SBML Model Report

Model name: "Haberichter2007_cellcycle"

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1 General Overview

This is a document in SBML Level 2 Version 1 format. This model was created by the following two authors: Enuo He[1] and Steven Dowdy[2] at March 20th 2007 at 1:29 p. m. and last time modified at July fifth 2012 at 2:49 p. 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	1
species types	0	species	57
events	1	constraints	0
reactions	138	function definitions	0
global parameters	61	unit definitions	2
rules	12	initial assignments	0

Model Notes

This model is according to the paper *A systems biology dynamical model of mammalian G1 cell cycle progression.* Supplementary Figure 2A has been reproduced by the MathSBML and CellDesigner. All the data of this model are from the set 2 of Supplementary talbe2.

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2 Unit Definitions

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

2.1 Unit `time`

Name min

Definition 60 s

2.2 Unit `substance`

Name #

Definition item

2.3 Unit `volume`

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

Definition l

2.4 Unit `area`

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

Definition m^2

2.5 Unit `length`

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

Definition m

3 Compartment

This model contains one compartment.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
X	cell		3	1	litre	☑	

3.1 Compartment X

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

Name cell

4 Species

This model contains 57 species. Section 9 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
APCC		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYCdk1Y00YCdk1Y01YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYCdk1Y10YCdk1Y11YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYCdk2Y000YCdk2Y002YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYCdk2Y010YCdk2Y012YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYCdk2Y100YCdk2Y102YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYCdk2Y110YCdk2Y112YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYCyclinAYInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
APCCYEmi1		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk1Y00		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk1Y01		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk1Y10		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk1Y11		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk1Y11YpRbY10YpRbY20YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk1Y11YpRbY11YpRbY21YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y000		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y001		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y002		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y010		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y011		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y011YpRbY10YpRbY20YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y011YpRbY11YpRbY21YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
Cdk2Y012		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y012YpRbY10YpRbY20YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y012YpRbY11YpRbY21YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y100		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y101		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y102		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y110		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y111		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk2Y112		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk4Y00		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk4Y01		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk4Y01YpRbY00YpRbY10YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk4Y01YpRbY01YpRbY11YInt		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk4Y10		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Cdk4Y11		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
CyclinA		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
CyclinD		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
CyclinE		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
E2F		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
Emi1		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
p27		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
pRbY00		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
pRbY01		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
pRbY10		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
pRbY11		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
pRbY20		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟
pRbY21		X	$\mathrm{item} \cdot \mathrm{l}^{-1}$	⊟	⊟

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
totalYCyclinYD		X	item · l^{-1}	⊟	⊟
totalYCyclinYE		X	item · l^{-1}	⊟	⊟
totalYCyclinYA		X	item · l^{-1}	⊟	⊟
totalYp27		X	item · l^{-1}	⊟	⊟
hypophosphorylatedYpRb		X	item · l^{-1}	⊟	⊟
hyperphosphorylatedYpRb		X	item · l^{-1}	⊟	⊟
totalYEmi1		X	item · l^{-1}	⊟	⊟
activeYCdk2		X	item · l^{-1}	⊟	⊟

5 Parameters

This model contains 61 global parameters.

Table 4: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
ksYE2F			0.000		☐
ksYEmi1			0.000		☐
ksYCyclinA			0.000		☐
ksYCyclinE			0.000		☐
kYact			0.000		☐
ksYCyclinD			1354.231		☑
ksYp27			195.472		☑
kdYp27			0.002		☑
kd1Yp27			0.071		☑
ks0YCyclinE			254.074		☑
ks1YCyclinE			980.611		☑
ksMYCyclinE			9992.647		☑
ks0YCyclinA			499.944		☑
ks1YCyclinA			7999.996		☑
ksMYCyclinA			4064.384		☑
ks0YE2F			6.927		☑
ks1YE2F			65.443		☑
ksMYE2F			9818.780		☑
kdYE2F			0.006		☑
kd0YE2F			0.002		☑
ks0YEmi1			2.005		☑
ks1YEmi1			1788.517		☑
ksMYEmi1			9608.162		☑
kdYEmi1			0.018		☑
kbYCyclinDYYCdk4			$1.43 \cdot 10^{-6}$		☑
kbYp27YYCdk4			$6.34 \cdot 10^{-6}$		☑
kbYp27YYCdk2			$1.23 \cdot 10^{-5}$		☑
k1Yact			0.011		☑
timeYModifier			240.064		☑
kbYCyclinEYYCdk2			$5.01 \cdot 10^{-5}$		☑
kbYCyclinAYYCdk2			$9.52 \cdot 10^{-5}$		☑
kbYCyclinAYYCdk1			$6.48 \cdot 10^{-5}$		☑
kbYD4YYpRb			$3.15 \cdot 10^{-5}$		☑
kupYD4YYpRb			1.695		☑
kbYE2YYpRb			$5.74 \cdot 10^{-5}$		☑
kupYE2YYpRb			4.783		☑
kbYA2YYpRb			$6.25 \cdot 10^{-5}$		☑

Id	Name	SBO	Value	Unit	Constant
kupYA2YYpRb			0.200		☑
kbYA1YYpRb			$6.73 \cdot 10^{-5}$		☑
kupYA1YYpRb			0.202		☑
ktYpRbYYDephos			0.023		☑
kbYE2FYYpRb			$9.66 \cdot 10^{-6}$		☑
kbYEmi1YYAPCC			10^{-4}		☑
kbYAPCCYYCyclinA			$1.61 \cdot 10^{-5}$		☑
kudYAPCCYYCyclinA			5.000		☑
kdYCyclinD			0.050		☑
kdYCyclinE			0.050		☑
kdYCyclinA			0.050		☑
kuYCyclinDYYCdk4			0.100		☑
kuYp27YYCdk4			0.100		☑
kuYCyclinEYYCdk2			0.100		☑
kuYp27YYCdk2			0.100		☑
kuYCyclinAYYCdk2			0.100		☑
kuYCyclinAYYCdk1			0.100		☑
kuYD4YYpRb			0.100		☑
kuYE2YYpRb			0.100		☑
kuYA2YYpRb			0.100		☑
kuYA1YYpRb			0.100		☑
kuYE2FYYpRb			0.100		☑
kuYEmi1YYAPCC			0.100		☑
kuYAPCCYYCyclinA			0.100		☑

6 Rules

This is an overview of twelve rules.

6.1 Rule totalYCyclinYD

Rule totalYCyclinYD is an assignment rule for species totalYCyclinYD:

$$\text{totalYCyclinYD} = [\text{CyclinD}] + [\text{Cdk4Y01}] + [\text{Cdk4Y11}] \tag{1}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.2 Rule totalYCyclinYE

Rule totalYCyclinYE is an assignment rule for species totalYCyclinYE:

$$\text{totalYCyclinYE} = [\text{CyclinE}] + [\text{Cdk2Y001}] + [\text{Cdk2Y011}] + [\text{Cdk2Y101}] + [\text{Cdk2Y111}] \tag{2}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.3 Rule totalYCyclinYA

Rule totalYCyclinYA is an assignment rule for species totalYCyclinYA:

$$\begin{aligned}\text{totalYCyclinYA} = {} & [\text{CyclinA}] + [\text{Cdk1Y01}] + [\text{Cdk1Y11}] + [\text{Cdk2Y002}] \\ & + [\text{Cdk2Y012}] + [\text{Cdk2Y102}] + [\text{Cdk2Y112}]\end{aligned} \tag{3}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.4 Rule totalYp27

Rule totalYp27 is an assignment rule for species totalYp27:

$$\begin{aligned}\text{totalYp27} = {} & [\text{p27}] + [\text{Cdk4Y10}] + [\text{Cdk4Y11}] + [\text{Cdk2Y100}] + [\text{Cdk2Y101}] \\ & + [\text{Cdk2Y102}] + [\text{Cdk2Y110}] + [\text{Cdk2Y111}] + [\text{Cdk2Y112}]\end{aligned} \tag{4}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.5 Rule hypophosphorylatedYpRb

Rule hypophosphorylatedYpRb is an assignment rule for species hypophosphorylatedYpRb:

$$\text{hypophosphorylatedYpRb} = [\text{pRbY10}] + [\text{pRbY11}] \tag{5}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.6 Rule hyperphosphorylatedYpRb

Rule hyperphosphorylatedYpRb is an assignment rule for species hyperphosphorylatedYpRb:

$$\text{hyperphosphorylatedYpRb} = [\text{pRbY20}] + [\text{pRbY21}] \tag{6}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.7 Rule activeYCdk2

Rule activeYCdk2 is an assignment rule for species activeYCdk2:

$$\text{activeYCdk2} = [\text{Cdk2Y011}] + [\text{Cdk2Y012}] \tag{7}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.8 Rule totalYEmi1

Rule totalYEmi1 is an assignment rule for species totalYEmi1:

$$\text{totalYEmi1} = [\text{Emi1}] + [\text{APCCYEmi1}] \tag{8}$$

Derived unit $\text{item} \cdot \text{l}^{-1}$

6.9 Rule ksYCyclinE

Rule ksYCyclinE is an assignment rule for parameter ksYCyclinE:

$$\text{ksYCyclinE} = \text{ks0YCyclinE} + \frac{\text{ks1YCyclinE} \cdot [\text{E2F}]}{\text{ksMYCyclinE} + [\text{E2F}]} \tag{9}$$

6.10 Rule ksYCyclinA

Rule ksYCyclinA is an assignment rule for parameter ksYCyclinA:

$$\text{ksYCyclinA} = \text{ks0YCyclinA} + \frac{\text{ks1YCyclinA} \cdot [\text{E2F}]}{\text{ksMYCyclinA} + [\text{E2F}]} \tag{10}$$

6.11 Rule ksYEmi1

Rule ksYEmi1 is an assignment rule for parameter ksYEmi1:

$$\text{ksYEmi1} = \text{ks0YEmi1} + \frac{\text{ks1YEmi1} \cdot [\text{E2F}]}{\text{ksMYEmi1} + [\text{E2F}]} \tag{11}$$

6.12 Rule ksYE2F

Rule ksYE2F is an assignment rule for parameter ksYE2F:

$$\text{ksYE2F} = \text{ks0YE2F} + \frac{\text{ks1YE2F} \cdot [\text{E2F}]}{\text{ksMYE2F} + [\text{E2F}]} \tag{12}$$

7 Event

This is an overview of one event. Each event is initiated whenever its trigger condition switches from false to true. A delay function postpones the effects of an event to a later time point. At the time of execution, an event can assign values to species, parameters or compartments if these are not set to constant.

7.1 Event event_0

Name modifier activation

Notes when time >= time_Modifier, kYact=k1Yact, otherwise kYact=0. Here time_Modifier=240.0637 from the set2 of the supplementary table 2.

Trigger condition

$$\text{time} > 240.0637 \tag{13}$$

Assignment

$$\text{kYact} = \text{k1Yact} \tag{14}$$

8 Reactions

This model contains 138 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	rxnY001		$\emptyset \longrightarrow$ CyclinD	
2	rxnY002		CyclinD $\longrightarrow \emptyset$	
3	rxnY003		Cdk4Y01 $\longrightarrow$ Cdk4Y00	
4	rxnY004		Cdk4Y11 $\longrightarrow$ Cdk4Y10	
5	rxnY005		$\emptyset \longrightarrow$ p27	
6	rxnY006		p27 $\longrightarrow \emptyset$	
7	rxnY007		Cdk4Y10 $\longrightarrow$ Cdk4Y00	
8	rxnY008		Cdk4Y11 $\longrightarrow$ Cdk4Y01	
9	rxnY009		Cdk2Y100 $\longrightarrow$ Cdk2Y000	
10	rxnY010		Cdk2Y101 $\longrightarrow$ Cdk2Y001	
11	rxnY011		Cdk2Y102 $\longrightarrow$ Cdk2Y002	
12	rxnY012		Cdk2Y110 $\longrightarrow$ Cdk2Y010	
13	rxnY013		Cdk2Y111 $\longrightarrow$ Cdk2Y011	
14	rxnY014		Cdk2Y112 $\longrightarrow$ Cdk2Y012	
15	rxnY015		$\emptyset \longrightarrow$ CyclinE	
16	rxnY016		CyclinE $\longrightarrow \emptyset$	
17	rxnY017		Cdk2Y001 $\longrightarrow$ Cdk2Y000	
18	rxnY018		Cdk2Y101 $\longrightarrow$ Cdk2Y100	
19	rxnY019		Cdk2Y011 $\longrightarrow$ Cdk2Y010	
20	rxnY020		Cdk2Y111 $\longrightarrow$ Cdk2Y110	
21	rxnY021		$\emptyset \longrightarrow$ CyclinA	
22	rxnY022		CyclinA $\longrightarrow \emptyset$	
23	rxnY023		Cdk1Y01 $\longrightarrow$ Cdk1Y00	

№	Id	Name	Reaction Equation	SBO
24	rxnY024		Cdk1Y11 ⟶ Cdk1Y10	
25	rxnY025		Cdk2Y002 ⟶ Cdk2Y000	
26	rxnY026		Cdk2Y102 ⟶ Cdk2Y100	
27	rxnY027		Cdk2Y012 ⟶ Cdk2Y010	
28	rxnY028		Cdk2Y112 ⟶ Cdk2Y110	
29	rxnY029		∅ ⟶ E2F	
30	rxnY030		E2F ⟶ ∅	
31	rxnY031		pRbY01 ⟶ pRbY00	
32	rxnY032		pRbY11 ⟶ pRbY10	
33	rxnY033		pRbY21 ⟶ pRbY20	
34	rxnY034		∅ ⟶ Emi1	
35	rxnY035		Emi1 ⟶ ∅	
36	rxnY036		APCCYEmi1 ⟶ APCC	
37	rxnY037		Cdk4Y00 + CyclinD ⟶ Cdk4Y01	
38	rxnY038		Cdk4Y01 ⟶ Cdk4Y00 + CyclinD	
39	rxnY039		Cdk4Y10 + CyclinD ⟶ Cdk4Y11	
40	rxnY040		Cdk4Y11 ⟶ Cdk4Y10 + CyclinD	
41	rxnY041		Cdk4Y00 + p27 ⟶ Cdk4Y10	
42	rxnY042		Cdk4Y10 ⟶ Cdk4Y00 + p27	
43	rxnY043		Cdk4Y01 + p27 ⟶ Cdk4Y11	
44	rxnY044		Cdk4Y11 ⟶ Cdk4Y01 + p27	
45	rxnY045		Cdk2Y000 + p27 ⟶ Cdk2Y100	
46	rxnY046		Cdk2Y100 ⟶ Cdk2Y000 + p27	
47	rxnY047		Cdk2Y001 + p27 ⟶ Cdk2Y101	
48	rxnY048		Cdk2Y101 ⟶ Cdk2Y001 + p27	
49	rxnY049		Cdk2Y002 + p27 ⟶ Cdk2Y102	
50	rxnY050		Cdk2Y102 ⟶ Cdk2Y002 + p27	
51	rxnY051		Cdk2Y010 + p27 ⟶ Cdk2Y110	
52	rxnY052		Cdk2Y110 ⟶ Cdk2Y010 + p27	

