

## SBML Model Report

**Model name: “Chen2009 - ErbB Signaling”**



May 6, 2016

### 1 General Overview

This is a document in SBML Level 2 Version 3 format. This model was created by Lukas Endler<sup>1</sup> at July 26<sup>th</sup> 2010 at 5:39 p. m. and last time modified at April eighth 2016 at 4:15 p. m. Table 1 shows an overview of the quantities of all components of this model.

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

Element	Quantity	Element	Quantity
compartment types	0	compartments	6
species types	0	species	504
events	0	constraints	0
reactions	827	function definitions	2
global parameters	238	unit definitions	5
rules	20	initial assignments	0

### Model Notes

This is A431 IERMv1.0 model described in the article

**Input-output behavior of ErbB signaling pathways as revealed by a mass action model trained against dynamic data.**

William W Chen, Birgit Schoeberl, Paul J Jasper, Mario Niepel, Ulrik B Nielsen, Douglas A Lauffenburger and Peter K Sorger. Molecular Systems Biology 2009; 5:239. PMID: [19156131](#), DOI: [10.1038/msb.2008.74](#)

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#### Abstract:

The ErbB signaling pathways, which regulate diverse physiological responses such as cell survival, proliferation and motility, have been subjected to extensive molecular analysis. Nonetheless, it remains poorly understood how different ligands induce different responses and how this is affected by oncogenic mutations. To quantify signal flow through ErbB-activated pathways we have constructed, trained and analyzed a mass action model of immediate-early signaling involving ErbB1-4 receptors (EGFR, HER2/Neu2, ErbB3 and ErbB4), and the MAPK and PI3K/Akt cascades. We find that parameter sensitivity is strongly dependent on the feature (e.g. ERK or Akt activation) or condition (e.g. EGF or heregulin stimulation) under examination and that this context dependence is informative with respect to mechanisms of signal propagation. Modeling predicts log-linear amplification so that significant ERK and Akt activation is observed at ligand concentrations far below the  $K(d)$  for receptor binding. However, MAPK and Akt modules isolated from the ErbB model continue to exhibit switch-like responses. Thus, key system-wide features of ErbB signaling arise from nonlinear interaction among signaling elements, the properties of which appear quite different in context and in isolation.

The sbml model is available as supplemental material to the article and at <http://www.cdpcenter.org/resources/model-et-al-2008/>. It was slightly changed to make it valid SBML and to incorporate the step functions, described in the readme file and needed for inhibitor preincubation. the equilibration processes end at 1800 sec, so to reproduce the dynamics shown in the publication and supplemental material, only the time points after 1800 need to be considered. The parameter set is the hand fitted one used for Sfigure 3 in the supplemental materials. All species are in molecules, apart from HRG, EGF and Inh, which are in M.

The results shown in SFigure 3 can be calculated dividing the parameters  $ERK\_PP$ ,  $AKT\_PP$  and  $ERB\_B1\_P\_tot$  by  $ERK\_t$ ,  $AKT\_t$  and  $EGFR\_t$ , respectively. Somehow we did not find the right scaling factor for the phosphorylated ErbB1 receptor. Therefore the model does only qualitatively reproduces the timecourses shown in the first row of Sfigure 3.

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To cite BioModels Database, please use Le Novre N., Bornstein B., Broicher A., Courtot M., Donizelli M., Dharuri H., Li L., Sauro H., Schilstra M., Shapiro B., Snoep J.L., Hucka M. (2006) BioModels Database: A Free, Centralized Database of Curated, Published, Quantitative Kinetic Models of Biochemical and Cellular Systems *Nucleic Acids Res.*, 34: D689-D691.

## 2 Unit Definitions

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

### 2.1 Unit time

#### Definition s

## 2.2 Unit substance

**Definition** item

## 2.3 Unit volume

**Definition** l

## 2.4 Unit per\_sec

**Definition** s<sup>-1</sup>

## 2.5 Unit per\_item\_per\_sec

**Definition** item<sup>-1</sup> · s<sup>-1</sup>

## 2.6 Unit area

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

**Definition** m<sup>2</sup>

## 2.7 Unit length

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

**Definition** m

# 3 Compartments

This model contains six compartments.

Table 2: Properties of all compartments.

Id	Name	SBO	Spatial Dimensions	Size	Unit	Constant	Outside
plasma_membrane	plasma membrane	0000290	2	1	m <sup>2</sup>	✓	
endosomes	endosomes	0000290	3	1	litre	✓	
lysosomes	lysosomes	0000290	3	1	litre	✓	
medium	medium	0000290	3	1	litre	✓	
endosomal_membrane	endosomal membrane	0000290	2	1	m <sup>2</sup>	✓	
cytoplasm	cytoplasm	0000290	3	1	litre	✓	

### 3.1 Compartment `plasma_membrane`

This is a two dimensional compartment with a constant size of one  $\text{m}^2$ .

**Name** `plasma membrane`

**SBO:0000290** `physical compartment`

### 3.2 Compartment `endosomes`

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

**Name** `endosomes`

**SBO:0000290** `physical compartment`

### 3.3 Compartment `lysosomes`

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

**Name** `lysosomes`

**SBO:0000290** `physical compartment`

### 3.4 Compartment `medium`

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

**Name** `medium`

**SBO:0000290** `physical compartment`

### 3.5 Compartment `endosomal_membrane`

This is a two dimensional compartment with a constant size of one  $\text{m}^2$ .

**Name** `endosomal membrane`

**SBO:0000290** `physical compartment`

### 3.6 Compartment `cytoplasm`

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

**Name** `cytoplasm`

**SBO:0000290** `physical compartment`

## 4 Species

This model contains 504 species. The boundary condition of four of these species is set to true so that these species' amount cannot be changed by any reaction. 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 Condi- tion
c1	EGF	medium	$\text{mol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c2	ErbB1:ATP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c3	EGF:ErbB1:ATP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c288	(ErbB2:ErbB3)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c335	(ErbB3:ErbB2)_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c117	ErbB2:ErbB4	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c336	(ErbB4:ErbB2)_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c286	ErbB1:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c499	EGF:ErbB1:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c500	(EGF:ErbB1:ATP::EGF:ErbB1:Inh)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c501	2(EGF:ErbB1:Inh)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c4	2(EGF:ErbB1:ATP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c10	EGF:ErbB1:ATP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c11	2(EGF:ErbB1:ATP)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c141	ErbB2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c145	EGF:ErbB1:ErbB2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c140	ErbB3	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c146	EGF:ErbB1:ErbB3	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c143	ErbB4	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c147	EGF:ErbB1:ErbB4	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c155	ErbB2	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c159	(EGF:ErbB1:ErbB2)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c154	ErbB3	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c160	(EGF:ErbB1:ErbB3)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c156	ErbB4	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c161	(EGF:ErbB1:ErbB4)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c492	EGF:ErbB1:Inh:ErB2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c493	EGF:ErbB1:Inh:ErB3	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c494	EGF:ErbB1:Inh:ErB4	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c502	ErbB2:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c504	(EGF:ErbB1:ErbB2):Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c503	ErbB4:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c505	(EGF:ErbB1:ErbB3)_P:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c506	ErbB3:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c507	(EGF:ErbB1:ErbB3)_P:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c105	ATP 1.2e9	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c123	(EGF:ErbB1:ErbB2):ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c124	(EGF:ErbB1:ErbB3):ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c125	(EGF:ErbB1:ErbB4):ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c126	2(EGF:ErbB1):ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c116	2(EGF:ErbB1:ATP)-FullActive	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c122	EGF:ErbB1:ErbB2:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c127	EGF:ErbB1:ErbB3:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c128	EGF:ErbB1:ErbB4:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c284	ErbB2:ErbB2_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c129	ErbB2:ErbB2_P:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c427	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c130	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c428	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c131	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c429	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c132	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c436	2(ErbB2)_P:GAP:Grb2:Gab1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c133	2(ErbB2)_P:GAP:Grb2:Gab1:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c439	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c134	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c442	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c135	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c483	2(EGF:ErbB1)_P:GAP:Grb2:Gab1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c136	2(EGF:ErbB1)_P:GAP:Grb2:Gab1:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c516	(HRG:ErbB3:ErbB1)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c137	(HRG:ErbB3:ErbB1):ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c517	(HRG:ErbB4:ErbB1)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c138	(HRG:ErbB4:ErbB1):ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c345	(HRG:ErbB4):ErbB2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c139	(HRG:ErbB4):ErbB2:ATP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c355	(HRG:ErbB3):ErbB2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c168	(HRG:ErbB3):ErbB2:ATP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c421	(HRG:ErbB3):ErbB2)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c169	((HRG:ErbB3):ErbB2):ATP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c422	((HRG:ErbB4):ErbB2)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c170	((HRG:ErbB4):ErbB2):ATP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c23	2(EGF:ErbB1)_P:GAP:Grb2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c12	cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c7	2(EGF:ErbB1)_P:GAP:Grb2:cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c88	2(EGF:ErbB1)_P:GAP:Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c27	2(EGF:ErbB1)- _P:GAP:Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c89	2(EGF:ErbB1)- _P:GAP:Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c29	2(EGF:ErbB1)- _P:GAP:Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c90	2(EGF:ErbB1)- _P:GAP:Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c34	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	plasma_membrane	item	$\square$	$\square$
c91	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c92	2(EGF:ErbB1)_P:GAP:(Shc- _P):Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c36	2(EGF:ErbB1)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c93	2(EGF:ErbB1)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c37	2(EGF:ErbB1)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c94	2(EGF:ErbB1)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c189	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	plasma_membrane	item	$\square$	$\square$
c195	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c190	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	plasma_membrane	item	$\square$	$\square$
c196	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:cPP	plasma_membrane	item	$\square$	$\square$



Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c191	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c197	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c204	(ErbB1:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c205	(ErbB1:ErbB3)_P:GAP:(Shc- _P):Grb2:Sos:cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c206	(ErbB1:ErbB4)_P:GAP:(Shc- _P):Grb2:Sos:cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c207	(ErbB1:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c213	(ErbB1:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c208	(ErbB1:ErbB3)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c214	(ErbB1:ErbB3)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c209	(ErbB1:ErbB4)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c215	(ErbB1:ErbB4)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c216	(ErbB1:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c222	(ErbB1:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c217	(ErbB1:ErbB3)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c223	(ErbB1:ErbB3)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c218	(ErbB1:ErbB4)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c224	(ErbB1:ErbB4)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c225	(ErbB1:ErbB2)_P:GAP:Grb2	plasma_membrane	item	$\square$	$\square$
c231	(ErbB1:ErbB2)_P:GAP:Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c226	(ErbB1:ErbB3)_P:GAP:Grb2	plasma_membrane	item	$\square$	$\square$
c232	(ErbB1:ErbB3)_P:GAP:Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c227	(ErbB1:ErbB4)_P:GAP:Grb2	plasma_membrane	item	$\square$	$\square$
c233	(ErbB1:ErbB4)_P:GAP:Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c243	(ErbB1:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c249	(ErbB1:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c244	(ErbB1:ErbB3)- _P:GAP:Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c250	(ErbB1:ErbB3)- _P:GAP:Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c245	(ErbB1:ErbB4)- _P:GAP:Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c251	(ErbB1:ErbB4)- _P:GAP:Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c252	(ErbB1:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c258	(ErbB1:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c253	(ErbB1:ErbB3)- _P:GAP:Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c259	(ErbB1:ErbB3)- _P:GAP:Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c254	(ErbB1:ErbB4)- _P:GAP:Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c260	(ErbB1:ErbB4)- _P:GAP:Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c240	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c241	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c242	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c300	2(ErbB2)_P:GAP:(Shc_P):Grb2	plasma_membrane	item	$\square$	$\square$
c301	2(ErbB2)_P:GAP:(Shc_P):Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c304	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c306	2(ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c307	2(ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c309	2(ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c310	2(ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c312	2(ErbB2)_P:GAP:Grb2	plasma_membrane	item	$\square$	$\square$
c313	2(ErbB2)_P:GAP:Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c315	2(ErbB2)_P:GAP:Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c316	2(ErbB2)_P:GAP:Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c318	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c319	2(ErbB2)-_P:GAP:Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c321	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c322	2(ErbB2)-_P:GAP:Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c357	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	plasma_membrane	item	$\square$	$\square$
c358	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c360	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	plasma_membrane	item	$\square$	$\square$
c361	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c367	(ErbB4:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c369	(ErbB3:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c370	(ErbB3:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c372	(ErbB4:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c373	(ErbB4:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c375	(ErbB3:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c376	(ErbB3:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c378	(ErbB4:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c379	(ErbB4:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c381	(ErbB3:ErbB2)_P:GAP:Grb2	plasma_membrane	item	$\square$	$\square$
c382	(ErbB3:ErbB2)_P:GAP:Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c363	(ErbB3:ErbB2)_P:GAP:(Shc-P):Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c364	(ErbB3:ErbB2)_P:GAP:(Shc-P):Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c384	(ErbB4:ErbB2)_P:GAP:Grb2	plasma_membrane	item	$\square$	$\square$
c385	(ErbB4:ErbB2)_P:GAP:Grb2:cPP	plasma_membrane	item	$\square$	$\square$
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c388	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	plasma_membrane	item	$\square$	$\square$
c391	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:cPP	plasma_membrane	item	$\square$	$\square$
c393	(ErbB3:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$
c394	(ErbB3:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c396	(ErbB4:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP)	plasma_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c397	(ErbB4:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP):cPP	plasma_membrane	item	$\square$	$\square$
c399	(ErbB3:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c400	(ErbB3:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c402	(ErbB4:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP)	plasma_membrane	item	$\square$	$\square$
c403	(ErbB4:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP):cPP	plasma_membrane	item	$\square$	$\square$
c9	cPP	endosomal_membrane	item	$\square$	$\square$
c404	(ErbB4:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c401	(ErbB3:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c398	(ErbB4:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c395	(ErbB3:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c386	(ErbB4:ErbB2)_P:GAP:Grb2	endosomal_membrane	item	$\square$	$\square$
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c383	(ErbB3:ErbB2)_P:GAP:Grb2	endosomal_membrane	item	$\square$	$\square$
c380	(ErbB4:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c377	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c374	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c371	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c362	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	endosomal_membrane	item	$\square$	$\square$
c359	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	endosomal_membrane	item	$\square$	$\square$
c323	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c320	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c317	2(ErbB2)_P:GAP:Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c314	2(ErbB2)_P:GAP:Grb2	endosomal_membrane	item	$\square$	$\square$
c311	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c308	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c302	2(ErbB2)_P:GAP:(Shc_P):Grb2	endosomal_membrane	item	$\square$	$\square$
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c257	(ErbB1:ErbB4)- _P:GAP:Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c256	(ErbB1:ErbB3)- _P:GAP:Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c255	(ErbB1:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c248	(ErbB1:ErbB4)- _P:GAP:Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c247	(ErbB1:ErbB3)- _P:GAP:Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c246	(ErbB1:ErbB2)- _P:GAP:Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c230	(ErbB1:ErbB4)_P:GAP:Grb2	endosomal_membrane	item	$\square$	$\square$
c229	(ErbB1:ErbB3)_P:GAP:Grb2	endosomal_membrane	item	$\square$	$\square$
c228	(ErbB1:ErbB2)_P:GAP:Grb2	endosomal_membrane	item	$\square$	$\square$
c221	(ErbB1:ErbB4)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c220	(ErbB1:ErbB3)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c219	(ErbB1:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	$\square$	$\square$
c212	(ErbB1:ErbB4)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c211	(ErbB1:ErbB3)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c210	(ErbB1:ErbB2)_P:GAP:(Shc- _P):Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	$\square$	$\square$
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	endosomal_membrane	item	$\square$	$\square$
c194	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	endosomal_membrane	item	$\square$	$\square$



Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c193	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c192	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c68	2(EGF:ErbB1)_P:GAP:(Shc-_P):Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c67	2(EGF:ErbB1)_P:GAP:(Shc-_P):Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c21	2(EGF:ErbB1)-_P:GAP:Grb2:Sos:(Ras:GTP)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c20	2(EGF:ErbB1)-_P:GAP:Grb2:Sos:(Ras:GDP)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c18	2(EGF:ErbB1)_P:GAP:Grb2	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c6	ErbB1:ATP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c5	2(EGF:ErbB1)_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c8	2(EGF:ErbB1)_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c15	2(EGF:ErbB1)_P:GAP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c17	2(EGF:ErbB1)_P:GAP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c32	2(EGF:ErbB1)_P:GAP:Shc	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c63	2(EGF:ErbB1)_P:GAP:Shc	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c33	2(EGF:ErbB1)_P:GAP:(Shc_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c64	2(EGF:ErbB1)_P:GAP:(Shc_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c347	(ErbB3:ErbB2)_P:GAP:Shc	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c349	(ErbB3:ErbB2)_P:GAP:Shc	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c348	(ErbB4:ErbB2)_P:GAP:Shc	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c350	(ErbB4:ErbB2)_P:GAP:Shc	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c351	(ErbB3:ErbB2)_P:GAP:(Shc_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c353	(ErbB3:ErbB2)_P:GAP:(Shc_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c508	ErbB2:Inh	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c512	ErbB4:Inh	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c354	(ErbB4:ErbB2)_P:GAP:(Shc_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c356	(ErbB4:ErbB2)_P:GAP:(Shc_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c148	(ErbB1:ErbB2)_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c162	(ErbB1:ErbB2)_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c149	(ErbB1:ErbB3)_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c163	(ErbB1:ErbB3)_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c150	(ErbB1:ErbB4)_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c164	(ErbB1:ErbB4)_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c289	2(ErbB2)_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c290	2(ErbB2)_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c337	(ErbB3:ErbB2)_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c338	(ErbB4:ErbB2)_P	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c291	2(ErbB2)_P:GAP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c293	2(ErbB2)_P:GAP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c294	2(ErbB2)_P:GAP:Shc	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c296	2(ErbB2)_P:GAP:Shc	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c297	2(ErbB2)_P:GAP:(Shc_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c299	2(ErbB2)_P:GAP:(Shc_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c14	GAP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c165	(ErbB1:ErbB2)_P:GAP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c166	(ErbB1:ErbB3)_P:GAP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c167	(ErbB1:ErbB4)_P:GAP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c151	(ErbB1:ErbB2)_P:GAP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c152	(ErbB1:ErbB3)_P:GAP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c153	(ErbB1:ErbB4)_P:GAP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c341	(ErbB3:ErbB2)_P:GAP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c344	(ErbB4:ErbB2)_P:GAP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c343	(ErbB3:ErbB2)_P:GAP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c346	(ErbB4:ErbB2)_P:GAP	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c16	EGF	endosomes	item	<input type="checkbox"/>	<input type="checkbox"/>
c515	HRG	endosomes	item	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c157	(HRG:ErbB3)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c22	Grb2	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c40	(Shc_P)	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c39	(Shc_P):Grb2	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c180	(ErbB1:ErbB2)_P:GAP:(Shc_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c181	(ErbB1:ErbB3)_P:GAP:(Shc_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c182	(ErbB1:ErbB4)_P:GAP:(Shc_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c183	(ErbB1:ErbB2)_P:GAP:(Shc_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c184	(ErbB1:ErbB3)_P:GAP:(Shc_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c185	(ErbB1:ErbB4)_P:GAP:(Shc_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c24	Sos	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c26	Ras:GDP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c28	Ras:GTP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c69	(Ras:GTP)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c43	Ras_activated:GTP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c71	(Ras_activated:GTP)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c31	Shc	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c171	(ErbB1:ErbB2)_P:GAP:Shc	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c172	(ErbB1:ErbB3)_P:GAP:Shc	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c173	(ErbB1:ErbB4)_P:GAP:Shc	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c174	(ErbB1:ErbB2)_P:GAP:Shc	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c175	(ErbB1:ErbB3)_P:GAP:Shc	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c176	(ErbB1:ErbB4)_P:GAP:Shc	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c41	Raf	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c42	Raf:Ras:GTP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c70	(Raf:Ras:GTP)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c72	(Raf_P)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c45	Raf_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c38	(Shc_P):Grb2:Sos	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c30	Grb2:Sos	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c44	Pase1	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c73	(Raf_P:Pase1)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c46	Raf_P:Pase1	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c75	(MEK_P)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c76	(MEK_P:Raf_P)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c47	MEK	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c74	(MEK:Raf_P)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c48	MEK:Raf_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c49	MEK_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c50	MEK_P:Raf_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c51	MEK_PP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c77	(MEK_PP)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c53	Pase2	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c78	(MEK_PP:Pase2)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c52	MEK_PP:Pase2	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c54	MEK_P:Pase2	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c79	(MEK_P:Pase2)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c55	ERK	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c56	ERK:MEK_PP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c57	ERK_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c58	ERK_P:MEK_PP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c80	MEK_PP:ERK	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c81	(ERK_P)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c82	MEK_PP:ERK_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c59	ERK_PP	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c83	(ERK_PP)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c60	Pase3	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c61	ERK_PP:Pase3	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c84	(ERK_PP:Pase3)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c62	ERK_P:Pase3	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c85	(ERK_P:Pase3)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c86	R_degraded	lysosomes	item	<input type="checkbox"/>	<input type="checkbox"/>
c425	2(ErbB2)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c13	EGF_degraded	lysosomes	item	<input type="checkbox"/>	<input type="checkbox"/>
c518	(HRG:ErbB3:ErbB1)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c519	(HRG:ErbB4:ErbB1)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c339	(ErbB3:ErbB2)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c340	(ErbB4:ErbB2)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c95	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(ERK_PP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c96	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(ERK_PP)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c97	2(EGF:ErbB1)_P:GAP:(Shc-_P):Grb2:Sos:ERK_PP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c98	2(EGF:ErbB1)_P:GAP:(Shc-_P):Grb2:Sos:(ERK_PP)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c101	(ERK_PP):Sos	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c102	((ERK_PP):Sos)_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c99	2(EGF:ErbB1)_P:GAP:Grb2:Sos_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c419	2(EGF:ErbB1)_P:GAP:(Shc-_P):Grb2:(Sos_P)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c103	Sos_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c100	2(EGF:ErbB1)_P:GAP:Grb2:(Sos_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c420	2(EGF:ErbB1)_P:GAP:(Shc-_P):Grb2:(Sos_P)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c287	PI3K	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c486	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P#)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c104	2(EGF:ErbB1)_P:GAP:Grb2:Gab1-_P:PI3K	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c447	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c263	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1-_P:PI3K	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c445	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c261	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c446	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c262	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1-_P:PI3K	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c454	2(ErbB2)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c324	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c457	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c405	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c460	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c408	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c106	PIP3	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c453	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:PIP2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c452	2(ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:PIP2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c448	2(EGF:ErbB1)_P:GAP:Grb2:Gab1-_P:PI3K:PIP2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c449	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:PIP2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c450	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1-_P:PI3K:PIP2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c451	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1-_P:PI3K:PIP2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c467	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:(PIP2)2	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c468	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:(PIP2)3	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c469	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:(PIP2)4	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c470	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:(PIP2)5	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c471	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-_P:PI3K:(PIP2)6	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c107	AKT	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c108	PIP3:AKT	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c112	AKT_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c495	PIP3:AKT_P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c109	PDK1	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c496	PIP3:AKT_P:PDK1	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c110	PIP3:AKT:PDK1	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c111	PIP3:PDK1	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c497	AKT:P:P	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c113	Pase4	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c498	AKT:P:P:Pase4	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c114	AKT_P:Pase4	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c280	RTK_Pase	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c281	(ErbB1:ErbB3)_P:RTK_Pase	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c282	(ErbB1:ErbB4)_P:RTK_Pase	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c415	2(EGF:ErbB1)_P:RTK_Pase	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c283	2(ErbB2)_P:RTK_Pase	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c417	(ErbB2:ErbB3)_P:RTK_Pase	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c418	(ErbB2:ErbB4)_P:RTK_Pase	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c416	(ErbB1:ErbB2)_P:RTK_Pase	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c87	ErbB2_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c531	ErbB1	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c285	Inh	medium	mol · l <sup>-1</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c330	EGF:ErbB1_P	plasma_membrane	item	$\square$	$\square$
c331	ErbB3_P	plasma_membrane	item	$\square$	$\square$
c332	ErbB4_P	plasma_membrane	item	$\square$	$\square$
c509	ErbB2:ErbB2:Inh	plasma_membrane	item	$\square$	$\square$
c510	ErbB3:ErbB2:Inh	plasma_membrane	item	$\square$	$\square$
c511	ErbB4:ErbB2:Inh	plasma_membrane	item	$\square$	$\square$
c513	ErbB4:Inh:ErbB2	plasma_membrane	item	$\square$	$\square$
c461	Shp	cytoplasm	item	$\square$	$\square$
c444	PIP2	cytoplasm	item	$\square$	$\square$
c462	PIP3:Shp	cytoplasm	item	$\square$	$\square$
c279	PTEN	cytoplasm	item	$\square$	$\square$
c482	PIP3:PTEN	cytoplasm	item	$\square$	$\square$
c426	Gab1	cytoplasm	item	$\square$	$\square$
c455	PI3K	cytoplasm	item	$\square$	$\square$
c463	Shp2	cytoplasm	item	$\square$	$\square$
c464	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1- _P:Shp2	plasma_membrane	item	$\square$	$\square$
c465	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1- _P:Shp2	plasma_membrane	item	$\square$	$\square$
c466	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1- _P:Shp2	plasma_membrane	item	$\square$	$\square$
c473	2(ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	plasma_membrane	item	$\square$	$\square$
c476	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1- _P:Shp2	plasma_membrane	item	$\square$	$\square$
c479	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1- _P:Shp2	plasma_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c489	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1-P):Shp2	plasma_membrane	item	$\square$	$\square$
c431	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1-P):ERK_PP	plasma_membrane	item	$\square$	$\square$
c432	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1-P):ERK_PP_i	plasma_membrane	item	$\square$	$\square$
c433	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1-P:ERK_PP	plasma_membrane	item	$\square$	$\square$
c434	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1-P:ERK_PP_i	plasma_membrane	item	$\square$	$\square$
c435	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1-P:ERK_PP	plasma_membrane	item	$\square$	$\square$
c437	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1-P:ERK_PP_i	endosomes	item	$\square$	$\square$
c438	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P-ERK_PP	endosomes	item	$\square$	$\square$
c440	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1-P:ERK_PP_i	endosomes	item	$\square$	$\square$
c474	2(ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	plasma_membrane	item	$\square$	$\square$
c475	2(ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP-i	plasma_membrane	item	$\square$	$\square$
c477	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-P:ERK_PP	plasma_membrane	item	$\square$	$\square$
c478	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1-P:ERK_PP_i	plasma_membrane	item	$\square$	$\square$
c480	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1-P:ERK_PP	plasma_membrane	item	$\square$	$\square$

