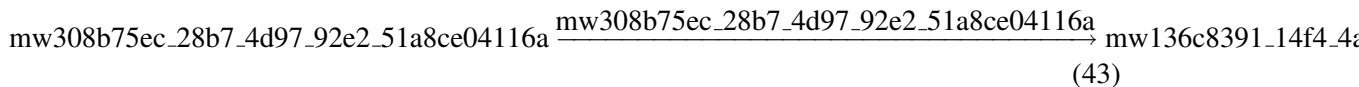
Id	Name	SBO	Value	Unit	Constant
mwf0b9efb6-f0e9-4704-b5b1-dec2a68c3321	k21		0.48	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.22 Reaction mw6a1c4c1\_677e\_41a0\_8608\_c2d1f9037a16

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 22

### Reaction equation



### Reactant

Table 89: Properties of each reactant.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

### Modifier

Table 90: Properties of each modifier.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

## Product

Table 91: Properties of each product.

Id	Name	SBO
mw136c8391_14f4_4a28_83a3_35cc74a2e040	NIK	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{22} = \frac{\text{mw}f5a1613b\_fb22\_43b0\_b95a\_2c18ecbcedd8 \cdot \text{mw}308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a}{\text{mw}85a8c1da\_f29f\_4dcf\_a515\_bf9f9921240b + \text{mw}308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a} \quad (44)$$

Table 92: Properties of each parameter.

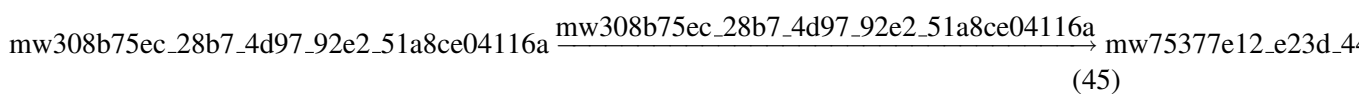
Id	Name	SBO	Value	Unit	Constant
mwf5a1613b- _fb22- _43b0_b95a- _2c18ecbcedd8	v22		0.5	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw85a8c1da- _f29f- _4dcf_a515- _bf9f9921240b	k22		0.2	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

## 5.23 Reaction mwa23e3682\_2d67\_49cf\_913c\_52aa41335371

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 23

## Reaction equation



## Reactant

Table 93: Properties of each reactant.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

## Modifier

Table 94: Properties of each modifier.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

## Product

Table 95: Properties of each product.

Id	Name	SBO
mw75377e12_e23d_44b3_9823_5fac9b23edc8	MKK1/2	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{23} = \frac{\text{mw1c3fcb1f\_0b90\_46dd\_b13a\_2950fb9e18ae} \cdot \text{mw308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a}}{\text{mw8a65d230\_2abb\_478d\_ab8a\_6719d972483d} + \text{mw308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a}} \quad (46)$$

Table 96: Properties of each parameter.

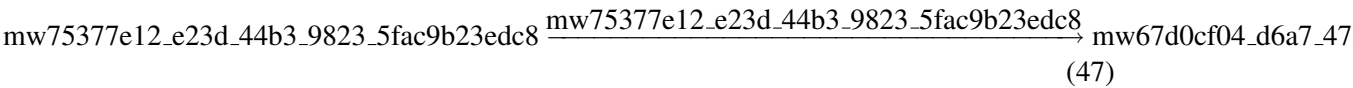
Id	Name	SBO	Value	Unit	Constant
mw1c3fcb1f_0b90_46dd_b13a_2950fb9e18ae	v23		0.20	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw8a65d230_2abb_478d_ab8a_6719d972483d	k23		0.01	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

5.24 Reaction mw49bb8edf\_f533\_4abe\_b55e\_468a1f3b296e

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 24

Reaction equation



Reactant

Table 97: Properties of each reactant.

Id	Name	SBO
mw75377e12_e23d_44b3_9823_5fac9b23edc8	MKK1/2	

Modifier

Table 98: Properties of each modifier.

Id	Name	SBO
mw75377e12_e23d_44b3_9823_5fac9b23edc8	MKK1/2	

Product

Table 99: Properties of each product.

Id	Name	SBO
mw67d0cf04_d6a7_4725_a869_098a96a3350d	ERK1/2	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{24} = \frac{\text{mw5990b7f9_7d15_4306_9047_6237ecf066ca} \cdot \text{mw75377e12_e23d_44b3_9823_5fac9b23edc8}}{\text{mwc29ba5b1_b0e7_4fa1_9e46_a4c0bdbdacc4} + \text{mw75377e12_e23d_44b3_9823_5fac9b23edc8}} \quad (48)$$

Table 100: Properties of each parameter.

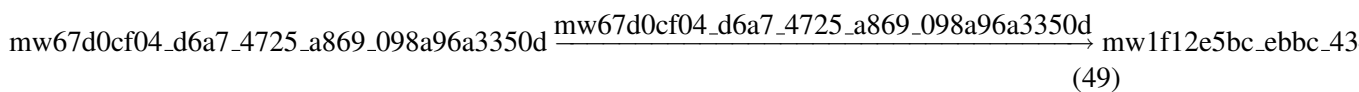
Id	Name	SBO	Value	Unit	Constant
mw5990b7f9- _7d15- _4306_9047- _6237ecf066ca	v24		0.9	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mwc29ba5b1- _b0e7- _4fa1_9e46- _a4c0bdbdacc4	k24		0.2	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.25 Reaction [mwe2722be2\\_db07\\_4c1d\\_879e\\_272e1518fb8e](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 25

#### Reaction equation



#### Reactant

Table 101: Properties of each reactant.

Id	Name	SBO
mw67d0cf04_d6a7_4725_a869_098a96a3350d	ERK1/2	

#### Modifier

Table 102: Properties of each modifier.

Id	Name	SBO
mw67d0cf04_d6a7_4725_a869_098a96a3350d	ERK1/2	

#### Product



Table 103: Properties of each product.

Id	Name	SBO
mw1f12e5bc_ebbc_4347_b6b7_5cd1740ac69a	ERK1/2	

### Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{25} = \text{mw}d2f6a3b7\_5a74\_4d77\_b40c\_1a6713b98554 \cdot \text{mw}67d0cf04\_d6a7\_4725\_a869\_098a96a3350d \quad (50)$$

Table 104: Properties of each parameter.

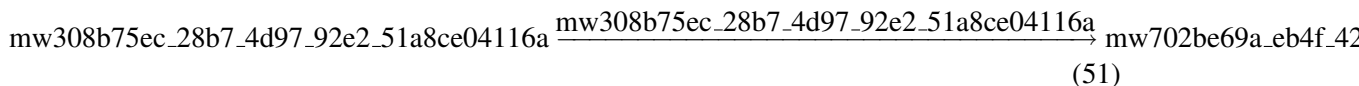
Id	Name	SBO	Value	Unit	Constant
mw d2f6a3b7- _5a74- _4d77_b40c- _1a6713b98554	k25		0.42	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.26 Reaction mw573abe13\_d3cc\_4f5a\_a886\_029e2d5da8df

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 26

### Reaction equation



### Reactant

Table 105: Properties of each reactant.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

### Modifier

Table 106: Properties of each modifier.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

## Product

Table 107: Properties of each product.

Id	Name	SBO
mw702be69a_eb4f_425e_87c7_ef7d85254536	MKK4/7	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{26} = \frac{\text{mw75017b10\_387d\_43e4\_9fb1\_fed7ce6bd490} \cdot \text{mw308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a}}{\text{mw251bb80a\_5527\_4b9c\_9834\_99556d4e824a} + \text{mw308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a}} \quad (52)$$

Table 108: Properties of each parameter.

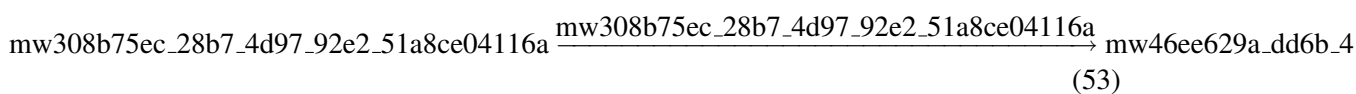
Id	Name	SBO	Value	Unit	Constant
mw75017b10- _387d- _43e4_9fb1- _fed7ce6bd490	v26		0.30	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw251bb80a- _5527- _4b9c_9834- _99556d4e824a	k26		0.01	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.27 Reaction mw0649b87c\_cb39\_43b6\_820a\_0f21572f784e

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 27

### Reaction equation



## Reactant

Table 109: Properties of each reactant.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

## Modifier

Table 110: Properties of each modifier.

Id	Name	SBO
mw308b75ec_28b7_4d97_92e2_51a8ce04116a	TAB2_TAK1_TAB1	

## Product

Table 111: Properties of each product.

Id	Name	SBO
mw46ee629a_dd6b_4163_9da1_2614bb1d74bc	MKK3/6	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{27} = \frac{\text{mw6ac279a2\_23fe\_4e48\_a910\_2a94ef61244c} \cdot \text{mw308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a}}{\text{mw0e1c63a9\_8b8a\_4ec7\_9608\_0059208d992f} + \text{mw308b75ec\_28b7\_4d97\_92e2\_51a8ce04116a}} \quad (54)$$

Table 112: Properties of each parameter.

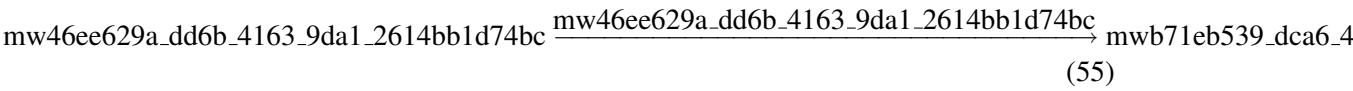
Id	Name	SBO	Value	Unit	Constant
mw6ac279a2- _23fe- _4e48_a910- _2a94ef61244c	v27		0.10	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw0e1c63a9- _8b8a- _4ec7_9608- _0059208d992f	k27		0.01	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

5.28 Reaction mw17bf22e9\_37fd\_42b6\_b648\_d2ae38fbc805

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 28

Reaction equation



Reactant

Table 113: Properties of each reactant.