№	Id	Name	Reaction Equation	SBO
53	rxnY053		Cdk2Y011 + p27 ⟶ Cdk2Y111	
54	rxnY054		Cdk2Y111 ⟶ Cdk2Y011 + p27	
55	rxnY055		Cdk2Y012 + p27 ⟶ Cdk2Y112	
56	rxnY056		Cdk2Y112 ⟶ Cdk2Y012 + p27	
57	rxnY057		Cdk2Y000 ⟶ Cdk2Y010	
58	rxnY058		Cdk2Y100 ⟶ Cdk2Y110	
59	rxnY059		Cdk2Y001 ⟶ Cdk2Y011	
60	rxnY060		Cdk2Y101 ⟶ Cdk2Y111	
61	rxnY061		Cdk2Y002 ⟶ Cdk2Y012	
62	rxnY062		Cdk2Y102 ⟶ Cdk2Y112	
63	rxnY063		Cdk2Y000 + CyclinE ⟶ Cdk2Y001	
64	rxnY064		Cdk2Y001 ⟶ Cdk2Y000 + CyclinE	
65	rxnY065		Cdk2Y100 + CyclinE ⟶ Cdk2Y101	
66	rxnY066		Cdk2Y101 ⟶ Cdk2Y100 + CyclinE	
67	rxnY067		Cdk2Y010 + CyclinE ⟶ Cdk2Y011	
68	rxnY068		Cdk2Y011 ⟶ Cdk2Y010 + CyclinE	
69	rxnY069		Cdk2Y110 + CyclinE ⟶ Cdk2Y111	
70	rxnY070		Cdk2Y111 ⟶ Cdk2Y110 + CyclinE	
71	rxnY071		Cdk2Y000 + CyclinA ⟶ Cdk2Y002	
72	rxnY072		Cdk2Y002 ⟶ Cdk2Y000 + CyclinA	
73	rxnY073		Cdk2Y100 + CyclinA ⟶ Cdk2Y102	
74	rxnY074		Cdk2Y102 ⟶ Cdk2Y100 + CyclinA	
75	rxnY075		Cdk2Y010 + CyclinA ⟶ Cdk2Y012	
76	rxnY076		Cdk2Y012 ⟶ Cdk2Y010 + CyclinA	
77	rxnY077		Cdk2Y110 + CyclinA ⟶ Cdk2Y112	
78	rxnY078		Cdk2Y112 ⟶ Cdk2Y110 + CyclinA	
79	rxnY079		Cdk1Y00 ⟶ Cdk1Y10	
80	rxnY080		Cdk1Y01 ⟶ Cdk1Y11	
81	rxnY081		Cdk1Y00 + CyclinA ⟶ Cdk1Y01	

№	Id	Name	Reaction Equation	SBO
82	rxnY082		Cdk1Y01 ⟶ Cdk1Y00 + CyclinA	
83	rxnY083		Cdk1Y10 + CyclinA ⟶ Cdk1Y11	
84	rxnY084		Cdk1Y11 ⟶ Cdk1Y10 + CyclinA	
85	rxnY085		pRbY00 + Cdk4Y01 ⟶ Cdk4Y01YpRbY00YpRbY10YInt	
86	rxnY086		Cdk4Y01YpRbY00YpRbY10YInt ⟶ pRbY00 + Cdk4Y01	
87	rxnY087		Cdk4Y01YpRbY00YpRbY10YInt ⟶ pRbY10 + Cdk4Y01	
88	rxnY088		pRbY01 + Cdk4Y01 ⟶ Cdk4Y01YpRbY01YpRbY11YInt	
89	rxnY089		Cdk4Y01YpRbY01YpRbY11YInt ⟶ pRbY01 + Cdk4Y01	
90	rxnY090		Cdk4Y01YpRbY01YpRbY11YInt ⟶ pRbY11 + Cdk4Y01	
91	rxnY091		pRbY10 + Cdk2Y011 ⟶ Cdk2Y011YpRbY10YpRbY20YInt	
92	rxnY092		Cdk2Y011YpRbY10YpRbY20YInt ⟶ pRbY10 + Cdk2Y011	
93	rxnY093		Cdk2Y011YpRbY10YpRbY20YInt ⟶ pRbY20 + Cdk2Y011	
94	rxnY094		pRbY11 + Cdk2Y011 ⟶ Cdk2Y011YpRbY11YpRbY21YInt	
95	rxnY095		Cdk2Y011YpRbY11YpRbY21YInt ⟶ pRbY11 + Cdk2Y011	
96	rxnY096		Cdk2Y011YpRbY11YpRbY21YInt ⟶ pRbY21 + Cdk2Y011	
97	rxnY097		pRbY10 + Cdk2Y012 ⟶ Cdk2Y012YpRbY10YpRbY20YInt	
98	rxnY098		Cdk2Y012YpRbY10YpRbY20YInt ⟶ pRbY10 + Cdk2Y012	
99	rxnY099		Cdk2Y012YpRbY10YpRbY20YInt ⟶ pRbY20 + Cdk2Y012	
100	rxnY100		pRbY11 + Cdk2Y012 ⟶ Cdk2Y012YpRbY11YpRbY21YInt	

№	Id	Name	Reaction Equation	SBO
101	rxnY101		$Cdk2Y012YpRbY11YpRbY21YInt \longrightarrow pRbY11 + Cdk2Y012$	
102	rxnY102		$Cdk2Y012YpRbY11YpRbY21YInt \longrightarrow pRbY21 + Cdk2Y012$	
103	rxnY103		$pRbY10 + Cdk1Y11 \longrightarrow Cdk1Y11YpRbY10YpRbY20YInt$	
104	rxnY104		$Cdk1Y11YpRbY10YpRbY20YInt \longrightarrow pRbY10 + Cdk1Y11$	
105	rxnY105		$Cdk1Y11YpRbY10YpRbY20YInt \longrightarrow pRbY20 + Cdk1Y11$	
106	rxnY106		$pRbY11 + Cdk1Y11 \xrightarrow{pRbY10} Cdk1Y11YpRbY11YpRbY21YInt$	
107	rxnY107		$Cdk1Y11YpRbY11YpRbY21YInt \longrightarrow pRbY11 + Cdk1Y11$	
108	rxnY108		$Cdk1Y11YpRbY11YpRbY21YInt \longrightarrow pRbY21 + Cdk1Y11$	
109	rxnY109		$pRbY20 \longrightarrow pRbY00$	
110	rxnY110		$pRbY21 \longrightarrow pRbY01$	
111	rxnY111		$pRbY00 + E2F \longrightarrow pRbY01$	
112	rxnY112		$pRbY01 \longrightarrow pRbY00 + E2F$	
113	rxnY113		$pRbY10 + E2F \longrightarrow pRbY11$	
114	rxnY114		$pRbY11 \longrightarrow pRbY10 + E2F$	
115	rxnY115		$pRbY21 \longrightarrow pRbY20 + E2F$	
116	rxnY116		$APCC + Emi1 \longrightarrow APCCYEmi1$	
117	rxnY117		$APCCYEmi1 \longrightarrow APCC + Emi1$	
118	rxnY118		$CyclinA + APCC \longrightarrow APCCYCyclinAYInt$	
119	rxnY119		$APCCYCyclinAYInt \longrightarrow CyclinA + APCC$	
120	rxnY120		$APCCYCyclinAYInt \longrightarrow APCC$	
121	rxnY121		$Cdk2Y002 + APCC \longrightarrow APCCYCdk2Y000YCdk2Y002YInt$	
122	rxnY122		$APCCYCdk2Y000YCdk2Y002YInt \longrightarrow Cdk2Y002 + APCC$	

№	Id	Name	Reaction Equation	SBO
123	rxnY123		APCCYCdk2Y000YCdk2Y002YInt ⟶ Cdk2Y000 + APCC	
124	rxnY124		Cdk2Y102 + APCC ⟶ APCCYCdk2Y100YCdk2Y102YInt	
125	rxnY125		APCCYCdk2Y100YCdk2Y102YInt ⟶ Cdk2Y102 + APCC	
126	rxnY126		APCCYCdk2Y100YCdk2Y102YInt ⟶ Cdk2Y100 + APCC	
127	rxnY127		Cdk2Y012 + APCC $\xrightarrow{\text{Cdk2Y102}}$ APCCYCdk2Y010YCdk2Y012YInt	
128	rxnY128		APCCYCdk2Y010YCdk2Y012YInt ⟶ Cdk2Y012 + APCC	
129	rxnY129		APCCYCdk2Y010YCdk2Y012YInt ⟶ Cdk2Y010 + APCC	
130	rxnY130		Cdk2Y112 + APCC ⟶ APCCYCdk2Y110YCdk2Y112YInt	
131	rxnY131		APCCYCdk2Y110YCdk2Y112YInt ⟶ Cdk2Y112 + APCC	
132	rxnY132		APCCYCdk2Y110YCdk2Y112YInt ⟶ Cdk2Y110 + APCC	
133	rxnY133		Cdk1Y01 + APCC ⟶ APCCYCdk1Y00YCdk1Y01YInt	
134	rxnY134		APCCYCdk1Y00YCdk1Y01YInt + APCC ⟶ Cdk1Y01	
135	rxnY135		APCCYCdk1Y00YCdk1Y01YInt ⟶ Cdk1Y00 + APCC	
136	rxnY136		Cdk1Y11 + APCC ⟶ APCCYCdk1Y10YCdk1Y11YInt	
137	rxnY137		APCCYCdk1Y10YCdk1Y11YInt + APCC ⟶ Cdk1Y11	
138	rxnY138		APCCYCdk1Y10YCdk1Y11YInt ⟶ Cdk1Y10 + APCC	

8.1 Reaction rxnY001

This is an irreversible reaction of no reactant forming one product.

Reaction equation

$$\emptyset \longrightarrow \text{CyclinD} \tag{15}$$

Product

Table 6: Properties of each product.

Id	Name	SBO
CyclinD		

Kinetic Law

Derived unit contains undeclared units

$$v_1 = \text{ksYCyclinD} \cdot \text{vol}(\text{X}) \tag{16}$$

8.2 Reaction rxnY002

This is an irreversible reaction of one reactant forming no product.

Reaction equation

$$\text{CyclinD} \longrightarrow \emptyset \tag{17}$$

Reactant

Table 7: Properties of each reactant.

Id	Name	SBO
CyclinD		

Kinetic Law

Derived unit contains undeclared units

$$v_2 = \text{kdYCyclinD} \cdot [\text{CyclinD}] \cdot \text{vol}(\text{X}) \tag{18}$$

8.3 Reaction rxnY003

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

Reaction equation

$$\text{Cdk4Y01} \longrightarrow \text{Cdk4Y00} \tag{19}$$

Reactant

Table 8: Properties of each reactant.

Id	Name	SBO
Cdk4Y01		

Product

Table 9: Properties of each product.

Id	Name	SBO
Cdk4Y00		

Kinetic Law

Derived unit contains undeclared units

$$v_3 = \text{kdYCyclinD} \cdot [\text{Cdk4Y01}] \cdot \text{vol}(\text{X}) \tag{20}$$

8.4 Reaction rxnY004

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

Reaction equation

$$\text{Cdk4Y11} \longrightarrow \text{Cdk4Y10} \tag{21}$$

Reactant

Table 10: Properties of each reactant.

Id	Name	SBO
Cdk4Y11		

Product

Table 11: Properties of each product.

Id	Name	SBO
Cdk4Y10		

Kinetic Law

Derived unit contains undeclared units

$$v_4 = \mathrm{kdYCyclinD} \cdot [\mathrm{Cdk4Y11}] \cdot \mathrm{vol}(\mathrm{X}) \tag{22}$$

8.5 Reaction rxnY005

This is an irreversible reaction of no reactant forming one product.

Reaction equation

$$\emptyset \longrightarrow \mathrm{p27} \tag{23}$$

Product

Table 12: Properties of each product.

Id	Name	SBO
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_5 = \mathrm{ksYp27} \cdot \mathrm{vol}(\mathrm{X}) \tag{24}$$

8.6 Reaction rxnY006

This is an irreversible reaction of one reactant forming no product.

Reaction equation

$$\mathrm{p27} \longrightarrow \emptyset \tag{25}$$

Reactant

Table 13: Properties of each reactant.

Id	Name	SBO
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_6 = \mathrm{kdYp27} \cdot [\mathrm{p27}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{26}$$

8.7 Reaction rxnY007

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

Reaction equation

$$\mathrm{Cdk4Y10} \longrightarrow \mathrm{Cdk4Y00} \tag{27}$$

Reactant

Table 14: Properties of each reactant.

Id	Name	SBO
Cdk4Y10		

Product

Table 15: Properties of each product.

Id	Name	SBO
Cdk4Y00		

Kinetic Law

Derived unit contains undeclared units

$$v_7 = \mathrm{kdYp27} \cdot [\mathrm{Cdk4Y10}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{28}$$

8.8 Reaction rxnY008

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

Reaction equation

$$\text{Cdk4Y11} \longrightarrow \text{Cdk4Y01} \tag{29}$$

Reactant

Table 16: Properties of each reactant.

Id	Name	SBO
Cdk4Y11		

Product

Table 17: Properties of each product.

Id	Name	SBO
Cdk4Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_8 = \text{kdYp27} \cdot [\text{Cdk4Y11}] \cdot \text{vol}(\text{X}) \tag{30}$$

8.9 Reaction rxnY009

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

Reaction equation

$$\text{Cdk2Y100} \longrightarrow \text{Cdk2Y000} \tag{31}$$

Reactant

Table 18: Properties of each reactant.

Id	Name	SBO
Cdk2Y100		

Product

Table 19: Properties of each product.

Id	Name	SBO
Cdk2Y000		

Kinetic Law

Derived unit contains undeclared units

$$v_9 = \mathrm{kdYp27} \cdot [\mathrm{Cdk2Y100}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{32}$$

8.10 Reaction rxnY010

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

Reaction equation

$$\mathrm{Cdk2Y101} \longrightarrow \mathrm{Cdk2Y001} \tag{33}$$

Reactant

Table 20: Properties of each reactant.

Id	Name	SBO
Cdk2Y101		

Product

Table 21: Properties of each product.

Id	Name	SBO
Cdk2Y001		

Kinetic Law

Derived unit contains undeclared units

$$v_{10} = \mathrm{kdYp27} \cdot [\mathrm{Cdk2Y101}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{34}$$

8.11 Reaction rxnY011

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

Reaction equation

$$\text{Cdk2Y102} \longrightarrow \text{Cdk2Y002} \tag{35}$$

Reactant

Table 22: Properties of each reactant.

Id	Name	SBO
Cdk2Y102		

Product

Table 23: Properties of each product.

Id	Name	SBO
Cdk2Y002		

Kinetic Law

Derived unit contains undeclared units

$$v_{11} = \text{kdYp27} \cdot [\text{Cdk2Y102}] \cdot \text{vol}(\text{X}) \tag{36}$$

8.12 Reaction rxnY012

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

Reaction equation

$$\text{Cdk2Y110} \longrightarrow \text{Cdk2Y010} \tag{37}$$

Reactant

Table 24: Properties of each reactant.

Id	Name	SBO
Cdk2Y110		

Product

Table 25: Properties of each product.