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c481	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1- _P:ERK_PP_i	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c491	ErbB3/4:ErbB2:Gab1_P#	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c490	2(ErbB2)2:Gab1_P#	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c410	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c409	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c430	ErbB1:ErbB:Gab1_P#	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c488	2(EGF:ErbB1):Gab1_P#	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c487	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:_PP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c264	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1- _P):PI3K:Ras:GDP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c265	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1- _P:PI3K:Ras:GDP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c266	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1- _P:PI3K:Ras:GDP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c267	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1- _P:PI3K:Ras:GDP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c268	2(ErbB2)_P:GAP:Grb2:Gab1- _P:PI3K:Ras:GDP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c269	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1- _P:PI3K:Ras:GDP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c325	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1- _P:PI3K:Ras:GDP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c472	AKT:P:P:Raf:P:Ser	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c484	AKT:P:P:Raf:P:Ser_i	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c485	Raf:P:Ser	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c520	MKP_deg	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condition
c521	Pase9t	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>
c522	2(EGF:ErbB1):Gab1_P#:Pase9t	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c523	2(ErbB2)2:Gab1_P#:Pase9t	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c411	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1-_P:Pase9t	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c412	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1-_P:Pase9t	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c456	ErbB3/4:ErbB2:Gab1_P#:Pase9t	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c424	ErbB1:ErbB:Gab1_P#:Pase9t	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c407	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:-_PP:Pase9t	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c514	HRG	medium	$\text{mol} \cdot \text{l}^{-1}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c142	HRG:ErbB3	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c144	HRG:ErbB4	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c158	(HRG:ErbB4)	endosomal_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c532	ErbB1_h	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c525	ErbB1_h:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c526	EGF:ErbB1_h:Inh	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c527	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c528	2(EGF:ErbB1_h:Inh)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c524	ErbB1_h:ATP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c529	EGF:ErbB1_h:ATP	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c530	ErbB1_h:ATP	endosomes	item	<input type="checkbox"/>	<input type="checkbox"/>
c115	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c121	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive	cytoplasm	item	<input type="checkbox"/>	<input type="checkbox"/>

Id	Name	Compartment	Derived Unit	Constant	Boundary Condi- tion
c550	(EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c551	(EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c552	2(EGF:ErbB1_h:ATP)-FullActive	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c553	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c554	(EGF:ErbB1:Inh::EGF:ErbB1_h:Inh)	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c555	(EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)- FullActive	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c556	(EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)- HalfActive	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c557	2(EGF:ErbB1_h:ATP)-FullActive	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>
c558	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)- HalfActive	plasma_membrane	item	<input type="checkbox"/>	<input type="checkbox"/>

## 5 Parameters

This model contains 238 global parameters.

Table 4: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
ERB_B1_P_tot	total ERB-B1_P		0.000	item	<input type="checkbox"/>
ERB_B1_P-_dimer			0.000	item	<input type="checkbox"/>
ERB_B1_4_P			0.000	item	<input type="checkbox"/>
ERB_B1_3_P			0.000	item	<input type="checkbox"/>
ERB_B1_2_P			0.000	item	<input type="checkbox"/>
EGFR_t	total EGF receptor		1080000.000	item	<input checked="" type="checkbox"/>
ERK_t	total ERK		695000.000	item	<input checked="" type="checkbox"/>
ERK_PP	total ERK_PP		0.000		<input type="checkbox"/>
AKT_t	total AKT		905000.000	item	<input checked="" type="checkbox"/>
AKT_PP	total AKT_PP		0.000		<input type="checkbox"/>
model_time	model_time		0.000	s	<input type="checkbox"/>
kd1	kd1		0.033		<input type="checkbox"/>
k1c	k1c		800.000		<input type="checkbox"/>
kd1c	kd1c		1.000		<input type="checkbox"/>
kd1d	kd1d		0.100		<input type="checkbox"/>
k1d	k1d		518.000		<input type="checkbox"/>
k2	k2		$7.44622 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd2	kd2		0.160		<input checked="" type="checkbox"/>
k2b	k2b		$3.73632 \cdot 10^{-8}$		<input checked="" type="checkbox"/>
kd2b	kd2b		0.016		<input checked="" type="checkbox"/>
k3	k3		1.000		<input checked="" type="checkbox"/>
kd3	kd3		0.001		<input checked="" type="checkbox"/>
k4	k4		$6.73 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd4	kd4		$1.66 \cdot 10^{-4}$		<input checked="" type="checkbox"/>
k4b	k4b		0.000		<input checked="" type="checkbox"/>
kd4b	kd4b		$1.66 \cdot 10^{-4}$		<input checked="" type="checkbox"/>
k5	k5		0.000		<input checked="" type="checkbox"/>
kd5	kd5		0.808		<input checked="" type="checkbox"/>
k5b	k5b		0.000		<input checked="" type="checkbox"/>
kd5b	kd5b		0.008		<input checked="" type="checkbox"/>
kd5c	kd5c		0.162		<input checked="" type="checkbox"/>
k6	k6		0.013		<input type="checkbox"/>
kd6	kd6		$5 \cdot 10^{-5}$		<input type="checkbox"/>
k8	k8		$5.91474 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd8	kd8		0.200		<input checked="" type="checkbox"/>
kd8b	kd8b		0.020		<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
k8b	k8b		$9.34641 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
k10	k10		140000.000		<input checked="" type="checkbox"/>
k10b	k10b		0.054		<input checked="" type="checkbox"/>
kd10	kd10		0.011		<input checked="" type="checkbox"/>
k13	k13		0.000		<input checked="" type="checkbox"/>
kd13	kd13		0.000		<input checked="" type="checkbox"/>
k14	k14		0.000		<input checked="" type="checkbox"/>
kd14	kd14		0.000		<input checked="" type="checkbox"/>
k15	k15		$1.667 \cdot 10^{-8}$		<input checked="" type="checkbox"/>
kd15	kd15		0.000		<input checked="" type="checkbox"/>
k16	k16		$1.67 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
k16b	k16b		$1.667 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
k17	k17		$1.67 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd17	kd17		0.060		<input checked="" type="checkbox"/>
k18	k18		$2.5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd18	kd18		1.300		<input checked="" type="checkbox"/>
k19	k19		$1.667 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd19	kd19		0.500		<input checked="" type="checkbox"/>
k20	k20		$1.1068 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd20	kd20		0.400		<input checked="" type="checkbox"/>
k21	k21		$3.67 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd21	kd21		0.230		<input checked="" type="checkbox"/>
k22	k22		$1.39338 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd22	kd22		0.100		<input checked="" type="checkbox"/>
k23	k23		6.000		<input checked="" type="checkbox"/>
kd23	kd23		0.060		<input checked="" type="checkbox"/>
kd24	kd24		0.550		<input checked="" type="checkbox"/>
k25	k25		$1.67 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd25	kd25		0.021		<input checked="" type="checkbox"/>
k28	k28		$5 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd28	kd28		0.005		<input checked="" type="checkbox"/>
k28b	k28b		$5 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd28b	kd28b		0.005		<input checked="" type="checkbox"/>
k29	k29		$1.17 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd29	kd29		3.100		<input checked="" type="checkbox"/>
kd32	kd32		0.100		<input checked="" type="checkbox"/>
k32	k32		$4 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd33	kd33		0.200		<input checked="" type="checkbox"/>
k33	k33		$3.5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd34	kd34		0.030		<input checked="" type="checkbox"/>
k34	k34		$7.5 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd35	kd35		0.002		<input type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
k35	k35		$7.5 \cdot 10^{-6}$		<input type="checkbox"/>
k36	k36		0.005		<input checked="" type="checkbox"/>
kd36	kd36		0.000		<input checked="" type="checkbox"/>
kd37	kd37		0.300		<input checked="" type="checkbox"/>
k37	k37		$1.5 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
k40	k40		$5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd40	kd40		0.064		<input checked="" type="checkbox"/>
k41	k41		$5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd41	kd41		0.043		<input checked="" type="checkbox"/>
k42	k42		$6 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd42	kd42		0.014		<input checked="" type="checkbox"/>
kd43	kd43		31.623		<input checked="" type="checkbox"/>
k43	k43		0.000		<input checked="" type="checkbox"/>
kd44	kd44		0.018		<input checked="" type="checkbox"/>
kd45	kd45		1.900		<input checked="" type="checkbox"/>
k45	k45		0.000		<input checked="" type="checkbox"/>
kd47	kd47		0.800		<input checked="" type="checkbox"/>
k47	k47		0.000		<input checked="" type="checkbox"/>
k48	k48		$2.37 \cdot 10^{-5}$		<input type="checkbox"/>
kd48	kd48		0.790		<input type="checkbox"/>
kd49	kd49		0.112		<input checked="" type="checkbox"/>
k49	k49		0.000		<input checked="" type="checkbox"/>
k50	k50		$4.74801 \cdot 10^{-8}$		<input checked="" type="checkbox"/>
kd50	kd50		0.253		<input checked="" type="checkbox"/>
kd52	kd52		0.033		<input checked="" type="checkbox"/>
kd53	kd53		0.280		<input checked="" type="checkbox"/>
k53	k53		0.000		<input checked="" type="checkbox"/>
kd55	kd55		70.166		<input checked="" type="checkbox"/>
k55	k55		0.000		<input checked="" type="checkbox"/>
kd56	kd56		5.000		<input type="checkbox"/>
k56	k56		$3.97392 \cdot 10^{-4}$		<input type="checkbox"/>
kd57	kd57		0.008		<input checked="" type="checkbox"/>
k57	k57		0.000		<input checked="" type="checkbox"/>
k58	k58		$8.33 \cdot 10^{-7}$		<input type="checkbox"/>
kd58	kd58		56.786		<input type="checkbox"/>
k52	k52		$8.85125 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
k44	k44		$1.07 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
k60	k60		0.003		<input checked="" type="checkbox"/>
kd60	kd60		0.000		<input checked="" type="checkbox"/>
k61	k61		$5.7 \cdot 10^{-4}$		<input checked="" type="checkbox"/>
kd61	kd61		0.000		<input checked="" type="checkbox"/>
kd63	kd63		0.275		<input checked="" type="checkbox"/>



Id	Name	SBO	Value	Unit	Constant
k64	k64		$1.67 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd64	kd64		0.300		<input checked="" type="checkbox"/>
kd65	kd65		0.200		<input checked="" type="checkbox"/>
k65	k65		0.000		<input checked="" type="checkbox"/>
k66	k66		$1.5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd66	kd66		0.200		<input checked="" type="checkbox"/>
k67	k67		$5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd67	kd67		0.020		<input checked="" type="checkbox"/>
kd68	kd68		0.200		<input checked="" type="checkbox"/>
k68	k68		0.000		<input checked="" type="checkbox"/>
kd68b	kd68b		20.500		<input checked="" type="checkbox"/>
k69	k69		$3.33 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd69	kd69		0.100		<input checked="" type="checkbox"/>
k70	k70		$6.67 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd70	kd70		0.100		<input checked="" type="checkbox"/>
k71	k71		0.000		<input checked="" type="checkbox"/>
kd71	kd71		25.200		<input checked="" type="checkbox"/>
k72	k72		0.000		<input checked="" type="checkbox"/>
kd72	kd72		5.012		<input checked="" type="checkbox"/>
k73	k73		0.004		<input type="checkbox"/>
kd73	kd73		0.500		<input type="checkbox"/>
k74	k74		$6.36184 \cdot 10^{-7}$		<input type="checkbox"/>
kd74	kd74		0.356		<input type="checkbox"/>
kd75	kd75		0.006		<input type="checkbox"/>
k75	k75		0.000		<input checked="" type="checkbox"/>
k76	k76		0.000		<input checked="" type="checkbox"/>
kd76	kd76		142.262		<input checked="" type="checkbox"/>
kd60d	kd60d		0.000		<input checked="" type="checkbox"/>
k22b	k22b		$3.5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd22b	kd22b		0.100		<input checked="" type="checkbox"/>
kd34b	kd34b		0.100		<input checked="" type="checkbox"/>
k34b	k34b		$7.5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
k94b	k94b		$5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
k94	k94		$5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd94	kd94		0.010		<input checked="" type="checkbox"/>
k95	k95		0.000		<input checked="" type="checkbox"/>
kd95	kd95		33.000		<input checked="" type="checkbox"/>
k96	k96		$1.67 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd96	kd96		0.100		<input checked="" type="checkbox"/>
kd6b	kd6b		0.000		<input checked="" type="checkbox"/>
k7	k7		$5 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd7	kd7		$1.38 \cdot 10^{-4}$		<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
k62b	k62b		$4.16 \cdot 10^{-4}$		<input checked="" type="checkbox"/>
kd60b	kd60b		0.000		<input checked="" type="checkbox"/>
k60c	k60c		$5.2 \cdot 10^{-4}$		<input checked="" type="checkbox"/>
k60b	k60b		0.047		<input checked="" type="checkbox"/>
KD_iressa_wt	KD_iressa_wt		$3.5 \cdot 10^{-8}$		<input checked="" type="checkbox"/>
k97	k97		1000000.000		<input type="checkbox"/>
kd97	kd97		0.015		<input type="checkbox"/>
KD_iressa_mt	KD_iressa_mt		$3 \cdot 10^{-9}$		<input checked="" type="checkbox"/>
k97c	k97c		1000000.000		<input type="checkbox"/>
kd97c	kd97c		0.001		<input type="checkbox"/>
Kinh2	Kinh2		$3 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd98	kd98		0.001		<input checked="" type="checkbox"/>
k98	k98		33300.000		<input checked="" type="checkbox"/>
Kinh4	Kinh4		0.113		<input checked="" type="checkbox"/>
kd99	kd99		0.500		<input checked="" type="checkbox"/>
k99	k99		4.420		<input type="checkbox"/>
Kinh3	Kinh3		0.001		<input checked="" type="checkbox"/>
kd100	kd100		0.001		<input checked="" type="checkbox"/>
k100	k100		1.000		<input checked="" type="checkbox"/>
k101	k101		$8.33 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd101	kd101		0.030		<input checked="" type="checkbox"/>
k102	k102		$5 \cdot 10^{-7}$		<input checked="" type="checkbox"/>
kd102	kd102		5.610		<input checked="" type="checkbox"/>
k103	k103		$8.36983 \cdot 10^{-9}$		<input type="checkbox"/>
kd103	kd103		0.016		<input type="checkbox"/>
k104	k104		0.000		<input checked="" type="checkbox"/>
kd104	kd104		0.200		<input checked="" type="checkbox"/>
k105	k105		$6.67 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd105	kd105		0.100		<input checked="" type="checkbox"/>
k106	k106		$1.33 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd106	kd106		0.100		<input checked="" type="checkbox"/>
k106b	k106b		$2.63418 \cdot 10^{-8}$		<input checked="" type="checkbox"/>
kd106b	kd106b		0.100		<input checked="" type="checkbox"/>
k107	k107		$3.33 \cdot 10^{-5}$		<input checked="" type="checkbox"/>
kd107	kd107		0.100		<input checked="" type="checkbox"/>
k108	k108		0.000		<input checked="" type="checkbox"/>
kd108	kd108		5.000		<input checked="" type="checkbox"/>
k109	k109		$5 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd109	kd109		0.100		<input checked="" type="checkbox"/>
k110	k110		$3.33 \cdot 10^{-4}$		<input checked="" type="checkbox"/>
kd110	kd110		0.100		<input checked="" type="checkbox"/>
kd111	kd111		6.570		<input checked="" type="checkbox"/>

Id	Name	SBO	Value	Unit	Constant
k111	k111		0.000		<input checked="" type="checkbox"/>
k112	k112		0.005		<input checked="" type="checkbox"/>
kd112	kd112		0.100		<input checked="" type="checkbox"/>
k113	k113		0.000		<input checked="" type="checkbox"/>
kd113	kd113		177.828		<input checked="" type="checkbox"/>
k114	k114		$4.98816 \cdot 10^{-6}$		<input checked="" type="checkbox"/>
kd114	kd114		0.100		<input checked="" type="checkbox"/>
k115	k115		0.000		<input checked="" type="checkbox"/>
kd115	kd115		1.000		<input checked="" type="checkbox"/>
k116	k116		0.015		<input type="checkbox"/>
kd116	kd116		0.000		<input checked="" type="checkbox"/>
k117	k117		$8.33 \cdot 10^{-8}$		<input checked="" type="checkbox"/>
kd117	kd117		0.100		<input checked="" type="checkbox"/>
k118	k118		0.000		<input checked="" type="checkbox"/>
kd118	kd118		0.030		<input checked="" type="checkbox"/>
kd119	kd119		0.010		<input checked="" type="checkbox"/>
k119	k119		0.000		<input type="checkbox"/>
k120	k120		$1.48131 \cdot 10^{-8}$		<input type="checkbox"/>
kd120	kd120		0.100		<input type="checkbox"/>
k120b	k120b		$5.92538 \cdot 10^{-11}$		<input type="checkbox"/>
kd120b	kd120b		0.100		<input type="checkbox"/>
Ks	Ks		0.001		<input checked="" type="checkbox"/>
k121	k121		0.001		<input checked="" type="checkbox"/>
kd121	kd121		1.000		<input checked="" type="checkbox"/>
kd122	kd122		1.000		<input type="checkbox"/>
k123	k123		0.000		<input checked="" type="checkbox"/>
kd123	kd123		0.178		<input checked="" type="checkbox"/>
k6b	k6b		0.000		<input checked="" type="checkbox"/>
k1	k1		0.000		<input type="checkbox"/>
k122	k122		$1.8704 \cdot 10^{-8}$		<input type="checkbox"/>
KD_ATP	KD_ATP		$10^{-4}$		<input checked="" type="checkbox"/>
k123h	k123h		0.000		<input checked="" type="checkbox"/>
kd123h	kd123h		0.100		<input checked="" type="checkbox"/>
KD	KD		1.000		<input checked="" type="checkbox"/>

## 6 Function definitions

This is an overview of two function definitions.

## 6.1 Function definition `stepfunc2`

**Arguments** `t`, `t_start`, `v_start`, `t_end`, `v_end`

**Mathematical Expression**

$$\begin{cases} v\_start & \text{if } t < t\_start \\ v\_end & \text{if } t > t\_end \\ \frac{v\_end - v\_start}{t\_end - t\_start} \cdot (t - t\_start) + v\_start & \text{otherwise} \end{cases} \quad (1)$$

## 6.2 Function definition `stepfunc`

**Arguments** `t`, `t_start`, `v_start`, `t_end`, `v_end`

**Mathematical Expression**

$$\begin{cases} v\_start & \text{if } t < t\_start \\ \begin{cases} v\_end & \text{if } t > t\_end \\ \frac{v\_start + v\_end}{2} + \frac{v\_end - v\_start}{2} \cdot \sin\left(\frac{\frac{3.14}{2} \cdot (2 \cdot t - t\_end - t\_start)}{t\_end - t\_start}\right) & \text{otherwise} \end{cases} & \text{otherwise} \end{cases} \quad (2)$$

# 7 Rules

This is an overview of 20 rules.