Id	Name	SBO
mw46ee629a_dd6b_4163_9da1_2614bb1d74bc	MKK3/6	

Modifier

Table 114: Properties of each modifier.

Id	Name	SBO
mw46ee629a_dd6b_4163_9da1_2614bb1d74bc	MKK3/6	

Product

Table 115: Properties of each product.

Id	Name	SBO
mwb71eb539_dca6_47ab_8df5_430d84af0bf	p38	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$v_{28}$

(56)

$$= \frac{\text{mwcad6928f\_259d\_4125\_987e\_977e0c40ef7d} \cdot \text{mw46ee629a\_dd6b\_4163\_9da1\_2614bb1d74bc}}{\text{mw1670fb0f\_e301\_4b7a\_93d4\_35fe7f504e92} + \text{mw46ee629a\_dd6b\_4163\_9da1\_2614bb1d74bc}}$$

Table 116: Properties of each parameter.

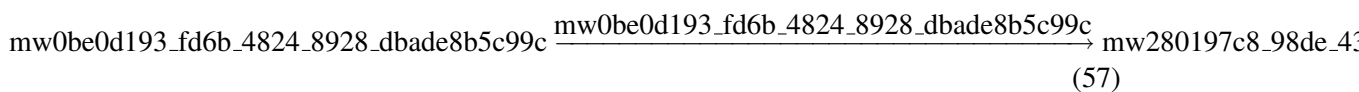
Id	Name	SBO	Value	Unit	Constant
mwcad6928f- _259d- _4125_987e- _977e0c40ef7d	v28		1.50	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw1670fb0f- _e301- _4b7a_93d4- _35fe7f504e92	k28		0.03	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

## 5.29 Reaction [mw75054b4a\\_cf66\\_4bfe\\_bda0\\_44b88f715532](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 29

### Reaction equation



### Reactant

Table 117: Properties of each reactant.

Id	Name	SBO
mw0be0d193_fd6b_4824_8928_dbade8b5c99c	EGF	

### Modifier

Table 118: Properties of each modifier.

Id	Name	SBO
mw0be0d193_fd6b_4824_8928_dbade8b5c99c	EGF	

### Product

Table 119: Properties of each product.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

### Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{29} = \text{mw1a4dcdaf\_ff4b\_41a9\_ac1d\_79fd2d942260} \cdot \text{mw0be0d193\_fd6b\_4824\_8928\_dbade8b5899c}$$

Table 120: Properties of each parameter.

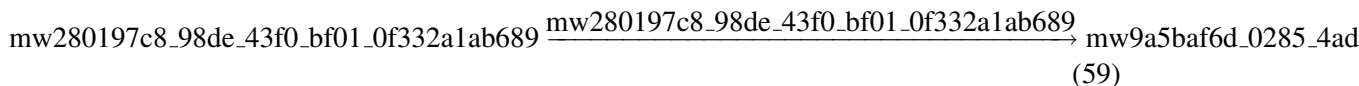
Id	Name	SBO	Value	Unit	Constant
mw1a4dcdaf\_ff4b\_41a9\_ac1d\_79fd2d942260	k29		0.6	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.30 Reaction mw4e1795dc\_c8de\_4708\_ba0d\_52d69fae724e

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 30

### Reaction equation



### Reactant

Table 121: Properties of each reactant.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

### Modifier

Table 122: Properties of each modifier.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

## Product

Table 123: Properties of each product.

Id	Name	SBO
mw9a5baf6d_0285_4ad3_9499_059c553d9cf6	PLC gamma	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{30} = \frac{\text{mw}b3751ef8\_2226\_4ec3\_9ac9\_f92f5771a1a4 \cdot \text{mw}280197c8\_98de\_43f0\_bf01\_0f332a1ab689}{\text{mw}244e346b\_4442\_45db\_864e\_0442ceca94d1 + \text{mw}280197c8\_98de\_43f0\_bf01\_0f332a1ab689} \quad (60)$$

Table 124: Properties of each parameter.

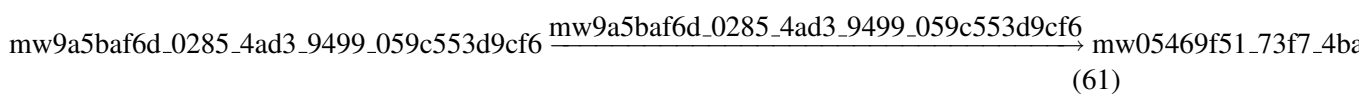
Id	Name	SBO	Value	Unit	Constant
mw b3751ef8- _2226- _4ec3_9ac9- _f92f5771a1a4	v30		$2 \cdot 10^{-4}$	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw244e346b- _4442- _45db_864e- _0442ceca94d1	k30		0.500	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.31 Reaction mw51210768\_0597\_4bf6\_a013\_49896f03c73d

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 31

#### Reaction equation



## Reactant

Table 125: Properties of each reactant.

Id	Name	SBO
mw9a5baf6d_0285_4ad3_9499_059c553d9cf6	PLC gamma	

## Modifier

Table 126: Properties of each modifier.

Id	Name	SBO
mw9a5baf6d_0285_4ad3_9499_059c553d9cf6	PLC gamma	

## Product

Table 127: Properties of each product.

Id	Name	SBO
mw05469f51_73f7_4ba1_9f1a_bce5fea143c2	PIP2	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{31} = \frac{\text{mw18e075a4\_dde4\_42be\_9315\_e0e90d461b99} \cdot \text{mw9a5baf6d\_0285\_4ad3\_9499\_059c553d9cf6}}{\text{mw6d4dc2a5\_6fe8\_4d80\_93f4\_b9f438b6eb0e} + \text{mw9a5baf6d\_0285\_4ad3\_9499\_059c553d9cf6}} \quad (62)$$

Table 128: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mw18e075a4-_dde4-_42be_9315-_e0e90d461b99	v31		0.6	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw6d4dc2a5-_6fe8-_4d80_93f4-_b9f438b6eb0e	k31		1.0	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

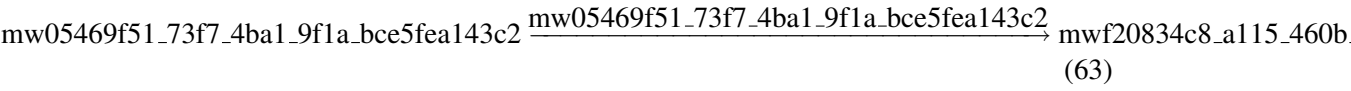


5.32 Reaction mw05368c46\_8a41\_4609\_b904\_25219691464b

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 32

Reaction equation



Reactant

Table 129: Properties of each reactant.

Id	Name	SBO
mw05469f51_73f7_4ba1_9f1a_bce5fea143c2	PIP2	

Modifier

Table 130: Properties of each modifier.

Id	Name	SBO
mw05469f51_73f7_4ba1_9f1a_bce5fea143c2	PIP2	

Product

Table 131: Properties of each product.

Id	Name	SBO
mwf20834c8_a115_460b_859c_4e3ca1ffd953	DAG	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{32} = \frac{\text{mweaee0b65_7c40_4c9e_bd70_c5454eeb41fa} \cdot \text{mw05469f51_73f7_4ba1_9f1a_bce5fea143c2}}{\text{mw84020ddc_e419_4aa4_ab12_e84989ad461d} + \text{mw05469f51_73f7_4ba1_9f1a_bce5fea143c2}} \quad (64)$$

Table 132: Properties of each parameter.

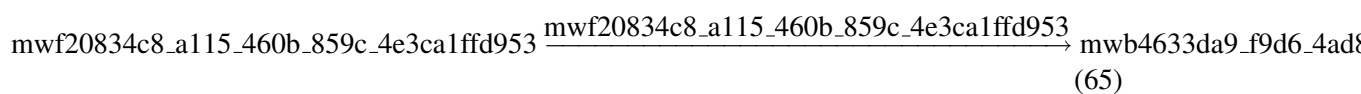
Id	Name	SBO	Value	Unit	Constant
mweaee0b65- _7c40- _4c9e_bd70- _c5454eeb41fa	v32		0.9	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw84020ddc- _e419- _4aa4_ab12- _e84989ad461d	k32		0.3	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.33 Reaction [mw86f53d9\\_af3e\\_499e\\_9c41\\_7aaf353919e0](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 33

#### Reaction equation



#### Reactant

Table 133: Properties of each reactant.

Id	Name	SBO
mwf20834c8_a115_460b_859c_4e3ca1ffd953	DAG	

#### Modifier

Table 134: Properties of each modifier.

Id	Name	SBO
mwf20834c8_a115_460b_859c_4e3ca1ffd953	DAG	

#### Product

Table 135: Properties of each product.

Id	Name	SBO
mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	PKC	

### Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{33} = \text{mw9d566811\_669e\_4b95\_8452\_c4853f54a2de} \cdot \text{mwf20834c8\_a115\_460b\_859c\_4e3ca106d953}$$

Table 136: Properties of each parameter.

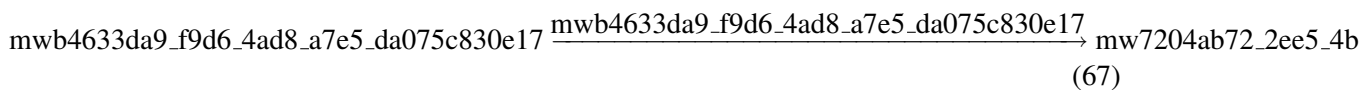
Id	Name	SBO	Value	Unit	Constant
mw9d566811\_669e\_4b95\_8452\_c4853f54a2de	k33		0.35	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.34 Reaction [mw1a0f986a\\_5f18\\_4312\\_bf3a\\_9e79ae4e7f36](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 34

### Reaction equation



### Reactant

Table 137: Properties of each reactant.

Id	Name	SBO
mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	PKC	

### Modifier

Table 138: Properties of each modifier.