Id	Name	SBO
Cdk2Y010		

Kinetic Law

Derived unit contains undeclared units

$$v_{12} = \mathrm{kdYp27} \cdot [\mathrm{Cdk2Y110}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{38}$$

8.13 Reaction rxnY013

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

Reaction equation

$$\mathrm{Cdk2Y111} \longrightarrow \mathrm{Cdk2Y011} \tag{39}$$

Reactant

Table 26: Properties of each reactant.

Id	Name	SBO
Cdk2Y111		

Product

Table 27: Properties of each product.

Id	Name	SBO
Cdk2Y011		

Kinetic Law

Derived unit contains undeclared units

$$v_{13} = \mathrm{kd1Yp27} \cdot [\mathrm{Cdk2Y111}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{40}$$

8.14 Reaction rxnY014

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

Reaction equation

$$\text{Cdk2Y112} \longrightarrow \text{Cdk2Y012} \tag{41}$$

Reactant

Table 28: Properties of each reactant.

Id	Name	SBO
Cdk2Y112		

Product

Table 29: Properties of each product.

Id	Name	SBO
Cdk2Y012		

Kinetic Law

Derived unit contains undeclared units

$$v_{14} = \text{kdYp27} \cdot [\text{Cdk2Y112}] \cdot \text{vol}(\text{X}) \tag{42}$$

8.15 Reaction rxnY015

This is an irreversible reaction of no reactant forming one product.

Reaction equation

$$\emptyset \longrightarrow \text{CyclinE} \tag{43}$$

Product

Table 30: Properties of each product.

Id	Name	SBO
CyclinE		

Kinetic Law

Derived unit contains undeclared units

$$v_{15} = \text{ksYCyclinE} \cdot \text{vol}(\text{X}) \tag{44}$$

8.16 Reaction rxnY016

This is an irreversible reaction of one reactant forming no product.

Reaction equation

$$\text{CyclinE} \longrightarrow \emptyset \tag{45}$$

Reactant

Table 31: Properties of each reactant.

Id	Name	SBO
CyclinE		

Kinetic Law

Derived unit contains undeclared units

$$v_{16} = \text{kdYCyclinE} \cdot [\text{CyclinE}] \cdot \text{vol}(\text{X}) \tag{46}$$

8.17 Reaction rxnY017

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

Reaction equation

$$\text{Cdk2Y001} \longrightarrow \text{Cdk2Y000} \tag{47}$$

Reactant

Table 32: Properties of each reactant.

Id	Name	SBO
Cdk2Y001		

Product

Table 33: Properties of each product.

Id	Name	SBO
Cdk2Y000		

Kinetic Law

Derived unit contains undeclared units

$$v_{17} = \text{kdYCyclinE} \cdot [\text{Cdk2Y001}] \cdot \text{vol}(\text{X}) \tag{48}$$

8.18 Reaction rxnY018

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

Reaction equation

$$\text{Cdk2Y101} \longrightarrow \text{Cdk2Y100} \tag{49}$$

Reactant

Table 34: Properties of each reactant.

Id	Name	SBO
Cdk2Y101		

Product

Table 35: Properties of each product.

Id	Name	SBO
Cdk2Y100		

Kinetic Law

Derived unit contains undeclared units

$$v_{18} = \text{kdYCyclinE} \cdot [\text{Cdk2Y101}] \cdot \text{vol}(\text{X}) \tag{50}$$

8.19 Reaction rxnY019

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

Reaction equation

$$\text{Cdk2Y011} \longrightarrow \text{Cdk2Y010} \tag{51}$$

Reactant

Table 36: Properties of each reactant.

Id	Name	SBO
Cdk2Y011		

Product

Table 37: Properties of each product.

Id	Name	SBO
Cdk2Y010		

Kinetic Law

Derived unit contains undeclared units

$$v_{19} = \text{kdYCyclinE} \cdot [\text{Cdk2Y011}] \cdot \text{vol}(\text{X}) \tag{52}$$

8.20 Reaction rxnY020

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

Reaction equation

$$\text{Cdk2Y111} \longrightarrow \text{Cdk2Y110} \tag{53}$$

Reactant

Table 38: Properties of each reactant.

Id	Name	SBO
Cdk2Y111		

Product

Table 39: Properties of each product.

Id	Name	SBO
Cdk2Y110		

Kinetic Law

Derived unit contains undeclared units

$$v_{20} = \text{kdYCyclinE} \cdot [\text{Cdk2Y111}] \cdot \text{vol}(\text{X}) \tag{54}$$

8.21 Reaction rxnY021

This is an irreversible reaction of no reactant forming one product.

Reaction equation

$$\emptyset \longrightarrow \text{CyclinA} \tag{55}$$

Product

Table 40: Properties of each product.

Id	Name	SBO
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{21} = \text{ksYCyclinA} \cdot \text{vol}(\text{X}) \tag{56}$$

8.22 Reaction rxnY022

This is an irreversible reaction of one reactant forming no product.

Reaction equation

$$\text{CyclinA} \longrightarrow \emptyset \tag{57}$$

Reactant

Table 41: Properties of each reactant.

Id	Name	SBO
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{22} = \text{kdYCyclinA} \cdot [\text{CyclinA}] \cdot \text{vol}(\text{X}) \tag{58}$$

8.23 Reaction rxnY023

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

Reaction equation

$$\text{Cdk1Y01} \longrightarrow \text{Cdk1Y00} \tag{59}$$

Reactant

Table 42: Properties of each reactant.

Id	Name	SBO
Cdk1Y01		

Product

Table 43: Properties of each product.

Id	Name	SBO
Cdk1Y00		

Kinetic Law

Derived unit contains undeclared units

$$v_{23} = \text{kdYCyclinA} \cdot [\text{Cdk1Y01}] \cdot \text{vol}(\text{X}) \tag{60}$$

8.24 Reaction rxnY024

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

Reaction equation

$$\text{Cdk1Y11} \longrightarrow \text{Cdk1Y10} \tag{61}$$

Reactant

Table 44: Properties of each reactant.

Id	Name	SBO
Cdk1Y11		

Product

Table 45: Properties of each product.

Id	Name	SBO
Cdk1Y10		

Kinetic Law

Derived unit contains undeclared units

$$v_{24} = \text{kdYCyclinA} \cdot [\text{Cdk1Y11}] \cdot \text{vol}(\text{X}) \tag{62}$$

8.25 Reaction rxnY025

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

Reaction equation

$$\text{Cdk2Y002} \longrightarrow \text{Cdk2Y000} \tag{63}$$

Reactant

Table 46: Properties of each reactant.

Id	Name	SBO
Cdk2Y002		

Product

Table 47: Properties of each product.

Id	Name	SBO
Cdk2Y000		

Kinetic Law

Derived unit contains undeclared units

$$v_{25} = \text{kdYCyclinA} \cdot [\text{Cdk2Y002}] \cdot \text{vol}(\text{X}) \tag{64}$$

8.26 Reaction rxnY026

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

Reaction equation

$$\text{Cdk2Y102} \longrightarrow \text{Cdk2Y100} \tag{65}$$

Reactant

Table 48: Properties of each reactant.

Id	Name	SBO
Cdk2Y102		

Product

Table 49: Properties of each product.

Id	Name	SBO
Cdk2Y100		

Kinetic Law

Derived unit contains undeclared units

$$v_{26} = \text{kdYCyclinA} \cdot [\text{Cdk2Y102}] \cdot \text{vol}(\text{X}) \tag{66}$$

8.27 Reaction rxnY027

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

Reaction equation

$$\text{Cdk2Y012} \longrightarrow \text{Cdk2Y010} \tag{67}$$

Reactant

Table 50: Properties of each reactant.

Id	Name	SBO
Cdk2Y012		

Product

Table 51: Properties of each product.

Id	Name	SBO
Cdk2Y010		

Kinetic Law

Derived unit contains undeclared units

$$v_{27} = \text{kdYCyclinA} \cdot [\text{Cdk2Y012}] \cdot \text{vol}(\text{X}) \tag{68}$$

8.28 Reaction rxnY028

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

Reaction equation

$$\text{Cdk2Y112} \longrightarrow \text{Cdk2Y110} \tag{69}$$

Reactant

Table 52: Properties of each reactant.

Id	Name	SBO
Cdk2Y112		

Product

Table 53: Properties of each product.

Id	Name	SBO
Cdk2Y110		

Kinetic Law

Derived unit contains undeclared units

$$v_{28} = \mathrm{kdYCyclinA} \cdot [\mathrm{Cdk2Y112}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{70}$$

8.29 Reaction rxnY029

This is an irreversible reaction of no reactant forming one product.

Reaction equation

$$\emptyset \longrightarrow \mathrm{E2F} \tag{71}$$

Product

Table 54: Properties of each product.

Id	Name	SBO
E2F		

Kinetic Law

Derived unit contains undeclared units

$$v_{29} = \mathrm{ksYE2F} \cdot \mathrm{vol}\,(\mathrm{X}) \tag{72}$$

8.30 Reaction rxnY030

This is an irreversible reaction of one reactant forming no product.

Reaction equation

$$\mathrm{E2F} \longrightarrow \emptyset \tag{73}$$

Reactant

Table 55: Properties of each reactant.

Id	Name	SBO
E2F		

Kinetic Law

Derived unit contains undeclared units

$$v_{30} = \text{kd0YE2F} \cdot [\text{E2F}] \cdot \text{vol}(\text{X}) \tag{74}$$

8.31 Reaction rxnY031

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

Reaction equation

$$\text{pRbY01} \longrightarrow \text{pRbY00} \tag{75}$$

Reactant

Table 56: Properties of each reactant.

Id	Name	SBO
pRbY01		

Product

Table 57: Properties of each product.

Id	Name	SBO
pRbY00		

Kinetic Law

Derived unit contains undeclared units

$$v_{31} = \text{kdYE2F} \cdot [\text{pRbY01}] \cdot \text{vol}(\text{X}) \tag{76}$$

8.32 Reaction rxnY032

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

Reaction equation

$$\text{pRbY11} \longrightarrow \text{pRbY10} \tag{77}$$

Reactant

Table 58: Properties of each reactant.

Id	Name	SBO
pRbY11		

Product

Table 59: Properties of each product.

Id	Name	SBO
pRbY10		

Kinetic Law

Derived unit contains undeclared units

$$v_{32} = \text{kdYE2F} \cdot [\text{pRbY11}] \cdot \text{vol}(\text{X}) \tag{78}$$

8.33 Reaction rxnY033

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

Reaction equation

$$\text{pRbY21} \longrightarrow \text{pRbY20} \tag{79}$$

Reactant

Table 60: Properties of each reactant.

Id	Name	SBO
pRbY21		

Product

Table 61: Properties of each product.

Id	Name	SBO
pRbY20		

Kinetic Law

Derived unit contains undeclared units

$$v_{33} = \mathrm{kdYE2F} \cdot [\mathrm{pRbY21}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{80}$$

8.34 Reaction rxnY034

This is an irreversible reaction of no reactant forming one product.

Reaction equation

$$\emptyset \longrightarrow \mathrm{Emi1} \tag{81}$$

Product

Table 62: Properties of each product.

Id	Name	SBO
Emi1		

Kinetic Law

Derived unit contains undeclared units

$$v_{34} = \mathrm{ksYEmi1} \cdot \mathrm{vol}\,(\mathrm{X}) \tag{82}$$

8.35 Reaction rxnY035

This is an irreversible reaction of one reactant forming no product.

Reaction equation

$$\mathrm{Emi1} \longrightarrow \emptyset \tag{83}$$

Reactant

Table 63: Properties of each reactant.

Id	Name	SBO
Emi1		

Kinetic Law

Derived unit contains undeclared units

$$v_{35} = \mathrm{kdYEmi1} \cdot [\mathrm{Emi1}] \cdot \mathrm{vol}(\mathrm{X}) \tag{84}$$

8.36 Reaction rxnY036

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

Reaction equation

$$\mathrm{APCCYEmi1} \longrightarrow \mathrm{APCC} \tag{85}$$

Reactant

Table 64: Properties of each reactant.

Id	Name	SBO
APCCYEmi1		

Product

Table 65: Properties of each product.

Id	Name	SBO
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{36} = \mathrm{kdYEmi1} \cdot [\mathrm{APCCYEmi1}] \cdot \mathrm{vol}(\mathrm{X}) \tag{86}$$

8.37 Reaction rxnY037

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk4Y00} + \mathrm{CyclinD} \longrightarrow \mathrm{Cdk4Y01} \tag{87}$$

Reactants

Table 66: Properties of each reactant.

Id	Name	SBO
Cdk4Y00		
CyclinD		

Product

Table 67: Properties of each product.

Id	Name	SBO
Cdk4Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_{37} = \mathrm{kbYCyclinDYYCdk4} \cdot [\mathrm{Cdk4Y00}] \cdot [\mathrm{CyclinD}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{88}$$

8.38 Reaction rxnY038

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

Reaction equation

$$\mathrm{Cdk4Y01} \longrightarrow \mathrm{Cdk4Y00} + \mathrm{CyclinD} \tag{89}$$

Reactant

Table 68: Properties of each reactant.

Id	Name	SBO
Cdk4Y01		

Products

Table 69: Properties of each product.

Id	Name	SBO
Cdk4Y00		
CyclinD		

Kinetic Law

Derived unit contains undeclared units

$$v_{38} = \mathrm{kuYCyclinDYYCdk4} \cdot [\mathrm{Cdk4Y01}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{90}$$

8.39 Reaction rxnY039

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk4Y10} + \mathrm{CyclinD} \longrightarrow \mathrm{Cdk4Y11} \tag{91}$$

Reactants

Table 70: Properties of each reactant.

Id	Name	SBO
Cdk4Y10		
CyclinD		

Product

Table 71: Properties of each product.

Id	Name	SBO
Cdk4Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{39} = \mathrm{kbYCyclinDYYCdk4} \cdot [\mathrm{Cdk4Y10}] \cdot [\mathrm{CyclinD}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{92}$$

8.40 Reaction rxnY040

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

Reaction equation

$$\text{Cdk4Y11} \longrightarrow \text{Cdk4Y10} + \text{CyclinD} \tag{93}$$

Reactant

Table 72: Properties of each reactant.

Id	Name	SBO
Cdk4Y11		

Products

Table 73: Properties of each product.

Id	Name	SBO
Cdk4Y10		
CyclinD		

Kinetic Law

Derived unit contains undeclared units

$$v_{40} = \text{kuYCyclinDYYCdk4} \cdot [\text{Cdk4Y11}] \cdot \text{vol}(\text{X}) \tag{94}$$

8.41 Reaction rxnY041

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\text{Cdk4Y00} + \text{p27} \longrightarrow \text{Cdk4Y10} \tag{95}$$

Reactants

Table 74: Properties of each reactant.

Id	Name	SBO
Cdk4Y00		

Id	Name	SBO
p27		

Product

Table 75: Properties of each product.

Id	Name	SBO
Cdk4Y10		

Kinetic Law

Derived unit contains undeclared units

$$v_{41} = \mathrm{kbYp27YYCdk4} \cdot [\mathrm{Cdk4Y00}] \cdot [\mathrm{p27}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{96}$$

8.42 Reaction rxnY042

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

Reaction equation

$$\mathrm{Cdk4Y10} \longrightarrow \mathrm{Cdk4Y00} + \mathrm{p27} \tag{97}$$

Reactant

Table 76: Properties of each reactant.

Id	Name	SBO
Cdk4Y10		

Products

Table 77: Properties of each product.