## 7.1 Rule `ERK_PP`

Rule `ERK_PP` is an assignment rule for parameter `ERK_PP`:

$$\begin{aligned} \text{ERK\_PP} = & c59 + c83 + c61 + c84 + c95 + c96 + c97 + c98 + c101 + c102 + c431 + c432 + c433 \\ & + c434 + c435 + c437 + c438 + c440 + c474 + c475 + c477 + c478 + c480 + c481 \end{aligned} \quad (3)$$

**Derived unit** `item`

## 7.2 Rule `AKT_PP`

Rule `AKT_PP` is an assignment rule for parameter `AKT_PP`:

$$\text{AKT\_PP} = c497 + c498 + c472 + c484 \quad (4)$$

**Derived unit** `item`

### 7.3 Rule `ERB_B1_P_dimer`

Rule `ERB_B1_P_dimer` is an assignment rule for parameter `ERB_B1_P_dimer`:

$$\begin{aligned} \text{ERB\_B1\_P\_dimer} = & c483 + c136 + c23 + c7 + c25 + c88 + c27 + c89 + c29 + c90 \\ & + c34 + c91 + c35 + c92 + c36 + c93 + c37 + c94 + c68 + c67 \\ & + c66 + c65 + c21 + c20 + c18 + c19 + c5 + c8 + c15 + c17 + c32 \\ & + c63 + c33 + c64 + c95 + c96 + c97 + c98 + c99 + c419 + c100 \\ & + c420 + c486 + c104 + c448 + c415 + c489 + c431 + c432 + c264 \end{aligned} \quad (5)$$

**Derived unit** item

### 7.4 Rule `ERB_B1_4_P`

Rule `ERB_B1_4_P` is an assignment rule for parameter `ERB_B1_4_P`:

$$\begin{aligned} \text{ERB\_B1\_4\_P} = & c429 + c132 + c191 + c197 + c200 + c206 + c209 + c215 + c218 + c224 + c227 \\ & + c233 + c245 + c251 + c254 + c260 + c236 + c242 + c239 + c257 + c248 + c230 \\ & + c221 + c212 + c203 + c194 + c150 + c164 + c167 + c153 + c182 + c185 + c173 \\ & + c176 + c447 + c263 + c451 + c282 + c466 + c438 + c440 + c410 + c267 + c412 \end{aligned} \quad (6)$$

**Derived unit** item

### 7.5 Rule `ERB_B1_3_P`

Rule `ERB_B1_3_P` is an assignment rule for parameter `ERB_B1_3_P`:

$$\begin{aligned} \text{ERB\_B1\_3\_P} = & c428 + c131 + c190 + c196 + c199 + c205 + c208 + c214 + c217 + c223 + c226 \\ & + c232 + c244 + c250 + c253 + c259 + c235 + c241 + c238 + c256 + c247 + c229 \\ & + c220 + c211 + c202 + c193 + c149 + c163 + c166 + c152 + c181 + c184 + c172 \\ & + c175 + c446 + c262 + c450 + c281 + c465 + c435 + c437 + c409 + c266 + c411 \end{aligned} \quad (7)$$

**Derived unit** item

### 7.6 Rule `ERB_B1_2_P`

Rule `ERB_B1_2_P` is an assignment rule for parameter `ERB_B1_2_P`:

$$\begin{aligned} \text{ERB\_B1\_2\_P} = & c427 + c130 + c189 + c195 + c198 + c204 + c207 + c213 + c216 + c222 + c225 \\ & + c231 + c243 + c249 + c252 + c258 + c234 + c240 + c237 + c255 + c246 + c228 \\ & + c219 + c210 + c201 + c192 + c148 + c162 + c165 + c151 + c180 + c183 \\ & + c171 + c174 + c445 + c261 + c449 + c416 + c464 + c433 + c434 + c265 \end{aligned} \quad (8)$$

**Derived unit** item

### 7.7 Rule `ERB_B1_P_tot`

Rule `ERB_B1_P_tot` is an assignment rule for parameter `ERB_B1_P_tot`:

$$\text{ERB\_B1\_P\_tot} = 2 \cdot \text{ERB\_B1\_P\_dimer} + \text{ERB\_B1\_4\_P} + \text{ERB\_B1\_3\_P} + \text{ERB\_B1\_2\_P} \quad (9)$$

### 7.8 Rule `model_time`

Rule `model_time` is an assignment rule for parameter `model_time`:

$$\text{model\_time} = \text{time} \quad (10)$$

**Derived unit** s

### 7.9 Rule `k116`

Rule `k116` is an assignment rule for parameter `k116`:

$$\text{k116} = \text{stepfunc}(\text{model\_time}, 2659.99, 0, 2660, 0.0150356) \quad (11)$$

### 7.10 Rule `k97`

Rule `k97` is an assignment rule for parameter `k97`:

$$\text{k97} = \frac{\text{kd97}}{\text{KD\_iressa\_wt}} \quad (12)$$

### 7.11 Rule `k97c`

Rule `k97c` is an assignment rule for parameter `k97c`:

$$\text{k97c} = \frac{\text{kd97c}}{\text{KD\_iressa\_mt}} \quad (13)$$

### 7.12 Rule `k1`

Rule `k1` is an assignment rule for parameter `k1`:

$$\text{k1} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 10000000) \quad (14)$$

### 7.13 Rule `kd1`

Rule `kd1` is an assignment rule for parameter `kd1`:

$$\text{kd1} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 0.0033) \quad (15)$$

### 7.14 Rule `k1c`

Rule `k1c` is an assignment rule for parameter `k1c`:

$$\text{k1c} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 0) \quad (16)$$

### 7.15 Rule `kd1c`

Rule `kd1c` is an assignment rule for parameter `kd1c`:

$$\text{kd1c} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 0) \quad (17)$$

### 7.16 Rule `kd1d`

Rule `kd1d` is an assignment rule for parameter `kd1d`:

$$\text{kd1d} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 0) \quad (18)$$

### 7.17 Rule `kd6`

Rule `kd6` is an assignment rule for parameter `kd6`:

$$\text{kd6} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 5.0E - 5) \quad (19)$$

### 7.18 Rule `kd122`

Rule `kd122` is an assignment rule for parameter `kd122`:

$$\text{kd122} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 1) \quad (20)$$

### 7.19 Rule `k122`

Rule `k122` is an assignment rule for parameter `k122`:

$$\text{k122} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 1.8704E - 8) \quad (21)$$

### 7.20 Rule `k119`

Rule `k119` is an assignment rule for parameter `k119`:

$$\text{k119} = \text{stepfunc}(\text{model\_time}, 1799.99, 0, 1800, 10000000) \quad (22)$$

## 8 Reactions

This model contains 827 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

Nº	Id	Name	Reaction Equation	SBO
1	v1	v1 EGF + ErbB1:ATP -> EGF:ErbB1:ATP k1 kd1	$c1 + c2 \rightleftharpoons c3$	
2	v2	v2 (ErbB2:ErbB3) + EGF -> (ErbB3:ErbB2)- #P k1c kd1c	$c288 + c1 \rightleftharpoons c335$	
3	v3	v3 ErbB2:ErbB4 + EGF -> (ErbB4:ErbB2)- #P k1d kd1d	$c117 + c1 \rightleftharpoons c336$	
4	v4	v4 EGF + ErbB1:Inh -> EGF:ErbB1:Inh k1 kd1	$c1 + c286 \rightleftharpoons c499$	
5	v5	v5 EGF:ErbB1:ATP + EGF:ErbB1:Inh -> (EGF:ErbB1:ErbB1):Inh k2 kd2	$c3 + c499 \rightleftharpoons c500$	
6	v6	v6 EGF:ErbB1:Inh + EGF:ErbB1:Inh -> 2(EGF:ErbB1:Inh) k2 kd2	$c499 + c499 \rightleftharpoons c501$	
7	v7	v7 EGF:ErbB1:ATP + EGF:ErbB1:ATP -> 2(EGF:ErbB1:ATP) k2 kd2	$c3 + c3 \rightleftharpoons c4$	
8	v8	v8 EGF:ErbB1:ATP + EGF:ErbB1:ATP -> 2(EGF:ErbB1:ATP) k2 kd2	$c10 + c10 \rightleftharpoons c11$	
9	v9	v9 EGF:ErbB1:ATP + ErbB2 -> EGF:ErbB1:ErbB2 k2b kd2b	$c3 + c141 \rightleftharpoons c145$	
10	v10	v10 EGF:ErbB1:ATP + ErbB3 -> EGF:ErbB1:ErbB3 k2b kd2b	$c3 + c140 \rightleftharpoons c146$	
11	v11	v11 ErbB4 + EGF:ErbB1:ATP -> EGF:ErbB1:ErbB4 k2b kd2b	$c143 + c3 \rightleftharpoons c147$	



Nº	Id	Name	Reaction Equation	SBO
12	v12	v12 EGF:ErbB1:ATP + ErbB2 (EGF:ErbB1:ErbB2) k2b kd2b	-> c10 + c155 $\rightleftharpoons$ c159	
13	v13	v13 EGF:ErbB1:ATP + ErbB3 (EGF:ErbB1:ErbB3) k2b kd2b	-> c10 + c154 $\rightleftharpoons$ c160	
14	v14	v14 EGF:ErbB1:ATP + ErbB4 (EGF:ErbB1:ErbB4) k2b kd2b	-> c10 + c156 $\rightleftharpoons$ c161	
15	v15	v15 EGF:ErbB1:Inh + ErbB2 EGF:ErbB1:Inh:ErB2 k2b kd2b	-> c499 + c141 $\rightleftharpoons$ c492	
16	v16	v16 ErbB3 + EGF:ErbB1:Inh EGF:ErbB1:Inh:ErB3 k2b kd2b	-> c140 + c499 $\rightleftharpoons$ c493	
17	v17	v17 ErbB4 + EGF:ErbB1:Inh EGF:ErbB1:Inh:ErB4 k2b kd2b	-> c143 + c499 $\rightleftharpoons$ c494	
18	v18	v18 EGF:ErbB1:ATP + ErbB2:Inh (EGF:ErbB1:ErbB2):Inh k2b kd2b	-> c3 + c502 $\rightleftharpoons$ c504	
19	v19	v19 EGF:ErbB1:ATP + ErbB4:Inh (EGF:ErbB1:ErbB3)#P:Inh k2b kd2b	-> c3 + c503 $\rightleftharpoons$ c505	
20	v20	v20 EGF:ErbB1:ATP + ErbB3:Inh (EGF:ErbB1:ErbB3)#P:Inh k2b kd2b	-> c3 + c506 $\rightleftharpoons$ c507	
21	v21	v21 (EGF:ErbB1:ErbB2) + ATP (EGF:ErbB1:ErbB2):ATP k122 kd122	-> c159 + c105 $\rightleftharpoons$ c123	
22	v22	v22 (EGF:ErbB1:ErbB3) + ATP (EGF:ErbB1:ErbB3):ATP k122 kd122	-> c160 + c105 $\rightleftharpoons$ c124	
23	v23	v23 (EGF:ErbB1:ErbB4) + ATP (EGF:ErbB1:ErbB4):ATP k122 kd122	-> c161 + c105 $\rightleftharpoons$ c125	
24	v24	v24 2(EGF:ErbB1:ATP) + ATP 2(EGF:ErbB1):ATP k122 kd122	-> c11 + c105 $\rightleftharpoons$ c126	
25	v25	v25 2(EGF:ErbB1:ATP)) + ATP kd122	-> k122 c4 + c105 $\rightleftharpoons$ c116	

Nº	Id	Name	Reaction Equation	SBO
26	v26	v26 EGF:ErbB1:ErbB2 + ATP EGF:ErbB1:ErbB2:ATP k122 kd122	-> c145 + c105 $\rightleftharpoons$ c122	
27	v27	v27 EGF:ErbB1:ErbB3 + ATP EGF:ErbB1:ErbB3:ATP k122 kd122	-> c146 + c105 $\rightleftharpoons$ c127	
28	v28	v28 EGF:ErbB1:ErbB4 + ATP EGF:ErbB1:ErbB4:ATP k122 kd122	-> c147 + c105 $\rightleftharpoons$ c128	
29	v29	v29 ErbB2:ErbB2#P + ATP ErbB2:ErbB2#P:ATP k122 kd122	-> c284 + c105 $\rightleftharpoons$ c129	
30	v30	v30 (ErbB1:ErbB2)#P:GAP:Grb2:Gab1 + ATP -> (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1:ATP k122 kd122	c427 + c105 $\rightleftharpoons$ c130	
31	v31	v31 (ErbB1:ErbB3)#P:GAP:Grb2:Gab1 + ATP -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1:ATP k122 kd122	c428 + c105 $\rightleftharpoons$ c131	
32	v32	v32 (ErbB1:ErbB4)#P:GAP:Grb2:Gab1 + ATP -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1:ATP k122 kd122	c429 + c105 $\rightleftharpoons$ c132	
33	v33	v33 2(ErbB2)#P:GAP:Grb2:Gab1 + ATP - > 2(ErbB2)#P:GAP:Grb2:Gab1:ATP k122 kd122	c436 + c105 $\rightleftharpoons$ c133	
34	v34	v34 (ErbB3:ErbB2)#P:GAP:Grb2:Gab1 + ATP -> (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1:ATP k122 kd122	c439 + c105 $\rightleftharpoons$ c134	
35	v35	v35 (ErbB4:ErbB2)#P:GAP:Grb2:Gab1 + ATP -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1:ATP k122 kd122	c442 + c105 $\rightleftharpoons$ c135	
36	v36	v36 2(EGF:ErbB1)#P:GAP:Grb2:Gab1 + ATP -> 2(EGF:ErbB1)- #P:GAP:Grb2:Gab1:ATP k122 kd122	c483 + c105 $\rightleftharpoons$ c136	

Nº	Id	Name	Reaction Equation	SBO
37	v37	v37 (HRG:ErbB3:ErbB1) + ATP (HRG:ErbB3:ErbB1):ATP k122 kd122	-> c516 + c105 $\rightleftharpoons$ c137	
38	v38	v38 (HRG:ErbB4:ErbB1) + ATP (HRG:ErbB4:ErbB1):ATP k122 kd122	-> c517 + c105 $\rightleftharpoons$ c138	
39	v39	v39 (HRG:ErbB4):ErbB2 + ATP (HRG:ErbB4):ErbB2:ATP k122 kd122	-> c345 + c105 $\rightleftharpoons$ c139	
40	v40	v40 (HRG:ErbB3):ErbB2 + ATP (HRG:ErbB3):ErbB2:ATP k122 kd122	-> c355 + c105 $\rightleftharpoons$ c168	
41	v41	v41 (HRG:ErbB3):ErbB2) + ATP (HRG:ErbB3):ErbB2):ATP k122 kd122	-> c421 + c105 $\rightleftharpoons$ c169	
42	v42	v42 (HRG:ErbB4):ErbB2) + ATP (HRG:ErbB4):ErbB2):ATP k122 kd122	-> c422 + c105 $\rightleftharpoons$ c170	
43	v43	v43 2(EGF:ErbB1)#P:GAP:Grb2 + cPP 2(EGF:ErbB1)#P:GAP:Grb2:cPP k4 kd4	-> c23 + c12 $\rightleftharpoons$ c7	
44	v44	v44 2(EGF:ErbB1)#P:GAP:Grb2:Sos + cPP -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:cPP k4 kd4	c25 + c12 $\rightleftharpoons$ c88	
45	v45	v45 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k4 kd4	c27 + c12 $\rightleftharpoons$ c89	
46	v46	v46 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k4 kd4	c29 + c12 $\rightleftharpoons$ c90	

Nº	Id	Name	Reaction Equation	SBO
47	v47	v47 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 + cPP -> 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:cPP k4 kd4	$c34 + c12 \rightleftharpoons c91$	
48	v48	v48 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos + cPP -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos:cPP k4 kd4	$c35 + c12 \rightleftharpoons c92$	
49	v49	v49 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) + cPP - > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP):cPP k4 kd4	$c36 + c12 \rightleftharpoons c93$	
50	v50	v50 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP - > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP):cPP k4 kd4	$c37 + c12 \rightleftharpoons c94$	
51	v52	v52 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 + cPP -> (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:cPP k4b kd4	$c189 + c12 \rightleftharpoons c195$	
52	v53	v53 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 + cPP -> (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:cPP k4b kd4	$c190 + c12 \rightleftharpoons c196$	
53	v54	v54 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 + cPP -> (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:cPP k4b kd4	$c191 + c12 \rightleftharpoons c197$	
54	v55	v55 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + cPP -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:cPP k4b kd4	$c198 + c12 \rightleftharpoons c204$	
55	v56	v56 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos + cPP -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos:cPP k4b kd4	$c199 + c12 \rightleftharpoons c205$	

Nº	Id	Name	Reaction Equation	SBO
56	v57	v57 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos + cPP -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos:cPP k4b kd4	$c200 + c12 \rightleftharpoons c206$	
57	v58	v58 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) + cPP - > (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c207 + c12 \rightleftharpoons c213$	
58	v59	v59 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) + cPP - > (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c208 + c12 \rightleftharpoons c214$	
59	v60	v60 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) + cPP - > (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c209 + c12 \rightleftharpoons c215$	
60	v61	v61 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP - > (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP):cPP k4b kd4	$c216 + c12 \rightleftharpoons c222$	
61	v62	v62 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP - > (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP):cPP k4b kd4	$c217 + c12 \rightleftharpoons c223$	
62	v63	v63 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP - > (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP):cPP k4b kd4	$c218 + c12 \rightleftharpoons c224$	
63	v64	v64 (ErbB1:ErbB2)#P:GAP:Grb2 + cPP -> (ErbB1:ErbB2)#P:GAP:Grb2:cPP k4b kd4	$c225 + c12 \rightleftharpoons c231$	

Nº	Id	Name	Reaction Equation	SBO
64	v65	v65 (ErbB1:ErbB3)#P:GAP:Grb2 + cPP ->	$c226 + c12 \rightleftharpoons c232$	
65	v66	(ErbB1:ErbB3)#P:GAP:Grb2:cPP k4b kd4 v66 (ErbB1:ErbB4)#P:GAP:Grb2 + cPP ->	$c227 + c12 \rightleftharpoons c233$	
66	v67	(ErbB1:ErbB4)#P:GAP:Grb2:cPP k4b kd4 v67 (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c243 + c12 \rightleftharpoons c249$	
67	v68	v68 (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c244 + c12 \rightleftharpoons c250$	
68	v69	v69 (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c245 + c12 \rightleftharpoons c251$	
69	v70	v70 (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k4 kd4	$c252 + c12 \rightleftharpoons c258$	
70	v71	v71 (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k4 kd4	$c253 + c12 \rightleftharpoons c259$	

Nº	Id	Name	Reaction Equation	SBO
71	v72	v72 (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k4 kd4	$c254 + c12 \rightleftharpoons c260$	
72	v75	v75 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + cPP -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:cPP k4b kd4	$c234 + c12 \rightleftharpoons c240$	
73	v76	v76 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + cPP -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:cPP k4b kd4	$c235 + c12 \rightleftharpoons c241$	
74	v77	v77 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + cPP -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:cPP k4b kd4	$c236 + c12 \rightleftharpoons c242$	
75	v78	v78 2(ErbB2)#P:GAP:(Shc#P):Grb2 + cPP -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:cPP k4b kd4	$c300 + c12 \rightleftharpoons c301$	
76	v79	v79 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos + cPP -> 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:cPP k4b kd4	$c303 + c12 \rightleftharpoons c304$	
77	v80	v80 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) + cPP -> 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c306 + c12 \rightleftharpoons c307$	
78	v81	v81 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP -> 2(ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k4b kd4	$c309 + c12 \rightleftharpoons c310$	

Nº	Id	Name	Reaction Equation	SBO
79	v82	v82 2(ErbB2)#P:GAP:Grb2 + cPP ->	c312 + c12 $\rightleftharpoons$ c313	
80	v83	2(ErbB2)#P:GAP:Grb2:cPP k4b kd4		
80	v83	v83 2(ErbB2)#P:GAP:Grb2:Sos + cPP ->	c315 + c12 $\rightleftharpoons$ c316	
		2(ErbB2)#P:GAP:Grb2:Sos:cPP k4b kd4		
81	v84	v84 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)	c318 + c12 $\rightleftharpoons$ c319	
		+ cPP -> 2(ErbB2)-		
		#P:GAP:Grb2:Sos:(Ras:GDP):cPP k4b		
		kd4		
82	v85	v85 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)	c321 + c12 $\rightleftharpoons$ c322	
		+ cPP -> 2(ErbB2)-		
		#P:GAP:Grb2:Sos:(Ras:GTP):cPP k4b		
		kd4		
83	v87	v87 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2	c357 + c12 $\rightleftharpoons$ c358	
		+ cPP -> (ErbB3:ErbB2)#P:GAP:(Shc-		
		#P):Grb2:cPP k4b kd4		
84	v88	v88 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2	c360 + c12 $\rightleftharpoons$ c361	
		+ cPP -> (ErbB4:ErbB2)#P:GAP:(Shc-		
		#P):Grb2:cPP k4b kd4		
85	v89	v89 (ErbB4:ErbB2)#P:GAP:(Shc-	c366 + c12 $\rightleftharpoons$ c367	
		#P):Grb2:Sos + cPP -> (ErbB4:ErbB2)-		
		#P:GAP:(Shc#P):Grb2:Sos:cPP k4b kd4		
86	v90	v90 (ErbB3:ErbB2)#P:GAP:(Shc-	c369 + c12 $\rightleftharpoons$ c370	
		#P):Grb2:Sos:(Ras:GDP) + cPP -		
		> (ErbB3:ErbB2)#P:GAP:(Shc-		
		#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4		
87	v91	v91 (ErbB4:ErbB2)#P:GAP:(Shc-	c372 + c12 $\rightleftharpoons$ c373	
		#P):Grb2:Sos:(Ras:GDP) + cPP -		
		> (ErbB4:ErbB2)#P:GAP:(Shc-		
		#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4		



Nº	Id	Name	Reaction Equation	SBO
88	v92	v92 (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP - > (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP):cPP k4b kd4	$c375 + c12 \rightleftharpoons c376$	
89	v93	v93 (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP - > (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP):cPP k4b kd4	$c378 + c12 \rightleftharpoons c379$	
90	v94	v94 (ErbB3:ErbB2)#P:GAP:Grb2 + cPP -> (ErbB3:ErbB2)#P:GAP:Grb2:cPP k4b kd4	$c381 + c12 \rightleftharpoons c382$	
91	v95	v95 (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + cPP -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:cPP k4b kd4	$c363 + c12 \rightleftharpoons c364$	
92	v96	v96 (ErbB4:ErbB2)#P:GAP:Grb2 + cPP -> (ErbB4:ErbB2)#P:GAP:Grb2:cPP k4b kd4	$c384 + c12 \rightleftharpoons c385$	
93	v97	v97 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + cPP -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:cPP k4b kd4	$c387 + c12 \rightleftharpoons c388$	
94	v98	v98 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + cPP -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:cPP k4b kd4	$c390 + c12 \rightleftharpoons c391$	
95	v99	v99 (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k4b kd4	$c393 + c12 \rightleftharpoons c394$	

