SBML Model Report

Model name: “Pathak2013 - MAPK activation in response to various abiotic stresses”

May 5, 2016

1 General Overview

This is a document in SBML Level 2 Version 4 format. This model was created by the following two authors: Vijayalakshmi Chelliah[1] and Rajesh Kumar Pathak[2] at November 15th 2013 at 11:52 a. m. and last time modified at February 25th 2015 at 12:02 a. m. Table 1 shows 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	3
species types	0	species	57
events	0	constraints	0
reactions	86	function definitions	0
global parameters	172	unit definitions	6
rules	0	initial assignments	0

Model Notes

Pathak2013 - MAPK activation in response to various abiotic stresses

MAPK activation mechanism in response to various abiotic stress conditions, such as cold, salt, drought, H2O2, heavy metal and ethylene, in plants

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This model is described in the article:Modeling of the MAPK machinery activation in response to various abiotic and biotic stresses in plants by a system biology approach.Pathak RK, Taj G, Pandey D, Arora S, Kumar A.Bioinformation 2013; 9(9): 443-449

Abstract:

Mitogen-Activated Protein Kinases (MAPKs) cascade plays an important role in regulating plant growth and development, generating cellular responses to the extracellular stimuli. MAPKs cascade mainly consist of three sub-families i.e. mitogen-activated protein kinase kinase kinase (MAPKKK), mitogen-activated protein kinase kinase (MAPKK) and mitogen activated protein kinase (MAPK), several cascades of which are activated by various abiotic and biotic stresses. In this work we have modeled the holistic molecular mechanisms essential to MAPKs activation in response to several abiotic and biotic stresses through a system biology approach and performed its simulation studies. As extent of abiotic and biotic stresses goes on increasing, the process of cell division, cell growth and cell differentiation slow down in time dependent manner. The models developed depict the combinatorial and multicomponent signaling triggered in response to several abiotic and biotic factors. These models can be used to predict behavior of cells in event of various stresses depending on their time and exposure through activation of complex signaling cascades.

This model is hosted on BioModels Database and identifiedby: BIOMD0000000491 .

To cite BioModels Database, please use: BioModels Database: An enhanced, curated and annotated resourcefor published quantitative kinetic models .

2 Unit Definitions

This is an overview of six unit definitions.

2.1 Unit `substance`

Name substance

Definition mmol

2.2 Unit `volume`

Name volume

Definition ml

2.3 Unit `area`

Name area

Definition m^2

2.4 Unit length

Name length

Definition m

2.5 Unit time

Name time

Definition s

2.6 Unit per_second

Definition s^{-1}

3 Compartments

This model contains three compartments.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
default			3	1	litre	☑	
c1	Cytosol		3	1	litre	☑	default
c2	Nucleus		3	1	litre	☑	c1

3.1 Compartment default

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

3.2 Compartment c1

This is a three dimensional compartment with a constant size of one ml, which is surrounded by default.

Name Cytosol

3.3 Compartment c2

This is a three dimensional compartment with a constant size of one ml, which is surrounded by c1 (Cytosol).

Name Nucleus

4 Species

This model contains 57 species. Section 7 provides further details and the derived rates of change of each species.

Table 3: Properties of each species.

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s1	Cold	default	mmol	⊟	⊟
s2	Salt	default	mmol	⊟	⊟
s3	Drought	default	mmol	⊟	⊟
s4	H2O2	default	mmol	⊟	⊟
s5	Heavy Metal	default	mmol	⊟	⊟
s6	Ethylene	default	mmol	⊟	⊟
s7	RLKs	c1	mmol	⊟	⊟
s8	LRR	c1	mmol	⊟	⊟
s9	CRKs	c1	mmol	⊟	⊟
s10	LecRK2	c1	mmol	⊟	⊟
s11	ETR1	c1	mmol	⊟	⊟
s12	ETR2	c1	mmol	⊟	⊟
s13	MAPKKK	c1	mmol	⊟	⊟
s14	MAPKKK	c1	mmol	⊟	⊟
s15	MAPKKK1	c1	mmol	⊟	⊟
s16	CTR1	c1	mmol	⊟	⊟
s17	MAPKK	c1	mmol	⊟	⊟
s18	MAPKK	c1	mmol	⊟	⊟
s27	MAPK	c1	mmol	⊟	⊟
s28	MAPK	c1	mmol	⊟	⊟
s19	MAPKK1	c1	mmol	⊟	⊟
s20	MAPKK2	c1	mmol	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s21	MAPKK3	c1	mmol	⊟	⊟
s22	MAPKK4	c1	mmol	⊟	⊟
s23	MAPKK5	c1	mmol	⊟	⊟
s24	MAPKK6	c1	mmol	⊟	⊟
s25	MAPKK7	c1	mmol	⊟	⊟
s26	MAPKK9	c1	mmol	⊟	⊟
s29	MAPK2	c1	mmol	⊟	⊟
s30	MAPK3	c1	mmol	⊟	⊟
s31	MAPK4	c1	mmol	⊟	⊟
s32	MAPK6	c1	mmol	⊟	⊟
s33	WRKY1	c2	mmol	⊟	⊟
s34	WRKY1	c2	mmol	⊟	⊟
s35	WRKY12	c2	mmol	⊟	⊟
s36	WRKY12	c2	mmol	⊟	⊟
s37	WRKY8	c2	mmol	⊟	⊟
s38	WRKY8	c2	mmol	⊟	⊟
s39	WRKY25	c2	mmol	⊟	⊟
s40	WRKY25	c2	mmol	⊟	⊟
s41	WRKY22	c2	mmol	⊟	⊟
s42	WRKY22	c2	mmol	⊟	⊟
s43	WRKY29	c2	mmol	⊟	⊟
s44	WRKY29	c2	mmol	⊟	⊟
s45	WRKY33	c2	mmol	⊟	⊟
s46	WRKY33	c2	mmol	⊟	⊟
s47	WRKY28	c2	mmol	⊟	⊟
s48	WRKY28	c2	mmol	⊟	⊟
s49	MYB2	c2	mmol	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
s50	MYB2	c2	mmol	⊟	⊟
s51	MYB4	c2	mmol	⊟	⊟
s52	MYB4	c2	mmol	⊟	⊟
s53	MYB44	c2	mmol	⊟	⊟
s54	NAC	c2	mmol	⊟	⊟
s55	bZIP	c2	mmol	⊟	⊟
s56	AP2	c2	mmol	⊟	⊟
s57	Response	default	mmol	⊟	⊟

5 Parameters

This model contains 172 global parameters.