Id	Name	SBO
Cdk4Y00		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{42} = \mathrm{kuYp27YYCdk4} \cdot [\mathrm{Cdk4Y10}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{98}$$

8.43 Reaction rxnY043

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk4Y01} + \mathrm{p27} \longrightarrow \mathrm{Cdk4Y11} \tag{99}$$

Reactants

Table 78: Properties of each reactant.

Id	Name	SBO
Cdk4Y01		
p27		

Product

Table 79: Properties of each product.

Id	Name	SBO
Cdk4Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{43} = \mathrm{kbYp27YYCdk4} \cdot [\mathrm{Cdk4Y01}] \cdot [\mathrm{p27}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{100}$$

8.44 Reaction rxnY044

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

Reaction equation

$$\mathrm{Cdk4Y11} \longrightarrow \mathrm{Cdk4Y01} + \mathrm{p27} \tag{101}$$

Reactant

Table 80: Properties of each reactant.

Id	Name	SBO
Cdk4Y11		

Products

Table 81: Properties of each product.

Id	Name	SBO
Cdk4Y01		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{44} = \mathrm{kuYp27YYCdk4} \cdot [\mathrm{Cdk4Y11}] \cdot \mathrm{vol}\,(\mathrm{X}) \tag{102}$$

8.45 Reaction rxnY045

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y000} + \mathrm{p27} \longrightarrow \mathrm{Cdk2Y100} \tag{103}$$

Reactants

Table 82: Properties of each reactant.

Id	Name	SBO
Cdk2Y000		
p27		

Product

Table 83: Properties of each product.

Id	Name	SBO
Cdk2Y100		

Kinetic Law

Derived unit contains undeclared units

$$v_{45} = \mathrm{kbYp27YYCdk2} \cdot [\mathrm{Cdk2Y000}] \cdot [\mathrm{p27}] \cdot \mathrm{vol}(\mathrm{X}) \tag{104}$$

8.46 Reaction rxnY046

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

Reaction equation

$$\mathrm{Cdk2Y100} \longrightarrow \mathrm{Cdk2Y000} + \mathrm{p27} \tag{105}$$

Reactant

Table 84: Properties of each reactant.

Id	Name	SBO
Cdk2Y100		

Products

Table 85: Properties of each product.

Id	Name	SBO
Cdk2Y000		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{46} = \mathrm{kuYp27YYCdk2} \cdot [\mathrm{Cdk2Y100}] \cdot \mathrm{vol}(\mathrm{X}) \tag{106}$$

8.47 Reaction rxnY047

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y001} + \mathrm{p27} \longrightarrow \mathrm{Cdk2Y101} \tag{107}$$

Reactants

Table 86: Properties of each reactant.

Id	Name	SBO
Cdk2Y001		
p27		

Product

Table 87: Properties of each product.

Id	Name	SBO
Cdk2Y101		

Kinetic Law

Derived unit contains undeclared units

$$v_{47} = \mathrm{kbYp27YYCdk2} \cdot [\mathrm{Cdk2Y001}] \cdot [\mathrm{p27}] \cdot \mathrm{vol}(\mathrm{X}) \tag{108}$$

8.48 Reaction rxnY048

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

Reaction equation

$$\mathrm{Cdk2Y101} \longrightarrow \mathrm{Cdk2Y001} + \mathrm{p27} \tag{109}$$

Reactant

Table 88: Properties of each reactant.

Id	Name	SBO
Cdk2Y101		

Products

Table 89: Properties of each product.

Id	Name	SBO
Cdk2Y001		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{48} = \mathrm{kuYp27YYCdk2} \cdot [\mathrm{Cdk2Y101}] \cdot \mathrm{vol}(\mathrm{X}) \tag{110}$$

8.49 Reaction rxnY049

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y002} + \mathrm{p27} \longrightarrow \mathrm{Cdk2Y102} \tag{111}$$

Reactants

Table 90: Properties of each reactant.

Id	Name	SBO
Cdk2Y002		
p27		

Product

Table 91: Properties of each product.

Id	Name	SBO
Cdk2Y102		

Kinetic Law

Derived unit contains undeclared units

$$v_{49} = \mathrm{kbYp27YYCdk2} \cdot [\mathrm{Cdk2Y002}] \cdot [\mathrm{p27}] \cdot \mathrm{vol}(\mathrm{X}) \tag{112}$$

8.50 Reaction rxnY050

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

Reaction equation

$$\text{Cdk2Y102} \longrightarrow \text{Cdk2Y002} + \text{p27} \tag{113}$$

Reactant

Table 92: Properties of each reactant.

Id	Name	SBO
Cdk2Y102		

Products

Table 93: Properties of each product.

Id	Name	SBO
Cdk2Y002		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{50} = \text{kuYp27YYCdk2} \cdot [\text{Cdk2Y102}] \cdot \text{vol}(\text{X}) \tag{114}$$

8.51 Reaction rxnY051

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\text{Cdk2Y010} + \text{p27} \longrightarrow \text{Cdk2Y110} \tag{115}$$

Reactants

Table 94: Properties of each reactant.

Id	Name	SBO
Cdk2Y010		

Id	Name	SBO
p27		

Product

Table 95: Properties of each product.

Id	Name	SBO
Cdk2Y110		

Kinetic Law

Derived unit contains undeclared units

$$v_{51} = \text{kbYp27YYCdk2} \cdot [\text{Cdk2Y010}] \cdot [\text{p27}] \cdot \text{vol}(\text{X}) \tag{116}$$

8.52 Reaction rxnY052

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

Reaction equation

$$\text{Cdk2Y110} \longrightarrow \text{Cdk2Y010} + \text{p27} \tag{117}$$

Reactant

Table 96: Properties of each reactant.

Id	Name	SBO
Cdk2Y110		

Products

Table 97: Properties of each product.

Id	Name	SBO
Cdk2Y010		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{52} = \mathrm{kuYp27YYCdk2} \cdot [\mathrm{Cdk2Y110}] \cdot \mathrm{vol}(\mathrm{X}) \tag{118}$$

8.53 Reaction rxnY053

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y011} + \mathrm{p27} \longrightarrow \mathrm{Cdk2Y111} \tag{119}$$

Reactants

Table 98: Properties of each reactant.

Id	Name	SBO
Cdk2Y011		
p27		

Product

Table 99: Properties of each product.

Id	Name	SBO
Cdk2Y111		

Kinetic Law

Derived unit contains undeclared units

$$v_{53} = \mathrm{kbYp27YYCdk2} \cdot [\mathrm{Cdk2Y011}] \cdot [\mathrm{p27}] \cdot \mathrm{vol}(\mathrm{X}) \tag{120}$$

8.54 Reaction rxnY054

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

Reaction equation

$$\mathrm{Cdk2Y111} \longrightarrow \mathrm{Cdk2Y011} + \mathrm{p27} \tag{121}$$

Reactant

Table 100: Properties of each reactant.

Id	Name	SBO
Cdk2Y111		

Products

Table 101: Properties of each product.

Id	Name	SBO
Cdk2Y011		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{54} = \mathrm{kuYp27YYCdk2} \cdot [\mathrm{Cdk2Y111}] \cdot \mathrm{vol}(\mathrm{X}) \tag{122}$$

8.55 Reaction rxnY055

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y012} + \mathrm{p27} \longrightarrow \mathrm{Cdk2Y112} \tag{123}$$

Reactants

Table 102: Properties of each reactant.

Id	Name	SBO
Cdk2Y012		
p27		

Product

Table 103: Properties of each product.

Id	Name	SBO
Cdk2Y112		

Kinetic Law

Derived unit contains undeclared units

$$v_{55} = \text{kbYp27YYCdk2} \cdot [\text{Cdk2Y012}] \cdot [\text{p27}] \cdot \text{vol}(\text{X}) \tag{124}$$

8.56 Reaction rxnY056

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

Reaction equation

$$\text{Cdk2Y112} \longrightarrow \text{Cdk2Y012} + \text{p27} \tag{125}$$

Reactant

Table 104: Properties of each reactant.

Id	Name	SBO
Cdk2Y112		

Products

Table 105: Properties of each product.

Id	Name	SBO
Cdk2Y012		
p27		

Kinetic Law

Derived unit contains undeclared units

$$v_{56} = \text{kuYp27YYCdk2} \cdot [\text{Cdk2Y112}] \cdot \text{vol}(\text{X}) \tag{126}$$

8.57 Reaction rxnY057

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

Reaction equation

$$\text{Cdk2Y000} \longrightarrow \text{Cdk2Y010} \tag{127}$$

Reactant

Table 106: Properties of each reactant.

Id	Name	SBO
Cdk2Y000		

Product

Table 107: Properties of each product.

Id	Name	SBO
Cdk2Y010		

Kinetic Law

Derived unit contains undeclared units

$$v_{57} = \text{kYact} \cdot [\text{Cdk2Y000}] \cdot \text{vol}(\text{X}) \tag{128}$$

8.58 Reaction rxnY058

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

Reaction equation

$$\text{Cdk2Y100} \longrightarrow \text{Cdk2Y110} \tag{129}$$

Reactant

Table 108: Properties of each reactant.

Id	Name	SBO
Cdk2Y100		

Product

Table 109: Properties of each product.

Id	Name	SBO
Cdk2Y110		

Kinetic Law

Derived unit contains undeclared units

$$v_{58} = \mathrm{kYact} \cdot [\mathrm{Cdk2Y100}] \cdot \mathrm{vol}(\mathrm{X}) \tag{130}$$

8.59 Reaction rxnY059

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

Reaction equation

$$\mathrm{Cdk2Y001} \longrightarrow \mathrm{Cdk2Y011} \tag{131}$$

Reactant

Table 110: Properties of each reactant.

Id	Name	SBO
Cdk2Y001		

Product

Table 111: Properties of each product.

Id	Name	SBO
Cdk2Y011		

Kinetic Law

Derived unit contains undeclared units

$$v_{59} = \mathrm{kYact} \cdot [\mathrm{Cdk2Y001}] \cdot \mathrm{vol}(\mathrm{X}) \tag{132}$$

8.60 Reaction rxnY060

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

Reaction equation

$$\text{Cdk2Y101} \longrightarrow \text{Cdk2Y111} \tag{133}$$

Reactant

Table 112: Properties of each reactant.

Id	Name	SBO
Cdk2Y101		

Product

Table 113: Properties of each product.

Id	Name	SBO
Cdk2Y111		

Kinetic Law

Derived unit contains undeclared units

$$v_{60} = \text{kYact} \cdot [\text{Cdk2Y101}] \cdot \text{vol}(\text{X}) \tag{134}$$

8.61 Reaction rxnY061

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

Reaction equation

$$\text{Cdk2Y002} \longrightarrow \text{Cdk2Y012} \tag{135}$$

Reactant

Table 114: Properties of each reactant.

Id	Name	SBO
Cdk2Y002		

Product

Table 115: Properties of each product.

Id	Name	SBO
Cdk2Y012		

Kinetic Law

Derived unit contains undeclared units

$$v_{61} = \mathrm{kYact} \cdot [\mathrm{Cdk2Y002}] \cdot \mathrm{vol}(\mathrm{X}) \tag{136}$$

8.62 Reaction rxnY062

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

Reaction equation

$$\mathrm{Cdk2Y102} \longrightarrow \mathrm{Cdk2Y112} \tag{137}$$

Reactant

Table 116: Properties of each reactant.

Id	Name	SBO
Cdk2Y102		

Product

Table 117: Properties of each product.

Id	Name	SBO
Cdk2Y112		

Kinetic Law

Derived unit contains undeclared units

$$v_{62} = \mathrm{kYact} \cdot [\mathrm{Cdk2Y102}] \cdot \mathrm{vol}(\mathrm{X}) \tag{138}$$

8.63 Reaction rxnY063

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y000} + \mathrm{CyclinE} \longrightarrow \mathrm{Cdk2Y001} \tag{139}$$

Reactants

Table 118: Properties of each reactant.

Id	Name	SBO
Cdk2Y000		
CyclinE		

Product

Table 119: Properties of each product.

Id	Name	SBO
Cdk2Y001		

Kinetic Law

Derived unit contains undeclared units

$$v_{63} = \mathrm{kbYCyclinEYYCdk2} \cdot [\mathrm{Cdk2Y000}] \cdot [\mathrm{CyclinE}] \cdot \mathrm{vol}(\mathrm{X}) \tag{140}$$

8.64 Reaction rxnY064

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

Reaction equation

$$\mathrm{Cdk2Y001} \longrightarrow \mathrm{Cdk2Y000} + \mathrm{CyclinE} \tag{141}$$

Reactant

Table 120: Properties of each reactant.

Id	Name	SBO
Cdk2Y001		

Products

Table 121: Properties of each product.

Id	Name	SBO
Cdk2Y000		
CyclinE		

Kinetic Law

Derived unit contains undeclared units

$$v_{64} = \mathrm{kuYCyclinEYYCdk2} \cdot [\mathrm{Cdk2Y001}] \cdot \mathrm{vol}(\mathrm{X}) \tag{142}$$

8.65 Reaction rxnY065

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y100} + \mathrm{CyclinE} \longrightarrow \mathrm{Cdk2Y101} \tag{143}$$

Reactants

Table 122: Properties of each reactant.

Id	Name	SBO
Cdk2Y100		
CyclinE		

Product

Table 123: Properties of each product.

Id	Name	SBO
Cdk2Y101		

Kinetic Law

Derived unit contains undeclared units

$$v_{65} = \mathrm{kbYCyclinEYYCdk2} \cdot [\mathrm{Cdk2Y100}] \cdot [\mathrm{CyclinE}] \cdot \mathrm{vol}(\mathrm{X}) \tag{144}$$

8.66 Reaction rxnY066

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

Reaction equation

$$\text{Cdk2Y101} \longrightarrow \text{Cdk2Y100} + \text{CyclinE} \tag{145}$$

Reactant

Table 124: Properties of each reactant.

Id	Name	SBO
Cdk2Y101		

Products

Table 125: Properties of each product.

Id	Name	SBO
Cdk2Y100		
CyclinE		

Kinetic Law

Derived unit contains undeclared units

$$v_{66} = \text{kuYCyclinEYYCdk2} \cdot [\text{Cdk2Y101}] \cdot \text{vol}(\text{X}) \tag{146}$$

8.67 Reaction rxnY067

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\text{Cdk2Y010} + \text{CyclinE} \longrightarrow \text{Cdk2Y011} \tag{147}$$

Reactants

Table 126: Properties of each reactant.

Id	Name	SBO
Cdk2Y010		

Id	Name	SBO
CyclinE		

Product

Table 127: Properties of each product.

Id	Name	SBO
Cdk2Y011		

Kinetic Law

Derived unit contains undeclared units

$$v_{67} = \mathrm{kbYCyclinEYYCdk2} \cdot [\mathrm{Cdk2Y010}] \cdot [\mathrm{CyclinE}] \cdot \mathrm{vol}(\mathrm{X}) \tag{148}$$

8.68 Reaction rxnY068

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

Reaction equation

$$\mathrm{Cdk2Y011} \longrightarrow \mathrm{Cdk2Y010} + \mathrm{CyclinE} \tag{149}$$

Reactant

Table 128: Properties of each reactant.

Id	Name	SBO
Cdk2Y011		

Products

Table 129: Properties of each product.