Nº	Id	Name	Reaction Equation	SBO
96	v100	v100 #P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k4b kd4	(ErbB4:ErbB2)- c396 + c12 $\rightleftharpoons$ c397	
97	v101	v101 #P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k4b kd4	(ErbB3:ErbB2)- c399 + c12 $\rightleftharpoons$ c400	
98	v102	v102 #P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k4b kd4	(ErbB4:ErbB2)- c402 + c12 $\rightleftharpoons$ c403	
99	v103	v103 cPP + (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k5b kd5b	c9 + c404 $\rightleftharpoons$ c403	
100	v104	v104 cPP + (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k5b kd5b	c9 + c401 $\rightleftharpoons$ c400	

Nº	Id	Name	Reaction Equation	SBO
101	v105	v105 cPP + (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k5b kd5b	c9 + c398 $\rightleftharpoons$ c397	
102	v106	v106 cPP + (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k5b kd5b	c9 + c395 $\rightleftharpoons$ c394	
103	v107	v107 cPP + (ErbB4:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:cPP k5b kd5b	c9 + c392 $\rightleftharpoons$ c391	
104	v108	v108 cPP + (ErbB3:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:cPP k5b kd5b	c9 + c389 $\rightleftharpoons$ c388	
105	v109	v109 cPP + (ErbB4:ErbB2)#P:GAP:Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2:cPP k5b kd5b	c9 + c386 $\rightleftharpoons$ c385	
106	v110	v110 cPP + (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:cPP k5b kd5b	c9 + c365 $\rightleftharpoons$ c364	
107	v111	v111 cPP + (ErbB3:ErbB2)#P:GAP:Grb2 -> (ErbB3:ErbB2)#P:GAP:Grb2:cPP k5b kd5b	c9 + c383 $\rightleftharpoons$ c382	
108	v112	v112 cPP + (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5b kd5b	c9 + c380 $\rightleftharpoons$ c379	

Nº	Id	Name	Reaction Equation	SBO
109	v113	v113 cPP + (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5b kd5b	$c9 + c377 \rightleftharpoons c376$	
110	v114	v114 cPP + (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5b kd5b	$c9 + c374 \rightleftharpoons c373$	
111	v115	v115 cPP + (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5b kd5b	$c9 + c371 \rightleftharpoons c370$	
112	v116	v116 cPP + (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:cPP k5b kd5b	$c9 + c368 \rightleftharpoons c367$	
113	v117	v117 cPP + (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:cPP k5b kd5b	$c9 + c362 \rightleftharpoons c361$	
114	v118	v118 cPP + (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:cPP k5b kd5b	$c9 + c359 \rightleftharpoons c358$	
115	v120	v120 cPP + 2(ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) -> 2(ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k5 kd5b	$c9 + c323 \rightleftharpoons c322$	
116	v121	v121 cPP + 2(ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) -> 2(ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k5 kd5b	$c9 + c320 \rightleftharpoons c319$	
117	v122	v122 cPP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:cPP k5 kd5b	$c9 + c317 \rightleftharpoons c316$	

Nº	Id	Name	Reaction Equation	SBO
118	v123	v123 cPP + 2(ErbB2)#P:GAP:Grb2	$\rightarrow$ c9 + c314 $\rightleftharpoons$ c313	
		2(ErbB2)#P:GAP:Grb2:cPP k5 kd5b		
119	v124	v124 cPP + 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP)	$\rightarrow$ 2(ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP	c9 + c311 $\rightleftharpoons$ c310
		k5 kd5b		
120	v125	v125 cPP + 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP)	$\rightarrow$ 2(ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP	c9 + c308 $\rightleftharpoons$ c307
		k5 kd5b		
121	v126	v126 cPP + 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos	$\rightarrow$ 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:cPP k5 kd5b	c9 + c305 $\rightleftharpoons$ c304
122	v127	v127 cPP + 2(ErbB2)#P:GAP:(Shc#P):Grb2	$\rightarrow$ 2(ErbB2)#P:GAP:(Shc#P):Grb2:cPP k5	c9 + c302 $\rightleftharpoons$ c301
		kd5b		
123	v128	v128 cPP + (ErbB1:ErbB4)- #P:GAP:Grb2:Sos	$\rightarrow$ (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:cPP k5 kd5b	c9 + c239 $\rightleftharpoons$ c242
124	v129	v129 cPP + (ErbB1:ErbB3)- #P:GAP:Grb2:Sos	$\rightarrow$ (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:cPP k5 kd5b	c9 + c238 $\rightleftharpoons$ c241
125	v130	v130 cPP + (ErbB1:ErbB2)- #P:GAP:Grb2:Sos	$\rightarrow$ (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:cPP k5 kd5b	c9 + c237 $\rightleftharpoons$ c240

Nº	Id	Name	Reaction Equation	SBO
126	v133	v133    cPP    +    (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP) ->    (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP    k5 kd5b	$c9 + c257 \rightleftharpoons c260$	
127	v134	v134    cPP    +    (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP) ->    (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP    k5 kd5b	$c9 + c256 \rightleftharpoons c259$	
128	v135	v135    cPP    +    (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) ->    (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP    k5 kd5b	$c9 + c255 \rightleftharpoons c258$	
129	v136	v136    cPP    +    (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP) ->    (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP    k5 kd5b	$c9 + c248 \rightleftharpoons c251$	
130	v137	v137    cPP    +    (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP) ->    (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP    k5 kd5b	$c9 + c247 \rightleftharpoons c250$	

Nº	Id	Name	Reaction Equation	SBO
131	v138	v138 cPP + (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k5 kd5b	$c9 + c246 \rightleftharpoons c249$	
132	v139	v139 cPP + (ErbB1:ErbB4)#P:GAP:Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2:cPP k5 kd5b	$c9 + c230 \rightleftharpoons c233$	
133	v140	v140 cPP + (ErbB1:ErbB3)#P:GAP:Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2:cPP k5 kd5b	$c9 + c229 \rightleftharpoons c232$	
134	v141	v141 cPP + (ErbB1:ErbB2)#P:GAP:Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2:cPP k5 kd5b	$c9 + c228 \rightleftharpoons c231$	
135	v142	v142 cPP + (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5b	$c9 + c221 \rightleftharpoons c224$	
136	v143	v143 cPP + (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5b	$c9 + c220 \rightleftharpoons c223$	
137	v144	v144 cPP + (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5b	$c9 + c219 \rightleftharpoons c222$	
138	v145	v145 cPP + (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5b	$c9 + c212 \rightleftharpoons c215$	

Nº	Id	Name	Reaction Equation	SBO
139	v146	v146 cPP + (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5b	$c9 + c211 \rightleftharpoons c214$	
140	v147	v147 cPP + (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5b	$c9 + c210 \rightleftharpoons c213$	
141	v148	v148 cPP + (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos:cPP k5 kd5b	$c9 + c203 \rightleftharpoons c206$	
142	v149	v149 cPP + (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos:cPP k5 kd5b	$c9 + c202 \rightleftharpoons c205$	
143	v150	v150 cPP + (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:cPP k5 kd5b	$c9 + c201 \rightleftharpoons c204$	
144	v151	v151 cPP + (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:cPP k5 kd5b	$c9 + c194 \rightleftharpoons c197$	
145	v152	v152 cPP + (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:cPP k5 kd5b	$c9 + c193 \rightleftharpoons c196$	
146	v153	v153 cPP + (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:cPP k5 kd5b	$c9 + c192 \rightleftharpoons c195$	



Nº	Id	Name	Reaction Equation	SBO
147	v155	v155 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) + cPP - > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP):cPP k5 kd5	$c68 + c9 \rightleftharpoons c94$	
148	v156	v156 cPP + 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5	$c9 + c67 \rightleftharpoons c93$	
149	v157	v157 cPP + 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos:cPP k5 kd5	$c9 + c66 \rightleftharpoons c92$	
150	v158	v158 cPP + 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:cPP k5 kd5	$c9 + c65 \rightleftharpoons c91$	
151	v159	v159 cPP + 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GTP) -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GTP):cPP k5 kd5	$c9 + c21 \rightleftharpoons c90$	
152	v160	v160 cPP + 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP):cPP k5 kd5	$c9 + c20 \rightleftharpoons c89$	
153	v161	v161 2(EGF:ErbB1)#P:GAP:Grb2 + cPP -> 2(EGF:ErbB1)#P:GAP:Grb2:cPP k5 kd5	$c18 + c9 \rightleftharpoons c7$	
154	v162	v162 cPP + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:cPP k5 kd5	$c9 + c19 \rightleftharpoons c88$	

Nº	Id	Name	Reaction Equation	SBO
155	v163	v163 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) k6 kd6	c27 $\rightleftharpoons$ c20	
156	v164	v164 ErbB1:ATP -> ErbB1:ATP k6 kd6	c2 $\rightleftharpoons$ c6	
157	v165	v165 2(EGF:ErbB1)#P -> 2(EGF:ErbB1)#P k6 kd6	c5 $\rightleftharpoons$ c8	
158	v166	v166 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP k6 kd6	c15 $\rightleftharpoons$ c17	
159	v167	v167 2(EGF:ErbB1)#P:GAP:Shc -> 2(EGF:ErbB1)#P:GAP:Shc k6 kd6	c32 $\rightleftharpoons$ c63	
160	v168	v168 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P) k6 kd6	c33 $\rightleftharpoons$ c64	
161	v169	v169 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k6 kd6	c25 $\rightleftharpoons$ c19	
162	v170	v170 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GTP) -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) k6 kd6	c29 $\rightleftharpoons$ c21	
163	v171	v171 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 - > 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 k6 kd6	c34 $\rightleftharpoons$ c65	
164	v172	v172 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos k6 kd6	c35 $\rightleftharpoons$ c66	
165	v173	v173 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k6 kd6	c36 $\rightleftharpoons$ c67	

Nº	Id	Name	Reaction Equation	SBO
166	v174	v174 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k6 kd6	$c37 \rightleftharpoons c68$	
167	v175	v175 2(EGF:ErbB1)#P:GAP:Grb2 + -> 2(EGF:ErbB1)#P:GAP:Grb2 k6 kd6	$c23 \rightleftharpoons c18$	
168	v176	v176 ErbB3 -> ErbB3 k6b kd6b	$c140 \rightleftharpoons c154$	
169	v177	v177 ErbB2 -> ErbB2 k6b kd6b	$c141 \rightleftharpoons c155$	
170	v178	v178 ErbB4 -> ErbB4 k6b kd6b	$c143 \rightleftharpoons c156$	
171	v179	v179 (ErbB3:ErbB2)#P:GAP:Shc - >(ErbB3:ErbB2)#P:GAP:Shc k6b kd6b	$c347 \rightleftharpoons c349$	
172	v180	v180 (ErbB4:ErbB2)#P:GAP:Shc -> (ErbB4:ErbB2)#P:GAP:Shc k6 kd6	$c348 \rightleftharpoons c350$	
173	v181	v181 (ErbB3:ErbB2)#P:GAP:(Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P) k6b kd6b	$c351 \rightleftharpoons c353$	
174	v182	v182 ErbB2:Inh -> ErbB2:Inh k6b kd6b	$c502 \rightleftharpoons c508$	
175	v183	v183 ErbB4:Inh -> ErbB4:Inh k6b kd6b	$c503 \rightleftharpoons c512$	
176	v184	v184 (ErbB4:ErbB2)#P:GAP:(Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P) k6b kd6b	$c354 \rightleftharpoons c356$	
177	v185	v185 (ErbB1:ErbB2)#P -> (ErbB1:ErbB2)#P k7 kd7	$c148 \rightleftharpoons c162$	
178	v186	v186 (ErbB1:ErbB3)#P -> (ErbB1:ErbB3)#P k7 kd7	$c149 \rightleftharpoons c163$	
179	v187	v187 (ErbB1:ErbB4)#P -> (ErbB1:ErbB4)#P k7 kd7	$c150 \rightleftharpoons c164$	
180	v188	v188 2(ErbB2)#P -> 2(ErbB2)#P k7 kd7	$c289 \rightleftharpoons c290$	
181	v189	v189 (ErbB3:ErbB2)#P -> (ErbB3:ErbB2)#P k7 kd7	$c335 \rightleftharpoons c337$	

Nº	Id	Name	Reaction Equation	SBO
182	v190	v190 (ErbB4:ErbB2)#P -> (ErbB4:ErbB2)#P k7 kd7	$c336 \rightleftharpoons c338$	
183	v191	v191 2(ErbB2)#P:GAP -> 2(ErbB2)#P:GAP k7 kd7	$c291 \rightleftharpoons c293$	
184	v192	v192 2(ErbB2)#P:GAP:Shc -> 2(ErbB2)- #P:GAP:Shc k7 kd7	$c294 \rightleftharpoons c296$	
185	v193	v193 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P) k7 kd7	$c297 \rightleftharpoons c299$	
186	v194	v194 (ErbB1:ErbB2)#P + GAP -> (ErbB1:ErbB2)#P:GAP k8b kd8b	$c162 + c14 \rightleftharpoons c165$	
187	v195	v195 (ErbB1:ErbB3)#P + GAP -> (ErbB1:ErbB3)#P:GAP k8b kd8b	$c163 + c14 \rightleftharpoons c166$	
188	v196	v196 (ErbB1:ErbB4)#P + GAP -> (ErbB1:ErbB4)#P:GAP k8b kd8b	$c164 + c14 \rightleftharpoons c167$	
189	v197	v197 2(EGF:ErbB1)#P + GAP -> 2(EGF:ErbB1)#P:GAP k8 kd8	$c8 + c14 \rightleftharpoons c17$	
190	v198	v198 2(EGF:ErbB1)#P + GAP -> 2(EGF:ErbB1)#P:GAP k8 kd8	$c5 + c14 \rightleftharpoons c15$	
191	v199	v199 (ErbB1:ErbB2)#P + GAP -> (ErbB1:ErbB2)#P:GAP k8 kd8	$c148 + c14 \rightleftharpoons c151$	
192	v200	v200 (ErbB1:ErbB3)#P + GAP -> (ErbB1:ErbB3)#P:GAP k8b kd8b	$c149 + c14 \rightleftharpoons c152$	
193	v201	v201 (ErbB1:ErbB4)#P + GAP -> (ErbB1:ErbB4)#P:GAP k8b kd8b	$c150 + c14 \rightleftharpoons c153$	
194	v202	v202 GAP + (ErbB3:ErbB2)#P -> (ErbB3:ErbB2)#P:GAP k8 kd8	$c14 + c335 \rightleftharpoons c341$	
195	v203	v203 GAP + (ErbB4:ErbB2)#P -> (ErbB4:ErbB2)#P:GAP k8 kd8	$c14 + c336 \rightleftharpoons c344$	

Nº	Id	Name	Reaction Equation	SBO
196	v204	v204 GAP + (ErbB3:ErbB2)#P -> (ErbB3:ErbB2)#P:GAP k8 kd8	$c14 + c337 \rightleftharpoons c343$	
197	v205	v205 GAP + (ErbB4:ErbB2)#P -> (ErbB4:ErbB2)#P:GAP k8 kd8	$c14 + c338 \rightleftharpoons c346$	
198	v206	v206 2(ErbB2)#P + GAP -> 2(ErbB2)-#P:GAP k8 kd8	$c290 + c14 \rightleftharpoons c293$	
199	v207	v207 2(ErbB2)#P + GAP -> 2(ErbB2)-#P:GAP k8 kd8	$c289 + c14 \rightleftharpoons c291$	
200	v208	v208 ErbB1:ATP + EGF -> EGF:ErbB1:ATP k10b kd10	$c6 + c16 \rightleftharpoons c10$	
201	v209	v209 ErbB3 + -> (HRG:ErbB3) k10b kd10	$c154 + c515 \rightleftharpoons c157$	
202	v211	v211 cPP + -> cPP k15 kd15	$c9 \rightleftharpoons c12$	
203	v212	v212 Grb2 + 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP:Grb2 k16 kd63	$c22 + c15 \rightleftharpoons c23$	
204	v213	v213 Grb2 + (Shc#P) -> (Shc#P):Grb2 k16 kd24	$c22 + c40 \rightleftharpoons c39$	
205	v214	v214 Grb2 + 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c33 \rightleftharpoons c34$	
206	v215	v215 2(EGF:ErbB1)#P:GAP + Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2 k16 kd63	$c17 + c22 \rightleftharpoons c18$	
207	v216	v216 Grb2 + 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c64 \rightleftharpoons c65$	
208	v217	v217 Grb2 + (ErbB1:ErbB2)#P:GAP -> (ErbB1:ErbB2)#P:GAP:Grb2 k16 kd24	$c22 + c151 \rightleftharpoons c225$	
209	v218	v218 Grb2 + (ErbB1:ErbB3)#P:GAP -> (ErbB1:ErbB3)#P:GAP:Grb2 k16 kd24	$c22 + c152 \rightleftharpoons c226$	

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210	v219	v219 Grb2 + (ErbB1:ErbB4)#P:GAP -> (ErbB1:ErbB4)#P:GAP:Grb2 k16 kd24	$c22 + c153 \rightleftharpoons c227$	
211	v220	v220 (ErbB1:ErbB2)#P:GAP + Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2 k16 kd24	$c165 + c22 \rightleftharpoons c228$	
212	v221	v221 (ErbB1:ErbB3)#P:GAP + Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2 k16 kd24	$c166 + c22 \rightleftharpoons c229$	
213	v222	v222 (ErbB1:ErbB4)#P:GAP + Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2 k16 kd24	$c167 + c22 \rightleftharpoons c230$	
214	v223	v223 Grb2 + (ErbB1:ErbB2)#P:GAP:(Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c180 \rightleftharpoons c189$	
215	v224	v224 Grb2 + (ErbB1:ErbB3)#P:GAP:(Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c181 \rightleftharpoons c190$	
216	v225	v225 Grb2 + (ErbB1:ErbB4)#P:GAP:(Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c182 \rightleftharpoons c191$	
217	v226	v226 Grb2 + (ErbB1:ErbB2)#P:GAP:(Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c183 \rightleftharpoons c192$	
218	v227	v227 Grb2 + (ErbB1:ErbB3)#P:GAP:(Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c184 \rightleftharpoons c193$	
219	v228	v228 Grb2 + (ErbB1:ErbB4)#P:GAP:(Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c185 \rightleftharpoons c194$	
220	v229	v229 Grb2 + 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2 k16 kd24	$c22 + c297 \rightleftharpoons c300$	

Nº	Id	Name	Reaction Equation	SBO
221	v230	v230 Grb2 + 2(ErbB2)#P:GAP:(Shc#P) ->	$c_{22} + c_{299} \rightleftharpoons c_{302}$	
		2(ErbB2)#P:GAP:(Shc#P):Grb2 k16 kd24		
222	v231	v231 2(ErbB2)#P:GAP + Grb2 -> 2(ErbB2)-	$c_{291} + c_{22} \rightleftharpoons c_{312}$	
		#P:GAP:Grb2 k16 kd63		
223	v232	v232 2(ErbB2)#P:GAP + Grb2 -> 2(ErbB2)-	$c_{293} + c_{22} \rightleftharpoons c_{314}$	
		#P:GAP:Grb2 k16 kd63		
224	v233	v233 Grb2 + (ErbB3:ErbB2)#P:GAP:(Shc#P)	$c_{22} + c_{351} \rightleftharpoons c_{357}$	
		-> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2		
		k16 kd24		
225	v234	v234 Grb2 + (ErbB3:ErbB2)#P:GAP:(Shc#P)	$c_{22} + c_{353} \rightleftharpoons c_{359}$	
		-> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2		
		k16 kd24		
226	v235	v235 Grb2 + (ErbB4:ErbB2)#P:GAP:(Shc#P)	$c_{22} + c_{354} \rightleftharpoons c_{360}$	
		-> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2		
		k16 kd24		
227	v236	v236 Grb2 + (ErbB4:ErbB2)#P:GAP:(Shc#P)	$c_{22} + c_{356} \rightleftharpoons c_{362}$	
		-> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2		
		k16 kd24		
228	v237	v237 (ErbB3:ErbB2)#P:GAP + Grb2 ->	$c_{341} + c_{22} \rightleftharpoons c_{381}$	
		(ErbB3:ErbB2)#P:GAP:Grb2 k16 kd63		
229	v238	v238 (ErbB3:ErbB2)#P:GAP + Grb2 ->	$c_{343} + c_{22} \rightleftharpoons c_{383}$	
		(ErbB3:ErbB2)#P:GAP:Grb2 k16 kd24		
230	v239	v239 (ErbB4:ErbB2)#P:GAP + Grb2 ->	$c_{344} + c_{22} \rightleftharpoons c_{384}$	
		(ErbB4:ErbB2)#P:GAP:Grb2 k16 kd24		
231	v240	v240 (ErbB4:ErbB2)#P:GAP + Grb2 ->	$c_{346} + c_{22} \rightleftharpoons c_{386}$	
		(ErbB4:ErbB2)#P:GAP:Grb2 k16 kd63		
232	v241	v241 Sos + (ErbB3:ErbB2)#P:GAP:Grb2 ->	$c_{24} + c_{381} \rightleftharpoons c_{387}$	
		(ErbB3:ErbB2)#P:GAP:Grb2:Sos k17 kd17		

Nº	Id	Name	Reaction Equation	SBO
233	v242	v242 Sos + (ErbB3:ErbB2)#P:GAP:Grb2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos k17 kd17	$c24 + c383 \rightleftharpoons c389$	
234	v243	v243 Sos + (ErbB4:ErbB2)#P:GAP:Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos k17 kd17	$c24 + c384 \rightleftharpoons c390$	
235	v244	v244 Sos + (ErbB4:ErbB2)#P:GAP:Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos k17 kd17	$c24 + c386 \rightleftharpoons c392$	
236	v245	v245 Sos + 2(ErbB2)#P:GAP:Grb2 -> 2(ErbB2)#P:GAP:Grb2:Sos k17 kd17	$c24 + c312 \rightleftharpoons c315$	
237	v246	v246 Sos + 2(ErbB2)#P:GAP:Grb2 -> 2(ErbB2)#P:GAP:Grb2:Sos k17 kd17	$c24 + c314 \rightleftharpoons c317$	
238	v247	v247 Sos + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k17 kd17	$c24 + c18 \rightleftharpoons c19$	
239	v248	v248 Sos + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k17 kd17	$c24 + c23 \rightleftharpoons c25$	
240	v249	v249 Sos + (ErbB1:ErbB2)#P:GAP:Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k17 kd17	$c24 + c225 \rightleftharpoons c234$	
241	v250	v250 Sos + (ErbB1:ErbB3)#P:GAP:Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k17 kd17	$c24 + c226 \rightleftharpoons c235$	
242	v251	v251 Sos + (ErbB1:ErbB4)#P:GAP:Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k17 kd17	$c24 + c227 \rightleftharpoons c236$	
243	v252	v252 Sos + (ErbB1:ErbB2)#P:GAP:Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k17 kd17	$c24 + c228 \rightleftharpoons c237$	
244	v253	v253 Sos + (ErbB1:ErbB3)#P:GAP:Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k17 kd17	$c24 + c229 \rightleftharpoons c238$	
245	v254	v254 Sos + (ErbB1:ErbB4)#P:GAP:Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k17 kd17	$c24 + c230 \rightleftharpoons c239$	
246	v255	v255 Ras:GDP + 2(EGF:ErbB1)-#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)-#P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c25 \rightleftharpoons c27$	