Id	Name	SBO
mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	PKC	

## Product

Table 139: Properties of each product.

Id	Name	SBO
mw7204ab72_2ee5_4b92_b420_2583dacc4343	IkK_NFkB	

## Kinetic Law

**Derived unit**  $0.9999999999999999 \text{ mol} \cdot \text{s}^{-1}$

$$v_{34} = \frac{\text{mw99befd62\_975f\_49e1\_bfaf\_22a482ce44ea} \cdot \text{mwb4633da9\_f9d6\_4ad8\_a7e5\_da075c830e17}}{\text{mwb38e4258\_82d9\_4b48\_8059\_eccf9fd6f8e3} + \text{mwb4633da9\_f9d6\_4ad8\_a7e5\_da075c830e17}} \quad (68)$$

Table 140: Properties of each parameter.

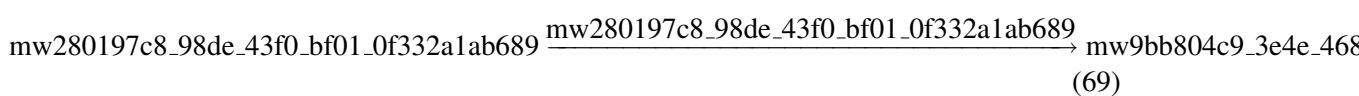
Id	Name	SBO	Value	Unit	Constant
mw99befd62-_975f-_49e1_bfaf-_22a482ce44ea	v34		1.2	$\text{mol} \cdot \text{s}^{-1} \cdot 10^{-9} \text{ dimensionless}$	<input checked="" type="checkbox"/>
mwb38e4258-_82d9-_4b48_8059-_eccf9fd6f8e3	k34		0.2	$10^{-9} \text{ mol}$	<input checked="" type="checkbox"/>

### 5.35 Reaction [mw17b927e1\\_56f3\\_4e65\\_a482\\_b8f190af70aa](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 35

### Reaction equation



## Reactant

Table 141: Properties of each reactant.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

## Modifier

Table 142: Properties of each modifier.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

## Product

Table 143: Properties of each product.

Id	Name	SBO
mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e	PI3K	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{35} = \frac{\text{mw78df1f4c\_2a96\_4d8f\_a009\_c19ba0ec406a} \cdot \text{mw280197c8\_98de\_43f0\_bf01\_0f332a1ab689}}{\text{mw6a74caa7\_9d44\_449b\_854b\_c1678b36ac1d} + \text{mw280197c8\_98de\_43f0\_bf01\_0f332a1ab689}} \quad (70)$$

Table 144: Properties of each parameter.

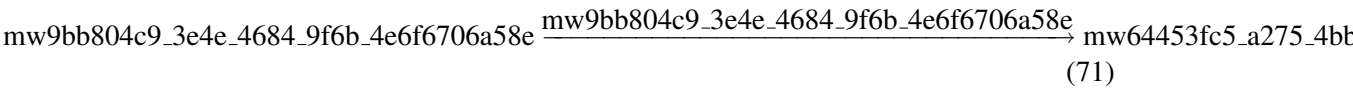
Id	Name	SBO	Value	Unit	Constant
mw78df1f4c- _2a96- _4d8f_a009- _c19ba0ec406a	v35		0.2	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw6a74caa7- _9d44- _449b_854b- _c1678b36ac1d	k35		0.8	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

5.36 Reaction mw0549a0ba\_63b4\_4a0e\_8506\_1c379b878280

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 36

Reaction equation



Reactant

Table 145: Properties of each reactant.

Id	Name	SBO
mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e	PI3K	

Modifier

Table 146: Properties of each modifier.

Id	Name	SBO
mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e	PI3K	

Product

Table 147: Properties of each product.

Id	Name	SBO
mw64453fc5_a275_4bbba_84f0_2af249b31514	Akt	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{36} = \frac{\text{mw3690266b_c916_4ba1_a98a_b589dc75c1cd} \cdot \text{mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e}}{\text{mw69d510c_dcde_4bfb_9e4a_89954f6a7bf5} + \text{mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e}} \quad (72)$$

Table 148: Properties of each parameter.

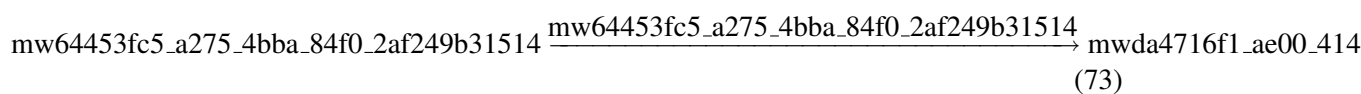
Id	Name	SBO	Value	Unit	Constant
mw3690266b- _c916- _4ba1_a98a- _b589dc75c1cd	v36		0.8	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw69d510c- _dcde- _4bfb_9e4a- _89954f6a7bf5	k36		1.5	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.37 Reaction mw7ec21bdc\_6e00\_410d\_8524\_046f820d0921

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 37

#### Reaction equation



#### Reactant

Table 149: Properties of each reactant.

Id	Name	SBO
mw64453fc5_a275_4bba_84f0_2af249b31514	Akt	

#### Modifier

Table 150: Properties of each modifier.

Id	Name	SBO
mw64453fc5_a275_4bba_84f0_2af249b31514	Akt	

#### Product

Table 151: Properties of each product.

Id	Name	SBO
mwda4716f1_ae00_4149_aec3_12531380425a	Akt	

### Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{37} = \text{mw}b336e12c\_0e62\_4fff\_94c0\_2771b1a19065 \cdot \text{mw}64453fc5\_a275\_4bba\_84f0\_2af249b674514$$

Table 152: Properties of each parameter.

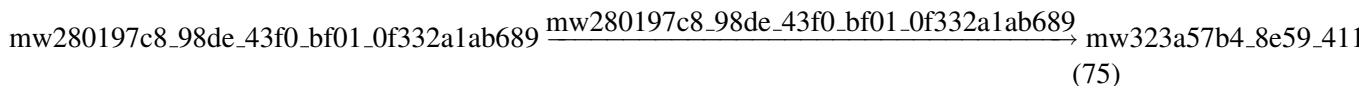
Id	Name	SBO	Value	Unit	Constant
mw b336e12c- _0e62- _4fff_94c0- _2771b1a19065	k37		0.2	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.38 Reaction [mwbc35988a\\_c061\\_4dff\\_a2b0\\_09fa8f45d873](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 38

### Reaction equation



### Reactant

Table 153: Properties of each reactant.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

### Modifier



Table 154: Properties of each modifier.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

## Product

Table 155: Properties of each product.

Id	Name	SBO
mw323a57b4_8e59_4116_9ad1_fe547b89c858	Shc/Grb2/Sos1	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{38} = \text{mw661c7759\_2bd3\_4c93\_bb0a\_823bb37b9820} \cdot \text{mw280197c8\_98de\_43f0\_bf01\_0f332a1ab689} \quad (76)$$

Table 156: Properties of each parameter.

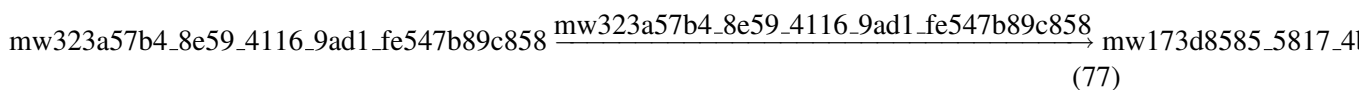
Id	Name	SBO	Value	Unit	Constant
mw661c7759- _2bd3- _4c93_bb0a- _823bb37b9820	k38		0.299	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

### 5.39 Reaction mwffb70cc8\_3371\_416f\_b374\_c518884ba240

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 39

## Reaction equation



## Reactant

Table 157: Properties of each reactant.

Id	Name	SBO
mw323a57b4_8e59_4116_9ad1_fe547b89c858	Shc/Grb2/Sos1	

## Modifier

Table 158: Properties of each modifier.

Id	Name	SBO
mw323a57b4_8e59_4116_9ad1_fe547b89c858	Shc/Grb2/Sos1	

## Product

Table 159: Properties of each product.

Id	Name	SBO
mw173d8585_5817_4b4c_932a_cf7d673680ac	Ras	

## Kinetic Law

**Derived unit**  $0.9999999999999999 \text{ mol} \cdot \text{s}^{-1}$

$$v_{39} = \frac{\text{mw883852ed\_c433\_4dec\_baa0\_386309fc085c} \cdot \text{mw323a57b4\_8e59\_4116\_9ad1\_fe547b89c858}}{\text{mw6069097b\_159a\_4bcf\_a591\_e496d06cf0a9} + \text{mw323a57b4\_8e59\_4116\_9ad1\_fe547b89c858}} \quad (78)$$

Table 160: Properties of each parameter.

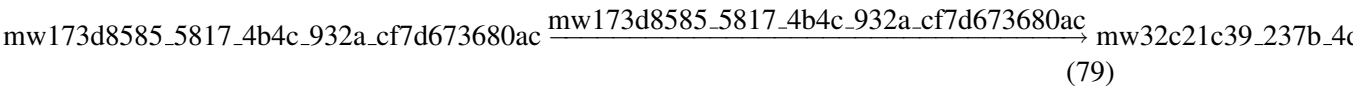
Id	Name	SBO	Value	Unit	Constant
mw883852ed-_c433-_4dec_baa0-_386309fc085c	v39		0.24	$\text{mol} \cdot \text{s}^{-1} \cdot 10^{-9}$ dimensionless	<input checked="" type="checkbox"/>
mw6069097b-_159a-_4bcf_a591-_e496d06cf0a9	k39		1.20	$10^{-9} \text{ mol}$	<input checked="" type="checkbox"/>

5.40 Reaction mwcf26ace1\_325c\_4287\_81d4\_382e2f2beb1c

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 40

Reaction equation



Reactant

Table 161: Properties of each reactant.

Id	Name	SBO
mw173d8585_5817_4b4c_932a_cf7d673680ac	Ras	

Modifier

Table 162: Properties of each modifier.