Id	Name	SBO
Cdk2Y010		
CyclinE		

Kinetic Law

Derived unit contains undeclared units

$$v_{68} = \text{kuYCyclinEYYCdk2} \cdot [\text{Cdk2Y011}] \cdot \text{vol}(\text{X}) \tag{150}$$

8.69 Reaction rxnY069

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\text{Cdk2Y110} + \text{CyclinE} \longrightarrow \text{Cdk2Y111} \tag{151}$$

Reactants

Table 130: Properties of each reactant.

Id	Name	SBO
Cdk2Y110		
CyclinE		

Product

Table 131: Properties of each product.

Id	Name	SBO
Cdk2Y111		

Kinetic Law

Derived unit contains undeclared units

$$v_{69} = \text{kbYCyclinEYYCdk2} \cdot [\text{Cdk2Y110}] \cdot [\text{CyclinE}] \cdot \text{vol}(\text{X}) \tag{152}$$

8.70 Reaction rxnY070

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

Reaction equation

$$\text{Cdk2Y111} \longrightarrow \text{Cdk2Y110} + \text{CyclinE} \tag{153}$$

Reactant

Table 132: Properties of each reactant.

Id	Name	SBO
Cdk2Y111		

Products

Table 133: Properties of each product.

Id	Name	SBO
Cdk2Y110		
CyclinE		

Kinetic Law

Derived unit contains undeclared units

$$v_{70} = \mathrm{kuYCyclinEYYCdk2} \cdot [\mathrm{Cdk2Y111}] \cdot \mathrm{vol}(\mathrm{X}) \tag{154}$$

8.71 Reaction rxnY071

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y000} + \mathrm{CyclinA} \longrightarrow \mathrm{Cdk2Y002} \tag{155}$$

Reactants

Table 134: Properties of each reactant.

Id	Name	SBO
Cdk2Y000		
CyclinA		

Product

Table 135: Properties of each product.

Id	Name	SBO
Cdk2Y002		

Kinetic Law

Derived unit contains undeclared units

$$v_{71} = \text{kbYCyclinAYYCdk2} \cdot [\text{Cdk2Y000}] \cdot [\text{CyclinA}] \cdot \text{vol}(\text{X}) \tag{156}$$

8.72 Reaction rxnY072

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

Reaction equation

$$\text{Cdk2Y002} \longrightarrow \text{Cdk2Y000} + \text{CyclinA} \tag{157}$$

Reactant

Table 136: Properties of each reactant.

Id	Name	SBO
Cdk2Y002		

Products

Table 137: Properties of each product.

Id	Name	SBO
Cdk2Y000		
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{72} = \text{kuYCyclinAYYCdk2} \cdot [\text{Cdk2Y002}] \cdot \text{vol}(\text{X}) \tag{158}$$

8.73 Reaction rxnY073

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y100} + \mathrm{CyclinA} \longrightarrow \mathrm{Cdk2Y102} \tag{159}$$

Reactants

Table 138: Properties of each reactant.

Id	Name	SBO
Cdk2Y100		
CyclinA		

Product

Table 139: Properties of each product.

Id	Name	SBO
Cdk2Y102		

Kinetic Law

Derived unit contains undeclared units

$$v_{73} = \mathrm{kbYCyclinAYYCdk2} \cdot [\mathrm{Cdk2Y100}] \cdot [\mathrm{CyclinA}] \cdot \mathrm{vol}(\mathrm{X}) \tag{160}$$

8.74 Reaction rxnY074

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

Reaction equation

$$\mathrm{Cdk2Y102} \longrightarrow \mathrm{Cdk2Y100} + \mathrm{CyclinA} \tag{161}$$

Reactant

Table 140: Properties of each reactant.

Id	Name	SBO
Cdk2Y102		

Products

Table 141: Properties of each product.

Id	Name	SBO
Cdk2Y100		
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{74} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYCyclinAYYCdk2} \cdot [\mathrm{Cdk2Y102}] \tag{162}$$

8.75 Reaction rxnY075

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y010} + \mathrm{CyclinA} \longrightarrow \mathrm{Cdk2Y012} \tag{163}$$

Reactants

Table 142: Properties of each reactant.

Id	Name	SBO
Cdk2Y010		
CyclinA		

Product

Table 143: Properties of each product.

Id	Name	SBO
Cdk2Y012		

Kinetic Law

Derived unit contains undeclared units

$$v_{75} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYCyclinAYYCdk2} \cdot [\mathrm{Cdk2Y010}] \cdot [\mathrm{CyclinA}] \tag{164}$$

8.76 Reaction rxnY076

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

Reaction equation

$$\text{Cdk2Y012} \longrightarrow \text{Cdk2Y010} + \text{CyclinA} \tag{165}$$

Reactant

Table 144: Properties of each reactant.

Id	Name	SBO
Cdk2Y012		

Products

Table 145: Properties of each product.

Id	Name	SBO
Cdk2Y010		
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{76} = \text{vol}(\text{X}) \cdot \text{kuYCyclinAYYCdk2} \cdot [\text{Cdk2Y012}] \tag{166}$$

8.77 Reaction rxnY077

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\text{Cdk2Y110} + \text{CyclinA} \longrightarrow \text{Cdk2Y112} \tag{167}$$

Reactants

Table 146: Properties of each reactant.

Id	Name	SBO
Cdk2Y110		

Id	Name	SBO
CyclinA		

Product

Table 147: Properties of each product.

Id	Name	SBO
Cdk2Y112		

Kinetic Law

Derived unit contains undeclared units

$$v_{77} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYCyclinAYYCdk2} \cdot [\mathrm{Cdk2Y110}] \cdot [\mathrm{CyclinA}] \tag{168}$$

8.78 Reaction rxnY078

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

Reaction equation

$$\mathrm{Cdk2Y112} \longrightarrow \mathrm{Cdk2Y110} + \mathrm{CyclinA} \tag{169}$$

Reactant

Table 148: Properties of each reactant.

Id	Name	SBO
Cdk2Y112		

Products

Table 149: Properties of each product.

Id	Name	SBO
Cdk2Y110		
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{78} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kuYCyclinAYYCdk2} \cdot [\mathrm{Cdk2Y112}] \tag{170}$$

8.79 Reaction rxnY079

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

Reaction equation

$$\mathrm{Cdk1Y00} \longrightarrow \mathrm{Cdk1Y10} \tag{171}$$

Reactant

Table 150: Properties of each reactant.

Id	Name	SBO
Cdk1Y00		

Product

Table 151: Properties of each product.

Id	Name	SBO
Cdk1Y10		

Kinetic Law

Derived unit contains undeclared units

$$v_{79} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kYact} \cdot [\mathrm{Cdk1Y00}] \tag{172}$$

8.80 Reaction rxnY080

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

Reaction equation

$$\mathrm{Cdk1Y01} \longrightarrow \mathrm{Cdk1Y11} \tag{173}$$

Reactant

Table 152: Properties of each reactant.

Id	Name	SBO
Cdk1Y01		

Product

Table 153: Properties of each product.

Id	Name	SBO
Cdk1Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{80} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kYact} \cdot [\mathrm{Cdk1Y01}] \tag{174}$$

8.81 Reaction rxnY081

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk1Y00} + \mathrm{CyclinA} \longrightarrow \mathrm{Cdk1Y01} \tag{175}$$

Reactants

Table 154: Properties of each reactant.

Id	Name	SBO
Cdk1Y00		
CyclinA		

Product

Table 155: Properties of each product.

Id	Name	SBO
Cdk1Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_{81} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYCyclinAYYCdk1} \cdot [\mathrm{Cdk1Y00}] \cdot [\mathrm{CyclinA}] \tag{176}$$

8.82 Reaction rxnY082

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

Reaction equation

$$\mathrm{Cdk1Y01} \longrightarrow \mathrm{Cdk1Y00} + \mathrm{CyclinA} \tag{177}$$

Reactant

Table 156: Properties of each reactant.

Id	Name	SBO
Cdk1Y01		

Products

Table 157: Properties of each product.

Id	Name	SBO
Cdk1Y00		
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{82} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYCyclinAYYCdk1} \cdot [\mathrm{Cdk1Y01}] \tag{178}$$

8.83 Reaction rxnY083

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk1Y10} + \mathrm{CyclinA} \longrightarrow \mathrm{Cdk1Y11} \tag{179}$$

Reactants

Table 158: Properties of each reactant.

Id	Name	SBO
Cdk1Y10		
CyclinA		

Product

Table 159: Properties of each product.

Id	Name	SBO
Cdk1Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{83} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYCyclinAYYCdk1} \cdot [\mathrm{Cdk1Y10}] \cdot [\mathrm{CyclinA}] \tag{180}$$

8.84 Reaction rxnY084

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

Reaction equation

$$\mathrm{Cdk1Y11} \longrightarrow \mathrm{Cdk1Y10} + \mathrm{CyclinA} \tag{181}$$

Reactant

Table 160: Properties of each reactant.

Id	Name	SBO
Cdk1Y11		

Products

Table 161: Properties of each product.

Id	Name	SBO
Cdk1Y10		
CyclinA		

Kinetic Law

Derived unit contains undeclared units

$$v_{84} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYCyclinAYYCdk1} \cdot [\mathrm{Cdk1Y11}] \tag{182}$$

8.85 Reaction rxnY085

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY00} + \mathrm{Cdk4Y01} \longrightarrow \mathrm{Cdk4Y01YpRbY00YpRbY10YInt} \tag{183}$$

Reactants

Table 162: Properties of each reactant.

Id	Name	SBO
pRbY00		
Cdk4Y01		

Product

Table 163: Properties of each product.

Id	Name	SBO
Cdk4Y01YpRbY00YpRbY10YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{85} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYD4YYpRb} \cdot [\mathrm{pRbY00}] \cdot [\mathrm{Cdk4Y01}] \tag{184}$$

8.86 Reaction rxnY086

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

Reaction equation

$$\text{Cdk4Y01YpRbY00YpRbY10YInt} \longrightarrow \text{pRbY00} + \text{Cdk4Y01} \tag{185}$$

Reactant

Table 164: Properties of each reactant.

Id	Name	SBO
Cdk4Y01YpRbY00YpRbY10YInt		

Products

Table 165: Properties of each product.

Id	Name	SBO
pRbY00		
Cdk4Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_{86} = \text{vol}\,(\text{X}) \cdot \text{kuYD4YYpRb} \cdot [\text{Cdk4Y01YpRbY00YpRbY10YInt}] \tag{186}$$

8.87 Reaction rxnY087

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

Reaction equation

$$\text{Cdk4Y01YpRbY00YpRbY10YInt} \longrightarrow \text{pRbY10} + \text{Cdk4Y01} \tag{187}$$

Reactant

Table 166: Properties of each reactant.

Id	Name	SBO
Cdk4Y01YpRbY00YpRbY10YInt		

Products

Table 167: Properties of each product.

Id	Name	SBO
pRbY10		
Cdk4Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_{87} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kupYD4YYpRb} \cdot [\mathrm{Cdk4Y01YpRbY00YpRbY10YInt}] \tag{188}$$

8.88 Reaction rxnY088

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY01} + \mathrm{Cdk4Y01} \longrightarrow \mathrm{Cdk4Y01YpRbY01YpRbY11YInt} \tag{189}$$

Reactants

Table 168: Properties of each reactant.

Id	Name	SBO
pRbY01		
Cdk4Y01		

Product

Table 169: Properties of each product.

Id	Name	SBO
Cdk4Y01YpRbY01YpRbY11YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{88} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYD4YYpRb} \cdot [\mathrm{pRbY01}] \cdot [\mathrm{Cdk4Y01}] \tag{190}$$

8.89 Reaction rxnY089

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

Reaction equation

$$\text{Cdk4Y01YpRbY01YpRbY11YInt} \longrightarrow \text{pRbY01} + \text{Cdk4Y01} \tag{191}$$

Reactant

Table 170: Properties of each reactant.

Id	Name	SBO
Cdk4Y01YpRbY01YpRbY11YInt		

Products

Table 171: Properties of each product.

Id	Name	SBO
pRbY01		
Cdk4Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_{89} = \text{vol}\,(\text{X}) \cdot \text{kuYD4YYpRb} \cdot [\text{Cdk4Y01YpRbY01YpRbY11YInt}] \tag{192}$$

8.90 Reaction rxnY090

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

Reaction equation

$$\text{Cdk4Y01YpRbY01YpRbY11YInt} \longrightarrow \text{pRbY11} + \text{Cdk4Y01} \tag{193}$$

Reactant

Table 172: Properties of each reactant.

Id	Name	SBO
Cdk4Y01YpRbY01YpRbY11YInt		

Products

Table 173: Properties of each product.

Id	Name	SBO
pRbY11		
Cdk4Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_{90} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kupYD4YYpRb} \cdot [\mathrm{Cdk4Y01YpRbY01YpRbY11YInt}] \tag{194}$$

8.91 Reaction rxnY091

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY10} + \mathrm{Cdk2Y011} \longrightarrow \mathrm{Cdk2Y011YpRbY10YpRbY20YInt} \tag{195}$$

Reactants

Table 174: Properties of each reactant.

Id	Name	SBO
pRbY10		
Cdk2Y011		

Product

Table 175: Properties of each product.

Id	Name	SBO
Cdk2Y011YpRbY10YpRbY20YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{91} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYE2YYpRb} \cdot [\mathrm{pRbY10}] \cdot [\mathrm{Cdk2Y011}] \tag{196}$$

8.92 Reaction rxnY092

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

Reaction equation

$$\text{Cdk2Y011YpRbY10YpRbY20YInt} \longrightarrow \text{pRbY10} + \text{Cdk2Y011} \tag{197}$$

Reactant

Table 176: Properties of each reactant.

Id	Name	SBO
Cdk2Y011YpRbY10YpRbY20YInt		

Products

Table 177: Properties of each product.

Id	Name	SBO
pRbY10		
Cdk2Y011		

Kinetic Law

Derived unit contains undeclared units

$$v_{92} = \text{vol}(\text{X}) \cdot \text{kuYE2YYpRb} \cdot [\text{Cdk2Y011YpRbY10YpRbY20YInt}] \tag{198}$$

8.93 Reaction rxnY093

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

Reaction equation

$$\text{Cdk2Y011YpRbY10YpRbY20YInt} \longrightarrow \text{pRbY20} + \text{Cdk2Y011} \tag{199}$$

Reactant

Table 178: Properties of each reactant.

Id	Name	SBO
Cdk2Y011YpRbY10YpRbY20YInt		

Products

Table 179: Properties of each product.

Id	Name	SBO
pRbY20		
Cdk2Y011		

Kinetic Law

Derived unit contains undeclared units

$$v_{93} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kupYE2YYpRb} \cdot [\mathrm{Cdk2Y011YpRbY10YpRbY20YInt}] \tag{200}$$

8.94 Reaction rxnY094

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY11} + \mathrm{Cdk2Y011} \longrightarrow \mathrm{Cdk2Y011YpRbY11YpRbY21YInt} \tag{201}$$

Reactants

Table 180: Properties of each reactant.

Id	Name	SBO
pRbY11		
Cdk2Y011		

Product

Table 181: Properties of each product.