Nº	Id	Name	Reaction Equation	SBO
247	v256	v256 Ras:GDP + 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c35 \rightleftharpoons c36$	
248	v257	v257 Ras:GDP + 2(EGF:ErbB1)- #P:GAP:Grb2:Sos -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c19 \rightleftharpoons c20$	
249	v258	v258 Ras:GDP + 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c66 \rightleftharpoons c67$	
250	v259	v259 Ras:GDP + (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos > (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c198 \rightleftharpoons c207$	
251	v260	v260 Ras:GDP + (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos > (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c199 \rightleftharpoons c208$	
252	v261	v261 Ras:GDP + (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos > (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c200 \rightleftharpoons c209$	
253	v262	v262 Ras:GDP + (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos > (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c201 \rightleftharpoons c210$	

Nº	Id	Name	Reaction Equation	SBO
254	v263	v263 Ras:GDP + (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos > (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c202 \rightleftharpoons c211$	
255	v264	v264 Ras:GDP + (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos > (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c203 \rightleftharpoons c212$	
256	v265	v265 Ras:GDP + (ErbB1:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c234 \rightleftharpoons c243$	
257	v266	v266 Ras:GDP + (ErbB1:ErbB3)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c235 \rightleftharpoons c244$	
258	v267	v267 Ras:GDP + (ErbB1:ErbB4)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c236 \rightleftharpoons c245$	
259	v268	v268 Ras:GDP + (ErbB1:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c237 \rightleftharpoons c246$	
260	v269	v269 Ras:GDP + (ErbB1:ErbB3)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c238 \rightleftharpoons c247$	
261	v270	v270 Ras:GDP + (ErbB1:ErbB4)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c239 \rightleftharpoons c248$	
262	v271	v271 Ras:GDP + 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c303 \rightleftharpoons c306$	

Nº	Id	Name	Reaction Equation	SBO
263	v272	v272 Ras:GDP + 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c305 \rightleftharpoons c308$	
264	v273	v273 Ras:GDP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c315 \rightleftharpoons c318$	
265	v274	v274 Ras:GDP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c317 \rightleftharpoons c320$	
266	v275	v275 Ras:GDP + (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c366 \rightleftharpoons c372$	
267	v276	v276 Ras:GDP + (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c368 \rightleftharpoons c374$	
268	v277	v277 Ras:GDP + (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c363 \rightleftharpoons c369$	
269	v278	v278 Ras:GDP + (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c365 \rightleftharpoons c371$	
270	v279	v279 Ras:GDP + (ErbB4:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c390 \rightleftharpoons c396$	

Nº	Id	Name	Reaction Equation	SBO
271	v280	v280 Ras:GDP + (ErbB4:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c392 \rightleftharpoons c398$	
272	v281	v281 Ras:GDP + (ErbB3:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c387 \rightleftharpoons c393$	
273	v282	v282 Ras:GDP + (ErbB3:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18	$c26 + c389 \rightleftharpoons c395$	
274	v283	v283 Ras:GTP + (ErbB3:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c387 \rightleftharpoons c393$	
275	v284	v284 (Ras:GTP) <sub>i</sub> + (ErbB3:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c69 + c389 \rightleftharpoons c395$	
276	v285	v285 Ras:GTP + (ErbB4:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c390 \rightleftharpoons c396$	
277	v286	v286 (Ras:GTP) <sub>i</sub> + (ErbB4:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c69 + c392 \rightleftharpoons c398$	
278	v287	v287 Ras:GTP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c315 \rightleftharpoons c318$	
279	v288	v288 (Ras:GTP) <sub>i</sub> + 2(ErbB2)- #P:GAP:Grb2:Sos -> 2(ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c69 + c317 \rightleftharpoons c320$	

Nº	Id	Name	Reaction Equation	SBO
280	v289	v289 Ras:GTP + 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c303 \rightleftharpoons c306$	
281	v290	v290 (Ras:GTP).i + 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c69 + c305 \rightleftharpoons c308$	
282	v291	v291 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos + (Ras:GTP).i - > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c66 + c69 \rightleftharpoons c67$	
283	v292	v292 (Ras:GTP).i + 2(EGF:ErbB1)- #P:GAP:Grb2:Sos -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c69 + c19 \rightleftharpoons c20$	
284	v293	v293 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GTP -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k19 kd19	$c35 + c28 \rightleftharpoons c36$	
285	v294	v294 Ras:GTP + 2(EGF:ErbB1)- #P:GAP:Grb2:Sos -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c25 \rightleftharpoons c27$	
286	v295	v295 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GTP -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k19 kd19	$c198 + c28 \rightleftharpoons c207$	
287	v296	v296 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GTP -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k19 kd19	$c199 + c28 \rightleftharpoons c208$	

Nº	Id	Name	Reaction Equation	SBO
288	v297	v297 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GTP -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k19 kd19	$c200 + c28 \rightleftharpoons c209$	
289	v298	v298 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + (Ras:GTP) <sub>i</sub> - > (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c201 + c69 \rightleftharpoons c210$	
290	v299	v299 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos + (Ras:GTP) <sub>i</sub> - > (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c202 + c69 \rightleftharpoons c211$	
291	v300	v300 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos + (Ras:GTP) <sub>i</sub> - > (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c203 + c69 \rightleftharpoons c212$	
292	v301	v301 Ras:GTP + (ErbB1:ErbB2)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c234 \rightleftharpoons c243$	
293	v302	v302 Ras:GTP + (ErbB1:ErbB3)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c235 \rightleftharpoons c244$	
294	v303	v303 Ras:GTP + (ErbB1:ErbB4)- #P:GAP:Grb2:Sos -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c236 \rightleftharpoons c245$	
295	v304	v304 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + (Ras:GTP) <sub>i</sub> -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c237 + c69 \rightleftharpoons c246$	

Nº	Id	Name	Reaction Equation	SBO
296	v305	v305 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + (Ras:GTP) <sub>i</sub> -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c238 + c69 \rightleftharpoons c247$	
297	v306	v306 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + (Ras:GTP) <sub>i</sub> -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP) k19 kd19	$c239 + c69 \rightleftharpoons c248$	
298	v307	v307 Ras:GTP + (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c363 \rightleftharpoons c369$	
299	v308	v308 (Ras:GTP) <sub>i</sub> + (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c69 + c365 \rightleftharpoons c371$	
300	v309	v309 Ras:GTP + (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c28 + c366 \rightleftharpoons c372$	
301	v310	v310 (Ras:GTP) <sub>i</sub> + (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) k19 kd19	$c69 + c368 \rightleftharpoons c374$	
302	v311	v311 Ras_activated:GTP + (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c43 + c366 \rightleftharpoons c378$	

Nº	Id	Name	Reaction Equation	SBO
303	v312	v312 (Ras_activated:GTP)_i + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c368 \rightleftharpoons c380$	
304	v313	v313 Ras_activated:GTP + (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c43 + c363 \rightleftharpoons c375$	
305	v314	v314 (Ras_activated:GTP)_i + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c365 \rightleftharpoons c377$	
306	v315	v315 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + Ras_activated:GTP -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c234 + c43 \rightleftharpoons c252$	
307	v316	v316 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + Ras_activated:GTP -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c235 + c43 \rightleftharpoons c253$	
308	v317	v317 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + Ras_activated:GTP -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c236 + c43 \rightleftharpoons c254$	
309	v318	v318 (Ras_activated:GTP)_i + (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c237 \rightleftharpoons c255$	
310	v319	v319 (Ras_activated:GTP)_i + (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c238 \rightleftharpoons c256$	



Nº	Id	Name	Reaction Equation	SBO
311	v320	v320 (Ras_activated:GTP)_i + (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c239 \rightleftharpoons c257$	
312	v321	v321 2(EGF:ErbB1)#P:GAP:Grb2:Sos + Ras_activated:GTP -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c25 + c43 \rightleftharpoons c29$	
313	v322	v322 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos + Ras_activated:GTP -> 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c35 + c43 \rightleftharpoons c37$	
314	v323	v323 (Ras_activated:GTP)_i + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c19 \rightleftharpoons c21$	
315	v324	v324 (Ras_activated:GTP)_i + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c66 \rightleftharpoons c68$	
316	v325	v325 Ras_activated:GTP + (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c43 + c198 \rightleftharpoons c216$	
317	v326	v326 Ras_activated:GTP + (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c43 + c199 \rightleftharpoons c217$	

Nº	Id	Name	Reaction Equation	SBO
318	v327	v327 Ras_activated:GTP + (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos - > (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c43 + c200 \rightleftharpoons c218$	
319	v328	v328 (Ras_activated:GTP)_i + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c201 \rightleftharpoons c219$	
320	v329	v329 (Ras_activated:GTP)_i + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c202 \rightleftharpoons c220$	
321	v330	v330 (Ras_activated:GTP)_i + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c203 \rightleftharpoons c221$	
322	v331	v331 Ras_activated:GTP + 2(ErbB2)- #P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20	$c43 + c303 \rightleftharpoons c309$	
323	v332	v332 (Ras_activated:GTP)_i + 2(ErbB2)- #P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20	$c71 + c305 \rightleftharpoons c311$	
324	v333	v333 2(ErbB2)#P:GAP:Grb2:Sos + Ras_activated:GTP -> 2(ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c315 + c43 \rightleftharpoons c321$	

Nº	Id	Name	Reaction Equation	SBO
325	v334	v334 2(ErbB2)#P:GAP:Grb2:Sos + (Ras_activated:GTP).i -> 2(ErbB2)-#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c317 + c71 \rightleftharpoons c323$	
326	v335	v335 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + Ras_activated:GTP -> (ErbB4:ErbB2)-#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c390 + c43 \rightleftharpoons c402$	
327	v336	v336 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + (Ras_activated:GTP).i -> (ErbB4:ErbB2)-#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c392 + c71 \rightleftharpoons c404$	
328	v337	v337 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + Ras_activated:GTP -> (ErbB3:ErbB2)-#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c387 + c43 \rightleftharpoons c399$	
329	v338	v338 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + (Ras_activated:GTP).i -> (ErbB3:ErbB2)-#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20	$c389 + c71 \rightleftharpoons c401$	
330	v339	v339 2(ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c315 + c26 \rightleftharpoons c321$	
331	v340	v340 2(ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c317 + c26 \rightleftharpoons c323$	
332	v341	v341 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c303 + c26 \rightleftharpoons c309$	
333	v342	v342 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c305 + c26 \rightleftharpoons c311$	

Nº	Id	Name	Reaction Equation	SBO
334	v343	v343 $2(\text{EGF:ErbB1})\#\text{P:GAP:}(\text{Shc-}\# \text{P}): \text{Grb2:Sos} + \text{Ras:GDP} \rightarrow 2(\text{EGF:ErbB1})\#\text{P:GAP:}(\text{Shc}\#\text{P}): \text{Grb2:Sos:}(\text{Ras:GTP})$ k21 kd21	$c66 + c26 \rightleftharpoons c68$	
335	v344	v344 $2(\text{EGF:ErbB1})\#\text{P:GAP:Grb2:Sos} + \text{Ras:GDP} \rightarrow 2(\text{EGF:ErbB1})\#\text{P:GAP:Grb2:Sos:}(\text{Ras:GTP})$ k21 kd21	$c19 + c26 \rightleftharpoons c21$	
336	v345	v345 $2(\text{EGF:ErbB1})\#\text{P:GAP:}(\text{Shc-}\# \text{P}): \text{Grb2:Sos} + \text{Ras:GDP} \rightarrow 2(\text{EGF:ErbB1})\#\text{P:GAP:}(\text{Shc}\#\text{P}): \text{Grb2:Sos:}(\text{Ras:GTP})$ k21 kd21	$c35 + c26 \rightleftharpoons c37$	
337	v346	v346 $2(\text{EGF:ErbB1})\#\text{P:GAP:Grb2:Sos} + \text{Ras:GDP} \rightarrow 2(\text{EGF:ErbB1})\#\text{P:GAP:Grb2:Sos:}(\text{Ras:GTP})$ k21 kd21	$c25 + c26 \rightleftharpoons c29$	
338	v347	v347 $(\text{ErbB1:ErbB2})\#\text{P:GAP:}(\text{Shc-}\# \text{P}): \text{Grb2:Sos} + \text{Ras:GDP} \rightarrow (\text{ErbB1:ErbB2})\#\text{P:GAP:}(\text{Shc}\#\text{P}): \text{Grb2:Sos:}(\text{Ras:GTP})$ k21 kd21	$c198 + c26 \rightleftharpoons c216$	
339	v348	v348 $(\text{ErbB1:ErbB3})\#\text{P:GAP:}(\text{Shc-}\# \text{P}): \text{Grb2:Sos} + \text{Ras:GDP} \rightarrow (\text{ErbB1:ErbB3})\#\text{P:GAP:}(\text{Shc}\#\text{P}): \text{Grb2:Sos:}(\text{Ras:GTP})$ k21 kd21	$c199 + c26 \rightleftharpoons c217$	
340	v349	v349 $(\text{ErbB1:ErbB4})\#\text{P:GAP:}(\text{Shc-}\# \text{P}): \text{Grb2:Sos} + \text{Ras:GDP} \rightarrow (\text{ErbB1:ErbB4})\#\text{P:GAP:}(\text{Shc}\#\text{P}): \text{Grb2:Sos:}(\text{Ras:GTP})$ k21 kd21	$c200 + c26 \rightleftharpoons c218$	

Nº	Id	Name	Reaction Equation	SBO
341	v350	v350 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c201 + c26 \rightleftharpoons c219$	
342	v351	v351 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c202 + c26 \rightleftharpoons c220$	
343	v352	v352 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c203 + c26 \rightleftharpoons c221$	
344	v353	v353 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c234 + c26 \rightleftharpoons c252$	
345	v354	v354 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c235 + c26 \rightleftharpoons c253$	
346	v355	v355 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c236 + c26 \rightleftharpoons c254$	
347	v356	v356 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c237 + c26 \rightleftharpoons c255$	
348	v357	v357 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c238 + c26 \rightleftharpoons c256$	

Nº	Id	Name	Reaction Equation	SBO
349	v358	v358 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c239 + c26 \rightleftharpoons c257$	
350	v359	v359 (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c363 + c26 \rightleftharpoons c375$	
351	v360	v360 (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c365 + c26 \rightleftharpoons c377$	
352	v361	v361 (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c366 + c26 \rightleftharpoons c378$	
353	v362	v362 (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k21 kd21	$c368 + c26 \rightleftharpoons c380$	
354	v363	v363 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c387 + c26 \rightleftharpoons c399$	
355	v364	v364 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c389 + c26 \rightleftharpoons c401$	
356	v365	v365 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c390 + c26 \rightleftharpoons c402$	

Nº	Id	Name	Reaction Equation	SBO
357	v366	v366 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21	$c392 + c26 \rightleftharpoons c404$	
358	v367	v367 Shc + 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP:Shc k22 kd22	$c31 + c15 \rightleftharpoons c32$	
359	v368	v368 Shc + 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP:Shc k22 kd22	$c31 + c17 \rightleftharpoons c63$	
360	v369	v369 Shc + (ErbB1:ErbB2)#P:GAP -> (ErbB1:ErbB2)#P:GAP:Shc k22 kd22b	$c31 + c151 \rightleftharpoons c171$	
361	v370	v370 Shc + (ErbB1:ErbB3)#P:GAP -> (ErbB1:ErbB3)#P:GAP:Shc k22 kd22b	$c31 + c152 \rightleftharpoons c172$	
362	v371	v371 Shc + (ErbB1:ErbB4)#P:GAP -> (ErbB1:ErbB4)#P:GAP:Shc k22 kd22b	$c31 + c153 \rightleftharpoons c173$	
363	v372	v372 Shc + (ErbB1:ErbB2)#P:GAP -> (ErbB1:ErbB2)#P:GAP:Shc k22 kd22b	$c31 + c165 \rightleftharpoons c174$	
364	v373	v373 Shc + (ErbB1:ErbB3)#P:GAP -> (ErbB1:ErbB3)#P:GAP:Shc k22 kd22b	$c31 + c166 \rightleftharpoons c175$	
365	v374	v374 Shc + (ErbB1:ErbB4)#P:GAP -> (ErbB1:ErbB4)#P:GAP:Shc k22 kd22b	$c31 + c167 \rightleftharpoons c176$	
366	v375	v375 Shc + 2(ErbB2)#P:GAP -> 2(ErbB2)- #P:GAP:Shc k22 kd22b	$c31 + c291 \rightleftharpoons c294$	
367	v376	v376 Shc + 2(ErbB2)#P:GAP -> 2(ErbB2)- #P:GAP:Shc k22 kd22b	$c31 + c293 \rightleftharpoons c296$	
368	v377	v377 Shc + (ErbB3:ErbB2)#P:GAP -> (ErbB3:ErbB2)#P:GAP:Shc k22 kd22b	$c31 + c341 \rightleftharpoons c347$	
369	v378	v378 Shc + (ErbB3:ErbB2)#P:GAP -> (ErbB3:ErbB2)#P:GAP:Shc k22 kd22b	$c31 + c343 \rightleftharpoons c349$	
370	v379	v379 Shc + (ErbB4:ErbB2)#P:GAP -> (ErbB4:ErbB2)#P:GAP:Shc k22 kd22	$c31 + c344 \rightleftharpoons c348$	

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371	v380	v380 Shc + (ErbB4:ErbB2)#P:GAP (ErbB4:ErbB2)#P:GAP:Shc k22 kd22	-> c31 + c346 $\rightleftharpoons$ c350	
372	v381	v381 (ErbB3:ErbB2)#P:GAP:Shc + (ErbB3:ErbB2)#P:GAP:(Shc#P) k23 kd23	-> c347 $\rightleftharpoons$ c351	
373	v382	v382 (ErbB3:ErbB2)#P:GAP:Shc + (ErbB3:ErbB2)#P:GAP:(Shc#P) k23 kd23	-> c349 $\rightleftharpoons$ c353	
374	v383	v383 (ErbB4:ErbB2)#P:GAP:Shc + (ErbB4:ErbB2)#P:GAP:(Shc#P) k23 kd23	-> c348 $\rightleftharpoons$ c354	
375	v384	v384 (ErbB4:ErbB2)#P:GAP:Shc + (ErbB4:ErbB2)#P:GAP:(Shc#P) k23 kd23	-> c350 $\rightleftharpoons$ c356	
376	v385	v385 2(ErbB2)#P:GAP:Shc + -> 2(ErbB2)- #P:GAP:(Shc#P) k23 kd23	c294 $\rightleftharpoons$ c297	
377	v386	v386 2(ErbB2)#P:GAP:Shc + -> 2(ErbB2)- #P:GAP:(Shc#P) k23 kd23	c296 $\rightleftharpoons$ c299	
378	v387	v387 2(EGF:ErbB1)#P:GAP:Shc + 2(EGF:ErbB1)#P:GAP:(Shc#P) k23 kd23	-> c63 $\rightleftharpoons$ c64	
379	v388	v388 2(EGF:ErbB1)#P:GAP:Shc + 2(EGF:ErbB1)#P:GAP:(Shc#P) k23 kd23	-> c32 $\rightleftharpoons$ c33	
380	v389	v389 (ErbB1:ErbB2)#P:GAP:Shc + (ErbB1:ErbB2)#P:GAP:(Shc#P) k23 kd23	-> c171 $\rightleftharpoons$ c180	
381	v390	v390 (ErbB1:ErbB3)#P:GAP:Shc + (ErbB1:ErbB3)#P:GAP:(Shc#P) k23 kd23	-> c172 $\rightleftharpoons$ c181	
382	v391	v391 (ErbB1:ErbB4)#P:GAP:Shc + (ErbB1:ErbB4)#P:GAP:(Shc#P) k23 kd23	-> c173 $\rightleftharpoons$ c182	
383	v392	v392 (ErbB1:ErbB2)#P:GAP:Shc + (ErbB1:ErbB2)#P:GAP:(Shc#P) k23 kd23	-> c174 $\rightleftharpoons$ c183	
384	v393	v393 (ErbB1:ErbB3)#P:GAP:Shc + (ErbB1:ErbB3)#P:GAP:(Shc#P) k23 kd23	-> c175 $\rightleftharpoons$ c184	



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385	v394	v394 (ErbB1:ErbB4)#P:GAP:Shc + -> (ErbB1:ErbB4)#P:GAP:(Shc#P) k23 kd23	$c176 \rightleftharpoons c185$	
386	v395	v395 Sos + 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c34 \rightleftharpoons c35$	
387	v396	v396 Sos + 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c65 \rightleftharpoons c66$	
388	v397	v397 Sos + (ErbB1:ErbB2)#P:GAP:(Shc-#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c189 \rightleftharpoons c198$	
389	v398	v398 Sos + (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c190 \rightleftharpoons c199$	
390	v399	v399 Sos + (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c191 \rightleftharpoons c200$	
391	v400	v400 Sos + (ErbB1:ErbB2)#P:GAP:(Shc-#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c192 \rightleftharpoons c201$	
392	v401	v401 Sos + (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c193 \rightleftharpoons c202$	
393	v402	v402 Sos + (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos k25 kd25	$c24 + c194 \rightleftharpoons c203$	
394	v403	v403 Sos + 2(ErbB2)#P:GAP:(Shc#P):Grb2 -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k25 kd25	$c24 + c300 \rightleftharpoons c303$	

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395	v404	v404 Sos + 2(ErbB2)#P:GAP:(Shc#P):Grb2 -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k25 kd25	$c24 + c302 \rightleftharpoons c305$	
396	v405	v405 Sos + (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos k25 kd25	$c24 + c360 \rightleftharpoons c366$	
397	v406	v406 Sos + (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos k25 kd25	$c24 + c362 \rightleftharpoons c368$	
398	v407	v407 Sos + (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos k25 kd25	$c24 + c357 \rightleftharpoons c363$	
399	v408	v408 Sos + (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos k25 kd25	$c24 + c359 \rightleftharpoons c365$	
400	v409	v409 Ras:GTP + Raf -> Raf:Ras:GTP k28 kd28	$c28 + c41 \rightleftharpoons c42$	
401	v410	v410 (Ras:GTP)_i + Raf -> (Raf:Ras:GTP)_i k28 kd28	$c69 + c41 \rightleftharpoons c70$	
402	v411	v411 (Ras_activated:GTP)_i + (Raf#P)_i -> (Raf:Ras:GTP)_i k29 kd29	$c71 + c72 \rightleftharpoons c70$	
403	v412	v412 Ras_activated:GTP + Raf#P -> Raf:Ras:GTP k29 kd29	$c43 + c45 \rightleftharpoons c42$	
404	v413	v413 2(EGF:ErbB1)#P:GAP + (Shc- #P):Grb2:Sos -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c15 + c38 \rightleftharpoons c35$	
405	v414	v414 2(EGF:ErbB1)#P:GAP + (Shc- #P):Grb2:Sos -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c17 + c38 \rightleftharpoons c66$	