Id	Name	SBO
mw173d8585_5817_4b4c_932a_cf7d673680ac	Ras	

Product

Table 163: Properties of each product.

Id	Name	SBO
mw32c21c39_237b_4d4c_bb5d_117cb30ce68a	Raf	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$$\begin{aligned} &v_{40} \\ = &\frac{\text{mw78a1e67e_883c_497f_86a6_f85da783010e} \cdot \text{mw173d8585_5817_4b4c_932a_cf7d673680ac}}{\text{mw5d6cf9c6_4dc0_4fe6_9afc_da397fe896b2} + \text{mw173d8585_5817_4b4c_932a_cf7d673680ac}} \end{aligned} \tag{80}$$

Table 164: Properties of each parameter.

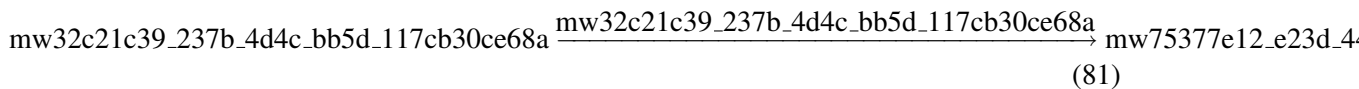
Id	Name	SBO	Value	Unit	Constant
mw78a1e67e- _883c- _497f_86a6- _f85da783010e	v40		0.2	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw5d6cf9c6- _4dc0- _4fe6_9afc- _da397fe896b2	k40		1.5	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

#### 5.41 Reaction [mwa52ff158\\_9e98\\_454a\\_a98e\\_3bc52e4aa39f](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 41

#### Reaction equation



#### Reactant

Table 165: Properties of each reactant.

Id	Name	SBO
mw32c21c39_237b_4d4c_bb5d_117cb30ce68a	Raf	

#### Modifier

Table 166: Properties of each modifier.

Id	Name	SBO
mw32c21c39_237b_4d4c_bb5d_117cb30ce68a	Raf	

#### Product

Table 167: Properties of each product.

Id	Name	SBO
mw75377e12_e23d_44b3_9823_5fac9b23edc8	MKK1/2	

### Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{41} = \frac{\text{mw26de6022\_cc14\_484b\_a172\_db4173a1ccaa} \cdot \text{mw32c21c39\_237b\_4d4c\_bb5d\_117cb30ce68a}}{\text{mw7e75e47c\_6d88\_49fb\_a9c4\_9154f12cc4d5} + \text{mw32c21c39\_237b\_4d4c\_bb5d\_117cb30ce68a}} \quad (82)$$

Table 168: Properties of each parameter.

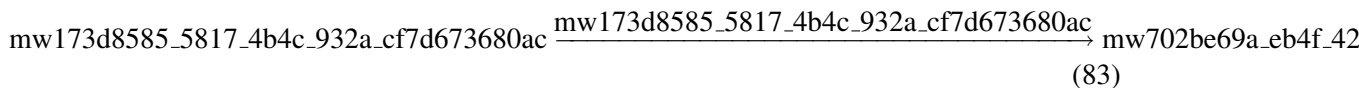
Id	Name	SBO	Value	Unit	Constant
mw26de6022- _cc14- _484b_a172- _db4173a1ccaa	v41		0.7	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw7e75e47c- _6d88- _49fb_a9c4- _9154f12cc4d5	k41		1.5	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.42 Reaction mw427812f2\_a2ec\_476c\_8359\_96749d8910f4

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 42

### Reaction equation



### Reactant

Table 169: Properties of each reactant.

Id	Name	SBO
mw173d8585_5817_4b4c_932a_cf7d673680ac	Ras	

## Modifier

Table 170: Properties of each modifier.

Id	Name	SBO
mw173d8585_5817_4b4c_932a_cf7d673680ac	Ras	

## Product

Table 171: Properties of each product.

Id	Name	SBO
mw702be69a_eb4f_425e_87c7_ef7d85254536	MKK4/7	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$\begin{aligned} & v_{42} \\ = & \frac{\text{mw2f1f65d1\_5633\_4625\_b2b7\_0eb267eac293} \cdot \text{mw173d8585\_5817\_4b4c\_932a\_cf7d673680ac}}{\text{mw0b0869f4\_26bb\_4d13\_9124\_b2c1b28e3ae1} + \text{mw173d8585\_5817\_4b4c\_932a\_cf7d673680ac}} \quad (84) \end{aligned}$$

Table 172: Properties of each parameter.

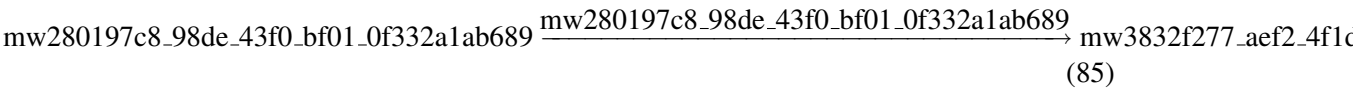
Id	Name	SBO	Value	Unit	Constant
mw2f1f65d1- _5633- _4625_b2b7- _0eb267eac293	v42		0.4	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw0b0869f4- _26bb- _4d13_9124- _b2c1b28e3ae1	k42		1.5	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

### 5.43 Reaction mw72aabd27\_658a\_45ef\_87b2\_cec59e2a548a

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 43

Reaction equation



Reactant

Table 173: Properties of each reactant.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

Modifier

Table 174: Properties of each modifier.

Id	Name	SBO
mw280197c8_98de_43f0_bf01_0f332a1ab689	EGFR	

Product

Table 175: Properties of each product.

Id	Name	SBO
mw3832f277_aef2_4f1d_87af_abc2a3c1a7d5	JAK	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

v<sub>43</sub>

=

mw234b354b\_eb7b\_4af6\_a678\_9339f6b5eb8d · mw280197c8\_98de\_43f0\_bf01\_0f332a1ab689

mw18baeb4d\_ad18\_4c22\_95c4\_2ada0f618c65 + mw280197c8\_98de\_43f0\_bf01\_0f332a1ab689

(86)

Table 176: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mw234b354b_eb7b_4af6_a678_9339f6b5eb8d	v43		0.01	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>

Produced by SBML2<sup>L</sup>AT<sup>E</sup>X

71

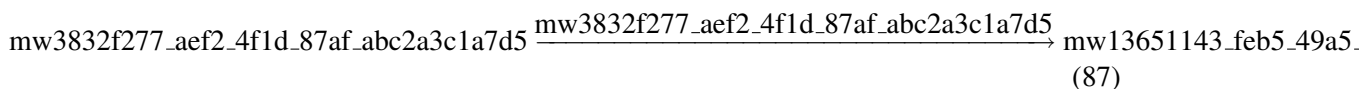
Id	Name	SBO	Value	Unit	Constant
mw18baeb4d-_ad18-_4c22_95c4-_2ada0f618c65	k43		1.80	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

#### 5.44 Reaction [mw1498886c\\_3fb6\\_44f5\\_ae32\\_7a8948030948](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 44

#### Reaction equation



#### Reactant

Table 177: Properties of each reactant.

Id	Name	SBO
mw3832f277\_aef2\_4f1d\_87af\_abc2a3c1a7d5	JAK	

#### Modifier

Table 178: Properties of each modifier.

Id	Name	SBO
mw3832f277\_aef2\_4f1d\_87af\_abc2a3c1a7d5	JAK	

#### Product

Table 179: Properties of each product.

Id	Name	SBO
mw13651143\_feb5\_49a5\_adab\_9105c2647446	STAT1/3	

#### Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>



$$v_{44} = \frac{\text{mw66285193\_607e\_42b6\_b726\_c2409a2ce563} \cdot \text{mw3832f277\_aef2\_4f1d\_87af\_abc2a3c1a7d5}}{\text{mwa4c28075\_8524\_4874\_aee5\_c38231bfbaae} + \text{mw3832f277\_aef2\_4f1d\_87af\_abc2a3c1a7d5}} \quad (88)$$

Table 180: Properties of each parameter.

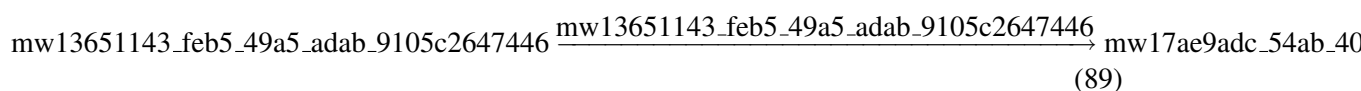
Id	Name	SBO	Value	Unit	Constant
mw66285193- _607e- _42b6_b726- _c2409a2ce563	v44		1.0	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mwa4c28075- _8524- _4874_aee5- _c38231bfbaae	k44		1.5	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

#### 5.45 Reaction mw dcd61085\_a433\_4362\_a836\_938c7ae43ded

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 45

#### Reaction equation



#### Reactant

Table 181: Properties of each reactant.

Id	Name	SBO
mw13651143_feb5_49a5_adab_9105c2647446	STAT1/3	

#### Modifier

Table 182: Properties of each modifier.

Id	Name	SBO
mw13651143_feb5_49a5_adab_9105c2647446	STAT1/3	

## Product

Table 183: Properties of each product.

Id	Name	SBO
mw17ae9adc_54ab_407b_a34d_8413a3a10cc6	STAT1/3	

## Kinetic Law

**Derived unit**  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$$v_{45} = \text{mw9a480703\_d4bb\_4de8\_8975\_13a18205ce53} \cdot \text{mw13651143\_feb5\_49a5\_adab\_9105c2647446} \quad (90)$$

Table 184: Properties of each parameter.