Table 4: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kdiss_re1	Dissociation constant of reaction re1	0000282	1.0	s^{-1}	☑
kass_re1	Association constant of reaction re1	0000337	1.0	s^{-1}	☑
kdiss_re2	Dissociation constant of reaction re2	0000282	1.0	s^{-1}	☑
kass_re2	Association constant of reaction re2	0000337	1.0	s^{-1}	☑
kdiss_re3	Dissociation constant of reaction re3	0000282	1.0	s^{-1}	☑
kass_re3	Association constant of reaction re3	0000337	1.0	s^{-1}	☑
kdiss_re4	Dissociation constant of reaction re4	0000282	1.0	s^{-1}	☑
kass_re4	Association constant of reaction re4	0000337	1.0	s^{-1}	☑
kdiss_re5	Dissociation constant of reaction re5	0000282	1.0	s^{-1}	☑
kass_re5	Association constant of reaction re5	0000337	1.0	s^{-1}	☑
kdiss_re6	Dissociation constant of reaction re6	0000282	1.0	s^{-1}	☑
kass_re6	Association constant of reaction re6	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re7	Dissociation constant of reaction re7	0000282	1.0	s^{-1}	☑
kass_re7	Association constant of reaction re7	0000337	1.0	s^{-1}	☑
kdiss_re8	Dissociation constant of reaction re8	0000282	1.0	s^{-1}	☑
kass_re8	Association constant of reaction re8	0000337	1.0	s^{-1}	☑
kdiss_re9	Dissociation constant of reaction re9	0000282	1.0	s^{-1}	☑
kass_re9	Association constant of reaction re9	0000337	1.0	s^{-1}	☑
kdiss_re10	Dissociation constant of reaction re10	0000282	1.0	s^{-1}	☑
kass_re10	Association constant of reaction re10	0000337	1.0	s^{-1}	☑
kdiss_re11	Dissociation constant of reaction re11	0000282	1.0	s^{-1}	☑
kass_re11	Association constant of reaction re11	0000337	1.0	s^{-1}	☑
kdiss_re12	Dissociation constant of reaction re12	0000282	1.0	s^{-1}	☑
kass_re12	Association constant of reaction re12	0000337	1.0	s^{-1}	☑
kdiss_re13	Dissociation constant of reaction re13	0000282	1.0	s^{-1}	☑
kass_re13	Association constant of reaction re13	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re14	Dissociation constant of reaction re14	0000282	1.0	s^{-1}	☑
kass_re14	Association constant of reaction re14	0000337	1.0	s^{-1}	☑
kdiss_re15	Dissociation constant of reaction re15	0000282	1.0	s^{-1}	☑
kass_re15	Association constant of reaction re15	0000337	1.0	s^{-1}	☑
kdiss_re16	Dissociation constant of reaction re16	0000282	1.0	s^{-1}	☑
kass_re16	Association constant of reaction re16	0000337	1.0	s^{-1}	☑
kdiss_re17	Dissociation constant of reaction re17	0000282	1.0	s^{-1}	☑
kass_re17	Association constant of reaction re17	0000337	1.0	s^{-1}	☑
kdiss_re18	Dissociation constant of reaction re18	0000282	1.0	s^{-1}	☑
kass_re18	Association constant of reaction re18	0000337	1.0	s^{-1}	☑
kdiss_re19	Dissociation constant of reaction re19	0000282	1.0	s^{-1}	☑
kass_re19	Association constant of reaction re19	0000337	1.0	s^{-1}	☑
kdiss_re20	Dissociation constant of reaction re20	0000282	1.0	s^{-1}	☑
kass_re20	Association constant of reaction re20	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re21	Dissociation constant of reaction re21	0000282	1.0	s^{-1}	☑
kass_re21	Association constant of reaction re21	0000337	1.0	s^{-1}	☑
kdiss_re22	Dissociation constant of reaction re22	0000282	1.0	s^{-1}	☑
kass_re22	Association constant of reaction re22	0000337	1.0	s^{-1}	☑
kdiss_re23	Dissociation constant of reaction re23	0000282	1.0	s^{-1}	☑
kass_re23	Association constant of reaction re23	0000337	1.0	s^{-1}	☑
kdiss_re24	Dissociation constant of reaction re24	0000282	1.0	s^{-1}	☑
kass_re24	Association constant of reaction re24	0000337	1.0	s^{-1}	☑
kdiss_re25	Dissociation constant of reaction re25	0000282	1.0	s^{-1}	☑
kass_re25	Association constant of reaction re25	0000337	1.0	s^{-1}	☑
kdiss_re26	Dissociation constant of reaction re26	0000282	1.0	s^{-1}	☑
kass_re26	Association constant of reaction re26	0000337	1.0	s^{-1}	☑
kdiss_re27	Dissociation constant of reaction re27	0000282	1.0	s^{-1}	☑
kass_re27	Association constant of reaction re27	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re28	Dissociation constant of reaction re28	0000282	1.0	s^{-1}	☑
kass_re28	Association constant of reaction re28	0000337	1.0	s^{-1}	☑
kdiss_re29	Dissociation constant of reaction re29	0000282	1.0	s^{-1}	☑
kass_re29	Association constant of reaction re29	0000337	1.0	s^{-1}	☑
kdiss_re30	Dissociation constant of reaction re30	0000282	1.0	s^{-1}	☑
kass_re30	Association constant of reaction re30	0000337	1.0	s^{-1}	☑
kdiss_re31	Dissociation constant of reaction re31	0000282	1.0	s^{-1}	☑
kass_re31	Association constant of reaction re31	0000337	1.0	s^{-1}	☑
kdiss_re32	Dissociation constant of reaction re32	0000282	1.0	s^{-1}	☑
kass_re32	Association constant of reaction re32	0000337	1.0	s^{-1}	☑
kdiss_re33	Dissociation constant of reaction re33	0000282	1.0	s^{-1}	☑
kass_re33	Association constant of reaction re33	0000337	1.0	s^{-1}	☑
kdiss_re34	Dissociation constant of reaction re34	0000282	1.0	s^{-1}	☑
kass_re34	Association constant of reaction re34	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re35	Dissociation constant of reaction re35	0000282	1.0	s^{-1}	☑
kass_re35	Association constant of reaction re35	0000337	1.0	s^{-1}	☑
kdiss_re36	Dissociation constant of reaction re36	0000282	1.0	s^{-1}	☑
kass_re36	Association constant of reaction re36	0000337	1.0	s^{-1}	☑
kdiss_re37	Dissociation constant of reaction re37	0000282	1.0	s^{-1}	☑
kass_re37	Association constant of reaction re37	0000337	1.0	s^{-1}	☑
kdiss_re38	Dissociation constant of reaction re38	0000282	1.0	s^{-1}	☑
kass_re38	Association constant of reaction re38	0000337	1.0	s^{-1}	☑
kdiss_re39	Dissociation constant of reaction re39	0000282	1.0	s^{-1}	☑
kass_re39	Association constant of reaction re39	0000337	1.0	s^{-1}	☑
kdiss_re40	Dissociation constant of reaction re40	0000282	1.0	s^{-1}	☑
kass_re40	Association constant of reaction re40	0000337	1.0	s^{-1}	☑
kdiss_re41	Dissociation constant of reaction re41	0000282	1.0	s^{-1}	☑
kass_re41	Association constant of reaction re41	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re42	Dissociation constant of reaction re42	0000282	1.0	s^{-1}	☑
kass_re42	Association constant of reaction re42	0000337	1.0	s^{-1}	☑
kdiss_re43	Dissociation constant of reaction re43	0000282	1.0	s^{-1}	☑
kass_re43	Association constant of reaction re43	0000337	1.0	s^{-1}	☑
kdiss_re44	Dissociation constant of reaction re44	0000282	1.0	s^{-1}	☑
kass_re44	Association constant of reaction re44	0000337	1.0	s^{-1}	☑
kdiss_re45	Dissociation constant of reaction re45	0000282	1.0	s^{-1}	☑
kass_re45	Association constant of reaction re45	0000337	1.0	s^{-1}	☑
kdiss_re46	Dissociation constant of reaction re46	0000282	1.0	s^{-1}	☑
kass_re46	Association constant of reaction re46	0000337	1.0	s^{-1}	☑
kdiss_re47	Dissociation constant of reaction re47	0000337	1.0	s^{-1}	☑
kass_re47	Association constant of reaction re47	0000337	1.0	s^{-1}	☑
kdiss_re48	Dissociation constant of reaction re48	0000282	1.0	s^{-1}	☑
kass_re48	Association constant of reaction re48	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re49	Dissociation constant of reaction re49	0000282	1.0	s^{-1}	☑
kass_re49	Association constant of reaction re49	0000337	1.0	s^{-1}	☑
kdiss_re50	Dissociation constant of reaction re50	0000282	1.0	s^{-1}	☑
kass_re50	Association constant of reaction re50	0000337	1.0	s^{-1}	☑
kdiss_re51	Dissociation constant of reaction re51	0000282	1.0	s^{-1}	☑
kass_re51	Association constant of reaction re51	0000337	1.0	s^{-1}	☑
kdiss_re52	Dissociation constant of reaction re52	0000282	1.0	s^{-1}	☑
kass_re52	Association constant of reaction re52	0000337	1.0	s^{-1}	☑
kdiss_re53	Dissociation constant of reaction re53	0000282	1.0	s^{-1}	☑
kass_re53	Association constant of reaction re53	0000337	1.0	s^{-1}	☑
kdiss_re54	Dissociation constant of reaction re54	0000282	1.0	s^{-1}	☑
kass_re54	Association constant of reaction re54	0000337	1.0	s^{-1}	☑
kdiss_re55	Dissociation constant of reaction re55	0000282	1.0	s^{-1}	☑
kass_re55	Association constant of reaction re55	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re56	Dissociation constant of reaction re56	0000282	1.0	s^{-1}	☑
kass_re56	Association constant of reaction re56	0000337	1.0	s^{-1}	☑
kdiss_re57	Dissociation constant of reaction re57	0000282	1.0	s^{-1}	☑
kass_re57	Association constant of reaction re57	0000337	1.0	s^{-1}	☑
kdiss_re58	Dissociation constant of reaction re58	0000282	1.0	s^{-1}	☑
kass_re58	Association constant of reaction re58	0000337	1.0	s^{-1}	☑
kdiss_re59	Dissociation constant of reaction re59	0000282	1.0	s^{-1}	☑
kass_re59	Association constant of reaction re59	0000337	1.0	s^{-1}	☑
kdiss_re60	Dissociation constant of reaction re60	0000282	1.0	s^{-1}	☑
kass_re60	Association constant of reaction re60	0000337	1.0	s^{-1}	☑
kdiss_re61	Dissociation constant of reaction re61	0000282	1.0	s^{-1}	☑
kass_re61	Association constant of reaction re61	0000337	1.0	s^{-1}	☑
kdiss_re62	Dissociation constant of reaction re62	0000282	1.0	s^{-1}	☑
kass_re62	Association constant of reaction re62	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re63	Dissociation constant of reaction re63	0000282	1.0	s^{-1}	☑
kass_re63	Association constant of reaction re63	0000337	1.0	s^{-1}	☑
kdiss_re64	Dissociation constant of reaction re64	0000282	1.0	s^{-1}	☑
kass_re64	Association constant of reaction re64	0000337	1.0	s^{-1}	☑
kdiss_re65	Dissociation constant of reaction re65	0000282	1.0	s^{-1}	☑
kass_re65	Association constant of reaction re65	0000337	1.0	s^{-1}	☑
kdiss_re66	Dissociation constant of reaction re66	0000282	1.0	s^{-1}	☑
kass_re66	Association constant of reaction re66	0000337	1.0	s^{-1}	☑
kdiss_re67	Dissociation constant of reaction re67	0000282	1.0	s^{-1}	☑
kass_re67	Association constant of reaction re67	0000337	1.0	s^{-1}	☑
kdiss_re68	Dissociation constant of reaction re68	0000282	1.0	s^{-1}	☑
kass_re68	Association constant of reaction re68	0000337	1.0	s^{-1}	☑
kdiss_re69	Dissociation constant of reaction re69	0000282	1.0	s^{-1}	☑
kass_re69	Association constant of reaction re69	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re70	Dissociation constant of reaction re70	0000282	1.0	s^{-1}	☑
kass_re70	Association constant of reaction re70	0000337	1.0	s^{-1}	☑
kdiss_re71	Dissociation constant of reaction re71	0000282	1.0	s^{-1}	☑
kass_re71	Association constant of reaction re71	0000337	1.0	s^{-1}	☑
kdiss_re72	Dissociation constant of reaction re72	0000282	1.0	s^{-1}	☑
kass_re72	Association constant of reaction re72	0000337	1.0	s^{-1}	☑
kdiss_re73	Dissociation constant of reaction re73	0000282	1.0	s^{-1}	☑
kass_re73	Association constant of reaction re73	0000337	1.0	s^{-1}	☑
kdiss_re74	Dissociation constant of reaction re74	0000282	1.0	s^{-1}	☑
kass_re74	Association constant of reaction re74	0000337	1.0	s^{-1}	☑
kdiss_re75	Dissociation constant of reaction re75	0000282	1.0	s^{-1}	☑
kass_re75	Association constant of reaction re75	0000337	1.0	s^{-1}	☑
kdiss_re76	Dissociation constant of reaction re76	0000282	1.0	s^{-1}	☑
kass_re76	Association constant of reaction re76	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re77	Dissociation constant of reaction re77	0000282	1.0	s^{-1}	☑
kass_re77	Association constant of reaction re77	0000337	1.0	s^{-1}	☑
kdiss_re78	Dissociation constant of reaction re78	0000282	1.0	s^{-1}	☑
kass_re78	Association constant of reaction re78	0000337	1.0	s^{-1}	☑
kdiss_re79	Dissociation constant of reaction re79	0000282	1.0	s^{-1}	☑
kass_re79	Association constant of reaction re79	0000337	1.0	s^{-1}	☑
kdiss_re80	Dissociation constant of reaction re80	0000282	1.0	s^{-1}	☑
kass_re80	Association constant of reaction re80	0000337	1.0	s^{-1}	☑
kdiss_re81	Dissociation constant of reaction re81	0000282	1.0	s^{-1}	☑
kass_re81	Association constant of reaction re81	0000337	1.0	s^{-1}	☑
kdiss_re82	Dissociation constant of reaction re82	0000282	1.0	s^{-1}	☑
kass_re82	Association constant of reaction re82	0000337	1.0	s^{-1}	☑
kdiss_re83	Dissociation constant of reaction re83	0000282	1.0	s^{-1}	☑
kass_re83	Association constant of reaction re83	0000337	1.0	s^{-1}	☑