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406	v415	v415 (ErbB1:ErbB2)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c151 + c38 \rightleftharpoons c198$	
407	v416	v416 (ErbB1:ErbB3)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c152 + c38 \rightleftharpoons c199$	
408	v417	v417 (ErbB1:ErbB4)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c153 + c38 \rightleftharpoons c200$	
409	v418	v418 (ErbB1:ErbB2)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c165 + c38 \rightleftharpoons c201$	
410	v419	v419 (ErbB1:ErbB3)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c166 + c38 \rightleftharpoons c202$	
411	v420	v420 (ErbB1:ErbB4)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c167 + c38 \rightleftharpoons c203$	
412	v421	v421 2(ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c291 + c38 \rightleftharpoons c303$	
413	v422	v422 2(ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c293 + c38 \rightleftharpoons c305$	
414	v423	v423 (ErbB3:ErbB2)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c341 + c38 \rightleftharpoons c363$	

Nº	Id	Name	Reaction Equation	SBO
415	v424	v424 (ErbB3:ErbB2)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c343 + c38 \rightleftharpoons c365$	
416	v425	v425 (ErbB4:ErbB2)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c344 + c38 \rightleftharpoons c366$	
417	v426	v426 (ErbB4:ErbB2)#P:GAP + (Shc- #P):Grb2:Sos -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k32 kd32	$c346 + c38 \rightleftharpoons c368$	
418	v427	v427 (Shc#P) + Grb2:Sos -> (Shc- #P):Grb2:Sos k33 kd33	$c40 + c30 \rightleftharpoons c38$	
419	v428	v428 2(EGF:ErbB1)#P:GAP + Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k34 kd34	$c15 + c30 \rightleftharpoons c25$	
420	v429	v429 2(EGF:ErbB1)#P:GAP + Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k34 kd34	$c17 + c30 \rightleftharpoons c19$	
421	v430	v430 (ErbB1:ErbB2)#P:GAP + Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k34 kd34	$c151 + c30 \rightleftharpoons c234$	
422	v431	v431 (ErbB1:ErbB3)#P:GAP + Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k34 kd34	$c152 + c30 \rightleftharpoons c235$	
423	v432	v432 (ErbB1:ErbB4)#P:GAP + Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k34 kd34	$c153 + c30 \rightleftharpoons c236$	
424	v433	v433 (ErbB1:ErbB2)#P:GAP + Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k34 kd34	$c165 + c30 \rightleftharpoons c237$	
425	v434	v434 (ErbB1:ErbB3)#P:GAP + Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k34 kd34	$c166 + c30 \rightleftharpoons c238$	
426	v435	v435 (ErbB1:ErbB4)#P:GAP + Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k34 kd34	$c167 + c30 \rightleftharpoons c239$	
427	v436	v436 2(ErbB2)#P:GAP + Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos k34 kd34	$c291 + c30 \rightleftharpoons c315$	

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428	v437	v437 2(ErbB2)#P:GAP + Grb2:Sos ->	c293 + c30 $\rightleftharpoons$ c317	
		2(ErbB2)#P:GAP:Grb2:Sos k34 kd34		
429	v438	v438 (ErbB3:ErbB2)#P:GAP + Grb2:Sos ->	c341 + c30 $\rightleftharpoons$ c387	
		(ErbB3:ErbB2)#P:GAP:Grb2:Sos k34 kd34		
430	v439	v439 (ErbB3:ErbB2)#P:GAP + Grb2:Sos ->	c343 + c30 $\rightleftharpoons$ c389	
		(ErbB3:ErbB2)#P:GAP:Grb2:Sos k34 kd34		
431	v440	v440 (ErbB4:ErbB2)#P:GAP + Grb2:Sos ->	c344 + c30 $\rightleftharpoons$ c390	
		(ErbB4:ErbB2)#P:GAP:Grb2:Sos k34 kd34		
432	v441	v441 (ErbB4:ErbB2)#P:GAP + Grb2:Sos ->	c346 + c30 $\rightleftharpoons$ c392	
		(ErbB4:ErbB2)#P:GAP:Grb2:Sos k34 kd34		
433	v442	v442 Sos + Grb2 -> Grb2:Sos k35 kd35	c24 + c22 $\rightleftharpoons$ c30	
434	v443	v443 (Shc#P) + -> Shc k36 kd36	c40 $\rightleftharpoons$ c31	
435	v444	v444 2(EGF:ErbB1)#P:GAP + (Shc#P) ->	c15 + c40 $\rightleftharpoons$ c33	
		2(EGF:ErbB1)#P:GAP:(Shc#P) k37 kd37		
436	v445	v445 2(EGF:ErbB1)#P:GAP + (Shc#P):Grb2 ->	c15 + c39 $\rightleftharpoons$ c34	
		2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 k37 kd37		
437	v446	v446 2(EGF:ErbB1)#P:GAP + (Shc#P) ->	c17 + c40 $\rightleftharpoons$ c64	
		2(EGF:ErbB1)#P:GAP:(Shc#P) k37 kd37		
438	v447	v447 2(EGF:ErbB1)#P:GAP + (Shc#P):Grb2 ->	c17 + c39 $\rightleftharpoons$ c65	
		2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 k37 kd37		
439	v448	v448 (ErbB1:ErbB2)#P:GAP + (Shc#P) ->	c151 + c40 $\rightleftharpoons$ c180	
		(ErbB1:ErbB2)#P:GAP:(Shc#P) k37 kd37		
440	v449	v449 (ErbB1:ErbB3)#P:GAP + (Shc#P) ->	c152 + c40 $\rightleftharpoons$ c181	
		(ErbB1:ErbB3)#P:GAP:(Shc#P) k37 kd37		
441	v450	v450 (ErbB1:ErbB4)#P:GAP + (Shc#P) ->	c153 + c40 $\rightleftharpoons$ c182	
		(ErbB1:ErbB4)#P:GAP:(Shc#P) k37 kd37		

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442	v451	v451 (ErbB1:ErbB2)#P:GAP + (Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P) k37 kd37	$c165 + c40 \rightleftharpoons c183$	
443	v452	v452 (ErbB1:ErbB3)#P:GAP + (Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P) k37 kd37	$c166 + c40 \rightleftharpoons c184$	
444	v453	v453 (ErbB1:ErbB4)#P:GAP + (Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P) k37 kd37	$c167 + c40 \rightleftharpoons c185$	
445	v454	v454 (ErbB1:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 k37 kd37	$c151 + c39 \rightleftharpoons c189$	
446	v455	v455 (ErbB1:ErbB3)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 k37 kd37	$c152 + c39 \rightleftharpoons c190$	
447	v456	v456 (ErbB1:ErbB4)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 k37 kd37	$c153 + c39 \rightleftharpoons c191$	
448	v457	v457 (ErbB1:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 k37 kd37	$c165 + c39 \rightleftharpoons c192$	
449	v458	v458 (ErbB1:ErbB3)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 k37 kd37	$c166 + c39 \rightleftharpoons c193$	
450	v459	v459 (ErbB1:ErbB4)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 k37 kd37	$c167 + c39 \rightleftharpoons c194$	
451	v460	v460 2(ErbB2)#P:GAP + (Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P) k37 kd37	$c291 + c40 \rightleftharpoons c297$	
452	v461	v461 2(ErbB2)#P:GAP + (Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P) k37 kd37	$c293 + c40 \rightleftharpoons c299$	

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453	v462	v462 2(ErbB2)#P:GAP + (Shc#P):Grb2 ->	c291 + c39 $\rightleftharpoons$ c300	
454	v463	2(ErbB2)#P:GAP:(Shc#P):Grb2 k37 kd37 v463 2(ErbB2)#P:GAP + (Shc#P):Grb2 ->	c293 + c39 $\rightleftharpoons$ c302	
455	v464	2(ErbB2)#P:GAP:(Shc#P):Grb2 k37 kd37 v464 (ErbB3:ErbB2)#P:GAP + (Shc#P) ->	c341 + c40 $\rightleftharpoons$ c351	
456	v465	(ErbB3:ErbB2)#P:GAP:(Shc#P) k37 kd37 v465 (ErbB3:ErbB2)#P:GAP + (Shc#P) ->	c343 + c40 $\rightleftharpoons$ c353	
457	v466	(ErbB3:ErbB2)#P:GAP:(Shc#P) k37 kd37 v466 (ErbB4:ErbB2)#P:GAP + (Shc#P) ->	c344 + c40 $\rightleftharpoons$ c354	
458	v467	(ErbB4:ErbB2)#P:GAP:(Shc#P) k37 kd37 v467 (ErbB4:ErbB2)#P:GAP + (Shc#P) ->	c346 + c40 $\rightleftharpoons$ c356	
459	v468	(ErbB4:ErbB2)#P:GAP:(Shc#P) k37 kd37 v468 (ErbB3:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2	c341 + c39 $\rightleftharpoons$ c357	
460	v469	k37 kd37 v469 (ErbB3:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2	c343 + c39 $\rightleftharpoons$ c359	
461	v470	k37 kd37 v470 (ErbB4:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2	c344 + c39 $\rightleftharpoons$ c360	
462	v471	k37 kd37 v471 (ErbB4:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2	c346 + c39 $\rightleftharpoons$ c362	
463	v472	k37 kd37 v472 Sos + (Shc#P):Grb2 -> (Shc- #P):Grb2:Sos k40 kd40	c24 + c39 $\rightleftharpoons$ c38	
464	v473	v473 Grb2:Sos + 2(EGF:ErbB1)- #P:GAP:(Shc#P) -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	c30 + c33 $\rightleftharpoons$ c35	

Nº	Id	Name	Reaction Equation	SBO
465	v474	v474 Grb2:Sos + 2(EGF:ErbB1)- #P:GAP:(Shc#P) -> 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c64 \rightleftharpoons c66$	
466	v475	v475 Grb2:Sos + (ErbB1:ErbB2)- #P:GAP:(Shc#P) -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c180 \rightleftharpoons c198$	
467	v476	v476 Grb2:Sos + (ErbB1:ErbB3)- #P:GAP:(Shc#P) -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c181 \rightleftharpoons c199$	
468	v477	v477 Grb2:Sos + (ErbB1:ErbB4)- #P:GAP:(Shc#P) -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c182 \rightleftharpoons c200$	
469	v478	v478 Grb2:Sos + (ErbB1:ErbB2)- #P:GAP:(Shc#P) -> (ErbB1:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c183 \rightleftharpoons c201$	
470	v479	v479 Grb2:Sos + (ErbB1:ErbB3)- #P:GAP:(Shc#P) -> (ErbB1:ErbB3)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c184 \rightleftharpoons c202$	
471	v480	v480 Grb2:Sos + (ErbB1:ErbB4)- #P:GAP:(Shc#P) -> (ErbB1:ErbB4)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c185 \rightleftharpoons c203$	
472	v481	v481 Grb2:Sos + 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c297 \rightleftharpoons c303$	
473	v482	v482 Grb2:Sos + 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c299 \rightleftharpoons c305$	



Nº	Id	Name	Reaction Equation	SBO
474	v483	v483 Grb2:Sos + (ErbB3:ErbB2)- #P:GAP:(Shc#P) -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c351 \rightleftharpoons c363$	
475	v484	v484 Grb2:Sos + (ErbB3:ErbB2)- #P:GAP:(Shc#P) -> (ErbB3:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c353 \rightleftharpoons c365$	
476	v485	v485 Grb2:Sos + (ErbB4:ErbB2)- #P:GAP:(Shc#P) -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c354 \rightleftharpoons c366$	
477	v486	v486 Grb2:Sos + (ErbB4:ErbB2)- #P:GAP:(Shc#P) -> (ErbB4:ErbB2)- #P:GAP:(Shc#P):Grb2:Sos k41 kd41	$c30 + c356 \rightleftharpoons c368$	
478	v487	v487 Pase1 + (Raf#P) <sub>i</sub> -> (Raf#P:Pase1) <sub>i</sub> k42 kd42	$c44 + c72 \rightleftharpoons c73$	
479	v488	v488 Pase1 + Raf#P -> Raf#P:Pase1 k42 kd42	$c44 + c45 \rightleftharpoons c46$	
480	v489	v489 Raf + Pase1 -> Raf#P:Pase1 k43 kd43	$c41 + c44 \rightleftharpoons c46$	
481	v490	v490 Raf + Pase1 -> (Raf#P:Pase1) <sub>i</sub> k43 kd43	$c41 + c44 \rightleftharpoons c73$	
482	v491	v491 (Raf#P) <sub>i</sub> + (MEK#P) <sub>i</sub> -> (MEK- #P:Raf#P) <sub>i</sub> k44 kd52	$c72 + c75 \rightleftharpoons c76$	
483	v492	v492 MEK + (Raf#P) <sub>i</sub> -> (MEK:Raf#P) <sub>i</sub> k44 kd52	$c47 + c72 \rightleftharpoons c74$	
484	v493	v493 MEK + Raf#P -> MEK:Raf#P k44 kd52	$c47 + c45 \rightleftharpoons c48$	
485	v494	v494 MEK#P + Raf#P -> MEK#P:Raf#P k44 kd52	$c49 + c45 \rightleftharpoons c50$	
486	v495	v495 MEK#P + Raf#P -> MEK:Raf#P k45 kd45	$c49 + c45 \rightleftharpoons c48$	

Nº	Id	Name	Reaction Equation	SBO
487	v496	v496 (MEK#P) <sub>i</sub> + (Raf#P) <sub>i</sub> -> (MEK:Raf- #P) <sub>i</sub> k45 kd45	$c75 + c72 \rightleftharpoons c74$	
488	v497	v497 MEK#P#P + Raf#P -> MEK#P:Raf#P k47 kd47	$c51 + c45 \rightleftharpoons c50$	
489	v498	v498 (Raf#P) <sub>i</sub> + (MEK#P#P) <sub>i</sub> -> (MEK- #P:Raf#P) <sub>i</sub> k47 kd47	$c72 + c77 \rightleftharpoons c76$	
490	v499	v499 (MEK#P#P) <sub>i</sub> + Pase2 -> (MEK#P- #P:Pase2) <sub>i</sub> k48 kd48	$c77 + c53 \rightleftharpoons c78$	
491	v500	v500 MEK#P#P + Pase2 -> MEK#P- #P:Pase2 k48 kd48	$c51 + c53 \rightleftharpoons c52$	
492	v501	v501 MEK#P + Pase2 -> MEK#P#P:Pase2 k49 kd49	$c49 + c53 \rightleftharpoons c52$	
493	v502	v502 MEK + Pase2 -> MEK#P:Pase2 k49 kd49	$c47 + c53 \rightleftharpoons c54$	
494	v503	v503 MEK + Pase2 -> (MEK#P:Pase2) <sub>i</sub> k49 kd49	$c47 + c53 \rightleftharpoons c79$	
495	v504	v504 (MEK#P) <sub>i</sub> + Pase2 -> (MEK#P- #P:Pase2) <sub>i</sub> k49 kd49	$c75 + c53 \rightleftharpoons c78$	
496	v505	v505 Pase2 + (MEK#P) <sub>i</sub> -> (MEK- #P:Pase2) <sub>i</sub> k50 kd50	$c53 + c75 \rightleftharpoons c79$	
497	v506	v506 Pase2 + MEK#P -> MEK#P:Pase2 k50 kd50	$c53 + c49 \rightleftharpoons c54$	
498	v507	v507 ERK + MEK#P#P -> ERK:MEK#P#P k52 kd44	$c55 + c51 \rightleftharpoons c56$	
499	v508	v508 MEK#P#P + ERK#P -> ERK#P:MEK- #P#P k52 kd44	$c51 + c57 \rightleftharpoons c58$	
500	v509	v509 ERK + (MEK#P#P) <sub>i</sub> -> MEK#P- #P:ERK k52 kd44	$c55 + c77 \rightleftharpoons c80$	

Nº	Id	Name	Reaction Equation	SBO
501	v510	v510 (MEK#P#P).i + (ERK#P).i -> MEK- #P#P:ERK#P k52 kd44	$c77 + c81 \rightleftharpoons c82$	
502	v511	v511 (ERK#P).i + (MEK#P#P).i -> MEK- #P#P:ERK k53 kd53	$c81 + c77 \rightleftharpoons c80$	
503	v512	v512 MEK#P#P + ERK#P -> ERK:MEK#P- #P k53 kd53	$c51 + c57 \rightleftharpoons c56$	
504	v513	v513 ERK#P#P + MEK#P#P -> ERK- #P:MEK#P#P k55 kd55	$c59 + c51 \rightleftharpoons c58$	
505	v514	v514 (ERK#P#P).i + (MEK#P#P).i -> MEK#P#P:ERK#P k55 kd55	$c83 + c77 \rightleftharpoons c82$	
506	v515	v515 ERK#P#P + Pase3 -> ERK#P#P:Pase3 k56 kd56	$c59 + c60 \rightleftharpoons c61$	
507	v516	v516 (ERK#P#P).i + Pase3 -> (ERK#P- #P:Pase3).i k56 kd56	$c83 + c60 \rightleftharpoons c84$	
508	v517	v517 (ERK#P).i + Pase3 -> (ERK#P- #P:Pase3).i k57 kd57	$c81 + c60 \rightleftharpoons c84$	
509	v518	v518 ERK#P + Pase3 -> ERK#P#P:Pase3 k57 kd57	$c57 + c60 \rightleftharpoons c61$	
510	v519	v519 ERK + Pase3 -> ERK#P:Pase3 k57 kd57	$c55 + c60 \rightleftharpoons c62$	
511	v520	v520 ERK + Pase3 -> (ERK#P:Pase3).i k57 kd57	$c55 + c60 \rightleftharpoons c85$	
512	v521	v521 Pase3 + ERK#P -> ERK#P:Pase3 k58 kd58	$c60 + c57 \rightleftharpoons c62$	
513	v522	v522 Pase3 + (ERK#P).i -> (ERK#P:Pase3)- .i k58 kd58	$c60 + c81 \rightleftharpoons c85$	
514	v523	v523 ErbB1:ATP -> R_degraded k60 kd60	$c6 \rightleftharpoons c86$	
515	v524	v524 2(EGF:ErbB1:ATP) -> R_degraded k60 kd60	$c11 \rightleftharpoons c86$	

Nº	Id	Name	Reaction Equation	SBO
516	v525	v525 2(EGF:ErbB1)#P:GAP -> R_degraded k60 kd60	$c17 \rightleftharpoons c86$	
517	v526	v526 2(EGF:ErbB1)#P:GAP:Grb2 -> R_degraded k60 kd60	$c18 \rightleftharpoons c86$	
518	v527	v527 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> R_degraded k60 kd60	$c19 \rightleftharpoons c86$	
519	v528	v528 2(EGF:ErbB1)-#P:GAP:Grb2:Sos:(Ras:GDP) -> R_degraded k60 kd60	$c20 \rightleftharpoons c86$	
520	v529	v529 2(EGF:ErbB1)-#P:GAP:Grb2:Sos:(Ras:GTP) -> R_degraded k60 kd60	$c21 \rightleftharpoons c86$	
521	v530	v530 2(EGF:ErbB1)#P:GAP:Shc -> R_degraded k60 kd60	$c63 \rightleftharpoons c86$	
522	v531	v531 2(EGF:ErbB1)#P:GAP:(Shc#P) -> R_degraded k60 kd60	$c64 \rightleftharpoons c86$	
523	v532	v532 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> R_degraded k60 kd60	$c65 \rightleftharpoons c86$	
524	v533	v533 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> R_degraded k60 kd60	$c66 \rightleftharpoons c86$	
525	v534	v534 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R_degraded k60 kd60	$c67 \rightleftharpoons c86$	
526	v535	v535 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + -> R_degraded k60 kd60	$c68 \rightleftharpoons c86$	
527	v537	v537 ErbB3 -> R_degraded k60b kd60b	$c154 \rightleftharpoons c86$	
528	v538	v538 ErbB2 -> R_degraded k60b kd60b	$c155 \rightleftharpoons c86$	
529	v539	v539 ErbB4 -> R_degraded k60b kd60b	$c156 \rightleftharpoons c86$	

Nº	Id	Name	Reaction Equation	SBO
530	v540	v540 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 - > R_degraded k60b kd60	$c192 \rightleftharpoons c86$	
531	v541	v541 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 - > R_degraded k60b kd60	$c193 \rightleftharpoons c86$	
532	v542	v542 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 - > R_degraded k60b kd60	$c194 \rightleftharpoons c86$	
533	v543	v543 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> R_degraded k60b kd60	$c201 \rightleftharpoons c86$	
534	v544	v544 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos -> R_degraded k60b kd60	$c202 \rightleftharpoons c86$	
535	v545	v545 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos -> R_degraded k60b kd60	$c203 \rightleftharpoons c86$	
536	v546	v546 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> R_degraded k60b kd60	$c210 \rightleftharpoons c86$	
537	v547	v547 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> R_degraded k60b kd60	$c211 \rightleftharpoons c86$	
538	v548	v548 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> R_degraded k60b kd60	$c212 \rightleftharpoons c86$	
539	v549	v549 (ErbB1:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	$c219 \rightleftharpoons c86$	
540	v550	v550 (ErbB1:ErbB3)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	$c220 \rightleftharpoons c86$	

Nº	Id	Name	Reaction Equation	SBO
541	v551	v551 (ErbB1:ErbB4)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	c221 $\rightleftharpoons$ c86	
542	v552	v552 (ErbB1:ErbB2)#P:GAP:Grb2 -> R- _degraded k60b kd60	c228 $\rightleftharpoons$ c86	
543	v553	v553 (ErbB1:ErbB3)#P:GAP:Grb2 -> R- _degraded k60b kd60	c229 $\rightleftharpoons$ c86	
544	v554	v554 (ErbB1:ErbB4)#P:GAP:Grb2 -> R- _degraded k60b kd60	c230 $\rightleftharpoons$ c86	
545	v555	v555 (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) -> R- _degraded k60b kd60	c246 $\rightleftharpoons$ c86	
546	v556	v556 (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GDP) -> R- _degraded k60b kd60	c247 $\rightleftharpoons$ c86	
547	v557	v557 (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GDP) -> R- _degraded k60b kd60	c248 $\rightleftharpoons$ c86	
548	v558	v558 (ErbB1:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	c255 $\rightleftharpoons$ c86	
549	v559	v559 (ErbB1:ErbB3)- #P:GAP:Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	c256 $\rightleftharpoons$ c86	
550	v560	v560 (ErbB1:ErbB4)- #P:GAP:Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	c257 $\rightleftharpoons$ c86	
551	v563	v563 (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> R_degraded k60b kd60	c237 $\rightleftharpoons$ c86	