Id	Name	SBO
Cdk2Y011YpRbY11YpRbY21YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{94} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYE2YYpRb} \cdot [\mathrm{pRbY11}] \cdot [\mathrm{Cdk2Y011}] \tag{202}$$

8.95 Reaction rxnY095

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

Reaction equation

$$\text{Cdk2Y011YpRbY11YpRbY21YInt} \longrightarrow \text{pRbY11} + \text{Cdk2Y011} \tag{203}$$

Reactant

Table 182: Properties of each reactant.

Id	Name	SBO
Cdk2Y011YpRbY11YpRbY21YInt		

Products

Table 183: Properties of each product.

Id	Name	SBO
pRbY11		
Cdk2Y011		

Kinetic Law

Derived unit contains undeclared units

$$v_{95} = \text{vol}(\text{X}) \cdot \text{kuYE2YYpRb} \cdot [\text{Cdk2Y011YpRbY11YpRbY21YInt}] \tag{204}$$

8.96 Reaction rxnY096

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

Reaction equation

$$\text{Cdk2Y011YpRbY11YpRbY21YInt} \longrightarrow \text{pRbY21} + \text{Cdk2Y011} \tag{205}$$

Reactant

Table 184: Properties of each reactant.

Id	Name	SBO
Cdk2Y011YpRbY11YpRbY21YInt		

Products

Table 185: Properties of each product.

Id	Name	SBO
pRbY21		
Cdk2Y011		

Kinetic Law

Derived unit contains undeclared units

$$v_{96} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kupYE2YYpRb} \cdot [\mathrm{Cdk2Y011YpRbY11YpRbY21YInt}] \tag{206}$$

8.97 Reaction rxnY097

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY10} + \mathrm{Cdk2Y012} \longrightarrow \mathrm{Cdk2Y012YpRbY10YpRbY20YInt} \tag{207}$$

Reactants

Table 186: Properties of each reactant.

Id	Name	SBO
pRbY10		
Cdk2Y012		

Product

Table 187: Properties of each product.

Id	Name	SBO
Cdk2Y012YpRbY10YpRbY20YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{97} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYA2YYpRb} \cdot [\mathrm{pRbY10}] \cdot [\mathrm{Cdk2Y012}] \tag{208}$$

8.98 Reaction rxnY098

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

Reaction equation

$$\text{Cdk2Y012YpRbY10YpRbY20YInt} \longrightarrow \text{pRbY10} + \text{Cdk2Y012} \tag{209}$$

Reactant

Table 188: Properties of each reactant.

Id	Name	SBO
Cdk2Y012YpRbY10YpRbY20YInt		

Products

Table 189: Properties of each product.

Id	Name	SBO
pRbY10		
Cdk2Y012		

Kinetic Law

Derived unit contains undeclared units

$$v_{98} = \text{vol}(\text{X}) \cdot \text{kuYA2YYpRb} \cdot [\text{Cdk2Y012YpRbY10YpRbY20YInt}] \tag{210}$$

8.99 Reaction rxnY099

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

Reaction equation

$$\text{Cdk2Y012YpRbY10YpRbY20YInt} \longrightarrow \text{pRbY20} + \text{Cdk2Y012} \tag{211}$$

Reactant

Table 190: Properties of each reactant.

Id	Name	SBO
Cdk2Y012YpRbY10YpRbY20YInt		

Products

Table 191: Properties of each product.

Id	Name	SBO
pRbY20		
Cdk2Y012		

Kinetic Law

Derived unit contains undeclared units

$$v_{99} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kupYA2YYpRb} \cdot [\mathrm{Cdk2Y012YpRbY10YpRbY20YInt}] \tag{212}$$

8.100 Reaction rxnY100

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY11} + \mathrm{Cdk2Y012} \longrightarrow \mathrm{Cdk2Y012YpRbY11YpRbY21YInt} \tag{213}$$

Reactants

Table 192: Properties of each reactant.

Id	Name	SBO
pRbY11		
Cdk2Y012		

Product

Table 193: Properties of each product.

Id	Name	SBO
Cdk2Y012YpRbY11YpRbY21YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{100} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYA2YYpRb} \cdot [\mathrm{pRbY11}] \cdot [\mathrm{Cdk2Y012}] \tag{214}$$

8.101 Reaction rxnY101

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

Reaction equation

$$\text{Cdk2Y012YpRbY11YpRbY21YInt} \longrightarrow \text{pRbY11} + \text{Cdk2Y012} \tag{215}$$

Reactant

Table 194: Properties of each reactant.

Id	Name	SBO
Cdk2Y012YpRbY11YpRbY21YInt		

Products

Table 195: Properties of each product.

Id	Name	SBO
pRbY11		
Cdk2Y012		

Kinetic Law

Derived unit contains undeclared units

$$v_{101} = \text{vol}(\text{X}) \cdot \text{kuYA2YYpRb} \cdot [\text{Cdk2Y012YpRbY11YpRbY21YInt}] \tag{216}$$

8.102 Reaction rxnY102

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

Reaction equation

$$\text{Cdk2Y012YpRbY11YpRbY21YInt} \longrightarrow \text{pRbY21} + \text{Cdk2Y012} \tag{217}$$

Reactant

Table 196: Properties of each reactant.

Id	Name	SBO
Cdk2Y012YpRbY11YpRbY21YInt		

Products

Table 197: Properties of each product.

Id	Name	SBO
pRbY21		
Cdk2Y012		

Kinetic Law

Derived unit contains undeclared units

$$v_{102} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kupYA2YYpRb} \cdot [\mathrm{Cdk2Y012YpRbY11YpRbY21YInt}] \tag{218}$$

8.103 Reaction rxnY103

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY10} + \mathrm{Cdk1Y11} \longrightarrow \mathrm{Cdk1Y11YpRbY10YpRbY20YInt} \tag{219}$$

Reactants

Table 198: Properties of each reactant.

Id	Name	SBO
pRbY10		
Cdk1Y11		

Product

Table 199: Properties of each product.

Id	Name	SBO
Cdk1Y11YpRbY10YpRbY20YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{103} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYA1YYpRb} \cdot [\mathrm{pRbY10}] \cdot [\mathrm{Cdk1Y11}] \tag{220}$$

8.104 Reaction rxnY104

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

Reaction equation

$$\text{Cdk1Y11YpRbY10YpRbY20YInt} \longrightarrow \text{pRbY10} + \text{Cdk1Y11} \tag{221}$$

Reactant

Table 200: Properties of each reactant.

Id	Name	SBO
Cdk1Y11YpRbY10YpRbY20YInt		

Products

Table 201: Properties of each product.

Id	Name	SBO
pRbY10		
Cdk1Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{104} = \text{vol}(\text{X}) \cdot \text{kuYA1YYpRb} \cdot [\text{Cdk1Y11YpRbY10YpRbY20YInt}] \tag{222}$$

8.105 Reaction rxnY105

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

Reaction equation

$$\text{Cdk1Y11YpRbY10YpRbY20YInt} \longrightarrow \text{pRbY20} + \text{Cdk1Y11} \tag{223}$$

Reactant

Table 202: Properties of each reactant.

Id	Name	SBO
Cdk1Y11YpRbY10YpRbY20YInt		

Products

Table 203: Properties of each product.

Id	Name	SBO
pRbY20		
Cdk1Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{105} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kupYA1YYpRb} \cdot [\mathrm{Cdk1Y11YpRbY10YpRbY20YInt}] \tag{224}$$

8.106 Reaction rxnY106

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

Reaction equation

$$\mathrm{pRbY11} + \mathrm{Cdk1Y11} \xrightarrow{\mathrm{pRbY10}} \mathrm{Cdk1Y11YpRbY11YpRbY21YInt} \tag{225}$$

Reactants

Table 204: Properties of each reactant.

Id	Name	SBO
pRbY11		
Cdk1Y11		

Modifier

Table 205: Properties of each modifier.

Id	Name	SBO
pRbY10		

Product

Table 206: Properties of each product.

Id	Name	SBO
Cdk1Y11YpRbY11YpRbY21YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{106} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYA1YYpRb} \cdot [\mathrm{pRbY10}] \cdot [\mathrm{Cdk1Y11}] \tag{226}$$

8.107 Reaction rxnY107

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

Reaction equation

$$\mathrm{Cdk1Y11YpRbY11YpRbY21YInt} \longrightarrow \mathrm{pRbY11} + \mathrm{Cdk1Y11} \tag{227}$$

Reactant

Table 207: Properties of each reactant.

Id	Name	SBO
Cdk1Y11YpRbY11YpRbY21YInt		

Products

Table 208: Properties of each product.

Id	Name	SBO
pRbY11		
Cdk1Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{107} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYA1YYpRb} \cdot [\mathrm{Cdk1Y11YpRbY11YpRbY21YInt}] \tag{228}$$

8.108 Reaction rxnY108

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

Reaction equation

$$\mathrm{Cdk1Y11YpRbY11YpRbY21YInt} \longrightarrow \mathrm{pRbY21} + \mathrm{Cdk1Y11} \tag{229}$$

Reactant

Table 209: Properties of each reactant.

Id	Name	SBO
Cdk1Y11YpRbY11YpRbY21YInt		

Products

Table 210: Properties of each product.

Id	Name	SBO
pRbY21		
Cdk1Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{108} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kupYA1YYpRb} \cdot [\mathrm{Cdk1Y11YpRbY11YpRbY21YInt}] \tag{230}$$

8.109 Reaction rxnY109

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

Reaction equation

$$\mathrm{pRbY20} \longrightarrow \mathrm{pRbY00} \tag{231}$$

Reactant

Table 211: Properties of each reactant.

Id	Name	SBO
pRbY20		

Product

Table 212: Properties of each product.

Id	Name	SBO
pRbY00		

Kinetic Law

Derived unit contains undeclared units

$$v_{109} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{ktYpRbYYDephos} \cdot [\mathrm{pRbY20}] \tag{232}$$

8.110 Reaction rxnY110

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

Reaction equation

$$\mathrm{pRbY21} \longrightarrow \mathrm{pRbY01} \tag{233}$$

Reactant

Table 213: Properties of each reactant.

Id	Name	SBO
pRbY21		

Product

Table 214: Properties of each product.

Id	Name	SBO
pRbY01		

Kinetic Law

Derived unit contains undeclared units

$$v_{110} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{ktYpRbYYDephos} \cdot [\mathrm{pRbY21}] \tag{234}$$

8.111 Reaction rxnY111

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY00} + \mathrm{E2F} \longrightarrow \mathrm{pRbY01} \tag{235}$$

Reactants

Table 215: Properties of each reactant.

Id	Name	SBO
pRbY00		
E2F		

Product

Table 216: Properties of each product.

Id	Name	SBO
pRbY01		

Kinetic Law

Derived unit contains undeclared units

$$v_{111} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYE2FYYpRb} \cdot [\mathrm{pRbY00}] \cdot [\mathrm{E2F}] \tag{236}$$

8.112 Reaction rxnY112

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

Reaction equation

$$\mathrm{pRbY01} \longrightarrow \mathrm{pRbY00} + \mathrm{E2F} \tag{237}$$

Reactant

Table 217: Properties of each reactant.

Id	Name	SBO
pRbY01		

Products

Table 218: Properties of each product.

Id	Name	SBO
pRbY00		
E2F		

Kinetic Law

Derived unit contains undeclared units

$$v_{112} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYE2FYYpRb} \cdot [\mathrm{pRbY01}] \tag{238}$$

8.113 Reaction rxnY113

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{pRbY10} + \mathrm{E2F} \longrightarrow \mathrm{pRbY11} \tag{239}$$

Reactants

Table 219: Properties of each reactant.

Id	Name	SBO
pRbY10		
E2F		

Product

Table 220: Properties of each product.

Id	Name	SBO
pRbY11		

Kinetic Law

Derived unit contains undeclared units

$$v_{113} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYE2FYYpRb} \cdot [\mathrm{pRbY10}] \cdot [\mathrm{E2F}] \tag{240}$$

8.114 Reaction rxnY114

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

Reaction equation

$$\text{pRbY11} \longrightarrow \text{pRbY10} + \text{E2F} \tag{241}$$

Reactant

Table 221: Properties of each reactant.

Id	Name	SBO
pRbY11		

Products

Table 222: Properties of each product.

Id	Name	SBO
pRbY10		
E2F		

Kinetic Law

Derived unit contains undeclared units

$$v_{114} = \text{vol}(\text{X}) \cdot \text{kuYE2FYYpRb} \cdot [\text{pRbY11}] \tag{242}$$

8.115 Reaction rxnY115

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

Reaction equation

$$\text{pRbY21} \longrightarrow \text{pRbY20} + \text{E2F} \tag{243}$$

Reactant

Table 223: Properties of each reactant.

Id	Name	SBO
pRbY21		

Products

Table 224: Properties of each product.

Id	Name	SBO
pRbY20		
E2F		

Kinetic Law

Derived unit contains undeclared units

$$v_{115} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYE2FYYpRb} \cdot [\mathrm{pRbY21}] \tag{244}$$

8.116 Reaction rxnY116

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{APCC} + \mathrm{Emi1} \longrightarrow \mathrm{APCCYEmi1} \tag{245}$$

Reactants

Table 225: Properties of each reactant.

Id	Name	SBO
APCC		
Emi1		

Product

Table 226: Properties of each product.

Id	Name	SBO
APCCYEmi1		

Kinetic Law

Derived unit contains undeclared units

$$v_{116} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYEmi1YYAPCC} \cdot [\mathrm{APCC}] \cdot [\mathrm{Emi1}] \tag{246}$$

8.117 Reaction rxnY117

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

Reaction equation

$$\text{APCCYEmi1} \longrightarrow \text{APCC} + \text{Emi1} \tag{247}$$

Reactant

Table 227: Properties of each reactant.

Id	Name	SBO
APCCYEmi1		

Products

Table 228: Properties of each product.

Id	Name	SBO
APCC		
Emi1		

Kinetic Law

Derived unit contains undeclared units

$$v_{117} = \text{vol}(\text{X}) \cdot \text{kuYEmi1YYAPCC} \cdot [\text{APCCYEmi1}] \tag{248}$$

8.118 Reaction rxnY118

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\text{CyclinA} + \text{APCC} \longrightarrow \text{APCCYCyclinAYInt} \tag{249}$$

Reactants

Table 229: Properties of each reactant.

Id	Name	SBO
CyclinA		

Id	Name	SBO
APCC		

Product

Table 230: Properties of each product.

Id	Name	SBO
APCCYCyclinAYInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{118} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYAPCCYYCyclinA} \cdot [\mathrm{CyclinA}] \cdot [\mathrm{APCC}] \tag{250}$$

8.119 Reaction rxnY119

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

Reaction equation

$$\mathrm{APCCYCyclinAYInt} \longrightarrow \mathrm{CyclinA} + \mathrm{APCC} \tag{251}$$

Reactant

Table 231: Properties of each reactant.

Id	Name	SBO
APCCYCyclinAYInt		

Products

Table 232: Properties of each product.

Id	Name	SBO
CyclinA		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{119} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYAPCCYYCyclinA} \cdot [\mathrm{APCCYCyclinAYInt}] \tag{252}$$

8.120 Reaction rxnY120

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

Reaction equation

$$\mathrm{APCCYCyclinAYInt} \longrightarrow \mathrm{APCC} \tag{253}$$

Reactant

Table 233: Properties of each reactant.

Id	Name	SBO
APCCYCyclinAYInt		

Product

Table 234: Properties of each product.