Id	Name	SBO	Value	Unit	Constant
kdiss_re84	Dissociation constant of reaction re84	0000282	1.0	s^{-1}	☑
kass_re84	Association constant of reaction re84	0000337	1.0	s^{-1}	☑
kdiss_re85	Dissociation constant of reaction re85	0000282	1.0	s^{-1}	☑
kass_re85	Association constant of reaction re85	0000337	1.0	s^{-1}	☑
kdiss_re86	Dissociation constant of reaction re86	0000282	1.0	s^{-1}	☑
kass_re86	Association constant of reaction re86	0000337	1.0	s^{-1}	☑

6 Reactions

This model contains 86 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 5: Overview of all reactions

№	Id	Name	Reaction Equation	SBO
1	re1		s1 $\rightleftharpoons$ s7	
2	re2		s2 $\rightleftharpoons$ s7	
3	re3		s2 $\rightleftharpoons$ s8	
4	re4		s2 $\rightleftharpoons$ s9	
5	re5		s6 $\rightleftharpoons$ s12	
6	re6		s6 $\rightleftharpoons$ s11	
7	re7		s6 $\rightleftharpoons$ s10	
8	re8		s3 $\rightleftharpoons$ s9	
9	re9		s3 $\rightleftharpoons$ s7	
10	re10		s4 $\rightleftharpoons$ s7	
11	re11		s5 $\rightleftharpoons$ s7	
12	re12		s13 $\rightleftharpoons$ s14	
13	re13		s7 $\rightleftharpoons$ s13	
14	re14		s8 $\rightleftharpoons$ s13	
15	re15		s9 $\rightleftharpoons$ s13	
16	re16		s10 $\rightleftharpoons$ s13	
17	re17		s14 $\rightleftharpoons$ s15	
18	re18		s7 $\rightleftharpoons$ s15	
19	re19		s14 $\rightleftharpoons$ s16	
20	re20		s11 $\rightleftharpoons$ s16	
21	re21		s12 $\rightleftharpoons$ s16	
22	re22		s17 $\rightleftharpoons$ s18	
23	re23		s14 $\rightleftharpoons$ s17	

№	Id	Name	Reaction Equation	SBO
24	re24		s18 $\rightleftharpoons$ s19	
25	re25		s18 $\rightleftharpoons$ s20	
26	re26		s18 $\rightleftharpoons$ s21	
27	re27		s18 $\rightleftharpoons$ s22	
28	re28		s18 $\rightleftharpoons$ s23	
29	re29		s18 $\rightleftharpoons$ s24	
30	re30		s18 $\rightleftharpoons$ s25	
31	re31		s18 $\rightleftharpoons$ s26	
32	re32		s27 $\rightleftharpoons$ s28	
33	re33		s18 $\rightleftharpoons$ s27	
34	re34		s15 $\rightleftharpoons$ s19	
35	re35		s15 $\rightleftharpoons$ s20	
36	re36		s16 $\rightleftharpoons$ s26	
37	re37		s28 $\rightleftharpoons$ s29	
38	re38		s28 $\rightleftharpoons$ s30	
39	re39		s28 $\rightleftharpoons$ s31	
40	re40		s28 $\rightleftharpoons$ s32	
41	re41		s20 $\rightleftharpoons$ s30	
42	re42		s20 $\rightleftharpoons$ s31	
43	re43		s20 $\rightleftharpoons$ s32	
44	re44		s26 $\rightleftharpoons$ s30	
45	re45		s33 $\rightleftharpoons$ s34	
46	re46		s35 $\rightleftharpoons$ s36	
47	re47		s37 $\rightleftharpoons$ s38	
48	re48		s39 $\rightleftharpoons$ s40	
49	re49		s41 $\rightleftharpoons$ s42	
50	re50		s43 $\rightleftharpoons$ s44	
51	re51		s45 $\rightleftharpoons$ s46	
52	re52		s47 $\rightleftharpoons$ s48	

№	Id	Name	Reaction Equation	SBO
53	re53		s49 $\rightleftharpoons$ s50	
54	re54		s51 $\rightleftharpoons$ s52	
55	re55		s29 $\rightleftharpoons$ s37	
56	re56		s29 $\rightleftharpoons$ s33	
57	re57		s30 $\rightleftharpoons$ s35	
58	re58		s30 $\rightleftharpoons$ s41	
59	re59		s30 $\rightleftharpoons$ s47	
60	re60		s31 $\rightleftharpoons$ s33	
61	re61		s31 $\rightleftharpoons$ s45	
62	re62		s31 $\rightleftharpoons$ s39	
63	re63		s32 $\rightleftharpoons$ s47	
64	re64		s32 $\rightleftharpoons$ s45	
65	re65		s32 $\rightleftharpoons$ s35	
66	re66		s28 $\rightleftharpoons$ s56	
67	re67		s28 $\rightleftharpoons$ s49	
68	re68		s28 $\rightleftharpoons$ s51	
69	re69		s28 $\rightleftharpoons$ s53	
70	re70		s28 $\rightleftharpoons$ s54	
71	re71		s28 $\rightleftharpoons$ s55	
72	re72		s40 $\rightleftharpoons$ s57	
73	re73		s53 $\rightleftharpoons$ s57	
74	re74		s54 $\rightleftharpoons$ s57	
75	re75		s52 $\rightleftharpoons$ s57	
76	re76		s50 $\rightleftharpoons$ s57	
77	re77		s56 $\rightleftharpoons$ s57	
78	re78		s48 $\rightleftharpoons$ s57	
79	re79		s30 $\rightleftharpoons$ s43	
80	re80		s55 $\rightleftharpoons$ s57	
81	re81		s42 $\rightleftharpoons$ s57	

№	Id	Name	Reaction Equation	SBO
82	re82		s44 $\rightleftharpoons$ s57	
83	re83		s38 $\rightleftharpoons$ s57	
84	re84		s36 $\rightleftharpoons$ s57	
85	re85		s34 $\rightleftharpoons$ s57	
86	re86		s46 $\rightleftharpoons$ s57	

6.1 Reaction re1

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

Reaction equation

$$\mathrm{s1} \rightleftharpoons \mathrm{s7} \tag{1}$$

Reactant

Table 6: Properties of each reactant.

Id	Name	SBO
s1	Cold	

Product

Table 7: Properties of each product.

Id	Name	SBO
s7	RLKs	

Kinetic Law

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

$$v_1 = \mathrm{kass\_re1} \cdot \mathrm{s1} - \mathrm{kdiss\_re1} \cdot \mathrm{s7} \tag{2}$$

6.2 Reaction re2

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

Reaction equation

$$\mathrm{s2} \rightleftharpoons \mathrm{s7} \tag{3}$$

Reactant

Table 8: Properties of each reactant.

Id	Name	SBO
s2	Salt	

Product

Table 9: Properties of each product.

Id	Name	SBO
s7	RLKs	

Kinetic Law

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

$$v_2 = \mathrm{kass\_re2} \cdot \mathrm{s2} - \mathrm{kdiss\_re2} \cdot \mathrm{s7} \tag{4}$$

6.3 Reaction re3

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

Reaction equation

$$\mathrm{s2} \rightleftharpoons \mathrm{s8} \tag{5}$$

Reactant

Table 10: Properties of each reactant.

Id	Name	SBO
s2	Salt	

Product

Table 11: Properties of each product.

Id	Name	SBO
s8	LRR	

Kinetic Law

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

$$v_3 = \mathrm{kass\_re3} \cdot \mathrm{s2} - \mathrm{kdiss\_re3} \cdot \mathrm{s8} \tag{6}$$

6.4 Reaction re4

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

Reaction equation

$$\mathrm{s2} \rightleftharpoons \mathrm{s9} \tag{7}$$

Reactant

Table 12: Properties of each reactant.

Id	Name	SBO
s2	Salt	

Product

Table 13: Properties of each product.

Id	Name	SBO
s9	CRKs	

Kinetic Law

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

$$v_4 = \mathrm{kass\_re4} \cdot \mathrm{s2} - \mathrm{kdiss\_re4} \cdot \mathrm{s9} \tag{8}$$

6.5 Reaction re5

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

Reaction equation

$$\mathrm{s6} \rightleftharpoons \mathrm{s12} \tag{9}$$

Reactant

Table 14: Properties of each reactant.

Id	Name	SBO
s6	Ethylene	

Product

Table 15: Properties of each product.

Id	Name	SBO
s12	ETR2	

Kinetic Law

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

$$v_5 = \mathrm{kass\_re5} \cdot \mathrm{s6} - \mathrm{kdiss\_re5} \cdot \mathrm{s12} \tag{10}$$

6.6 Reaction re6

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

Reaction equation

$$\mathrm{s6} \rightleftharpoons \mathrm{s11} \tag{11}$$

Reactant

Table 16: Properties of each reactant.

Id	Name	SBO
s6	Ethylene	

Product

Table 17: Properties of each product.

Id	Name	SBO
s11	ETR1	

Kinetic Law

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

$$v_6 = \mathrm{kass\_re6} \cdot \mathrm{s6} - \mathrm{kdiss\_re6} \cdot \mathrm{s11} \tag{12}$$

6.7 Reaction re7

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

Reaction equation

$$\mathrm{s6} \rightleftharpoons \mathrm{s10} \tag{13}$$

Reactant

Table 18: Properties of each reactant.

Id	Name	SBO
s6	Ethylene	

Product

Table 19: Properties of each product.