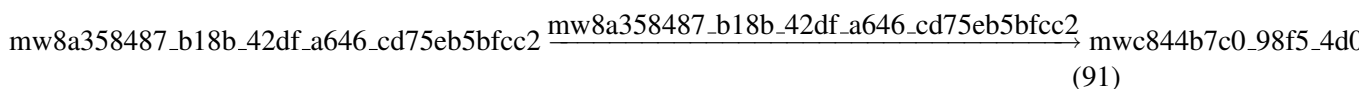
Id	Name	SBO	Value	Unit	Constant
mw9a480703\_d4bb\_4de8\_8975\_13a18205ce53	k45		0.19	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

## 5.46 Reaction [mw820c3d2\\_bbc1\\_4211\\_9818\\_1e515a583b8a](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 46

### Reaction equation



## Reactant

Table 185: Properties of each reactant.

Id	Name	SBO
mw8a358487_b18b_42df_a646_cd75eb5bfcc2	NFkB	

Modifier

Table 186: Properties of each modifier.

Id	Name	SBO
mw8a358487_b18b_42df_a646_cd75eb5bfcc2	NFkB	

Product

Table 187: Properties of each product.

Id	Name	SBO
mwc844b7c0_98f5_4d0d_8f0c_00dfe8b54e6d	TNF	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{46} = \frac{\text{mwbad3f510\_fbca\_4aa7\_a4c2\_5c1b47297802} \cdot \text{mw8a358487\_b18b\_42df\_a646\_cd75eb5bfcc2}^{\text{mw4d5fd70d\_8603\_4056\_adfa\_5af26d657455}}}{\text{mw2fa0d3fe\_4e99\_49d2\_a339\_089198589a1e} + \text{mw8a358487\_b18b\_42df\_a646\_cd75eb5bfcc2}^{\text{mw4d5fd70d\_8603\_4056\_adfa\_5af26d657455}}}$$

(92)

Table 188: Properties of each parameter.

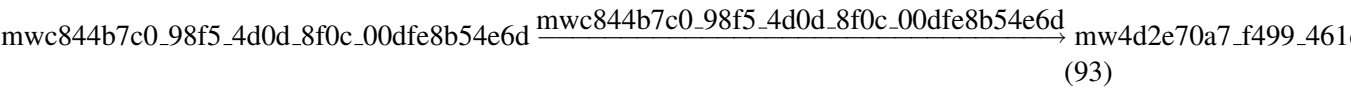
Id	Name	SBO	Value	Unit	Constant
mwbad3f510_fbca_4aa7_a4c2_5c1b47297802	v46		2.35	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw4d5fd70d_8603_4056_adfa_5af26d657455	n46		1.00		<input checked="" type="checkbox"/>
mw2fa0d3fe_4e99_49d2_a339_089198589a1e	kp47		0.43	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

5.47 Reaction mwd95fbca0\_6234\_4c19\_81ea\_5e74b558e2f1

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 47

Reaction equation



Reactant

Table 189: Properties of each reactant.

Id	Name	SBO
mwc844b7c0_98f5_4d0d_8f0c_00dfe8b54e6d	TNF	

Modifier

Table 190: Properties of each modifier.

Id	Name	SBO
mwc844b7c0_98f5_4d0d_8f0c_00dfe8b54e6d	TNF	

Product

Table 191: Properties of each product.

Id	Name	SBO
mw4d2e70a7_f499_461d_ae18_bc53b365b091	TNF	

Kinetic Law

Derived unit  $\text{s}^{-1} \cdot 10^{-9} \text{ mol}$

$v_{47} = \text{mw2b132eeb\_ce2a\_4a53\_8c22\_c102ebd2edb9} \cdot \text{mwc844b7c0\_98f5\_4d0d\_8f0c\_00dfe8b54e6d}$  (94)

Table 192: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mw2b132eeb- _ce2a- _4a53_8c22- _c102ebd2edb9	k47		1.1	$\text{s}^{-1} \cdot \text{dimensionless}$	<input checked="" type="checkbox"/>

#### 5.48 Reaction [mw36e7aae0\\_ea29\\_437f\\_a9c0\\_57981e85b29e](#)

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

**Name** 48

#### Reaction equation

[mw4633da9\\_f9d6\\_4ad8\\_a7e5\\_da075c830e17](#)  $\xrightarrow{\text{mw4633da9_f9d6_4ad8_a7e5_da075c830e17}}$  [mw173d8585\\_5817\\_4b4c\\_932a\\_cf7d673680ac](#)  
(95)

#### Reactant

Table 193: Properties of each reactant.

Id	Name	SBO
<a href="#">mw4633da9_f9d6_4ad8_a7e5_da075c830e17</a>	PKC	

#### Modifier

Table 194: Properties of each modifier.

Id	Name	SBO
<a href="#">mw4633da9_f9d6_4ad8_a7e5_da075c830e17</a>	PKC	

#### Product

Table 195: Properties of each product.

Id	Name	SBO
<a href="#">mw173d8585_5817_4b4c_932a_cf7d673680ac</a>	Ras	

Kinetic Law

Derived unit 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{48} = \frac{mwdeab2870\_570e\_4b2c\_b73d\_84c1ad8c2262 \cdot mwb4633da9\_f9d6\_4ad8\_a7e5\_da075c830e17}{mw4945db3d\_e20c\_4870\_b96b\_6fb98c4b12f6 + mwb4633da9\_f9d6\_4ad8\_a7e5\_da075c830e17}$$

(96)

Table 196: Properties of each parameter.

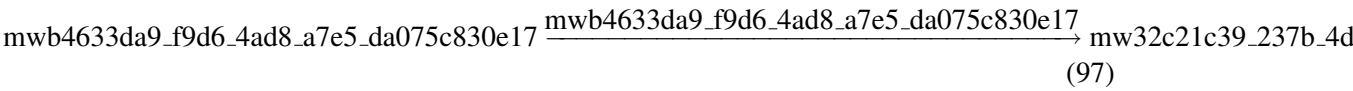
Id	Name	SBO	Value	Unit	Constant
mwdeab2870- _570e- _4b2c_b73d- _84c1ad8c2262	v48		1.0	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw4945db3d- _e20c- _4870_b96b- _6fb98c4b12f6	k48		1.0	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

5.49 Reaction mwe6aec30e\_5e5f\_4427\_bda2\_9c7edc4d5547

This is an irreversible reaction of one reactant forming one product influenced by one modifier.

Name 49

Reaction equation



Reactant

Table 197: Properties of each reactant.

Id	Name	SBO
mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	PKC	

Modifier

Table 198: Properties of each modifier.

Id	Name	SBO
mwb4633da9_f9d6_4ad8_a7e5_da075c830e17	PKC	

## Product

Table 199: Properties of each product.

Id	Name	SBO
mw32c21c39_237b_4d4c_bb5d_117cb30ce68a	Raf	

## Kinetic Law

**Derived unit** 0.9999999999999999 mol · s<sup>-1</sup>

$$v_{49} = \frac{\text{mw0f1ee85e\_95a3\_42c7\_94ae\_71f36061aaf0} \cdot \text{mwb4633da9\_f9d6\_4ad8\_a7e5\_da075c830e17}}{\text{mw933afd80\_4eff\_4c6c\_967b\_d15b2244e55d} + \text{mwb4633da9\_f9d6\_4ad8\_a7e5\_da075c830e17}} \quad (98)$$

Table 200: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
mw0f1ee85e\_95a3\_42c7\_94ae\_71f36061aaf0	v49		1.0	mol · s <sup>-1</sup> · 10 <sup>-9</sup> dimensionless	<input checked="" type="checkbox"/>
mw933afd80\_4eff\_4c6c\_967b\_d15b2244e55d	k49		1.0	10 <sup>-9</sup> mol	<input checked="" type="checkbox"/>

## 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 [mw4d2e70a7\\_f499\\_461d\\_ae18\\_bc53b365b091](#)

**Name** TNF

**Initial amount** 1.5 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw56c6d2a8\\_5d66\\_4b27\\_841a\\_662ac710fac3](#) and as a product in [mwd95fbca0\\_6234\\_4c19\\_81ea\\_5e74b558e2f1](#) and as a modifier in [mw56c6d2a8\\_5d66\\_4b27\\_841a\\_662ac710fac3](#)).

$$\frac{d}{dt}mw4d2e70a7_f499_461d_ae18_bc53b365b091 = v_{47} - v_1 \quad (99)$$

## 6.2 Species [mw8cc67de0\\_64e6\\_428f\\_ab09\\_4c2825cc172c](#)

**Name** TNFR1

**Initial amount** 1.3 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw2055093c\\_9534\\_4ee3\\_999e\\_dc4d7e0246cf](#) and as a product in [mw56c6d2a8\\_5d66\\_4b27\\_841a\\_662ac710fac3](#) and as a modifier in [mw2055093c\\_9534\\_4ee3\\_999e\\_dc4d7e0246cf](#)).

$$\frac{d}{dt}mw8cc67de0_64e6_428f_ab09_4c2825cc172c = v_1 - v_2 \quad (100)$$

## 6.3 Species [mw6ee00a71\\_ab68\\_454b\\_b1cd\\_60c1ebd19cfa](#)

**Name** TRADD\_TRAF2\_RIP

**SBO:0000296** macromolecular complex

**Initial amount** 1.3 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in seven reactions (as a reactant in [mw8d01ca0a\\_dc27\\_461f\\_a854\\_cede0c0697dd](#), [mwc021dbe5\\_8831\\_4239\\_b280\\_9dcfb2ce1101](#), [mwa502f05a\\_b689\\_4ad9\\_855e\\_90ae77824ba0](#) and as a product in [mw2055093c\\_9534\\_4ee3\\_999e\\_dc4d7e0246cf](#) and as a modifier in [mw8d01ca0a\\_dc27\\_461f\\_a854\\_cede0c0697dd](#), [mwc021dbe5\\_8831\\_4239\\_b280\\_9dcfb2ce1101](#), [mwa502f05a\\_b689\\_4ad9\\_855e\\_90ae77824ba0](#)).

$$\frac{d}{dt}mw6ee00a71_ab68_454b_b1cd_60c1ebd19cfa = v_2 - v_3 - v_4 - v_{13} \quad (101)$$