Nº	Id	Name	Reaction Equation	SBO
552	v564	v564 (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> R_degraded k60b kd60	$c_{238} \rightleftharpoons c_{86}$	
553	v565	v565 (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> R_degraded k60b kd60	$c_{239} \rightleftharpoons c_{86}$	
554	v566	v566 2(ErbB2) -> R_degraded k60b kd60	$c_{425} \rightleftharpoons c_{86}$	
555	v567	v567 2(ErbB2)#P:GAP -> R_degraded k60b kd60	$c_{293} \rightleftharpoons c_{86}$	
556	v568	v568 2(ErbB2)#P:GAP:Shc -> R_degraded k60b kd60	$c_{296} \rightleftharpoons c_{86}$	
557	v569	v569 2(ErbB2)#P:GAP:(Shc#P) -> R_degraded k60b kd60	$c_{299} \rightleftharpoons c_{86}$	
558	v570	v570 2(ErbB2)#P:GAP:(Shc#P):Grb2 -> R_degraded k60b kd60	$c_{302} \rightleftharpoons c_{86}$	
559	v572	v572 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R_degraded k60b kd60	$c_{308} \rightleftharpoons c_{86}$	
560	v573	v573 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	$c_{311} \rightleftharpoons c_{86}$	
561	v574	v574 2(ErbB2)#P:GAP:Grb2 -> R_degraded k60b kd60	$c_{314} \rightleftharpoons c_{86}$	
562	v575	v575 2(ErbB2)#P:GAP:Grb2:Sos -> R_degraded k60b kd60	$c_{317} \rightleftharpoons c_{86}$	
563	v576	v576 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> R_degraded k60b kd60	$c_{320} \rightleftharpoons c_{86}$	
564	v577	v577 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> R_degraded k60b kd60	$c_{323} \rightleftharpoons c_{86}$	
565	v579	v579 (ErbB3:ErbB2)#P:GAP:Shc -> R_degraded k60c kd60	$c_{349} \rightleftharpoons c_{86}$	

Nº	Id	Name	Reaction Equation	SBO
566	v580	v580 (ErbB4:ErbB2)#P:GAP:Shc -> R- _degraded k60c kd60	$c350 \rightleftharpoons c86$	
567	v581	v581 (ErbB3:ErbB2)#P:GAP:(Shc#P) -> R- _degraded k60c kd60	$c353 \rightleftharpoons c86$	
568	v582	v582 (ErbB4:ErbB2)#P:GAP:(Shc#P) -> R- _degraded k60c kd60	$c356 \rightleftharpoons c86$	
569	v583	v583 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 - > R_degraded k60c kd60	$c359 \rightleftharpoons c86$	
570	v584	v584 (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> R_degraded k60c kd60	$c368 \rightleftharpoons c86$	
571	v585	v585 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 - > R_degraded k60c kd60	$c362 \rightleftharpoons c86$	
572	v586	v586 (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos -> R_degraded k60c kd60	$c365 \rightleftharpoons c86$	
573	v587	v587 (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> R_degraded k60c kd60	$c377 \rightleftharpoons c86$	
574	v588	v588 (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GTP) -> R_degraded k60c kd60	$c380 \rightleftharpoons c86$	
575	v589	v589 (ErbB4:ErbB2)#P:GAP:Grb2 -> R- _degraded k60c kd60	$c386 \rightleftharpoons c86$	
576	v590	v590 (ErbB3:ErbB2)#P:GAP:Grb2 -> R- _degraded k60c kd60	$c383 \rightleftharpoons c86$	
577	v591	v591 (ErbB3:ErbB2)#P:GAP:Grb2:Sos -> R_degraded k60c kd60	$c389 \rightleftharpoons c86$	
578	v592	v592 (ErbB4:ErbB2)#P:GAP:Grb2:Sos -> R_degraded k60c kd60	$c392 \rightleftharpoons c86$	



Nº	Id	Name	Reaction Equation	SBO
579	v593	v593 (ErbB3:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> R_degraded k60c kd60	$c371 \rightleftharpoons c86$	
580	v594	v594 (ErbB4:ErbB2)#P:GAP:(Shc- #P):Grb2:Sos:(Ras:GDP) -> R_degraded k60c kd60	$c374 \rightleftharpoons c86$	
581	v595	v595 (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) -> R- _degraded k60c kd60	$c395 \rightleftharpoons c86$	
582	v596	v596 (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GDP) -> R- _degraded k60c kd60	$c398 \rightleftharpoons c86$	
583	v597	v597 (ErbB3:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) -> R_degraded k60c kd60	$c401 \rightleftharpoons c86$	
584	v598	v598 (ErbB4:ErbB2)- #P:GAP:Grb2:Sos:(Ras:GTP) -> R_degraded k60c kd60	$c404 \rightleftharpoons c86$	
585	v599	v599 EGF -> EGF_degraded k61 kd61	$c16 \rightleftharpoons c13$	
586	v600	v600 (EGF:ErbB1:ErbB2) -> R_degraded k62b kd60b	$c159 \rightleftharpoons c86$	
587	v601	v601 (EGF:ErbB1:ErbB3) -> R_degraded k62b kd60b	$c160 \rightleftharpoons c86$	
588	v602	v602 (EGF:ErbB1:ErbB4) -> R_degraded k62b kd60b	$c161 \rightleftharpoons c86$	
589	v603	v603 (HRG:ErbB3:ErbB1) -> R_degraded k62b kd60b	$c518 \rightleftharpoons c86$	
590	v604	v604 (HRG:ErbB4:ErbB1) -> R_degraded k62b kd60b	$c519 \rightleftharpoons c86$	

Nº	Id	Name	Reaction Equation	SBO
591	v605	v605 (HRG:ErbB3):ErbB2) -> R_degraded k62b kd60b	$c421 \rightleftharpoons c86$	
592	v606	v606 (HRG:ErbB4):ErbB2) -> R_degraded k62b kd60b	$c422 \rightleftharpoons c86$	
593	v607	v607 (ErbB3:ErbB2) -> R_degraded k62b kd60b	$c339 \rightleftharpoons c86$	
594	v608	v608 (ErbB4:ErbB2) -> R_degraded k62b kd60b	$c340 \rightleftharpoons c86$	
595	v609	v609 ERK#P#P + 2(EGF:ErbB1)-#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)-#P:GAP:Grb2:Sos:(ERK#P#P) k64 kd64	$c59 + c25 \rightleftharpoons c95$	
596	v610	v610 (ERK#P#P)_i + 2(EGF:ErbB1)-#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)-#P:GAP:Grb2:Sos:(ERK#P#P) k64 kd64	$c83 + c19 \rightleftharpoons c96$	
597	v611	v611 ERK#P#P + 2(EGF:ErbB1)-#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:ERK#P#P k64 kd64	$c59 + c35 \rightleftharpoons c97$	
598	v612	v612 (ERK#P#P)_i + 2(EGF:ErbB1)-#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(ERK#P#P) k64 kd64	$c83 + c66 \rightleftharpoons c98$	
599	v613	v613 ERK#P#P + Sos -> (ERK#P#P):Sos k64 kd64	$c59 + c24 \rightleftharpoons c101$	
600	v614	v614 (ERK#P#P)_i + Sos -> ((ERK#P#P):Sos)_i k64 kd64	$c83 + c24 \rightleftharpoons c102$	
601	v615	v615 ERK#P#P + 2(EGF:ErbB1)-#P:GAP:Grb2:Sos#P -> 2(EGF:ErbB1)-#P:GAP:Grb2:Sos:(ERK#P#P) k65 kd65	$c59 + c99 \rightleftharpoons c95$	

Nº	Id	Name	Reaction Equation	SBO
602	v616	v616 ERK#P#P + 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:(Sos#P) - > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:ERK#P#P k65 kd65	$c59 + c419 \rightleftharpoons c97$	
603	v617	v617 ERK#P#P + Sos#P -> (ERK#P#P):Sos k65 kd65	$c59 + c103 \rightleftharpoons c101$	
604	v618	v618 (ERK#P#P).i + 2(EGF:ErbB1)- #P:GAP:Grb2:(Sos#P) -> 2(EGF:ErbB1)- #P:GAP:Grb2:Sos:(ERK#P#P) k65 kd65	$c83 + c100 \rightleftharpoons c96$	
605	v619	v619 (ERK#P#P).i + 2(EGF:ErbB1)- #P:GAP:(Shc#P):Grb2:(Sos#P) - > 2(EGF:ErbB1)#P:GAP:(Shc- #P):Grb2:Sos:(ERK#P#P) k65 kd65	$c83 + c420 \rightleftharpoons c98$	
606	v620	v620 (ERK#P#P).i + Sos#P -> ((ERK#P- #P):Sos).i k65 kd65	$c83 + c103 \rightleftharpoons c102$	
607	v621	v621 PI3K + 2(EGF:ErbB1)- #P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K k66 kd66	$c287 + c486 \rightleftharpoons c104$	
608	v622	v622 PI3K + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:PI3K k66 kd66	$c287 + c447 \rightleftharpoons c263$	
609	v623	v623 PI3K + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K k66 kd66	$c287 + c445 \rightleftharpoons c261$	
610	v624	v624 PI3K + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:PI3K k67 kd67	$c287 + c446 \rightleftharpoons c262$	

Nº	Id	Name	Reaction Equation	SBO
611	v625	v625 PI3K + 2(ErbB2)#P:GAP:Grb2:Gab1- #P -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K k67 kd67	$c287 + c454 \rightleftharpoons c324$	
612	v626	v626 PI3K + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K k67 kd67	$c287 + c457 \rightleftharpoons c405$	
613	v627	v627 PI3K + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K k66 kd66	$c287 + c460 \rightleftharpoons c408$	
614	v628	v628 PIP3 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k68 kd68b	$c106 + c405 \rightleftharpoons c453$	
615	v629	v629 PIP3 + 2(ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K -> 2(ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k68 kd68	$c106 + c324 \rightleftharpoons c452$	
616	v630	v630 2(EGF:ErbB1)#P:GAP:Grb2:Gab1- #P:PI3K + PIP3 -> 2(EGF:ErbB1)- #P:GAP:Grb2:Gab1#P:PI3K:PIP2 k68 kd68	$c104 + c106 \rightleftharpoons c448$	
617	v631	v631 PIP3 + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k68 kd68	$c106 + c261 \rightleftharpoons c449$	
618	v632	v632 PIP3 + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k68 kd68	$c106 + c262 \rightleftharpoons c450$	

Nº	Id	Name	Reaction Equation	SBO
619	v633	v633 PIP3 + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k68 kd68	$c106 + c263 \rightleftharpoons c451$	
620	v634	v634 PIP3 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:PIP2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)2 k68 kd68b	$c106 + c453 \rightleftharpoons c467$	
621	v635	v635 PIP3 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)3 k68 kd68b	$c106 + c467 \rightleftharpoons c468$	
622	v636	v636 PIP3 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)4 k68 kd68b	$c106 + c468 \rightleftharpoons c469$	
623	v637	v637 PIP3 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)5 k68 kd68b	$c106 + c469 \rightleftharpoons c470$	
624	v638	v638 PIP3 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)6 k68 kd68b	$c106 + c470 \rightleftharpoons c471$	
625	v639	v639 PIP3 + AKT -> PIP3:AKT k69 kd69	$c106 + c107 \rightleftharpoons c108$	
626	v640	v640 PIP3 + AKT#P -> PIP3:AKT#P k69 kd69	$c106 + c112 \rightleftharpoons c495$	
627	v641	v641 PDK1 + PIP3:AKT#P -> PIP3:AKT- #P:PDK1 k70 kd70	$c109 + c495 \rightleftharpoons c496$	

Nº	Id	Name	Reaction Equation	SBO
628	v642	v642 PDK1 + PIP3:AKT PIP3:AKT:PDK1 k70 kd70	-> c109 + c108 $\rightleftharpoons$ c110	
629	v643	v643 PIP3:PDK1 + AKT#P PIP3:AKT:PDK1 k71 kd71	-> c111 + c112 $\rightleftharpoons$ c110	
630	v644	v644 AKT#P#P + PIP3:PDK1 #P:PDK1 k72 kd72	-> PIP3:AKT- c497 + c111 $\rightleftharpoons$ c496	
631	v645	v645 AKT#P#P + Pase4 k74 kd74	-> AKT#P#P:Pase4 c497 + c113 $\rightleftharpoons$ c498	
632	v646	v646 AKT#P + Pase4 kd73	-> AKT#P:Pase4 k73 c112 + c113 $\rightleftharpoons$ c114	
633	v647	v647 AKT + Pase4 kd75	-> AKT#P:Pase4 k75 c107 + c113 $\rightleftharpoons$ c114	
634	v648	v648 AKT#P + Pase4 k75 kd75	-> AKT#P#P:Pase4 c112 + c113 $\rightleftharpoons$ c498	
635	v649	v649 PDK1 + PIP3	-> PIP3:PDK1 k76 kd76 c109 + c106 $\rightleftharpoons$ c111	
636	v650	v650 RTK_Pase + (ErbB1:ErbB3)#P (ErbB1:ErbB3)#P:RTK_Pase k94b kd94	-> c280 + c163 $\rightleftharpoons$ c281	
637	v651	v651 RTK_Pase + (ErbB1:ErbB4)#P (ErbB1:ErbB4)#P:RTK_Pase k94b kd94	-> c280 + c164 $\rightleftharpoons$ c282	
638	v652	v652 RTK_Pase + 2(EGF:ErbB1)#P 2(EGF:ErbB1)#P:RTK_Pase k94 kd94	-> c280 + c8 $\rightleftharpoons$ c415	
639	v653	v653 RTK_Pase + 2(ErbB2)#P #P:RTK_Pase k94 kd94	-> 2(ErbB2)- c280 + c290 $\rightleftharpoons$ c283	
640	v654	v654 RTK_Pase + (ErbB3:ErbB2)#P (ErbB2:ErbB3)#P:RTK_Pase k94 kd94	-> c280 + c337 $\rightleftharpoons$ c417	
641	v655	v655 RTK_Pase + (ErbB4:ErbB2)#P (ErbB2:ErbB4)#P:RTK_Pase k94 kd94	-> c280 + c338 $\rightleftharpoons$ c418	
642	v656	v656 RTK_Pase + (ErbB1:ErbB2)#P (ErbB1:ErbB2)#P:RTK_Pase k94 kd94	-> c280 + c162 $\rightleftharpoons$ c416	

Nº	Id	Name	Reaction Equation	SBO
643	v657	v657 RTK_Pase + (EGF:ErbB1:ErbB2) -> (ErbB1:ErbB2)#P:RTK_Pase k95 kd95	$c280 + c159 \rightleftharpoons c416$	
644	v658	v658 RTK_Pase + (EGF:ErbB1:ErbB3) -> (ErbB1:ErbB3)#P:RTK_Pase k95 kd95	$c280 + c160 \rightleftharpoons c281$	
645	v659	v659 RTK_Pase + (EGF:ErbB1:ErbB4) -> (ErbB1:ErbB4)#P:RTK_Pase k95 kd95	$c280 + c161 \rightleftharpoons c282$	
646	v660	v660 RTK_Pase + 2(EGF:ErbB1:ATP) -> 2(EGF:ErbB1)#P:RTK_Pase k95 kd95	$c280 + c11 \rightleftharpoons c415$	
647	v661	v661 RTK_Pase + 2(ErbB2) -> 2(ErbB2)#P:RTK_Pase k95 kd95	$c280 + c425 \rightleftharpoons c283$	
648	v662	v662 RTK_Pase + (ErbB3:ErbB2) -> (ErbB2:ErbB3)#P:RTK_Pase k95 kd95	$c280 + c339 \rightleftharpoons c417$	
649	v663	v663 RTK_Pase + (ErbB4:ErbB2) -> (ErbB2:ErbB4)#P:RTK_Pase k95 kd95	$c280 + c340 \rightleftharpoons c418$	
650	v664	v664 ErbB2#P + ErbB2#P -> 2(ErbB2)#P k96 kd96	$c87 + c87 \rightleftharpoons c289$	
651	v665	v665 ErbB1 + Inh -> ErbB1:Inh k97 kd97	$c531 + c285 \rightleftharpoons c286$	
652	v666	v666 ErbB2 + Inh -> ErbB2:Inh k98 kd98	$c141 + c285 \rightleftharpoons c502$	
653	v667	v667 ErbB4 + Inh -> ErbB4:Inh k99 kd99	$c143 + c285 \rightleftharpoons c503$	
654	v668	v668 ErbB3 + Inh -> ErbB3:Inh k100 kd100	$c140 + c285 \rightleftharpoons c506$	
655	v669	v669 Sos#P + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos#P k101 kd101	$c103 + c23 \rightleftharpoons c99$	
656	v670	v670 Sos#P + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:(Sos#P) k101 kd101	$c103 + c18 \rightleftharpoons c100$	
657	v671	v671 Sos#P + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) k101 kd101	$c103 + c34 \rightleftharpoons c419$	

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658	v672	v672 Sos#P + 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2:(Sos#P) k101 kd101	$c103 + c65 \rightleftharpoons c420$	
659	v673	v673 EGF:ErbB1#P + EGF:ErbB1#P -> 2(EGF:ErbB1)#P k102 kd102	$c330 + c330 \rightleftharpoons c5$	
660	v674	v674 ErbB2#P + EGF:ErbB1#P -> (ErbB1:ErbB2)#P k102 kd102	$c87 + c330 \rightleftharpoons c148$	
661	v675	v675 EGF:ErbB1#P + ErbB3#P -> (ErbB1:ErbB3)#P k102 kd102	$c330 + c331 \rightleftharpoons c149$	
662	v676	v676 EGF:ErbB1#P + ErbB4#P -> (ErbB1:ErbB4)#P k102 kd102	$c330 + c332 \rightleftharpoons c150$	
663	v677	v677 ErbB2#P + ErbB2 -> ErbB2:ErbB2#P k103 kd103	$c87 + c141 \rightleftharpoons c284$	
664	v678	v678 ErbB2 + ErbB3 -> (ErbB2:ErbB3) k103 kd103	$c141 + c140 \rightleftharpoons c288$	
665	v679	v679 ErbB2 + ErbB4 -> ErbB2:ErbB4 k103 kd103	$c141 + c143 \rightleftharpoons c117$	
666	v680	v680 ErbB2#P + ErbB3#P -> (ErbB3:ErbB2)#P k103 kd103	$c87 + c331 \rightleftharpoons c335$	
667	v681	v681 ErbB2#P + ErbB4#P -> (ErbB4:ErbB2)#P k103 kd103	$c87 + c332 \rightleftharpoons c336$	
668	v682	v682 ErbB2#P + ErbB2:Inh -> ErbB2:ErbB2:Inh k103 kd103	$c87 + c502 \rightleftharpoons c509$	
669	v683	v683 ErbB2:Inh + ErbB3 -> ErbB3:ErbB2:Inh k103 kd103	$c502 + c140 \rightleftharpoons c510$	
670	v684	v684 ErbB2:Inh + ErbB4 -> ErbB4:ErbB2:Inh k103 kd103	$c502 + c143 \rightleftharpoons c511$	
671	v685	v685 ErbB2 + ErbB4:Inh -> ErbB4:Inh:ErbB2 k103 kd103	$c141 + c503 \rightleftharpoons c513$	



Nº	Id	Name	Reaction Equation	SBO
672	v686	v686 Shp + PIP2 -> PIP3:Shp k104 kd104	$c461 + c444 \rightleftharpoons c462$	
673	v687	v687 PTEN + PIP2 -> PIP3:PTEN k104 kd104	$c279 + c444 \rightleftharpoons c482$	
674	v688	v688 2(EGF:ErbB1)#P:GAP:Grb2 + Gab1 -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1 k105 kd105	$c23 + c426 \rightleftharpoons c483$	
675	v689	v689 (ErbB1:ErbB2)#P:GAP:Grb2 + Gab1 -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1 k105 kd105	$c225 + c426 \rightleftharpoons c427$	
676	v690	v690 (ErbB1:ErbB3)#P:GAP:Grb2 + Gab1 -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1 k105 kd105	$c226 + c426 \rightleftharpoons c428$	
677	v691	v691 (ErbB1:ErbB4)#P:GAP:Grb2 + Gab1 -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1 k105 kd105	$c227 + c426 \rightleftharpoons c429$	
678	v692	v692 2(ErbB2)#P:GAP:Grb2 + Gab1 -> 2(ErbB2)#P:GAP:Grb2:Gab1 k105 kd105	$c312 + c426 \rightleftharpoons c436$	
679	v693	v693 (ErbB3:ErbB2)#P:GAP:Grb2 + Gab1 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1 k105 kd105	$c381 + c426 \rightleftharpoons c439$	
680	v694	v694 (ErbB4:ErbB2)#P:GAP:Grb2 + Gab1 -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1 k105 kd105	$c384 + c426 \rightleftharpoons c442$	
681	v695	v695 PIP2 + 2(EGF:ErbB1)-#P:GAP:Grb2:Gab1#P:PI3K -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1-#P:PI3K:PIP2 k106b kd106b	$c444 + c104 \rightleftharpoons c448$	

Nº	Id	Name	Reaction Equation	SBO
682	v696	v696 PIP2 + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k106b kd106b	$c444 + c261 \rightleftharpoons c449$	
683	v697	v697 PIP2 + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k106b kd106b	$c444 + c262 \rightleftharpoons c450$	
684	v698	v698 PIP2 + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k106b kd106b	$c444 + c263 \rightleftharpoons c451$	
685	v699	v699 PIP2 + 2(ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K -> 2(ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k106 kd106	$c444 + c324 \rightleftharpoons c452$	
686	v700	v700 PIP2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:PIP2 k106 kd106	$c444 + c405 \rightleftharpoons c453$	
687	v701	v701 PIP2 + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> PI3K k106 kd106	$c444 + c408 \rightleftharpoons c455$	
688	v702	v702 PIP2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:PIP2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)2 k106 kd106	$c444 + c453 \rightleftharpoons c467$	

Nº	Id	Name	Reaction Equation	SBO
689	v703	v703 PIP2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)3 k106 kd106	$c444 + c467 \rightleftharpoons c468$	
690	v704	v704 PIP2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)4 k106 kd106	$c444 + c468 \rightleftharpoons c469$	
691	v705	v705 PIP2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)5 k106 kd106	$c444 + c469 \rightleftharpoons c470$	
692	v706	v706 PIP2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:(PIP2)6 k106 kd106	$c444 + c470 \rightleftharpoons c471$	
693	v707	v707 Shp2 + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:Shp2 k107 kd107	$c463 + c445 \rightleftharpoons c464$	
694	v708	v708 Shp2 + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:Shp2 k107 kd107	$c463 + c446 \rightleftharpoons c465$	
695	v709	v709 Shp2 + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:Shp2 k107 kd107	$c463 + c447 \rightleftharpoons c466$	
696	v710	v710 Shp2 + 2(ErbB2)#P:GAP:Grb2:Gab1- #P -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 k107 kd107	$c463 + c454 \rightleftharpoons c473$	