Id	Name	SBO
s10	LecRK2	

Kinetic Law

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

$$v_7 = \mathrm{kass\_re7} \cdot \mathrm{s6} - \mathrm{kdiss\_re7} \cdot \mathrm{s10} \tag{14}$$

6.8 Reaction re8

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

Reaction equation

$$\mathrm{s3} \rightleftharpoons \mathrm{s9} \tag{15}$$

Reactant

Table 20: Properties of each reactant.

Id	Name	SBO
s3	Drought	

Product

Table 21: Properties of each product.

Id	Name	SBO
s9	CRKs	

Kinetic Law

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

$$v_8 = \mathrm{kass\_re8} \cdot \mathrm{s3} - \mathrm{kdiss\_re8} \cdot \mathrm{s9} \tag{16}$$

6.9 Reaction re9

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

Reaction equation

$$\mathrm{s3} \rightleftharpoons \mathrm{s7} \tag{17}$$

Reactant

Table 22: Properties of each reactant.

Id	Name	SBO
s3	Drought	

Product

Table 23: Properties of each product.

Id	Name	SBO
s7	RLKs	

Kinetic Law

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

$$v_9 = \mathrm{kass\_re9} \cdot \mathrm{s3} - \mathrm{kdiss\_re9} \cdot \mathrm{s7} \tag{18}$$

6.10 Reaction re10

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

Reaction equation

$$\mathrm{s4} \rightleftharpoons \mathrm{s7} \tag{19}$$

Reactant

Table 24: Properties of each reactant.

Id	Name	SBO
s4	H2O2	

Product

Table 25: Properties of each product.

Id	Name	SBO
s7	RLKs	

Kinetic Law

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

$$v_{10} = \mathrm{kass\_re10} \cdot \mathrm{s4} - \mathrm{kdiss\_re10} \cdot \mathrm{s7} \tag{20}$$

6.11 Reaction re11

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

Reaction equation

$$\mathrm{s5} \rightleftharpoons \mathrm{s7} \tag{21}$$

Reactant

Table 26: Properties of each reactant.

Id	Name	SBO
s5	Heavy Metal	

Product

Table 27: Properties of each product.

Id	Name	SBO
s7	RLKs	

Kinetic Law

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

$$v_{11} = \mathrm{kass\_re11} \cdot \mathrm{s5} - \mathrm{kdiss\_re11} \cdot \mathrm{s7} \tag{22}$$

6.12 Reaction re12

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

Reaction equation

$$\mathrm{s13} \rightleftharpoons \mathrm{s14} \tag{23}$$

Reactant

Table 28: Properties of each reactant.

Id	Name	SBO
s13	MAPKKK	

Product

Table 29: Properties of each product.

Id	Name	SBO
s14	MAPKKK	

Kinetic Law

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

$$v_{12} = \mathrm{kass\_re12} \cdot \mathrm{s13} - \mathrm{kdiss\_re12} \cdot \mathrm{s14} \tag{24}$$

6.13 Reaction re13

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

Reaction equation

$$\mathrm{s7} \rightleftharpoons \mathrm{s13} \tag{25}$$

Reactant

Table 30: Properties of each reactant.

Id	Name	SBO
s7	RLKs	

Product

Table 31: Properties of each product.

Id	Name	SBO
s13	MAPKKK	

Kinetic Law

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

$$v_{13} = \mathrm{kass\_re13} \cdot \mathrm{s7} - \mathrm{kdiss\_re13} \cdot \mathrm{s13} \tag{26}$$

6.14 Reaction re14

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

Reaction equation

$$\mathrm{s8} \rightleftharpoons \mathrm{s13} \tag{27}$$

Reactant

Table 32: Properties of each reactant.

Id	Name	SBO
s8	LRR	

Product

Table 33: Properties of each product.

Id	Name	SBO
s13	MAPKKK	

Kinetic Law

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

$$v_{14} = \mathrm{kass\_re14} \cdot \mathrm{s8} - \mathrm{kdiss\_re14} \cdot \mathrm{s13} \tag{28}$$

6.15 Reaction re15

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

Reaction equation

$$\mathrm{s9} \rightleftharpoons \mathrm{s13} \tag{29}$$

Reactant

Table 34: Properties of each reactant.

Id	Name	SBO
s9	CRKs	

Product

Table 35: Properties of each product.

Id	Name	SBO
s13	MAPKKK	

Kinetic Law

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

$$v_{15} = \mathrm{kass\_re15} \cdot \mathrm{s9} - \mathrm{kdiss\_re15} \cdot \mathrm{s13} \tag{30}$$

6.16 Reaction re16

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

Reaction equation

$$\mathrm{s10} \rightleftharpoons \mathrm{s13} \tag{31}$$

Reactant

Table 36: Properties of each reactant.

Id	Name	SBO
s10	LecRK2	

Product

Table 37: Properties of each product.

Id	Name	SBO
s13	MAPKKK	

Kinetic Law

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

$$v_{16} = \mathrm{kass\_re16} \cdot \mathrm{s10} - \mathrm{kdiss\_re16} \cdot \mathrm{s13} \tag{32}$$

6.17 Reaction re17

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

Reaction equation

$$\mathrm{s14} \rightleftharpoons \mathrm{s15} \tag{33}$$

Reactant

Table 38: Properties of each reactant.

Id	Name	SBO
s14	MAPKKK	

Product

Table 39: Properties of each product.

Id	Name	SBO
s15	MAPKKK1	

Kinetic Law

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

$$v_{17} = \mathrm{kass\_re17} \cdot \mathrm{s14} - \mathrm{kdiss\_re17} \cdot \mathrm{s15} \tag{34}$$

6.18 Reaction re18

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

Reaction equation

$$\mathrm{s7} \rightleftharpoons \mathrm{s15} \tag{35}$$

Reactant

Table 40: Properties of each reactant.

Id	Name	SBO
s7	RLKs	

Product

Table 41: Properties of each product.

Id	Name	SBO
s15	MAPKKK1	

Kinetic Law

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

$$v_{18} = \mathrm{kass\_re18} \cdot \mathrm{s7} - \mathrm{kdiss\_re18} \cdot \mathrm{s15} \tag{36}$$

6.19 Reaction re19

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

Reaction equation

$$\mathrm{s14} \rightleftharpoons \mathrm{s16} \tag{37}$$

Reactant

Table 42: Properties of each reactant.

Id	Name	SBO
s14	MAPKKK	

Product

Table 43: Properties of each product.

Id	Name	SBO
s16	CTR1	

Kinetic Law

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

$$v_{19} = \mathrm{kass\_re19} \cdot \mathrm{s14} - \mathrm{kdiss\_re19} \cdot \mathrm{s16} \tag{38}$$

6.20 Reaction re20

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

Reaction equation

$$\mathrm{s11} \rightleftharpoons \mathrm{s16} \tag{39}$$

Reactant

Table 44: Properties of each reactant.

Id	Name	SBO
s11	ETR1	

Product

Table 45: Properties of each product.

Id	Name	SBO
s16	CTR1	

Kinetic Law

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

$$v_{20} = \mathrm{kass\_re20} \cdot \mathrm{s11} - \mathrm{kdiss\_re20} \cdot \mathrm{s16} \tag{40}$$

6.21 Reaction re21

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

Reaction equation

$$\mathrm{s12} \rightleftharpoons \mathrm{s16} \tag{41}$$

Reactant

Table 46: Properties of each reactant.

Id	Name	SBO
s12	ETR2	

Product

Table 47: Properties of each product.

Id	Name	SBO
s16	CTR1	

Kinetic Law

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

$$v_{21} = \mathrm{kass\_re21} \cdot \mathrm{s12} - \mathrm{kdiss\_re21} \cdot \mathrm{s16} \tag{42}$$

6.22 Reaction re22

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

Reaction equation

$$\mathrm{s17} \rightleftharpoons \mathrm{s18} \tag{43}$$

Reactant

Table 48: Properties of each reactant.

Id	Name	SBO
s17	MAPKK	

Product

Table 49: Properties of each product.

Id	Name	SBO
s18	MAPKK	

Kinetic Law

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

$$v_{22} = \mathrm{kass\_re22} \cdot \mathrm{s17} - \mathrm{kdiss\_re22} \cdot \mathrm{s18} \tag{44}$$

6.23 Reaction re23

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

Reaction equation

$$\mathrm{s14} \rightleftharpoons \mathrm{s17} \tag{45}$$

Reactant

Table 50: Properties of each reactant.

Id	Name	SBO
s14	MAPKKK	

Product

Table 51: Properties of each product.

Id	Name	SBO
s17	MAPKK	

Kinetic Law

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

$$v_{23} = \mathrm{kass\_re23} \cdot \mathrm{s14} - \mathrm{kdiss\_re23} \cdot \mathrm{s17} \tag{46}$$

6.24 Reaction re24

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s19} \tag{47}$$

Reactant

Table 52: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 53: Properties of each product.

Id	Name	SBO
s19	MAPKK1	

Kinetic Law

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

$$v_{24} = \mathrm{kass\_re24} \cdot \mathrm{s18} - \mathrm{kdiss\_re24} \cdot \mathrm{s19} \tag{48}$$

6.25 Reaction re25

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s20} \tag{49}$$

Reactant

Table 54: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 55: Properties of each product.

Id	Name	SBO
s20	MAPKK2	

Kinetic Law

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

$$v_{25} = \mathrm{kass\_re25} \cdot \mathrm{s18} - \mathrm{kdiss\_re25} \cdot \mathrm{s20} \tag{50}$$

6.26 Reaction re26

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s21} \tag{51}$$

Reactant

Table 56: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 57: Properties of each product.

Id	Name	SBO
s21	MAPKK3	

Kinetic Law

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

$$v_{26} = \mathrm{kass\_re26} \cdot \mathrm{s18} - \mathrm{kdiss\_re26} \cdot \mathrm{s21} \tag{52}$$

6.27 Reaction re27

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s22} \tag{53}$$

Reactant

Table 58: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 59: Properties of each product.

Id	Name	SBO
s22	MAPKK4	

Kinetic Law

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

$$v_{27} = \mathrm{kass\_re27} \cdot \mathrm{s18} - \mathrm{kdiss\_re27} \cdot \mathrm{s22} \tag{54}$$

6.28 Reaction re28

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s23} \tag{55}$$

Reactant

Table 60: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 61: Properties of each product.