## 6.4 Species [mw2dc73059\\_a841\\_48d5\\_b4bd\\_3ac24d94c42e](#)

**Name** IkB

**Initial amount** 0.8 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw065ddcfd\\_fe93\\_45f6\\_9ad4\\_a5aa4529aad4](#) and as a product in [mwc064fbe4\\_1c49\\_4130\\_b601\\_efefacd114e4](#) and as a modifier in [mw065ddcfd\\_fe93\\_45f6\\_9ad4\\_a5aa4529aad4](#)).

$$\frac{d}{dt}mw2dc73059_a841_48d5_b4bd_3ac24d94c42e = v_5 - v_8 \quad (102)$$



## 6.5 Species [mw136c8391\\_14f4\\_4a28\\_83a3\\_35cc74a2e040](#)

**Name** NIK

**Initial amount** 1.5 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in four reactions (as a reactant in [mwc064fbe4\\_1c49\\_4130\\_b601\\_efefacd114e4](#) and as a product in [mw8d01ca0a\\_dc27\\_461f\\_a854\\_cede0c0697dd](#), [mwb6a1c4c1\\_677e\\_41a0-\\_8608\\_c2d1f9037a16](#) and as a modifier in [mwc064fbe4\\_1c49\\_4130\\_b601\\_efefacd114e4](#)).

$$\frac{d}{dt}mw136c8391_14f4_4a28_83a3_35cc74a2e040 = v_3 + v_{22} - v_5 \quad (103)$$

## 6.6 Species [mw7204ab72\\_2ee5\\_4b92\\_b420\\_2583dacc4343](#)

**Name** IkK\_NFkB

**Initial amount** 1.4 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in four reactions (as a reactant in [mw57e0090c\\_072b\\_4494\\_bdf6\\_a005150e0f42](#) and as a product in [mw065ddcfd\\_fe93\\_45f6\\_9ad4\\_a5aa4529aad4](#), [mw1a0f986a\\_5f18\\_4312-\\_bf3a\\_9e79ae4e7f36](#) and as a modifier in [mw57e0090c\\_072b\\_4494\\_bdf6\\_a005150e0f42](#)).

$$\frac{d}{dt}mw7204ab72_2ee5_4b92_b420_2583dacc4343 = v_8 + v_{34} - v_6 \quad (104)$$

## 6.7 Species [mw6939cefe\\_e7ff\\_4a3f\\_b45b\\_a9234d1b5573](#)

**Name** NFkB

**Initial amount** 1.2 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwd78707fa\\_21d0\\_4f82\\_b3d1-\\_a74ba6b8f727](#) and as a product in [mw57e0090c\\_072b\\_4494\\_bdf6\\_a005150e0f42](#) and as a modifier in [mwd78707fa\\_21d0\\_4f82\\_b3d1\\_a74ba6b8f727](#)).

$$\frac{d}{dt}mw6939cefe_e7ff_4a3f_b45b_a9234d1b5573 = v_6 - v_7 \quad (105)$$

## 6.8 Species [mwf8cfed1b\\_6fcf\\_4cba\\_bc30\\_b44490814a7a](#)

**Name** MEKK1

**Initial amount** 1.4 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwc23385ec\\_434f\\_4f84\\_897b-\\_fdb26e2fc8c9](#) and as a product in [mwc021dbe5\\_8831\\_4239\\_b280\\_9dcfb2ce1101](#) and as a modifier in [mwc23385ec\\_434f\\_4f84\\_897b\\_fdb26e2fc8c9](#)).

$$\frac{d}{dt}mwf8cfed1b_6fcf_4cba_bc30_b44490814a7a = v_4 - v_9 \quad (106)$$

## 6.9 Species [mw702be69a\\_eb4f\\_425e\\_87c7\\_ef7d85254536](#)

**Name** MKK4/7

**Initial amount** 1.2 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in five reactions (as a reactant in [mw4dded01e\\_6e25\\_4d1e\\_aa54\\_62db26069cad](#) and as a product in [mwc23385ec\\_434f\\_4f84\\_897b\\_fdb26e2fc8c9](#), [mw573abe13\\_d3cc\\_4f5a-\\_a886\\_029e2d5da8df](#), [mw427812f2\\_a2ec\\_476c\\_8359\\_96749d8910f4](#) and as a modifier in [mw4dded01e\\_6e25\\_4d1e\\_aa54\\_62db26069cad](#)).

$$\frac{d}{dt}\text{mw702be69a\_eb4f\_425e\_87c7\_ef7d85254536} = v_9 + v_{26} + v_{42} - v_{10} \quad (107)$$

## 6.10 Species [mwbee11634\\_55df\\_4a3f\\_998a\\_634dfaf46fd7](#)

**Name** JNK

**Initial amount** 1.2 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwef3506d1\\_e875\\_48e5\\_8c0a-\\_4ffebdcd0f32](#) and as a product in [mw4dded01e\\_6e25\\_4d1e\\_aa54\\_62db26069cad](#) and as a modifier in [mwef3506d1\\_e875\\_48e5\\_8c0a\\_4ffebdcd0f32](#)).

$$\frac{d}{dt}\text{mwbee11634\_55df\_4a3f\_998a\_634dfaf46fd7} = v_{10} - v_{11} \quad (108)$$

## 6.11 Species [mw805b55df\\_cc91\\_4227\\_bb52\\_930e961b682c](#)

**Name** ASK

**Initial amount** 1.5 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw01a7e271\\_19c9\\_40a0\\_bb62-\\_505bad155195](#) and as a product in [mwa502f05a\\_b689\\_4ad9\\_855e\\_90ae77824ba0](#) and as a modifier in [mw01a7e271\\_19c9\\_40a0\\_bb62\\_505bad155195](#)).

$$\frac{d}{dt}\text{mw805b55df\_cc91\_4227\_bb52\_930e961b682c} = v_{13} - v_{14} \quad (109)$$

## 6.12 Species [mw71eb539\\_dca6\\_47ab\\_8df5\\_430d84af0bfb](#)

**Name** p38

**Initial amount** 0.9 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw7db85cdd\\_f1ac\\_4e07\\_9a35-\\_809b7ab77aec](#) and as a product in [mw17bf22e9\\_37fd\\_42b6\\_b648\\_d2ae38fbc805](#) and as a modifier in [mw7db85cdd\\_f1ac\\_4e07\\_9a35\\_809b7ab77aec](#)).

$$\frac{d}{dt}\text{mw71eb539\_dca6\_47ab\_8df5\_430d84af0bfb} = v_{28} - v_{15} \quad (110)$$

### 6.13 Species [mwa5d6f7e4\\_dc4d\\_4931\\_91ce\\_1e78e7b2f195](#)

**Name** LPG

**Initial amount**  $1.5 \text{ UnknownunitMWBUILTINPREFIX}_n \text{ano}_M \text{WBUILTINUNIT}_m \text{ole}$

This species takes part in two reactions (as a reactant in [mwd67b18a5\\_bb79\\_4581\\_8afa\\_9bc34a4fe139](#) and as a modifier in [mwd67b18a5\\_bb79\\_4581\\_8afa\\_9bc34a4fe139](#)).

$$\frac{d}{dt} \text{mwa5d6f7e4\_dc4d\_4931\_91ce\_1e78e7b2f195} = -v_{17} \quad (111)$$

### 6.14 Species [mw4079e13c\\_446e\\_4aa2\\_9ec4\\_233583833d02](#)

**Name** CD14-TLR

**Initial amount**  $1.5 \text{ UnknownunitMWBUILTINPREFIX}_n \text{ano}_M \text{WBUILTINUNIT}_m \text{ole}$

This species takes part in three reactions (as a reactant in [mwe28d9fcb\\_8170\\_4cbd\\_b3cc\\_564c18d65fcc](#) and as a product in [mwd67b18a5\\_bb79\\_4581\\_8afa\\_9bc34a4fe139](#) and as a modifier in [mwe28d9fcb\\_8170\\_4cbd\\_b3cc\\_564c18d65fcc](#)).

$$\frac{d}{dt} \text{mw4079e13c\_446e\_4aa2\_9ec4\_233583833d02} = v_{17} - v_{18} \quad (112)$$

### 6.15 Species [mwe5fade7d\\_1715\\_4bb1\\_843f\\_923da8ecddf1](#)

**Name** MyD88

**Initial amount**  $0.85 \text{ UnknownunitMWBUILTINPREFIX}_n \text{ano}_M \text{WBUILTINUNIT}_m \text{ole}$

This species takes part in three reactions (as a reactant in [mw215b36f5\\_a3a1\\_44bf\\_b976\\_c52cb6daddb8](#) and as a product in [mwe28d9fcb\\_8170\\_4cbd\\_b3cc\\_564c18d65fcc](#) and as a modifier in [mw215b36f5\\_a3a1\\_44bf\\_b976\\_c52cb6daddb8](#)).

$$\frac{d}{dt} \text{mwe5fade7d\_1715\_4bb1\_843f\_923da8ecddf1} = v_{18} - v_{19} \quad (113)$$

### 6.16 Species [mw262497ec\\_3d54\\_4367\\_bfe3\\_76a9c57497cb](#)

**Name** IRAK1/4

**Initial amount**  $1 \text{ UnknownunitMWBUILTINPREFIX}_n \text{ano}_M \text{WBUILTINUNIT}_m \text{ole}$

This species takes part in three reactions (as a reactant in [mw15c83962\\_bdf0\\_43f0\\_b5df\\_9ab227af0595](#) and as a product in [mw215b36f5\\_a3a1\\_44bf\\_b976\\_c52cb6daddb8](#) and as a modifier in [mw15c83962\\_bdf0\\_43f0\\_b5df\\_9ab227af0595](#)).

$$\frac{d}{dt} \text{mw262497ec\_3d54\_4367\_bfe3\_76a9c57497cb} = v_{19} - v_{20} \quad (114)$$

## 6.17 Species [mw8bffd47e\\_34de\\_4738\\_81bf\\_7a39a40b3ae8](#)

**Name** TRAF6

**Initial amount** 1.1 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwa3c7ed09\\_4e90\\_417b\\_a301\\_2a0b4ac2e1d5](#) and as a product in [mw15c83962\\_bdf0\\_43f0\\_b5df\\_9ab227af0595](#) and as a modifier in [mwa3c7ed09\\_4e90\\_417b\\_a301\\_2a0b4ac2e1d5](#)).