Id	Name	SBO
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{120} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kudYAPCCYYCyclinA} \cdot [\mathrm{APCCYCyclinAYInt}] \tag{254}$$

8.121 Reaction rxnY121

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y002} + \mathrm{APCC} \longrightarrow \mathrm{APCCYCdk2Y000YCdk2Y002YInt} \tag{255}$$

Reactants

Table 235: Properties of each reactant.

Id	Name	SBO
Cdk2Y002		
APCC		

Product

Table 236: Properties of each product.

Id	Name	SBO
APCCYCdk2Y000YCdk2Y002YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{121} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYAPCCYYCyclinA} \cdot [\mathrm{Cdk2Y002}] \cdot [\mathrm{APCC}] \tag{256}$$

8.122 Reaction rxnY122

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

Reaction equation

$$\mathrm{APCCYCdk2Y000YCdk2Y002YInt} \longrightarrow \mathrm{Cdk2Y002} + \mathrm{APCC} \tag{257}$$

Reactant

Table 237: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y000YCdk2Y002YInt		

Products

Table 238: Properties of each product.

Id	Name	SBO
Cdk2Y002		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{122} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk2Y000YCdk2Y002YInt}] \quad (258)$$

8.123 Reaction rxnY123

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

Reaction equation

$$\mathrm{APCCYCdk2Y000YCdk2Y002YInt} \longrightarrow \mathrm{Cdk2Y000} + \mathrm{APCC} \quad (259)$$

Reactant

Table 239: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y000YCdk2Y002YInt		

Products

Table 240: Properties of each product.

Id	Name	SBO
Cdk2Y000		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{123} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kudYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk2Y000YCdk2Y002YInt}] \quad (260)$$

8.124 Reaction rxnY124

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y102} + \mathrm{APCC} \longrightarrow \mathrm{APCCYCdk2Y100YCdk2Y102YInt} \quad (261)$$

Reactants

Table 241: Properties of each reactant.

Id	Name	SBO
Cdk2Y102		
APCC		

Product

Table 242: Properties of each product.

Id	Name	SBO
APCCYCdk2Y100YCdk2Y102YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{124} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYAPCCYYCyclinA} \cdot [\mathrm{Cdk2Y102}] \cdot [\mathrm{APCC}] \tag{262}$$

8.125 Reaction rxnY125

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

Reaction equation

$$\mathrm{APCCYCdk2Y100YCdk2Y102YInt} \longrightarrow \mathrm{Cdk2Y102} + \mathrm{APCC} \tag{263}$$

Reactant

Table 243: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y100YCdk2Y102YInt		

Products

Table 244: Properties of each product.

Id	Name	SBO
Cdk2Y102		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{125} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kuYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk2Y100YCdk2Y102YInt}] \quad (264)$$

8.126 Reaction rxnY126

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

Reaction equation

$$\mathrm{APCCYCdk2Y100YCdk2Y102YInt} \longrightarrow \mathrm{Cdk2Y100} + \mathrm{APCC} \quad (265)$$

Reactant

Table 245: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y100YCdk2Y102YInt		

Products

Table 246: Properties of each product.

Id	Name	SBO
Cdk2Y100		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{126} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kudYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk2Y100YCdk2Y102YInt}] \quad (266)$$

8.127 Reaction rxnY127

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

Reaction equation

$$\text{Cdk2Y012} + \text{APCC} \xrightarrow{\text{Cdk2Y102}} \text{APCCYCdk2Y010YCdk2Y012YInt} \tag{267}$$

Reactants

Table 247: Properties of each reactant.

Id	Name	SBO
Cdk2Y012		
APCC		

Modifier

Table 248: Properties of each modifier.

Id	Name	SBO
Cdk2Y102		

Product

Table 249: Properties of each product.

Id	Name	SBO
APCCYCdk2Y010YCdk2Y012YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{127} = \text{vol}(\text{X}) \cdot \text{kbYAPCCYYCyclinA} \cdot [\text{Cdk2Y102}] \cdot [\text{APCC}] \tag{268}$$

8.128 Reaction rxnY128

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

Reaction equation

$$\text{APCCYCdk2Y010YCdk2Y012YInt} \longrightarrow \text{Cdk2Y012} + \text{APCC} \tag{269}$$

Reactant

Table 250: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y010YCdk2Y012YInt		

Products

Table 251: Properties of each product.

Id	Name	SBO
Cdk2Y012		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{128} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kuYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk2Y010YCdk2Y012YInt}] \quad (270)$$

8.129 Reaction rxnY129

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

Reaction equation

$$\mathrm{APCCYCdk2Y010YCdk2Y012YInt} \longrightarrow \mathrm{Cdk2Y010} + \mathrm{APCC} \quad (271)$$

Reactant

Table 252: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y010YCdk2Y012YInt		

Products

Table 253: Properties of each product.

Id	Name	SBO
Cdk2Y010		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{129} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kudYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk2Y010YCdk2Y012YInt}] \quad (272)$$

8.130 Reaction rxnY130

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk2Y112} + \mathrm{APCC} \longrightarrow \mathrm{APCCYCdk2Y110YCdk2Y112YInt} \quad (273)$$

Reactants

Table 254: Properties of each reactant.

Id	Name	SBO
Cdk2Y112		
APCC		

Product

Table 255: Properties of each product.

Id	Name	SBO
APCCYCdk2Y110YCdk2Y112YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{130} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYAPCCYYCyclinA} \cdot [\mathrm{Cdk2Y112}] \cdot [\mathrm{APCC}] \quad (274)$$

8.131 Reaction rxnY131

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

Reaction equation

$$\text{APCCYCdk2Y110YCdk2Y112YInt} \longrightarrow \text{Cdk2Y112} + \text{APCC} \tag{275}$$

Reactant

Table 256: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y110YCdk2Y112YInt		

Products

Table 257: Properties of each product.

Id	Name	SBO
Cdk2Y112		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{131} = \text{vol}(\text{X}) \cdot \text{kuYAPCCYYCyclinA} \cdot [\text{APCCYCdk2Y110YCdk2Y112YInt}] \tag{276}$$

8.132 Reaction rxnY132

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

Reaction equation

$$\text{APCCYCdk2Y110YCdk2Y112YInt} \longrightarrow \text{Cdk2Y110} + \text{APCC} \tag{277}$$

Reactant

Table 258: Properties of each reactant.

Id	Name	SBO
APCCYCdk2Y110YCdk2Y112YInt		

Products

Table 259: Properties of each product.

Id	Name	SBO
Cdk2Y110		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{132} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kudYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk2Y110YCdk2Y112YInt}] \quad (278)$$

8.133 Reaction rxnY133

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk1Y01} + \mathrm{APCC} \longrightarrow \mathrm{APCCYCdk1Y00YCdk1Y01YInt} \quad (279)$$

Reactants

Table 260: Properties of each reactant.

Id	Name	SBO
Cdk1Y01		
APCC		

Product

Table 261: Properties of each product.

Id	Name	SBO
APCCYCdk1Y00YCdk1Y01YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{133} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kbYAPCCYYCyclinA} \cdot [\mathrm{Cdk1Y01}] \cdot [\mathrm{APCC}] \quad (280)$$

8.134 Reaction rxnY134

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{APCCYCdk1Y00YCdk1Y01YInt} + \mathrm{APCC} \longrightarrow \mathrm{Cdk1Y01} \tag{281}$$

Reactants

Table 262: Properties of each reactant.

Id	Name	SBO
APCCYCdk1Y00YCdk1Y01YInt		
APCC		

Product

Table 263: Properties of each product.

Id	Name	SBO
Cdk1Y01		

Kinetic Law

Derived unit contains undeclared units

$$v_{134} = \mathrm{vol}\left(\mathrm{X}\right) \cdot \mathrm{kuYAPCCYYCyclinA} \cdot \left[\mathrm{APCCYCdk1Y00YCdk1Y01YInt}\right] \tag{282}$$

8.135 Reaction rxnY135

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

Reaction equation

$$\mathrm{APCCYCdk1Y00YCdk1Y01YInt} \longrightarrow \mathrm{Cdk1Y00} + \mathrm{APCC} \tag{283}$$

Reactant

Table 264: Properties of each reactant.

Id	Name	SBO
APCCYCdk1Y00YCdk1Y01YInt		

Products

Table 265: Properties of each product.

Id	Name	SBO
Cdk1Y00		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{135} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kudYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk1Y00YCdk1Y01YInt}] \quad (284)$$

8.136 Reaction rxnY136

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\mathrm{Cdk1Y11} + \mathrm{APCC} \longrightarrow \mathrm{APCCYCdk1Y10YCdk1Y11YInt} \quad (285)$$

Reactants

Table 266: Properties of each reactant.

Id	Name	SBO
Cdk1Y11		
APCC		

Product

Table 267: Properties of each product.

Id	Name	SBO
APCCYCdk1Y10YCdk1Y11YInt		

Kinetic Law

Derived unit contains undeclared units

$$v_{136} = \mathrm{vol}\,(\mathrm{X}) \cdot \mathrm{kbYAPCCYYCyclinA} \cdot [\mathrm{Cdk1Y11}] \cdot [\mathrm{APCC}] \quad (286)$$

8.137 Reaction rxnY137

This is an irreversible reaction of two reactants forming one product.

Reaction equation

$$\text{APCCYCdk1Y10YCdk1Y11YInt} + \text{APCC} \longrightarrow \text{Cdk1Y11} \tag{287}$$

Reactants

Table 268: Properties of each reactant.

Id	Name	SBO
APCCYCdk1Y10YCdk1Y11YInt		
APCC		

Product

Table 269: Properties of each product.

Id	Name	SBO
Cdk1Y11		

Kinetic Law

Derived unit contains undeclared units

$$v_{137} = \text{vol}(\text{X}) \cdot \text{kuYAPCCYYCyclinA} \cdot [\text{APCCYCdk1Y10YCdk1Y11YInt}] \tag{288}$$

8.138 Reaction rxnY138

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

Reaction equation

$$\text{APCCYCdk1Y10YCdk1Y11YInt} \longrightarrow \text{Cdk1Y10} + \text{APCC} \tag{289}$$

Reactant

Table 270: Properties of each reactant.

Id	Name	SBO
APCCYCdk1Y10YCdk1Y11YInt		

Products

Table 271: Properties of each product.

Id	Name	SBO
Cdk1Y10		
APCC		

Kinetic Law

Derived unit contains undeclared units

$$v_{138} = \mathrm{vol}(\mathrm{X}) \cdot \mathrm{kudYAPCCYYCyclinA} \cdot [\mathrm{APCCYCdk1Y10YCdk1Y11YInt}] \quad (290)$$

9 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.

Identifiers for kinetic laws highlighted in gray cannot be verified to evaluate to units of SBML `substance` per `time`. As a result, some SBML interpreters may not be able to verify the consistency of the units on quantities in the model. Please check if

- parameters without an unit definition are involved or
- volume correction is necessary because the `hasOnlySubstanceUnits` flag may be set to `false` and `spacialDimensions`> 0 for certain species.

9.1 Species APCC

Initial amount 24582.9 item

This species takes part in 24 reactions (as a reactant in rxnY116, rxnY118, rxnY121, rxnY124, rxnY127, rxnY130, rxnY133, rxnY134, rxnY136, rxnY137 and as a product in rxnY036, rxnY117, rxnY119, rxnY120, rxnY122, rxnY123, rxnY125, rxnY126, rxnY128, rxnY129, rxnY131, rxnY132, rxnY135, rxnY138).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCC} = {} & v_{36} + v_{117} + v_{119} + v_{120} + v_{122} + v_{123} + v_{125} + v_{126} \\ & + v_{128} + v_{129} + v_{131} + v_{132} + v_{135} + v_{138} - v_{116} - v_{118} \\ & - v_{121} - v_{124} - v_{127} - v_{130} - v_{133} - v_{134} - v_{136} - v_{137}\end{aligned} \quad (291)$$

9.2 Species APCCYCdk1Y00YCdk1Y01YInt

Initial amount 104.388 item

This species takes part in three reactions (as a reactant in rxnY134, rxnY135 and as a product in rxnY133).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYCdk1Y00YCdk1Y01YInt} = v_{133} - v_{134} - v_{135} \tag{292}$$

9.3 Species APCCYCdk1Y10YCdk1Y11YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY137, rxnY138 and as a product in rxnY136).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYCdk1Y10YCdk1Y11YInt} = v_{136} - v_{137} - v_{138} \tag{293}$$

9.4 Species APCCYCdk2Y000YCdk2Y002YInt

Initial amount 52.8191 item

This species takes part in three reactions (as a reactant in rxnY122, rxnY123 and as a product in rxnY121).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYCdk2Y000YCdk2Y002YInt} = v_{121} - v_{122} - v_{123} \tag{294}$$

9.5 Species APCCYCdk2Y010YCdk2Y012YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY128, rxnY129 and as a product in rxnY127).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYCdk2Y010YCdk2Y012YInt} = v_{127} - v_{128} - v_{129} \tag{295}$$

9.6 Species APCCYCdk2Y100YCdk2Y102YInt

Initial amount 90.5091 item

This species takes part in three reactions (as a reactant in rxnY125, rxnY126 and as a product in rxnY124).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYCdk2Y100YCdk2Y102YInt} = v_{124} - v_{125} - v_{126} \tag{296}$$

9.7 Species APCCYCdk2Y110YCdk2Y112YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY131, rxnY132 and as a product in rxnY130).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYCdk2Y110YCdk2Y112YInt} = v_{130} - v_{131} - v_{132} \tag{297}$$

9.8 Species APCCYCyclinAYInt

Initial amount 8.79462 item

This species takes part in three reactions (as a reactant in rxnY119, rxnY120 and as a product in rxnY118).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYCyclinAYInt} = v_{118} - v_{119} - v_{120} \tag{298}$$

9.9 Species APCCYEmi1

Initial amount 5160.61 item

This species takes part in three reactions (as a reactant in rxnY036, rxnY117 and as a product in rxnY116).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{APCCYEmi1} = v_{116} - v_{36} - v_{117} \tag{299}$$

9.10 Species Cdk1Y00

Initial amount 98550.6 item

This species takes part in five reactions (as a reactant in rxnY079, rxnY081 and as a product in rxnY023, rxnY082, rxnY135).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk1Y00} = v_{23} + v_{82} + v_{135} - v_{79} - v_{81} \tag{300}$$

9.11 Species Cdk1Y01

Initial amount 1345.01 item

This species takes part in six reactions (as a reactant in rxnY023, rxnY080, rxnY082, rxnY133 and as a product in rxnY081, rxnY134).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk1Y01} = v_{81} + v_{134} - v_{23} - v_{80} - v_{82} - v_{133} \tag{301}$$

9.12 Species Cdk1Y10

Initial amount 0 item

This species takes part in five reactions (as a reactant in rxnY083 and as a product in rxnY024, rxnY079, rxnY084, rxnY138).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk1Y10} = v_{24} + v_{79} + v_{84} + v_{138} - v_{83} \tag{302}$$