Id	Name	SBO
s23	MAPKK5	

Kinetic Law

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

$$v_{28} = \mathrm{kass\_re28} \cdot \mathrm{s18} - \mathrm{kdiss\_re28} \cdot \mathrm{s23} \tag{56}$$

6.29 Reaction re29

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s24} \tag{57}$$

Reactant

Table 62: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 63: Properties of each product.

Id	Name	SBO
s24	MAPKK6	

Kinetic Law

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

$$v_{29} = \mathrm{kass\_re29} \cdot \mathrm{s18} - \mathrm{kdiss\_re29} \cdot \mathrm{s24} \tag{58}$$

6.30 Reaction re30

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s25} \tag{59}$$

Reactant

Table 64: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 65: Properties of each product.

Id	Name	SBO
s25	MAPKK7	

Kinetic Law

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

$$v_{30} = \mathrm{kass\_re30} \cdot \mathrm{s18} - \mathrm{kdiss\_re30} \cdot \mathrm{s25} \tag{60}$$

6.31 Reaction re31

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s26} \tag{61}$$

Reactant

Table 66: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 67: Properties of each product.

Id	Name	SBO
s26	MAPKK9	

Kinetic Law

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

$$v_{31} = \mathrm{kass\_re31} \cdot \mathrm{s18} - \mathrm{kdiss\_re31} \cdot \mathrm{s26} \tag{62}$$

6.32 Reaction re32

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

Reaction equation

$$\mathrm{s27} \rightleftharpoons \mathrm{s28} \tag{63}$$

Reactant

Table 68: Properties of each reactant.

Id	Name	SBO
s27	MAPK	

Product

Table 69: Properties of each product.

Id	Name	SBO
s28	MAPK	

Kinetic Law

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

$$v_{32} = \mathrm{kass\_re32} \cdot \mathrm{s27} - \mathrm{kdiss\_re32} \cdot \mathrm{s28} \tag{64}$$

6.33 Reaction re33

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

Reaction equation

$$\mathrm{s18} \rightleftharpoons \mathrm{s27} \tag{65}$$

Reactant

Table 70: Properties of each reactant.

Id	Name	SBO
s18	MAPKK	

Product

Table 71: Properties of each product.

Id	Name	SBO
s27	MAPK	

Kinetic Law

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

$$v_{33} = \mathrm{kass\_re33} \cdot \mathrm{s18} - \mathrm{kdiss\_re33} \cdot \mathrm{s27} \tag{66}$$

6.34 Reaction re34

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

Reaction equation

$$\mathrm{s15} \rightleftharpoons \mathrm{s19} \tag{67}$$

Reactant

Table 72: Properties of each reactant.

Id	Name	SBO
s15	MAPKKK1	

Product

Table 73: Properties of each product.

Id	Name	SBO
s19	MAPKK1	

Kinetic Law

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

$$v_{34} = \mathrm{kass\_re34} \cdot \mathrm{s15} - \mathrm{kdiss\_re34} \cdot \mathrm{s19} \tag{68}$$

6.35 Reaction re35

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

Reaction equation

$$\mathrm{s15} \rightleftharpoons \mathrm{s20} \tag{69}$$

Reactant

Table 74: Properties of each reactant.

Id	Name	SBO
s15	MAPKKK1	

Product

Table 75: Properties of each product.

Id	Name	SBO
s20	MAPKK2	

Kinetic Law

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

$$v_{35} = \mathrm{kass\_re35} \cdot \mathrm{s15} - \mathrm{kdiss\_re35} \cdot \mathrm{s20} \tag{70}$$

6.36 Reaction re36

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

Reaction equation

$$\mathrm{s16} \rightleftharpoons \mathrm{s26} \tag{71}$$

Reactant

Table 76: Properties of each reactant.

Id	Name	SBO
s16	CTR1	

Product

Table 77: Properties of each product.

Id	Name	SBO
s26	MAPKK9	

Kinetic Law

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

$$v_{36} = \mathrm{kass\_re36} \cdot \mathrm{s16} - \mathrm{kdiss\_re36} \cdot \mathrm{s26} \tag{72}$$

6.37 Reaction re37

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

Reaction equation

$$\mathrm{s28} \rightleftharpoons \mathrm{s29} \tag{73}$$

Reactant

Table 78: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 79: Properties of each product.

Id	Name	SBO
s29	MAPK2	

Kinetic Law

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

$$v_{37} = \mathrm{kass\_re37} \cdot \mathrm{s28} - \mathrm{kdiss\_re37} \cdot \mathrm{s29} \tag{74}$$

6.38 Reaction re38

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

Reaction equation

$$\mathrm{s28} \rightleftharpoons \mathrm{s30} \tag{75}$$

Reactant

Table 80: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 81: Properties of each product.

Id	Name	SBO
s30	MAPK3	

Kinetic Law

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

$$v_{38} = \mathrm{kass\_re38} \cdot \mathrm{s28} - \mathrm{kdiss\_re38} \cdot \mathrm{s30} \tag{76}$$

6.39 Reaction re39

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

Reaction equation

$$\mathrm{s28} \rightleftharpoons \mathrm{s31} \tag{77}$$

Reactant

Table 82: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 83: Properties of each product.

Id	Name	SBO
s31	MAPK4	

Kinetic Law

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

$$v_{39} = \mathrm{kass\_re39} \cdot \mathrm{s28} - \mathrm{kdiss\_re39} \cdot \mathrm{s31} \tag{78}$$

6.40 Reaction re40

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

Reaction equation

$$\mathrm{s28} \rightleftharpoons \mathrm{s32} \tag{79}$$

Reactant

Table 84: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 85: Properties of each product.

Id	Name	SBO
s32	MAPK6	

Kinetic Law

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

$$v_{40} = \mathrm{kass\_re40} \cdot \mathrm{s28} - \mathrm{kdiss\_re40} \cdot \mathrm{s32} \tag{80}$$

6.41 Reaction re41

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

Reaction equation

$$\mathrm{s20} \rightleftharpoons \mathrm{s30} \tag{81}$$

Reactant

Table 86: Properties of each reactant.

Id	Name	SBO
s20	MAPKK2	

Product

Table 87: Properties of each product.

Id	Name	SBO
s30	MAPK3	

Kinetic Law

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

$$v_{41} = \mathrm{kass\_re41} \cdot \mathrm{s20} - \mathrm{kdiss\_re41} \cdot \mathrm{s30} \tag{82}$$

6.42 Reaction re42

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

Reaction equation

$$\mathrm{s20} \rightleftharpoons \mathrm{s31} \tag{83}$$

Reactant

Table 88: Properties of each reactant.

Id	Name	SBO
s20	MAPKK2	

Product

Table 89: Properties of each product.

Id	Name	SBO
s31	MAPK4	

Kinetic Law

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

$$v_{42} = \mathrm{kass\_re42} \cdot \mathrm{s20} - \mathrm{kdiss\_re42} \cdot \mathrm{s31} \tag{84}$$

6.43 Reaction re43

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

Reaction equation

$$\text{s20} \rightleftharpoons \text{s32} \tag{85}$$

Reactant

Table 90: Properties of each reactant.

Id	Name	SBO
s20	MAPKK2	

Product

Table 91: Properties of each product.

Id	Name	SBO
s32	MAPK6	

Kinetic Law

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

$$v_{43} = \text{kass\_re43} \cdot \text{s20} - \text{kdiss\_re43} \cdot \text{s32} \tag{86}$$

6.44 Reaction re44

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

Reaction equation

$$\text{s26} \rightleftharpoons \text{s30} \tag{87}$$

Reactant

Table 92: Properties of each reactant.

Id	Name	SBO
s26	MAPKK9	

Product

Table 93: Properties of each product.

Id	Name	SBO
s30	MAPK3	

Kinetic Law

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

$$v_{44} = \mathrm{kass\_re44} \cdot \mathrm{s26} - \mathrm{kdiss\_re44} \cdot \mathrm{s30} \tag{88}$$

6.45 Reaction re45

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

Reaction equation

$$\mathrm{s33} \rightleftharpoons \mathrm{s34} \tag{89}$$

Reactant

Table 94: Properties of each reactant.

Id	Name	SBO
s33	WRKY1	

Product

Table 95: Properties of each product.

Id	Name	SBO
s34	WRKY1	

Kinetic Law

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

$$v_{45} = \mathrm{kass\_re45} \cdot \mathrm{s33} - \mathrm{kdiss\_re45} \cdot \mathrm{s34} \tag{90}$$

6.46 Reaction re46

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

Reaction equation

$$\mathrm{s35} \rightleftharpoons \mathrm{s36} \tag{91}$$

Reactant

Table 96: Properties of each reactant.

Id	Name	SBO
s35	WRKY12	

Product

Table 97: Properties of each product.

Id	Name	SBO
s36	WRKY12	

Kinetic Law

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

$$v_{46} = \mathrm{kass\_re46} \cdot \mathrm{s35} - \mathrm{kdiss\_re46} \cdot \mathrm{s36} \tag{92}$$

6.47 Reaction re47

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

Reaction equation

$$\mathrm{s37} \rightleftharpoons \mathrm{s38} \tag{93}$$

Reactant

Table 98: Properties of each reactant.

Id	Name	SBO
s37	WRKY8	

Product

Table 99: Properties of each product.

Id	Name	SBO
s38	WRKY8	

Kinetic Law

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

$$v_{47} = \mathrm{kass\_re47} \cdot \mathrm{s37} - \mathrm{kdiss\_re47} \cdot \mathrm{s38} \tag{94}$$

6.48 Reaction re48

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

Reaction equation

$$\mathrm{s39} \rightleftharpoons \mathrm{s40} \tag{95}$$

Reactant

Table 100: Properties of each reactant.

Id	Name	SBO
s39	WRKY25	

Product

Table 101: Properties of each product.

Id	Name	SBO
s40	WRKY25	

Kinetic Law

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

$$v_{48} = \mathrm{kass\_re48} \cdot \mathrm{s39} - \mathrm{kdiss\_re48} \cdot \mathrm{s40} \tag{96}$$

6.49 Reaction re49

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

Reaction equation

$$\mathrm{s41} \rightleftharpoons \mathrm{s42} \tag{97}$$

Reactant

Table 102: Properties of each reactant.