$$\frac{d}{dt}mw8bffd47e_34de_4738_81bf_7a39a40b3ae8 = v_{20} - v_{21} \quad (115)$$

## 6.18 Species [mw308b75ec\\_28b7\\_4d97\\_92e2\\_51a8ce04116a](#)

**Name** TAB2\_TAK1\_TAB1

**Initial amount** 1.3 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in nine reactions (as a reactant in [mwb6a1c4c1\\_677e\\_41a0\\_8608\\_c2d1f9037a16](#), [mwa23e3682\\_2d67\\_49cf\\_913c\\_52aa41335371](#), [mw573abe13\\_d3cc\\_4f5a\\_a886\\_029e2d5da8df](#), [mw0649b87c\\_cb39\\_43b6\\_820a\\_0f21572f784e](#) and as a product in [mwa3c7ed09\\_4e90\\_417b\\_a301\\_2a0b4ac2e1d5](#) and as a modifier in [mwb6a1c4c1\\_677e\\_41a0\\_8608\\_c2d1f9037a16](#), [mwa23e3682\\_2d67\\_49cf\\_913c\\_52aa41335371](#), [mw573abe13\\_d3cc\\_4f5a\\_a886\\_029e2d5da8df](#), [mw0649b87c\\_cb39\\_43b6\\_820a\\_0f21572f784e](#)).

$$\frac{d}{dt}mw308b75ec_28b7_4d97_92e2_51a8ce04116a = v_{21} - v_{22} - v_{23} - v_{26} - v_{27} \quad (116)$$

## 6.19 Species [mw75377e12\\_e23d\\_44b3\\_9823\\_5fac9b23edc8](#)

**Name** MKK1/2

**Initial amount** 1.1 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in four reactions (as a reactant in [mw49bb8edf\\_f533\\_4abe\\_b55e\\_468a1f3b296e](#) and as a product in [mwa23e3682\\_2d67\\_49cf\\_913c\\_52aa41335371](#), [mwa52ff158\\_9e98\\_454a\\_a98e\\_3bc52e4aa39f](#) and as a modifier in [mw49bb8edf\\_f533\\_4abe\\_b55e\\_468a1f3b296e](#)).

$$\frac{d}{dt}mw75377e12_e23d_44b3_9823_5fac9b23edc8 = v_{23} + v_{41} - v_{24} \quad (117)$$

## 6.20 Species [mw67d0cf04\\_d6a7\\_4725\\_a869\\_098a96a3350d](#)

**Name** ERK1/2

**Initial amount** 0.8 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwe2722be2\\_db07\\_4c1d\\_879e-272e1518fb8e](#) and as a product in [mw49bb8edf\\_f533\\_4abe\\_b55e\\_468a1f3b296e](#) and as a modifier in [mwe2722be2\\_db07\\_4c1d\\_879e\\_272e1518fb8e](#)).

$$\frac{d}{dt}\text{mw67d0cf04_d6a7_4725_a869_098a96a3350d} = v_{24} - v_{25} \quad (118)$$

## 6.21 Species [mw46ee629a\\_dd6b\\_4163\\_9da1\\_2614bb1d74bc](#)

**Name** MKK3/6

**Initial amount** 1.5 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>mole</sub>*

This species takes part in four reactions (as a reactant in [mw17bf22e9\\_37fd\\_42b6\\_b648\\_d2ae38fbc805](#) and as a product in [mw01a7e271\\_19c9\\_40a0\\_bb62\\_505bad155195](#), [mw0649b87c\\_cb39\\_43b6-\\_820a\\_0f21572f784e](#) and as a modifier in [mw17bf22e9\\_37fd\\_42b6\\_b648\\_d2ae38fbc805](#)).

$$\frac{d}{dt}\text{mw46ee629a_dd6b_4163_9da1_2614bb1d74bc} = v_{14} + v_{27} - v_{28} \quad (119)$$

## 6.22 Species [mw0be0d193\\_fd6b\\_4824\\_8928\\_dbade8b5c99c](#)

**Name** EGF

**Initial amount** 1.6 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>mole</sub>*

This species takes part in two reactions (as a reactant in [mw75054b4a\\_cf66\\_4bfe\\_bda0\\_44b88f715532](#) and as a modifier in [mw75054b4a\\_cf66\\_4bfe\\_bda0\\_44b88f715532](#)).

$$\frac{d}{dt}\text{mw0be0d193_fd6b_4824_8928_dbade8b5c99c} = -v_{29} \quad (120)$$

## 6.23 Species [mw280197c8\\_98de\\_43f0\\_bf01\\_0f332a1ab689](#)

**Name** EGFR

**Initial amount** 1.3 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>mole</sub>*

This species takes part in nine reactions (as a reactant in [mw4e1795dc\\_c8de\\_4708\\_ba0d\\_52d69fae724e](#), [mw17b927e1\\_56f3\\_4e65\\_a482\\_b8f190af70aa](#), [mwbc35988a\\_c061\\_4dff\\_a2b0\\_09fa8f45d873](#), [mw72aabd27\\_658a\\_45ef\\_87b2\\_cec59e2a548a](#) and as a product in [mw75054b4a\\_cf66\\_4bfe-\\_bda0\\_44b88f715532](#) and as a modifier in [mw4e1795dc\\_c8de\\_4708\\_ba0d\\_52d69fae724e](#), [mw17b927e1\\_56f3\\_4e65\\_a482\\_b8f190af70aa](#), [mwbc35988a\\_c061\\_4dff\\_a2b0\\_09fa8f45d873](#), [mw72aabd27\\_658a\\_45ef\\_87b2\\_cec59e2a548a](#)).

$$\frac{d}{dt}\text{mw280197c8_98de_43f0_bf01_0f332a1ab689} = v_{29} - v_{30} - v_{35} - v_{38} - v_{43} \quad (121)$$

## 6.24 Species [mw9a5baf6d\\_0285\\_4ad3\\_9499\\_059c553d9cf6](#)

**Name** PLC gamma

**Initial amount** 1.6 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw51210768\\_0597\\_4bf6\\_a013\\_49896f03c73d](#) and as a product in [mw4e1795dc\\_c8de\\_4708\\_ba0d\\_52d69fae724e](#) and as a modifier in [mw51210768\\_0597\\_4bf6\\_a013\\_49896f03c73d](#)).

$$\frac{d}{dt}mw9a5baf6d_0285_4ad3_9499_059c553d9cf6 = v_{30} - v_{31} \quad (122)$$

## 6.25 Species [mw05469f51\\_73f7\\_4ba1\\_9f1a\\_bce5fea143c2](#)

**Name** PIP2

**Initial amount** 1.45 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw05368c46\\_8a41\\_4609\\_b904\\_25219691464b](#) and as a product in [mw51210768\\_0597\\_4bf6\\_a013\\_49896f03c73d](#) and as a modifier in [mw05368c46\\_8a41\\_4609\\_b904\\_25219691464b](#)).

$$\frac{d}{dt}mw05469f51_73f7_4ba1_9f1a_bce5fea143c2 = v_{31} - v_{32} \quad (123)$$

## 6.26 Species [mwf20834c8\\_a115\\_460b\\_859c\\_4e3ca1ffd953](#)

**Name** DAG

**Initial amount** 0.9 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwb86f53d9\\_af3e\\_499e\\_9c41\\_7aaf353919e0](#) and as a product in [mw05368c46\\_8a41\\_4609\\_b904\\_25219691464b](#) and as a modifier in [mwb86f53d9\\_af3e\\_499e\\_9c41\\_7aaf353919e0](#)).

$$\frac{d}{dt}mwf20834c8_a115_460b_859c_4e3ca1ffd953 = v_{32} - v_{33} \quad (124)$$

## 6.27 Species [mwb4633da9\\_f9d6\\_4ad8\\_a7e5\\_da075c830e17](#)

**Name** PKC

**Initial amount** 1.5 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in seven reactions (as a reactant in [mw1a0f986a\\_5f18\\_4312\\_bf3a\\_9e79ae4e7f36](#), [mw36e7aae0\\_ea29\\_437f\\_a9c0\\_57981e85b29e](#), [mwe6aec30e\\_5e5f\\_4427\\_bda2\\_9c7edc4d5547](#) and as a product in [mwb86f53d9\\_af3e\\_499e\\_9c41\\_7aaf353919e0](#) and as a modifier in [mw1a0f986a\\_5f18\\_4312\\_bf3a\\_9e79ae4e7f36](#), [mw36e7aae0\\_ea29\\_437f\\_a9c0\\_57981e85b29e](#), [mwe6aec30e\\_5e5f\\_4427\\_bda2\\_9c7edc4d5547](#)).

$$\frac{d}{dt}mwb4633da9_f9d6_4ad8_a7e5_da075c830e17 = v_{33} - v_{34} - v_{48} - v_{49} \quad (125)$$

## 6.28 Species [mw9bb804c9\\_3e4e\\_4684\\_9f6b\\_4e6f6706a58e](#)

**Name** PI3K

**Initial amount** 1.6 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw0549a0ba\\_63b4\\_4a0e\\_8506\\_1c379b878280](#) and as a product in [mw17b927e1\\_56f3\\_4e65\\_a482\\_b8f190af70aa](#) and as a modifier in [mw0549a0ba\\_63b4\\_4a0e\\_8506\\_1c379b878280](#)).

$$\frac{d}{dt}\text{mw9bb804c9_3e4e_4684_9f6b_4e6f6706a58e} = v_{35} - v_{36} \quad (126)$$

## 6.29 Species [mw64453fc5\\_a275\\_4bba\\_84f0\\_2af249b31514](#)

**Name** Akt

**Initial amount** 1.2 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw7ec21bdc\\_6e00\\_410d\\_8524\\_046f820d0921](#) and as a product in [mw0549a0ba\\_63b4\\_4a0e\\_8506\\_1c379b878280](#) and as a modifier in [mw7ec21bdc\\_6e00\\_410d\\_8524\\_046f820d0921](#)).