9.13 Species Cdk1Y11

Initial amount 0 item

This species takes part in twelve reactions (as a reactant in rxnY024, rxnY084, rxnY103, rxnY106, rxnY136 and as a product in rxnY080, rxnY083, rxnY104, rxnY105, rxnY107, rxnY108, rxnY137).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk1Y11} = {} & v_{80} + v_{83} + v_{104} + v_{105} + v_{107} + v_{108} \\ & + v_{137} - v_{24} - v_{84} - v_{103} - v_{106} - v_{136}\end{aligned} \tag{303}$$

9.14 Species Cdk1Y11YpRbY10YpRbY20YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY104, rxnY105 and as a product in rxnY103).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk1Y11YpRbY10YpRbY20YInt} = v_{103} - v_{104} - v_{105} \tag{304}$$

9.15 Species Cdk1Y11YpRbY11YpRbY21YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY107, rxnY108 and as a product in rxnY106).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk1Y11YpRbY11YpRbY21YInt} = v_{106} - v_{107} - v_{108} \tag{305}$$

9.16 Species Cdk2Y000

Initial amount 33942 item

This species takes part in eleven reactions (as a reactant in rxnY045, rxnY057, rxnY063, rxnY071 and as a product in rxnY009, rxnY017, rxnY025, rxnY046, rxnY064, rxnY072, rxnY123).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y000} = v_{9} + v_{17} + v_{25} + v_{46} + v_{64} + v_{72} + v_{123} - v_{45} - v_{57} - v_{63} - v_{71} \tag{306}$$

9.17 Species Cdk2Y001

Initial amount 2176.46 item

This species takes part in seven reactions (as a reactant in rxnY017, rxnY047, rxnY059, rxnY064 and as a product in rxnY010, rxnY048, rxnY063).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y001} = v_{10} + v_{48} + v_{63} - v_{17} - v_{47} - v_{59} - v_{64} \tag{307}$$

9.18 Species Cdk2Y002

Initial amount 680.557 item

This species takes part in nine reactions (as a reactant in rxnY025, rxnY049, rxnY061, rxnY072, rxnY121 and as a product in rxnY011, rxnY050, rxnY071, rxnY122).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y002} = v_{11} + v_{50} + v_{71} + v_{122} - v_{25} - v_{49} - v_{61} - v_{72} - v_{121} \tag{308}$$

9.19 Species Cdk2Y010

Initial amount 0 item

This species takes part in eleven reactions (as a reactant in rxnY051, rxnY067, rxnY075 and as a product in rxnY012, rxnY019, rxnY027, rxnY052, rxnY057, rxnY068, rxnY076, rxnY129).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y010} = v_{12} + v_{19} + v_{27} + v_{52} + v_{57} + v_{68} + v_{76} + v_{129} - v_{51} - v_{67} - v_{75} \tag{309}$$

9.20 Species Cdk2Y011

Initial amount 0 item

This species takes part in 13 reactions (as a reactant in rxnY019, rxnY053, rxnY068, rxnY091, rxnY094 and as a product in rxnY013, rxnY054, rxnY059, rxnY067, rxnY092, rxnY093, rxnY095, rxnY096).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y011} = {} & v_{13} + v_{54} + v_{59} + v_{67} + v_{92} + v_{93} + v_{95} \\ & + v_{96} - v_{19} - v_{53} - v_{68} - v_{91} - v_{94}\end{aligned} \tag{310}$$

9.21 Species Cdk2Y011YpRbY10YpRbY20YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY092, rxnY093 and as a product in rxnY091).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y011YpRbY10YpRbY20YInt} = v_{91} - v_{92} - v_{93} \tag{311}$$

9.22 Species Cdk2Y011YpRbY11YpRbY21YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY095, rxnY096 and as a product in rxnY094).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y011YpRbY11YpRbY21YInt} = v_{94} - v_{95} - v_{96} \tag{312}$$

9.23 Species Cdk2Y012

Initial amount 0 item

This species takes part in 15 reactions (as a reactant in rxnY027, rxnY055, rxnY076, rxnY097, rxnY100, rxnY127 and as a product in rxnY014, rxnY056, rxnY061, rxnY075, rxnY098, rxnY099, rxnY101, rxnY102, rxnY128).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y012} = {} & v_{14} + v_{56} + v_{61} + v_{75} + v_{98} + v_{99} + v_{101} + v_{102} \\ & + v_{128} - v_{27} - v_{55} - v_{76} - v_{97} - v_{100} - v_{127}\end{aligned} \tag{313}$$

9.24 Species Cdk2Y012YpRbY10YpRbY20YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY098, rxnY099 and as a product in rxnY097).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y012YpRbY10YpRbY20YInt} = v_{97} - v_{98} - v_{99} \tag{314}$$

9.25 Species Cdk2Y012YpRbY11YpRbY21YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY101, rxnY102 and as a product in rxnY100).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y012YpRbY11YpRbY21YInt} = v_{100} - v_{101} - v_{102} \tag{315}$$

9.26 Species Cdk2Y100

Initial amount 58162 item

This species takes part in eleven reactions (as a reactant in rxnY009, rxnY046, rxnY058, rxnY065, rxnY073 and as a product in rxnY018, rxnY026, rxnY045, rxnY066, rxnY074, rxnY126).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y100} = v_{18} + v_{26} + v_{45} + v_{66} + v_{74} + v_{126} - v_{9} - v_{46} - v_{58} - v_{65} - v_{73} \tag{316}$$

9.27 Species Cdk2Y101

Initial amount 3729.51 item

This species takes part in seven reactions (as a reactant in rxnY010, rxnY018, rxnY048, rxnY060, rxnY066 and as a product in rxnY047, rxnY065).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y101} = v_{47} + v_{65} - v_{10} - v_{18} - v_{48} - v_{60} - v_{66} \tag{317}$$

9.28 Species Cdk2Y102

Initial amount 1166.18 item

This species takes part in ten reactions (as a reactant in rxnY011, rxnY026, rxnY050, rxnY062, rxnY074, rxnY124 and as a product in rxnY049, rxnY073, rxnY125 and as a modifier in rxnY127).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y102} = v_{49} + v_{73} + v_{125} - v_{11} - v_{26} - v_{50} - v_{62} - v_{74} - v_{124} \tag{318}$$

9.29 Species Cdk2Y110

Initial amount 0 item

This species takes part in eleven reactions (as a reactant in rxnY012, rxnY052, rxnY069, rxnY077 and as a product in rxnY020, rxnY028, rxnY051, rxnY058, rxnY070, rxnY078, rxnY132).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y110} = v_{20} + v_{28} + v_{51} + v_{58} + v_{70} + v_{78} + v_{132} - v_{12} - v_{52} - v_{69} - v_{77} \tag{319}$$

9.30 Species Cdk2Y111

Initial amount 0 item

This species takes part in seven reactions (as a reactant in rxnY013, rxnY020, rxnY054, rxnY070 and as a product in rxnY053, rxnY060, rxnY069).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y111} = v_{53} + v_{60} + v_{69} - v_{13} - v_{20} - v_{54} - v_{70} \tag{320}$$

9.31 Species Cdk2Y112

Initial amount 0 item

This species takes part in nine reactions (as a reactant in rxnY014, rxnY028, rxnY056, rxnY078, rxnY130 and as a product in rxnY055, rxnY062, rxnY077, rxnY131).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk2Y112} = v_{55} + v_{62} + v_{77} + v_{131} - v_{14} - v_{28} - v_{56} - v_{78} - v_{130} \tag{321}$$

9.32 Species Cdk4Y00

Initial amount 46551.9 item

This species takes part in six reactions (as a reactant in rxnY037, rxnY041 and as a product in rxnY003, rxnY007, rxnY038, rxnY042).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk4Y00} = v_3 + v_7 + v_{38} + v_{42} - v_{37} - v_{41} \tag{322}$$

9.33 Species Cdk4Y01

Initial amount 6547.64 item

This species takes part in twelve reactions (as a reactant in rxnY003, rxnY038, rxnY043, rxnY085, rxnY088 and as a product in rxnY008, rxnY037, rxnY044, rxnY086, rxnY087, rxnY089, rxnY090).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk4Y01} = v_8 + v_{37} + v_{44} + v_{86} + v_{87} + v_{89} + v_{90} - v_3 - v_{38} - v_{43} - v_{85} - v_{88} \tag{323}$$

9.34 Species Cdk4Y01YpRbY00YpRbY10YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY086, rxnY087 and as a product in rxnY085).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk4Y01YpRbY00YpRbY10YInt} = v_{85} - v_{86} - v_{87} \tag{324}$$

9.35 Species Cdk4Y01YpRbY01YpRbY11YInt

Initial amount 0 item

This species takes part in three reactions (as a reactant in rxnY089, rxnY090 and as a product in rxnY088).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk4Y01YpRbY01YpRbY11YInt} = v_{88} - v_{89} - v_{90} \tag{325}$$

9.36 Species Cdk4Y10

Initial amount 41117.2 item

This species takes part in six reactions (as a reactant in rxnY007, rxnY039, rxnY042 and as a product in rxnY004, rxnY040, rxnY041).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk4Y10} = v_4 + v_{40} + v_{41} - v_7 - v_{39} - v_{42} \tag{326}$$

9.37 Species Cdk4Y11

Initial amount 5783.23 item

This species takes part in six reactions (as a reactant in rxnY004, rxnY008, rxnY040, rxnY044 and as a product in rxnY039, rxnY043).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Cdk4Y11} = v_{39} + v_{43} - v_4 - v_8 - v_{40} - v_{44} \tag{327}$$

9.38 Species CyclinA

Initial amount 113.316 item

This species takes part in 16 reactions (as a reactant in rxnY022, rxnY071, rxnY073, rxnY075, rxnY077, rxnY081, rxnY083, rxnY118 and as a product in rxnY021, rxnY072, rxnY074, rxnY076, rxnY078, rxnY082, rxnY084, rxnY119).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{CyclinA} = {} & v_{21} + v_{72} + v_{74} + v_{76} + v_{78} + v_{82} + v_{84} + v_{119} \\ & - v_{22} - v_{71} - v_{73} - v_{75} - v_{77} - v_{81} - v_{83} - v_{118}\end{aligned} \tag{328}$$

9.39 Species CyclinD

Initial amount 14753.7 item

This species takes part in six reactions (as a reactant in rxnY002, rxnY037, rxnY039 and as a product in rxnY001, rxnY038, rxnY040).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{CyclinD} = v_1 + v_{38} + v_{40} - v_2 - v_{37} - v_{39} \tag{329}$$

9.40 Species CyclinE

Initial amount 191.985 item

This species takes part in ten reactions (as a reactant in rxnY016, rxnY063, rxnY065, rxnY067, rxnY069 and as a product in rxnY015, rxnY064, rxnY066, rxnY068, rxnY070).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{CyclinE} = v_{15} + v_{64} + v_{66} + v_{68} + v_{70} - v_{16} - v_{63} - v_{65} - v_{67} - v_{69} \tag{330}$$

9.41 Species E2F

Initial amount 546.211 item

This species takes part in seven reactions (as a reactant in rxnY030, rxnY111, rxnY113 and as a product in rxnY029, rxnY112, rxnY114, rxnY115).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{E2F} = v_{29} + v_{112} + v_{114} + v_{115} - v_{30} - v_{111} - v_{113} \tag{331}$$

9.42 Species Emi1

Initial amount 248.046 item

This species takes part in four reactions (as a reactant in rxnY035, rxnY116 and as a product in rxnY034, rxnY117).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{Emi1} = v_{34} + v_{117} - v_{35} - v_{116} \tag{332}$$

9.43 Species p27

Initial amount 14150.9 item

This species takes part in 18 reactions (as a reactant in rxnY006, rxnY041, rxnY043, rxnY045, rxnY047, rxnY049, rxnY051, rxnY053, rxnY055 and as a product in rxnY005, rxnY042, rxnY044, rxnY046, rxnY048, rxnY050, rxnY052, rxnY054, rxnY056).

$$\begin{aligned}\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{p27} = {} & v_5 + v_{42} + v_{44} + v_{46} + v_{48} + v_{50} + v_{52} + v_{54} + v_{56} \\ & - v_6 - v_{41} - v_{43} - v_{45} - v_{47} - v_{49} - v_{51} - v_{53} - v_{55}\end{aligned} \tag{333}$$

9.44 Species pRbY00

Initial amount 30000 item

This species takes part in six reactions (as a reactant in rxnY085, rxnY111 and as a product in rxnY031, rxnY086, rxnY109, rxnY112).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{pRbY00} = v_{31} + v_{86} + v_{109} + v_{112} - v_{85} - v_{111} \tag{334}$$

9.45 Species pRbY01

Initial amount 0 item

This species takes part in six reactions (as a reactant in rxnY031, rxnY088, rxnY112 and as a product in rxnY089, rxnY110, rxnY111).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{pRbY01} = v_{89} + v_{110} + v_{111} - v_{31} - v_{88} - v_{112} \tag{335}$$

9.46 Species pRbY10

Initial amount 28583.4 item

This species takes part in eleven reactions (as a reactant in rxnY091, rxnY097, rxnY103, rxnY113 and as a product in rxnY032, rxnY087, rxnY092, rxnY098, rxnY104, rxnY114 and as a modifier in rxnY106).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{pRbY10} = v_{32} + v_{87} + v_{92} + v_{98} + v_{104} + v_{114} - v_{91} - v_{97} - v_{103} - v_{113} \tag{336}$$

9.47 Species pRbY11

Initial amount 1416.59 item

This species takes part in ten reactions (as a reactant in rxnY032, rxnY094, rxnY100, rxnY106, rxnY114 and as a product in rxnY090, rxnY095, rxnY101, rxnY107, rxnY113).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{pRbY11} = v_{90} + v_{95} + v_{101} + v_{107} + v_{113} - v_{32} - v_{94} - v_{100} - v_{106} - v_{114} \quad (337)$$

9.48 Species pRbY20

Initial amount 0 item

This species takes part in six reactions (as a reactant in rxnY109 and as a product in rxnY033, rxnY093, rxnY099, rxnY105, rxnY115).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{pRbY20} = v_{33} + v_{93} + v_{99} + v_{105} + v_{115} - v_{109} \quad (338)$$

9.49 Species pRbY21

Initial amount 0 item

This species takes part in six reactions (as a reactant in rxnY033, rxnY110, rxnY115 and as a product in rxnY096, rxnY102, rxnY108).

$$\frac{\mathrm{d}}{\mathrm{d}t}\mathrm{pRbY21} = v_{96} + v_{102} + v_{108} - v_{33} - v_{110} - v_{115} \quad (339)$$

9.50 Species totalYCyclinYD

Involved in rule totalYCyclinYD

One rule which determines this species' quantity.

9.51 Species totalYCyclinYE

Involved in rule totalYCyclinYE

One rule which determines this species' quantity.

9.52 Species totalYCyclinYA

Involved in rule totalYCyclinYA

One rule which determines this species' quantity.

9.53 Species totalYp27

Involved in rule totalYp27

One rule which determines this species' quantity.

9.54 Species hypophosphorylatedYpRb

Involved in rule hypophosphorylatedYpRb

One rule which determines this species' quantity.

9.55 Species hyperphosphorylatedYpRb

Involved in rule hyperphosphorylatedYpRb

One rule which determines this species' quantity.

9.56 Species totalYEmi1

Involved in rule totalYEmi1

One rule which determines this species' quantity.

9.57 Species activeYCdk2

Involved in rule activeYCdk2

One rule which determines this species' quantity.

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

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