Id	Name	SBO
s41	WRKY22	

Product

Table 103: Properties of each product.

Id	Name	SBO
s42	WRKY22	

Kinetic Law

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

$$v_{49} = \mathrm{kass\_re49} \cdot \mathrm{s41} - \mathrm{kdiss\_re49} \cdot \mathrm{s42} \tag{98}$$

6.50 Reaction re50

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

Reaction equation

$$\mathrm{s43} \rightleftharpoons \mathrm{s44} \tag{99}$$

Reactant

Table 104: Properties of each reactant.

Id	Name	SBO
s43	WRKY29	

Product

Table 105: Properties of each product.

Id	Name	SBO
s44	WRKY29	

Kinetic Law

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

$$v_{50} = \mathrm{kass\_re50} \cdot \mathrm{s43} - \mathrm{kdiss\_re50} \cdot \mathrm{s44} \tag{100}$$

6.51 Reaction re51

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

Reaction equation

$$\mathrm{s45} \rightleftharpoons \mathrm{s46} \tag{101}$$

Reactant

Table 106: Properties of each reactant.

Id	Name	SBO
s45	WRKY33	

Product

Table 107: Properties of each product.

Id	Name	SBO
s46	WRKY33	

Kinetic Law

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

$$v_{51} = \mathrm{kass\_re51} \cdot \mathrm{s45} - \mathrm{kdiss\_re51} \cdot \mathrm{s46} \tag{102}$$

6.52 Reaction re52

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

Reaction equation

$$\text{s47} \rightleftharpoons \text{s48} \tag{103}$$

Reactant

Table 108: Properties of each reactant.

Id	Name	SBO
s47	WRKY28	

Product

Table 109: Properties of each product.

Id	Name	SBO
s48	WRKY28	

Kinetic Law

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

$$v_{52} = \text{kass\_re52} \cdot \text{s47} - \text{kdiss\_re52} \cdot \text{s48} \tag{104}$$

6.53 Reaction re53

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

Reaction equation

$$\text{s49} \rightleftharpoons \text{s50} \tag{105}$$

Reactant

Table 110: Properties of each reactant.

Id	Name	SBO
s49	MYB2	

Product

Table 111: Properties of each product.

Id	Name	SBO
s50	MYB2	

Kinetic Law

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

$$v_{53} = \mathrm{kass\_re53} \cdot \mathrm{s49} - \mathrm{kdiss\_re53} \cdot \mathrm{s50} \tag{106}$$

6.54 Reaction re54

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

Reaction equation

$$\mathrm{s51} \rightleftharpoons \mathrm{s52} \tag{107}$$

Reactant

Table 112: Properties of each reactant.

Id	Name	SBO
s51	MYB4	

Product

Table 113: Properties of each product.

Id	Name	SBO
s52	MYB4	

Kinetic Law

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

$$v_{54} = \mathrm{kass\_re54} \cdot \mathrm{s51} - \mathrm{kdiss\_re54} \cdot \mathrm{s52} \tag{108}$$

6.55 Reaction re55

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

Reaction equation

$$\mathrm{s29} \rightleftharpoons \mathrm{s37} \tag{109}$$

Reactant

Table 114: Properties of each reactant.

Id	Name	SBO
s29	MAPK2	

Product

Table 115: Properties of each product.

Id	Name	SBO
s37	WRKY8	

Kinetic Law

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

$$v_{55} = \mathrm{kass\_re55} \cdot \mathrm{s29} - \mathrm{kdiss\_re55} \cdot \mathrm{s37} \tag{110}$$

6.56 Reaction re56

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

Reaction equation

$$\mathrm{s29} \rightleftharpoons \mathrm{s33} \tag{111}$$

Reactant

Table 116: Properties of each reactant.

Id	Name	SBO
s29	MAPK2	

Product

Table 117: Properties of each product.

Id	Name	SBO
s33	WRKY1	

Kinetic Law

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

$$v_{56} = \mathrm{kass\_re56} \cdot \mathrm{s29} - \mathrm{kdiss\_re56} \cdot \mathrm{s33} \tag{112}$$

6.57 Reaction re57

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

Reaction equation

$$\mathrm{s30} \rightleftharpoons \mathrm{s35} \tag{113}$$

Reactant

Table 118: Properties of each reactant.

Id	Name	SBO
s30	MAPK3	

Product

Table 119: Properties of each product.

Id	Name	SBO
s35	WRKY12	

Kinetic Law

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

$$v_{57} = \mathrm{kass\_re57} \cdot \mathrm{s30} - \mathrm{kdiss\_re57} \cdot \mathrm{s35} \tag{114}$$

6.58 Reaction re58

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

Reaction equation

$$\mathrm{s30} \rightleftharpoons \mathrm{s41} \tag{115}$$

Reactant

Table 120: Properties of each reactant.

Id	Name	SBO
s30	MAPK3	

Product

Table 121: Properties of each product.

Id	Name	SBO
s41	WRKY22	

Kinetic Law

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

$$v_{58} = \mathrm{kass\_re58} \cdot \mathrm{s30} - \mathrm{kdiss\_re58} \cdot \mathrm{s41} \tag{116}$$

6.59 Reaction re59

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

Reaction equation

$$\mathrm{s30} \rightleftharpoons \mathrm{s47} \tag{117}$$

Reactant

Table 122: Properties of each reactant.

Id	Name	SBO
s30	MAPK3	

Product

Table 123: Properties of each product.

Id	Name	SBO
s47	WRKY28	

Kinetic Law

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

$$v_{59} = \mathrm{kass\_re59} \cdot \mathrm{s30} - \mathrm{kdiss\_re59} \cdot \mathrm{s47} \tag{118}$$

6.60 Reaction re60

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

Reaction equation

$$\mathrm{s31} \rightleftharpoons \mathrm{s33} \tag{119}$$

Reactant

Table 124: Properties of each reactant.

Id	Name	SBO
s31	MAPK4	

Product

Table 125: Properties of each product.

Id	Name	SBO
s33	WRKY1	

Kinetic Law

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

$$v_{60} = \mathrm{kass\_re60} \cdot \mathrm{s31} - \mathrm{kdiss\_re60} \cdot \mathrm{s33} \tag{120}$$

6.61 Reaction re61

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

Reaction equation

$$\mathrm{s31} \rightleftharpoons \mathrm{s45} \tag{121}$$

Reactant

Table 126: Properties of each reactant.

Id	Name	SBO
s31	MAPK4	

Product

Table 127: Properties of each product.

Id	Name	SBO
s45	WRKY33	

Kinetic Law

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

$$v_{61} = \mathrm{kass\_re61} \cdot \mathrm{s31} - \mathrm{kdiss\_re61} \cdot \mathrm{s45} \tag{122}$$

6.62 Reaction re62

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

Reaction equation

$$\mathrm{s31} \rightleftharpoons \mathrm{s39} \tag{123}$$

Reactant

Table 128: Properties of each reactant.

Id	Name	SBO
s31	MAPK4	

Product

Table 129: Properties of each product.

Id	Name	SBO
s39	WRKY25	

Kinetic Law

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

$$v_{62} = \mathrm{kass\_re62} \cdot \mathrm{s31} - \mathrm{kdiss\_re62} \cdot \mathrm{s39} \tag{124}$$

6.63 Reaction re63

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

Reaction equation

$$\mathrm{s32} \rightleftharpoons \mathrm{s47} \tag{125}$$

Reactant

Table 130: Properties of each reactant.

Id	Name	SBO
s32	MAPK6	

Product

Table 131: Properties of each product.

Id	Name	SBO
s47	WRKY28	

Kinetic Law

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

$$v_{63} = \mathrm{kass\_re63} \cdot \mathrm{s32} - \mathrm{kdiss\_re63} \cdot \mathrm{s47} \tag{126}$$

6.64 Reaction re64

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

Reaction equation

$$\mathrm{s32} \rightleftharpoons \mathrm{s45} \tag{127}$$

Reactant

Table 132: Properties of each reactant.

Id	Name	SBO
s32	MAPK6	

Product

Table 133: Properties of each product.

Id	Name	SBO
s45	WRKY33	

Kinetic Law

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

$$v_{64} = \mathrm{kass\_re64} \cdot \mathrm{s32} - \mathrm{kdiss\_re64} \cdot \mathrm{s45} \tag{128}$$

6.65 Reaction re65

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

Reaction equation

$$\mathrm{s32} \rightleftharpoons \mathrm{s35} \tag{129}$$

Reactant

Table 134: Properties of each reactant.

Id	Name	SBO
s32	MAPK6	

Product

Table 135: Properties of each product.

Id	Name	SBO
s35	WRKY12	

Kinetic Law

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

$$v_{65} = \mathrm{kass\_re65} \cdot \mathrm{s32} - \mathrm{kdiss\_re65} \cdot \mathrm{s35} \tag{130}$$

6.66 Reaction re66

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

Reaction equation

$$\mathrm{s28} \rightleftharpoons \mathrm{s56} \tag{131}$$

Reactant

Table 136: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 137: Properties of each product.

Id	Name	SBO
s56	AP2	

Kinetic Law

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

$$v_{66} = \mathrm{kass\_re66} \cdot \mathrm{s28} - \mathrm{kdiss\_re66} \cdot \mathrm{s56} \tag{132}$$

6.67 Reaction re67

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

Reaction equation

$$\text{s28} \rightleftharpoons \text{s49} \tag{133}$$

Reactant

Table 138: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 139: Properties of each product.

Id	Name	SBO
s49	MYB2	

Kinetic Law

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

$$v_{67} = \text{kass\_re67} \cdot \text{s28} - \text{kdiss\_re67} \cdot \text{s49} \tag{134}$$

6.68 Reaction re68

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

Reaction equation

$$\text{s28} \rightleftharpoons \text{s51} \tag{135}$$

Reactant

Table 140: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 141: Properties of each product.

Id	Name	SBO
s51	MYB4	

Kinetic Law

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

$$v_{68} = \mathrm{kass\_re68} \cdot \mathrm{s28} - \mathrm{kdiss\_re68} \cdot \mathrm{s51} \tag{136}$$

6.69 Reaction re69

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

Reaction equation

$$\mathrm{s28} \rightleftharpoons \mathrm{s53} \tag{137}$$

Reactant

Table 142: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 143: Properties of each product.