$$\frac{d}{dt}\text{mw64453fc5_a275_4bba_84f0_2af249b31514} = v_{36} - v_{37} \quad (127)$$

## 6.30 Species [mw323a57b4\\_8e59\\_4116\\_9ad1\\_fe547b89c858](#)

**Name** Shc/Grb2/Sos1

**SBO:0000296** macromolecular complex

**Initial amount** 0.3 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwffb70cc8\\_3371\\_416f\\_b374\\_c518884ba240](#) and as a product in [mwbc35988a\\_c061\\_4dff\\_a2b0\\_09fa8f45d873](#) and as a modifier in [mwffb70cc8\\_3371\\_416f\\_b374\\_c518884ba240](#)).

$$\frac{d}{dt}\text{mw323a57b4_8e59_4116_9ad1_fe547b89c858} = v_{38} - v_{39} \quad (128)$$

## 6.31 Species [mw173d8585\\_5817\\_4b4c\\_932a\\_cf7d673680ac](#)

**Name** Ras

**Initial amount** 1.2 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in six reactions (as a reactant in [mwcf26ace1\\_325c\\_4287\\_81d4\\_382e2f2beb1c](#), [mw427812f2\\_a2ec\\_476c\\_8359\\_96749d8910f4](#) and as a product in [mwffb70cc8\\_3371\\_416f\\_b374\\_c518884ba240](#), [mw36e7aae0\\_ea29\\_437f\\_a9c0\\_57981e85b29e](#) and as a modifier in [mwcf26ace1\\_325c\\_4287\\_81d4\\_382e2f2beb1c](#), [mw427812f2\\_a2ec\\_476c\\_8359\\_96749d8910f4](#)).

$$\frac{d}{dt}\text{mw173d8585_5817_4b4c_932a_cf7d673680ac} = v_{39} + v_{48} - v_{40} - v_{42} \quad (129)$$

### 6.32 Species [mw32c21c39\\_237b\\_4d4c\\_bb5d\\_117cb30ce68a](#)

**Name** Raf

**Initial amount** 1.2 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in four reactions (as a reactant in [mwa52ff158\\_9e98\\_454a\\_a98e\\_3bc52e4aa39f](#) and as a product in [mwcf26ace1\\_325c\\_4287\\_81d4\\_382e2f2beb1c](#), [mwe6aec30e\\_5e5f\\_4427-\\_bda2\\_9c7edc4d5547](#) and as a modifier in [mwa52ff158\\_9e98\\_454a\\_a98e\\_3bc52e4aa39f](#)).

$$\frac{d}{dt}mw32c21c39_237b_4d4c_bb5d_117cb30ce68a = v_{40} + v_{49} - v_{41} \quad (130)$$

### 6.33 Species [mw3832f277\\_aef2\\_4f1d\\_87af\\_abc2a3c1a7d5](#)

**Name** JAK

**Initial amount** 1.6 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mw1498886c\\_3fb6\\_44f5\\_ae32-\\_7a8948030948](#) and as a product in [mw72aabd27\\_658a\\_45ef\\_87b2\\_cec59e2a548a](#) and as a modifier in [mw1498886c\\_3fb6\\_44f5\\_ae32\\_7a8948030948](#)).

$$\frac{d}{dt}mw3832f277_aef2_4f1d_87af_abc2a3c1a7d5 = v_{43} - v_{44} \quad (131)$$

### 6.34 Species [mw13651143\\_feb5\\_49a5\\_adab\\_9105c2647446](#)

**Name** STAT1/3

**Initial amount** 1.1 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwdcd61085\\_a433\\_4362\\_a836-\\_938c7ae43ded](#) and as a product in [mw1498886c\\_3fb6\\_44f5\\_ae32\\_7a8948030948](#) and as a modifier in [mwdcd61085\\_a433\\_4362\\_a836\\_938c7ae43ded](#)).

$$\frac{d}{dt}mw13651143_feb5_49a5_adab_9105c2647446 = v_{44} - v_{45} \quad (132)$$

### 6.35 Species [mw8a358487\\_b18b\\_42df\\_a646\\_cd75eb5bfcc2](#)

**Name** NFkB

**Initial amount** 0.2 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwe820c3d2\\_bbc1\\_4211\\_9818-\\_1e515a583b8a](#) and as a product in [mwd78707fa\\_21d0\\_4f82\\_b3d1\\_a74ba6b8f727](#) and as a modifier in [mwe820c3d2\\_bbc1\\_4211\\_9818\\_1e515a583b8a](#)).

$$\frac{d}{dt}mw8a358487_b18b_42df_a646_cd75eb5bfcc2 = v_7 - v_{46} \quad (133)$$



### 6.36 Species [mwd9e7a9b9\\_6f1b\\_4bbc\\_afa5\\_6cb192b62ce8](#)

**Name** JNK

**Initial amount** 0.6 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>mole</sub>*

This species takes part in three reactions (as a reactant in [mwc4a3a397\\_b069\\_48dc\\_9f2b\\_411ca1448d98](#) and as a product in [mwef3506d1\\_e875\\_48e5\\_8c0a\\_4ffebdcd0f32](#) and as a modifier in [mwc4a3a397\\_b069\\_48dc\\_9f2b\\_411ca1448d98](#)).

$$\frac{d}{dt} \text{mwd9e7a9b9_6f1b_4bbc_afa5_6cb192b62ce8} = v_{11} - v_{12} \quad (134)$$

### 6.37 Species [mwfed5a135\\_c91b\\_4d20\\_91b2\\_3a61723544dd](#)

**Name** cjun

**Initial amount** 0.91 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>mole</sub>*

This species takes part in one reaction (as a product in [mwc4a3a397\\_b069\\_48dc\\_9f2b\\_411ca1448d98](#)).

$$\frac{d}{dt} \text{mwfed5a135_c91b_4d20_91b2_3a61723544dd} = v_{12} \quad (135)$$

### 6.38 Species [mw97345a67\\_a8e8\\_42aa\\_8e62\\_69e9d2b6cf45](#)

**Name** p38

**Initial amount** 0.8 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>mole</sub>*

This species takes part in three reactions (as a reactant in [mw8917d625\\_0012\\_45c7\\_aede\\_8a528181d93d](#) and as a product in [mw7db85cdd\\_f1ac\\_4e07\\_9a35\\_809b7ab77aec](#) and as a modifier in [mw8917d625\\_0012\\_45c7\\_aede\\_8a528181d93d](#)).

$$\frac{d}{dt} \text{mw97345a67_a8e8_42aa_8e62_69e9d2b6cf45} = v_{15} - v_{16} \quad (136)$$

### 6.39 Species [mw5c67812a\\_17f5\\_43cf\\_8acb\\_9bde272c1911](#)

**Name** cfos

**Initial amount** 0.5 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>mole</sub>*

This species takes part in one reaction (as a product in [mw8917d625\\_0012\\_45c7\\_aede\\_8a528181d93d](#)).

$$\frac{d}{dt} \text{mw5c67812a_17f5_43cf_8acb_9bde272c1911} = v_{16} \quad (137)$$

#### 6.40 Species [mw1f12e5bc\\_ebbc\\_4347\\_b6b7\\_5cd1740ac69a](#)

**Name** ERK1/2

**Initial amount** 0 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in one reaction (as a product in [mwe2722be2\\_db07\\_4c1d\\_879e\\_272e1518fb8e](#)).

$$\frac{d}{dt}mw1f12e5bc\_ebbc\_4347\_b6b7\_5cd1740ac69a = v_{25} \quad (138)$$

#### 6.41 Species [mwda4716f1\\_ae00\\_4149\\_aec3\\_12531380425a](#)

**Name** Akt

**Initial amount** 0 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in one reaction (as a product in [mw7ec21bdc\\_6e00\\_410d\\_8524\\_046f820d0921](#)).

$$\frac{d}{dt}mwda4716f1\_ae00\_4149\_aec3\_12531380425a = v_{37} \quad (139)$$

#### 6.42 Species [mw17ae9adc\\_54ab\\_407b\\_a34d\\_8413a3a10cc6](#)

**Name** STAT1/3

**Initial amount** 0 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in one reaction (as a product in [mwdcd61085\\_a433\\_4362\\_a836\\_938c7ae43ded](#)).

$$\frac{d}{dt}mw17ae9adc\_54ab\_407b\_a34d\_8413a3a10cc6 = v_{45} \quad (140)$$

#### 6.43 Species [mwc844b7c0\\_98f5\\_4d0d\\_8f0c\\_00dfe8b54e6d](#)

**Name** TNF

**Initial amount** 0 *UnknownunitMWBUILTINPREFIX<sub>n</sub>ano<sub>M</sub>WBUILTINUNIT<sub>m</sub>ole*

This species takes part in three reactions (as a reactant in [mwd95fbca0\\_6234\\_4c19\\_81ea\\_5e74b558e2f1](#) and as a product in [mwe820c3d2\\_bbc1\\_4211\\_9818\\_1e515a583b8a](#) and as a modifier in [mwd95fbca0\\_6234\\_4c19\\_81ea\\_5e74b558e2f1](#)).

$$\frac{d}{dt}mwc844b7c0\_98f5\_4d0d\_8f0c\_00dfe8b54e6d = v_{46} - v_{47} \quad (141)$$

## A Glossary of Systems Biology Ontology Terms

**SBO:0000296 macromolecular complex:** Non-covalent complex of one or more macromolecules and zero or more simple chemicals

SBML<sup>2</sup>TeX was developed by Andreas Dräger<sup>a</sup>, Hannes Planatscher<sup>a</sup>, Dieudonné M Wouamba<sup>a</sup>, Adrian Schröder<sup>a</sup>, Michael Hucka<sup>b</sup>, Lukas Endler<sup>c</sup>, Martin Golebiewski<sup>d</sup> and Andreas Zell<sup>a</sup>. Please see <http://www.ra.cs.uni-tuebingen.de/software/SBML2LaTeX> for more information.

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