Id	Name	SBO
s53	MYB44	

Kinetic Law

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

$$v_{69} = \mathrm{kass\_re69} \cdot \mathrm{s28} - \mathrm{kdiss\_re69} \cdot \mathrm{s53} \tag{138}$$

6.70 Reaction re70

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

Reaction equation

$$\text{s28} \rightleftharpoons \text{s54} \tag{139}$$

Reactant

Table 144: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 145: Properties of each product.

Id	Name	SBO
s54	NAC	

Kinetic Law

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

$$v_{70} = \text{kass\_re70} \cdot \text{s28} - \text{kdiss\_re70} \cdot \text{s54} \tag{140}$$

6.71 Reaction re71

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

Reaction equation

$$\text{s28} \rightleftharpoons \text{s55} \tag{141}$$

Reactant

Table 146: Properties of each reactant.

Id	Name	SBO
s28	MAPK	

Product

Table 147: Properties of each product.

Id	Name	SBO
s55	bZIP	

Kinetic Law

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

$$v_{71} = \mathrm{kass\_re71} \cdot \mathrm{s28} - \mathrm{kdiss\_re71} \cdot \mathrm{s55} \tag{142}$$

6.72 Reaction re72

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

Reaction equation

$$\mathrm{s40} \rightleftharpoons \mathrm{s57} \tag{143}$$

Reactant

Table 148: Properties of each reactant.

Id	Name	SBO
s40	WRKY25	

Product

Table 149: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{72} = \mathrm{kass\_re72} \cdot \mathrm{s40} - \mathrm{kdiss\_re72} \cdot \mathrm{s57} \tag{144}$$

6.73 Reaction re73

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

Reaction equation

$$\mathrm{s53} \rightleftharpoons \mathrm{s57} \tag{145}$$

Reactant

Table 150: Properties of each reactant.

Id	Name	SBO
s53	MYB44	

Product

Table 151: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{73} = \mathrm{kass\_re73} \cdot \mathrm{s53} - \mathrm{kdiss\_re73} \cdot \mathrm{s57} \tag{146}$$

6.74 Reaction re74

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

Reaction equation

$$\mathrm{s54} \rightleftharpoons \mathrm{s57} \tag{147}$$

Reactant

Table 152: Properties of each reactant.

Id	Name	SBO
s54	NAC	

Product

Table 153: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{74} = \mathrm{kass\_re74} \cdot \mathrm{s54} - \mathrm{kdiss\_re74} \cdot \mathrm{s57} \tag{148}$$

6.75 Reaction re75

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

Reaction equation

$$\mathrm{s52} \rightleftharpoons \mathrm{s57} \tag{149}$$

Reactant

Table 154: Properties of each reactant.

Id	Name	SBO
s52	MYB4	

Product

Table 155: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{75} = \mathrm{kass\_re75} \cdot \mathrm{s52} - \mathrm{kdiss\_re75} \cdot \mathrm{s57} \tag{150}$$

6.76 Reaction re76

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

Reaction equation

$$\mathrm{s50} \rightleftharpoons \mathrm{s57} \tag{151}$$

Reactant

Table 156: Properties of each reactant.

Id	Name	SBO
s50	MYB2	

Product

Table 157: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{76} = \mathrm{kass\_re76} \cdot \mathrm{s50} - \mathrm{kdiss\_re76} \cdot \mathrm{s57} \tag{152}$$

6.77 Reaction re77

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

Reaction equation

$$\mathrm{s56} \rightleftharpoons \mathrm{s57} \tag{153}$$

Reactant

Table 158: Properties of each reactant.

Id	Name	SBO
s56	AP2	

Product

Table 159: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{77} = \mathrm{kass\_re77} \cdot \mathrm{s56} - \mathrm{kdiss\_re77} \cdot \mathrm{s57} \tag{154}$$

6.78 Reaction re78

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

Reaction equation

$$\mathrm{s48} \rightleftharpoons \mathrm{s57} \tag{155}$$

Reactant

Table 160: Properties of each reactant.

Id	Name	SBO
s48	WRKY28	

Product

Table 161: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{78} = \mathrm{kass\_re78} \cdot \mathrm{s48} - \mathrm{kdiss\_re78} \cdot \mathrm{s57} \tag{156}$$

6.79 Reaction re79

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

Reaction equation

$$\text{s30} \rightleftharpoons \text{s43} \tag{157}$$

Reactant

Table 162: Properties of each reactant.

Id	Name	SBO
s30	MAPK3	

Product

Table 163: Properties of each product.

Id	Name	SBO
s43	WRKY29	

Kinetic Law

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

$$v_{79} = \text{kass\_re79} \cdot \text{s30} - \text{kdiss\_re79} \cdot \text{s43} \tag{158}$$

6.80 Reaction re80

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

Reaction equation

$$\text{s55} \rightleftharpoons \text{s57} \tag{159}$$

Reactant

Table 164: Properties of each reactant.

Id	Name	SBO
s55	bZIP	

Product

Table 165: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{80} = \mathrm{kass\_re80} \cdot \mathrm{s55} - \mathrm{kdiss\_re80} \cdot \mathrm{s57} \tag{160}$$

6.81 Reaction re81

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

Reaction equation

$$\mathrm{s42} \rightleftharpoons \mathrm{s57} \tag{161}$$

Reactant

Table 166: Properties of each reactant.

Id	Name	SBO
s42	WRKY22	

Product

Table 167: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{81} = \mathrm{kass\_re81} \cdot \mathrm{s42} - \mathrm{kdiss\_re81} \cdot \mathrm{s57} \tag{162}$$

6.82 Reaction re82

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

Reaction equation

$$\text{s44} \rightleftharpoons \text{s57} \tag{163}$$

Reactant

Table 168: Properties of each reactant.

Id	Name	SBO
s44	WRKY29	

Product

Table 169: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{82} = \text{kass\_re82} \cdot \text{s44} - \text{kdiss\_re82} \cdot \text{s57} \tag{164}$$

6.83 Reaction re83

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

Reaction equation

$$\text{s38} \rightleftharpoons \text{s57} \tag{165}$$

Reactant

Table 170: Properties of each reactant.

Id	Name	SBO
s38	WRKY8	

Product

Table 171: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{83} = \mathrm{kass\_re83} \cdot \mathrm{s38} - \mathrm{kdiss\_re83} \cdot \mathrm{s57} \tag{166}$$

6.84 Reaction re84

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

Reaction equation

$$\mathrm{s36} \rightleftharpoons \mathrm{s57} \tag{167}$$

Reactant

Table 172: Properties of each reactant.

Id	Name	SBO
s36	WRKY12	

Product

Table 173: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{84} = \mathrm{kass\_re84} \cdot \mathrm{s36} - \mathrm{kdiss\_re84} \cdot \mathrm{s57} \tag{168}$$

6.85 Reaction re85

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

Reaction equation

$$\text{s34} \rightleftharpoons \text{s57} \tag{169}$$

Reactant

Table 174: Properties of each reactant.

Id	Name	SBO
s34	WRKY1	

Product

Table 175: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{85} = \text{kass\_re85} \cdot \text{s34} - \text{kdiss\_re85} \cdot \text{s57} \tag{170}$$

6.86 Reaction re86

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

Reaction equation

$$\text{s46} \rightleftharpoons \text{s57} \tag{171}$$

Reactant

Table 176: Properties of each reactant.

Id	Name	SBO
s46	WRKY33	

Product

Table 177: Properties of each product.

Id	Name	SBO
s57	Response	

Kinetic Law

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

$$v_{86} = \mathrm{kass\_re86} \cdot \mathrm{s46} - \mathrm{kdiss\_re86} \cdot \mathrm{s57} \tag{172}$$

7 Derived Rate Equations

When interpreted as an ordinary differential equation framework, this model implies the following set of equations for the rates of change of each species.

7.1 Species s1

Name Cold

Initial amount 0.5

Charge 0

This species takes part in one reaction (as a reactant in re1).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s1} = -v_1 \tag{173}$$

7.2 Species s2

Name Salt

Initial amount 0.5

Charge 0

This species takes part in three reactions (as a reactant in re2, re3, re4).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s2} = -v_2 - v_3 - v_4 \tag{174}$$

7.3 Species s3

Name Drought

Initial amount 0.5

Charge 0

This species takes part in two reactions (as a reactant in re8, re9).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s3} = -v_8 - v_9 \tag{175}$$

7.4 Species s4

Name H2O2

Initial amount 0.5

Charge 0

This species takes part in one reaction (as a reactant in re10).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s4} = -v_{10} \tag{176}$$

7.5 Species s5

Name Heavy Metal

Initial amount 0.5

Charge 0

This species takes part in one reaction (as a reactant in re11).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s5} = -v_{11} \tag{177}$$

7.6 Species s6

Name Ethylene

Initial amount 0.5

Charge 0

This species takes part in three reactions (as a reactant in re5, re6, re7).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s6} = -v_5 - v_6 - v_7 \tag{178}$$

7.7 Species s7

Name RLKs

Initial amount 0.8

Charge 0

This species takes part in seven reactions (as a reactant in re13, re18 and as a product in re1, re2, re9, re10, re11).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s7} = v_1 + v_2 + v_9 + v_{10} + v_{11} - v_{13} - v_{18} \tag{179}$$

7.8 Species s8

Name LRR

Initial amount 0.8

Charge 0

This species takes part in two reactions (as a reactant in re14 and as a product in re3).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s8} = v_3 - v_{14} \tag{180}$$

7.9 Species s9

Name CRKs

Initial amount 0.8

Charge 0

This species takes part in three reactions (as a reactant in re15 and as a product in re4, re8).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s9} = v_4 + v_8 - v_{15} \tag{181}$$

7.10 Species s10

Name LecRK2

Initial amount 0.8

Charge 0

This species takes part in two reactions (as a reactant in re16 and as a product in re7).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s10} = v_7 - v_{16} \tag{182}$$

7.11 Species s11

Name ETR1

Initial amount 0.8

Charge 0

This species takes part in two reactions (as a reactant in re20 and as a product in re6).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s11} = v_6 - v_{20} \tag{183}$$

7.12 Species s12

Name ETR2

Initial amount 0.8

Charge 0

This species takes part in two reactions (as a reactant in re21 and as a product in re5).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s12} = v_5 - v_{21} \tag{184}$$

7.13 Species s13

Name MAPKKK

Initial amount 1

Charge 0

This species takes part in five reactions (as a reactant in re12 and as a product in re13, re14, re15, re16).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s13} = v_{13} + v_{14} + v_{15} + v_{16} - v_{12} \tag{185}$$

7.14 Species s14

Name MAPKKK

Initial amount 1

Charge 0

This species takes part in four reactions (as a reactant in re17, re19, re23 and as a product in re12).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s14} = v_{12} - v_{17} - v_{19} - v_{23} \tag{186}$$

7.15 Species s15

Name MAPKKK1

Initial amount 1

Charge 0

This species takes part in four reactions (as a reactant in re34, re35 and as a product in re17, re18).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s15} = v_{17} + v_{18} - v_{34} - v_{35} \tag{187}$$

7.16 Species s16

Name CTR1

Initial amount 1

Charge 0

This species takes part in four reactions (as a reactant in re36 and as a product in re19, re20, re21).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s16} = v_{19} + v_{20} + v_{21} - v_{36} \tag{188}$$

7.17 Species s17

Name MAPKK

Initial amount 1

Charge 0

This species takes part in two reactions (as a reactant in re22 and as a product in re23).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s17} = v_{23} - v_{22} \tag{189}$$

7.18 Species s18

Name MAPKK

Initial amount 1

Charge 0

This species takes part in ten reactions (as a reactant in re24, re25, re26, re27, re28, re29, re30, re31, re33 and as a product in re22).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s18} = v_{22} - v_{24} - v_{25} - v_{26} - v_{27} - v_{28} - v_{29} - v_{30} - v_{31} - v_{33} \tag{190}$$

7.19 Species s27

Name MAPK

Initial amount 1

Charge 0

This species takes part in two reactions (as a reactant in re32 and as a product in re33).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s27} = v_{33} - v_{32} \tag{191}$$

7.20 Species s28

Name MAPK

Initial amount 1

Charge 0

This species takes part in eleven reactions (as a reactant in re37, re38, re39, re40, re66, re67, re68, re69, re70, re71 and as a product in re32).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s28} = v_{32} - v_{37} - v_{38} - v_{39} - v_{40} - v_{66} - v_{67} - v_{68} - v_{69} - v_{70} - v_{71} \tag{192}$$

7.21 Species s19

Name MAPKK1

Initial amount 1

Charge 0

This species takes part in two reactions (as a product in re24, re34).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s19} = v_{24} + v_{34} \tag{193}$$

7.22 Species s20

Name MAPKK2

Initial amount 1

Charge 0

This species takes part in five reactions (as a reactant in re41, re42, re43 and as a product in re25, re35).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s20} = v_{25} + v_{35} - v_{41} - v_{42} - v_{43} \tag{194}$$

7.23 Species s21

Name MAPKK3

Initial amount 1

Charge 0

This species takes part in one reaction (as a product in re26).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s21} = v_{26} \tag{195}$$

7.24 Species s22

Name MAPKK4

Initial amount 1

Charge 0

This species takes part in one reaction (as a product in re27).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s22} = v_{27} \tag{196}$$

7.25 Species s23

Name MAPKK5

Initial amount 1

Charge 0

This species takes part in one reaction (as a product in re28).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s23} = v_{28} \tag{197}$$

7.26 Species s24

Name MAPKK6

Initial amount 1

Charge 0

This species takes part in one reaction (as a product in re29).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s24} = v_{29} \tag{198}$$

7.27 Species s25

Name MAPKK7

Initial amount 1

Charge 0

This species takes part in one reaction (as a product in re30).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s25} = v_{30} \tag{199}$$

7.28 Species s26

Name MAPKK9

Initial amount 1

Charge 0

This species takes part in three reactions (as a reactant in re44 and as a product in re31, re36).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s26} = v_{31} + v_{36} - v_{44} \tag{200}$$

7.29 Species s29

Name MAPK2

Initial amount 1

Charge 0

This species takes part in three reactions (as a reactant in re55, re56 and as a product in re37).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s29} = v_{37} - v_{55} - v_{56} \tag{201}$$

7.30 Species s30

Name MAPK3

Initial amount 1

Charge 0

This species takes part in seven reactions (as a reactant in re57, re58, re59, re79 and as a product in re38, re41, re44).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s30} = v_{38} + v_{41} + v_{44} - v_{57} - v_{58} - v_{59} - v_{79} \tag{202}$$

7.31 Species s31

Name MAPK4

Initial amount 1

Charge 0

This species takes part in five reactions (as a reactant in re60, re61, re62 and as a product in re39, re42).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s31} = v_{39} + v_{42} - v_{60} - v_{61} - v_{62} \tag{203}$$

7.32 Species s32

Name MAPK6

Initial amount 1

Charge 0

This species takes part in five reactions (as a reactant in re63, re64, re65 and as a product in re40, re43).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s32} = v_{40} + v_{43} - v_{63} - v_{64} - v_{65} \tag{204}$$

7.33 Species s33

Name WRKY1

Initial amount 1.2

Charge 0

This species takes part in three reactions (as a reactant in re45 and as a product in re56, re60).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s33} = v_{56} + v_{60} - v_{45} \tag{205}$$

7.34 Species s34

Name WRKY1

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re85 and as a product in re45).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s34} = v_{45} - v_{85} \tag{206}$$

7.35 Species s35

Name WRKY12

Initial amount 1.2

Charge 0

This species takes part in three reactions (as a reactant in re46 and as a product in re57, re65).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s35} = v_{57} + v_{65} - v_{46} \tag{207}$$

7.36 Species s36

Name WRKY12

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re84 and as a product in re46).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s36} = v_{46} - v_{84} \tag{208}$$

7.37 Species s37

Name WRKY8

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re47 and as a product in re55).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s37} = v_{55} - v_{47} \tag{209}$$

7.38 Species s38

Name WRKY8

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re83 and as a product in re47).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s38} = v_{47} - v_{83} \tag{210}$$

7.39 Species s39

Name WRKY25

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re48 and as a product in re62).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s39} = v_{62} - v_{48} \tag{211}$$

7.40 Species s40

Name WRKY25

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re72 and as a product in re48).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s40} = v_{48} - v_{72} \tag{212}$$

7.41 Species s41

Name WRKY22

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re49 and as a product in re58).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s41} = v_{58} - v_{49} \tag{213}$$

7.42 Species s42

Name WRKY22

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re81 and as a product in re49).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s42} = v_{49} - v_{81} \tag{214}$$

7.43 Species s43

Name WRKY29

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re50 and as a product in re79).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s43} = v_{79} - v_{50} \tag{215}$$

7.44 Species s44

Name WRKY29

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re82 and as a product in re50).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s44} = v_{50} - v_{82} \tag{216}$$

7.45 Species s45

Name WRKY33

Initial amount 1.2

Charge 0

This species takes part in three reactions (as a reactant in re51 and as a product in re61, re64).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s45} = v_{61} + v_{64} - v_{51} \tag{217}$$

7.46 Species s46

Name WRKY33

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re86 and as a product in re51).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s46} = v_{51} - v_{86} \tag{218}$$

7.47 Species s47

Name WRKY28

Initial amount 1.2

Charge 0

This species takes part in three reactions (as a reactant in re52 and as a product in re59, re63).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s47} = v_{59} + v_{63} - v_{52} \tag{219}$$

7.48 Species s48

Name WRKY28

Initial amount 1.2

Charge 0

This species takes part in two reactions (as a reactant in re78 and as a product in re52).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s48} = v_{52} - v_{78} \tag{220}$$

7.49 Species s49

Name MYB2

Initial amount 1.5

Charge 0

This species takes part in two reactions (as a reactant in re53 and as a product in re67).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s49} = v_{67} - v_{53} \tag{221}$$

7.50 Species s50

Name MYB2

Initial amount 1.5

Charge 0

This species takes part in two reactions (as a reactant in re76 and as a product in re53).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s50} = v_{53} - v_{76} \tag{222}$$

7.51 Species s51

Name MYB4

Initial amount 1.5

Charge 0

This species takes part in two reactions (as a reactant in re54 and as a product in re68).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s51} = v_{68} - v_{54} \tag{223}$$

7.52 Species s52

Name MYB4

Initial amount 1.5

Charge 0

This species takes part in two reactions (as a reactant in re75 and as a product in re54).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s52} = v_{54} - v_{75} \tag{224}$$

7.53 Species s53

Name MYB44

Initial amount 1.5

Charge 0

This species takes part in two reactions (as a reactant in re73 and as a product in re69).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s53} = v_{69} - v_{73} \tag{225}$$

7.54 Species s54

Name NAC

Initial amount 1.8

Charge 0

This species takes part in two reactions (as a reactant in re74 and as a product in re70).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s54} = v_{70} - v_{74} \tag{226}$$

7.55 Species s55

Name bZIP

Initial amount 2

Charge 0

This species takes part in two reactions (as a reactant in re80 and as a product in re71).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s55} = v_{71} - v_{80} \tag{227}$$

7.56 Species s56

Name AP2

Initial amount 2.2

Charge 0

This species takes part in two reactions (as a reactant in re77 and as a product in re66).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s56} = v_{66} - v_{77} \tag{228}$$

7.57 Species s57

Name Response

Initial amount 2.5

Charge 0

This species takes part in 14 reactions (as a product in re72, re73, re74, re75, re76, re77, re78, re80, re81, re82, re83, re84, re85, re86).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{s57} = v_{72} + v_{73} + v_{74} + v_{75} + v_{76} + v_{77} + v_{78} + v_{80} + v_{81} + v_{82} + v_{83} + v_{84} + v_{85} + v_{86} \tag{229}$$

A Glossary of Systems Biology Ontology Terms

SBO:0000282 dissociation constant: Equilibrium constant that measures the propensity of a larger object to separate (dissociate) reversibly into smaller components, as when a complex falls apart into its component molecules, or when a salt splits up into its component ions. The dissociation constant is usually denoted Kd and is the inverse of the affinity constant.

SBO:0000337 association constant: Equilibrium constant that measures the propensity of two objects to assemble (associate) reversibly into a larger component. The association constant is usually denoted Ka and is the inverse of the dissociation constant.

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