Nº	Id	Name	Reaction Equation	SBO
697	v711	v711 Shp2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:Shp2 k107 kd107	$c463 + c457 \rightleftharpoons c476$	
698	v712	v712 Shp2 + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:Shp2 k107 kd107	$c463 + c460 \rightleftharpoons c479$	
699	v713	v713 Shp2 + 2(EGF:ErbB1)- #P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):Shp2 k107 kd107	$c463 + c486 \rightleftharpoons c489$	
700	v714	v714 Shp2 + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1 -> (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:Shp2 k108 kd108	$c463 + c427 \rightleftharpoons c464$	
701	v715	v715 Shp2 + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1 -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:Shp2 k108 kd108	$c463 + c428 \rightleftharpoons c465$	
702	v716	v716 Shp2 + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1 -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:Shp2 k108 kd108	$c463 + c429 \rightleftharpoons c466$	
703	v717	v717 Shp2 + 2(ErbB2)#P:GAP:Grb2:Gab1 -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 k108 kd108	$c463 + c436 \rightleftharpoons c473$	
704	v718	v718 Shp2 + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1 -> (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:Shp2 k108 kd108	$c463 + c439 \rightleftharpoons c476$	
705	v719	v719 Shp2 + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1 -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:Shp2 k108 kd108	$c463 + c442 \rightleftharpoons c479$	

Nº	Id	Name	Reaction Equation	SBO
706	v720	v720 Shp2 + 2(EGF:ErbB1)- #P:GAP:Grb2:Gab1 -> 2(EGF:ErbB1)- #P:GAP:Grb2:(Gab1#P):Shp2 k108 kd108	$c463 + c483 \rightleftharpoons c489$	
707	v721	v721 PIP3 + PTEN -> PIP3:PTEN k109 kd109	$c106 + c279 \rightleftharpoons c482$	
708	v722	v722 PIP3 + Shp -> PIP3:Shp k109 kd109	$c106 + c461 \rightleftharpoons c462$	
709	v723	v723 ERK#P#P + 2(EGF:ErbB1)- #P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1- #P):ERK#P#P k110 kd110	$c59 + c486 \rightleftharpoons c431$	
710	v724	v724 (ERK#P#P)_i + 2(EGF:ErbB1)- #P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1- #P):ERK#P#P_i k110 kd110	$c83 + c486 \rightleftharpoons c432$	
711	v725	v725 ERK#P#P + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P k110 kd110	$c59 + c445 \rightleftharpoons c433$	
712	v726	v726 (ERK#P#P)_i + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P_i k110 kd110	$c83 + c445 \rightleftharpoons c434$	
713	v727	v727 ERK#P#P + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:ERK#P#P k110 kd110	$c59 + c446 \rightleftharpoons c435$	

Nº	Id	Name	Reaction Equation	SBO
714	v728	v728 (ERK#P#P) <sub>i</sub> + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:ERK#P#P <sub>i</sub> k110 kd110	$c83 + c446 \rightleftharpoons c437$	
715	v729	v729 ERK#P#P + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:ERK#P#P k110 kd110	$c59 + c447 \rightleftharpoons c438$	
716	v730	v730 (ERK#P#P) <sub>i</sub> + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:ERK#P#P <sub>i</sub> k110 kd110	$c83 + c447 \rightleftharpoons c440$	
717	v731	v731 ERK#P#P + 2(ErbB2)- #P:GAP:Grb2:Gab1#P -> 2(ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P k110 kd110	$c59 + c454 \rightleftharpoons c474$	
718	v732	v732 (ERK#P#P) <sub>i</sub> + 2(ErbB2)- #P:GAP:Grb2:Gab1#P -> 2(ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P <sub>i</sub> k110 kd110	$c83 + c454 \rightleftharpoons c475$	
719	v733	v733 ERK#P#P + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P k110 kd110	$c59 + c457 \rightleftharpoons c477$	
720	v734	v734 (ERK#P#P) <sub>i</sub> + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P <sub>i</sub> k110 kd110	$c83 + c457 \rightleftharpoons c478$	

Nº	Id	Name	Reaction Equation	SBO
721	v735	v735 ERK#P#P + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P k110 kd110	$c59 + c460 \rightleftharpoons c480$	
722	v736	v736 (ERK#P#P) <sub>i</sub> + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:ERK#P#P <sub>i</sub> k110 kd110	$c83 + c460 \rightleftharpoons c481$	
723	v737	v737 ERK#P#P + ErbB3/4:ErbB2:Gab1#P- ## -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:ERK#P#P k111 kd111	$c59 + c491 \rightleftharpoons c477$	
724	v738	v738 (ERK#P#P) <sub>i</sub> + ErbB3/4:ErbB2:Gab1- #P## -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:ERK#P#P <sub>i</sub> k111 kd111	$c83 + c491 \rightleftharpoons c478$	
725	v739	v739 ERK#P#P + 2(ErbB2)2:Gab1#P## - > 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P- #P k111 kd111	$c59 + c490 \rightleftharpoons c474$	
726	v740	v740 (ERK#P#P) <sub>i</sub> + 2(ErbB2)2:Gab1#P## -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P- #P <sub>i</sub> k111 kd111	$c83 + c490 \rightleftharpoons c475$	
727	v741	v741 ERK#P#P + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P_ERK#P#P k111 kd111	$c59 + c410 \rightleftharpoons c438$	
728	v742	v742 (ERK#P#P) <sub>i</sub> + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:ERK#P#P <sub>i</sub> k111 kd111	$c83 + c410 \rightleftharpoons c440$	

Nº	Id	Name	Reaction Equation	SBO
729	v743	v743 ERK#P#P + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:ERK#P#P k111 kd111	$c59 + c409 \rightleftharpoons c435$	
730	v744	v744 (ERK#P#P) <sub>i</sub> + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:ERK#P#P <sub>i</sub> k111 kd111	$c83 + c409 \rightleftharpoons c437$	
731	v745	v745 ERK#P#P + ErbB1:ErbB:Gab1#P- ## -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1- #P:ERK#P#P k111 kd111	$c59 + c430 \rightleftharpoons c433$	
732	v746	v746 (ERK#P#P) <sub>i</sub> + ErbB1:ErbB:Gab1#P- ## -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1- #P:ERK#P#P <sub>i</sub> k111 kd111	$c83 + c430 \rightleftharpoons c434$	
733	v747	v747 ERK#P#P + 2(EGF:ErbB1):Gab1#P- ## -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1- #P):ERK#P#P k111 kd111	$c59 + c488 \rightleftharpoons c431$	
734	v748	v748 (ERK#P#P) <sub>i</sub> + 2(EGF:ErbB1):Gab1- #P## -> 2(EGF:ErbB1)- #P:GAP:Grb2:(Gab1#P):ERK#P#P <sub>i</sub> k111 kd111	$c83 + c488 \rightleftharpoons c432$	
735	v749	v749 ERK#P#P + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1:#P#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:ERK- #P#P k111 kd111	$c59 + c487 \rightleftharpoons c480$	
736	v750	v750 (ERK#P#P) <sub>i</sub> + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1:#P#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:ERK- #P#P <sub>i</sub> k111 kd111	$c83 + c487 \rightleftharpoons c481$	



Nº	Id	Name	Reaction Equation	SBO
737	v751	v751 Ras:GDP + 2(EGF:ErbB1)- #P:GAP:Grb2:Gab1#P:PI3K -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1- #P):PI3K:Ras:GDP k112 kd112	$c26 + c104 \rightleftharpoons c264$	
738	v752	v752 Ras:GDP + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k112 kd112	$c26 + c261 \rightleftharpoons c265$	
739	v753	v753 Ras:GDP + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k112 kd112	$c26 + c262 \rightleftharpoons c266$	
740	v754	v754 Ras:GDP + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k112 kd112	$c26 + c263 \rightleftharpoons c267$	
741	v755	v755 Ras:GDP + 2(ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> 2(ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP k112 kd112	$c26 + c324 \rightleftharpoons c268$	
742	v756	v756 Ras:GDP + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k112 kd112	$c26 + c405 \rightleftharpoons c269$	
743	v757	v757 Ras:GDP + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k112 kd112	$c26 + c408 \rightleftharpoons c325$	

Nº	Id	Name	Reaction Equation	SBO
744	v758	v758 Ras:GTP + 2(EGF:ErbB1)- #P:GAP:Grb2:Gab1#P:PI3K -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1- #P):PI3K:Ras:GDP k113 kd113	$c28 + c104 \rightleftharpoons c264$	
745	v759	v759 Ras:GTP + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k113 kd113	$c28 + c261 \rightleftharpoons c265$	
746	v760	v760 Ras:GTP + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k113 kd113	$c28 + c262 \rightleftharpoons c266$	
747	v761	v761 Ras:GTP + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k113 kd113	$c28 + c263 \rightleftharpoons c267$	
748	v762	v762 Ras:GTP + 2(ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> 2(ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP k113 kd113	$c28 + c324 \rightleftharpoons c268$	
749	v763	v763 Ras:GTP + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k113 kd113	$c28 + c405 \rightleftharpoons c269$	
750	v764	v764 Ras:GTP + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P:Shp2 -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1- #P:PI3K:Ras:GDP k113 kd113	$c28 + c479 \rightleftharpoons c325$	

Nº	Id	Name	Reaction Equation	SBO
751	v765	v765 AKT#P#P + Raf#P AKT:P:P:Raf:P:Ser k114 kd114	-> c497 + c45 $\rightleftharpoons$ c472	
752	v766	v766 AKT#P#P + (Raf#P).i AKT:P:P:Raf:P:Ser.i k114 kd114	-> c497 + c72 $\rightleftharpoons$ c484	
753	v767	v767 Raf:P:Ser + AKT#P#P AKT:P:P:Raf:P:Ser k115 kd115	-> c485 + c497 $\rightleftharpoons$ c472	
754	v768	v768 Raf:P:Ser + AKT#P#P AKT:P:P:Raf:P:Ser.i k115 kd115	-> c485 + c497 $\rightleftharpoons$ c484	
755	v769	v769 Pase3 + -> MKP_deg k116 kd116	c60 $\rightleftharpoons$ c520	
756	v770	v770 Pase9t + 2(EGF:ErbB1):Gab1#P## -> 2(EGF:ErbB1):Gab1#P##:Pase9t k117 kd117	c521 + c488 $\rightleftharpoons$ c522	
757	v771	v771 Pase9t + 2(ErbB2)2:Gab1#P## 2(ErbB2)2:Gab1#P##:Pase9t k117 kd117	-> c521 + c490 $\rightleftharpoons$ c523	
758	v772	v772 Pase9t + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1##P:Pase9t k117 kd117	c521 + c409 $\rightleftharpoons$ c411	
759	v773	v773 Pase9t + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1##P:Pase9t k117 kd117	c521 + c410 $\rightleftharpoons$ c412	
760	v774	v774 Pase9t + ErbB3/4:ErbB2:Gab1#P## -> ErbB3/4:ErbB2:Gab1#P##:Pase9t k117 kd117	c521 + c491 $\rightleftharpoons$ c456	
761	v775	v775 Pase9t + ErbB1:ErbB:Gab1#P## ErbB1:ErbB:Gab1#P##:Pase9t k117 kd117	-> c521 + c430 $\rightleftharpoons$ c424	
762	v776	v776 Pase9t + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1:#P#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:#P- #P:Pase9t k117 kd117	c521 + c487 $\rightleftharpoons$ c407	

Nº	Id	Name	Reaction Equation	SBO
763	v777	v777 Pase9t + 2(EGF:ErbB1)- #P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1):Gab1#P##:Pase9t k118 kd118	$c521 + c486 \rightleftharpoons c522$	
764	v778	v778 Pase9t + 2(ErbB2)#P:GAP:Grb2:Gab1- #P -> 2(ErbB2)2:Gab1#P##:Pase9t k118 kd118	$c521 + c454 \rightleftharpoons c523$	
765	v779	v779 Pase9t + (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1##P:Pase9t k118 kd118	$c521 + c446 \rightleftharpoons c411$	
766	v780	v780 Pase9t + (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1##P:Pase9t k118 kd118	$c521 + c447 \rightleftharpoons c412$	
767	v781	v781 Pase9t + (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1#P -> ErbB3/4:ErbB2:Gab1#P##:Pase9t k118 kd118	$c521 + c457 \rightleftharpoons c456$	
768	v782	v782 Pase9t + (ErbB1:ErbB2)- #P:GAP:Grb2:Gab1#P -> ErbB1:ErbB:Gab1#P##:Pase9t k118 kd118	$c521 + c445 \rightleftharpoons c424$	
769	v783	v783 Pase9t + (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1:#P#P:Pase9t k118 kd118	$c521 + c460 \rightleftharpoons c407$	
770	v784	v784 HRG + ErbB3 -> HRG:ErbB3 k119 kd119	$c514 + c140 \rightleftharpoons c142$	
771	v785	v785 ErbB4 + HRG -> HRG:ErbB4 k119 kd119	$c143 + c514 \rightleftharpoons c144$	

Nº	Id	Name	Reaction Equation	SBO
772	v786	v786 HRG:ErbB3 + ErbB2 -> (HRG:ErbB3):ErbB2 k120 kd120	$c142 + c141 \rightleftharpoons c355$	
773	v787	v787 (HRG:ErbB3) + ErbB2 -> (HRG:ErbB3):ErbB2 k120 kd120	$c157 + c155 \rightleftharpoons c421$	
774	v788	v788 + HRG:ErbB4 -> k120 kd120	$c141 + c144 \rightleftharpoons c345$	
775	v789	v789 HRG:ErbB3 + ErbB1:ATP -> (HRG:ErbB3:ErbB1) k120b kd120	$c142 + c2 \rightleftharpoons c516$	
776	v790	v790 HRG:ErbB4 + ErbB1:ATP -> (HRG:ErbB4:ErbB1) k120b kd120	$c144 + c2 \rightleftharpoons c517$	
777	v791	v791 + (HRG:ErbB4) -> k120 kd120	$c155 + c158 \rightleftharpoons c422$	
778	v792	v792 ErbB1:ATP + (HRG:ErbB3) -> (HRG:ErbB3:ErbB1) k120b kd120	$c6 + c157 \rightleftharpoons c518$	
779	v793	v793 ErbB1:ATP + (HRG:ErbB4) -> (HRG:ErbB4:ErbB1) k120b kd120	$c6 + c158 \rightleftharpoons c519$	
780	v794	v794 ErbB1_h + Inh -> ErbB1_h:Inh k97c kd97c	$c532 + c285 \rightleftharpoons c525$	
781	v795	v795 EGF + ErbB1_h:Inh -> EGF:ErbB1_h:Inh k1 kd1	$c1 + c525 \rightleftharpoons c526$	
782	v796	v796 EGF:ErbB1:ATP + EGF:ErbB1_h:Inh -> EGF:ErbB1:ErbB1_h:Inh k2 kd2	$c3 + c526 \rightleftharpoons c527$	
783	v797	v797 EGF:ErbB1_h:Inh + EGF:ErbB1_h:Inh -> 2(EGF:ErbB1_h:Inh) k2 kd2	$c526 + c526 \rightleftharpoons c528$	
784	v798	v798 EGF + ErbB1_h:ATP -> EGF:ErbB1_h:ATP k1 kd1	$c1 + c524 \rightleftharpoons c529$	
785	v799	v799 ErbB1_h:ATP + -> ErbB1_h:ATP k6 kd6	$c524 \rightleftharpoons c530$	
786	v801	v801 ErbB1_h:ATP + EGF -> EGF:ErbB1:ATP k10b kd10	$c530 + c16 \rightleftharpoons c10$	

Nº	Id	Name	Reaction Equation	SBO
787	v802	v802 (EGF:ErbB1:ErbB1):Inh + ATP -> (EGF:ErbB1:ErbB1):Inh:ATP k122 kd122	$c500 + c105 \rightleftharpoons c115$	
788	v803	v803 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1:ErbB1):Inh:ATP k123 kd123	$c5 + c105 \rightleftharpoons c115$	
789	v804	v804 2(EGF:ErbB1)#P + ATP -> k123 kd123	$c5 + c105 \rightleftharpoons c116$	
790	v805	v805 EGF:ErbB1:ErbB1_h:Inh + ATP -> k122 kd122	$c527 + c105 \rightleftharpoons c121$	
791	v806	v806 2(EGF:ErbB1)#P + ATP -> k123 kd123	$c5 + c105 \rightleftharpoons c121$	
792	v807	v807 (ErbB1:ErbB2)#P + ATP -> EGF:ErbB1:ErbB2:ATP k123 kd123	$c148 + c105 \rightleftharpoons c122$	
793	v808	v808 (ErbB1:ErbB2)#P + ATP -> (EGF:ErbB1:ErbB2):ATP k123 kd123	$c162 + c105 \rightleftharpoons c123$	
794	v809	v809 (ErbB1:ErbB3)#P + ATP -> (EGF:ErbB1:ErbB3):ATP k123 kd123	$c163 + c105 \rightleftharpoons c124$	
795	v810	v810 (ErbB1:ErbB4)#P + ATP -> (EGF:ErbB1:ErbB4):ATP k123 kd123	$c164 + c105 \rightleftharpoons c125$	
796	v811	v811 2(EGF:ErbB1)#P + ATP -> 2(EGF:ErbB1):ATP k123 kd123	$c8 + c105 \rightleftharpoons c126$	
797	v812	v812 (ErbB1:ErbB3)#P + ATP -> EGF:ErbB1:ErbB3:ATP k123 kd123	$c149 + c105 \rightleftharpoons c127$	
798	v813	v813 (ErbB1:ErbB4)#P + ATP -> EGF:ErbB1:ErbB4:ATP k123 kd123	$c150 + c105 \rightleftharpoons c128$	
799	v814	v814 2(ErbB2)#P + ATP -> ErbB2:ErbB2-#P:ATP k123 kd123	$c289 + c105 \rightleftharpoons c129$	
800	v815	v815 (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-#P + ATP -> (ErbB1:ErbB2)-#P:GAP:Grb2:Gab1:ATP k123 kd123	$c445 + c105 \rightleftharpoons c130$	

Nº	Id	Name	Reaction Equation	SBO
801	v816	v816 (ErbB1:ErbB3)#P:GAP:Grb2:Gab1- #P + ATP -> (ErbB1:ErbB3)- #P:GAP:Grb2:Gab1:ATP k123 kd123	$c446 + c105 \rightleftharpoons c131$	
802	v817	v817 (ErbB1:ErbB4)#P:GAP:Grb2:Gab1- #P + ATP -> (ErbB1:ErbB4)- #P:GAP:Grb2:Gab1:ATP k123 kd123	$c447 + c105 \rightleftharpoons c132$	
803	v818	v818 2(ErbB2)#P:GAP:Grb2:Gab1#P + ATP -> 2(ErbB2)#P:GAP:Grb2:Gab1:ATP k123 kd123	$c454 + c105 \rightleftharpoons c133$	
804	v819	v819 (ErbB3:ErbB2)#P:GAP:Grb2:Gab1- #P + ATP -> (ErbB3:ErbB2)- #P:GAP:Grb2:Gab1:ATP k123 kd123	$c457 + c105 \rightleftharpoons c134$	
805	v820	v820 (ErbB4:ErbB2)#P:GAP:Grb2:Gab1- #P + ATP -> (ErbB4:ErbB2)- #P:GAP:Grb2:Gab1:ATP k123 kd123	$c460 + c105 \rightleftharpoons c135$	
806	v821	v821 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1- #P##) + ATP -> 2(EGF:ErbB1)- #P:GAP:Grb2:Gab1:ATP k123 kd123	$c486 + c105 \rightleftharpoons c136$	
807	v822	v822 (ErbB1:ErbB3)#P + ATP -> (HRG:ErbB3:ErbB1):ATP k123 kd123	$c149 + c105 \rightleftharpoons c137$	
808	v823	v823 (ErbB1:ErbB4)#P + ATP -> (HRG:ErbB4:ErbB1):ATP k123 kd123	$c150 + c105 \rightleftharpoons c138$	
809	v824	v824 (ErbB4:ErbB2)#P + ATP -> (HRG:ErbB4):ErbB2:ATP k123 kd123	$c336 + c105 \rightleftharpoons c139$	
810	v825	v825 (ErbB3:ErbB2)#P + ATP -> (HRG:ErbB3):ErbB2:ATP k123 kd123	$c335 + c105 \rightleftharpoons c168$	
811	v826	v826 (ErbB3:ErbB2)#P + ATP -> (HRG:ErbB3):ErbB2):ATP k123 kd123	$c337 + c105 \rightleftharpoons c169$	

Nº	Id	Name	Reaction Equation	SBO
812	v827	v827 (ErbB4:ErbB2)#P + ATP -> (HRG:ErbB4):ErbB2):ATP k123 kd123	$c338 + c105 \rightleftharpoons c170$	
813	v828	v828 ErbB1 + ATP -> ErbB1:ATP k122 kd122	$c531 + c105 \rightleftharpoons c2$	
814	v829	v829 ErbB1_h + ATP -> ErbB1_h:ATP k122 kd122	$c532 + c105 \rightleftharpoons c524$	
815	v850	v850 EGF:ErbB1:ATP + EGF:ErbB1_h:ATP -> EGF:ErbB1:ATP::EGF:ErbB1_h:ATP k2 kd2	$c3 + c529 \rightleftharpoons c550$	
816	v851	v851 EGF:ErbB1:Inh + EGF:ErbB1_h:ATP -> EGF:ErbB1:Inh::EGF:ErbB1_h:ATP k2 kd2	$c499 + c529 \rightleftharpoons c551$	
817	v852	v852 EGF:ErbB1_h:ATP + EGF:ErbB1_h:ATP -> 2(EGF:ErbB1_h:ATP) k2 kd2	$c529 + c529 \rightleftharpoons c552$	
818	v853	v853 EGF:ErbB1_h:ATP + EGF:ErbB1_h:Inh -> EGF:ErbB1_h:ATP::EGF:ErbB1_h:Inh k2 kd2	$c529 + c526 \rightleftharpoons c553$	
819	v854	v854 EGF:ErbB1_h:Inh + EGF:ErbB1:Inh -> EGF:ErbB1_h:Inh::EGF:ErbB1:Inh k2 kd2	$c526 + c499 \rightleftharpoons c554$	
820	v855	v855 EGF:ErbB1:ATP::EGF:ErbB1_h:ATP + ATP -> (EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)-FullActive k122 kd122	$c550 + c105 \rightleftharpoons c555$	
821	v856	v856 EGF:ErbB1:Inh::EGF:ErbB1_h:ATP + ATP -> (EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)-HalfActive k122 kd122	$c551 + c105 \rightleftharpoons c556$	
822	v857	v857 2(EGF:ErbB1_h:ATP) + ATP -> 2(EGF:ErbB1_h:ATP)-FullActive k122 kd122	$c552 + c105 \rightleftharpoons c557$	



Nº	Id	Name	Reaction Equation	SBO
823	v858	v858 EGF:ErbB1_h:ATP::EGF:ErbB1_h:Inh + ATP -> (EGF:ErbB1_h:ATP::EGF:ErbB1_h:Inh)-HalfActive k122 kd122	$c553 + c105 \rightleftharpoons c558$	
824	v859	v859 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)-FullActive k123 kd123	$c5 + c105 \rightleftharpoons c555$	
825	v860	v860 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)-HalfActive k123h kd123h	$c5 + c105 \rightleftharpoons c556$	
826	v861	v861 2(EGF:ErbB1)#P + ATP -> 2(EGF:ErbB1_h:ATP)-FullActive k123 kd123	$c5 + c105 \rightleftharpoons c557$	
827	v862	v862 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1_h:ATP::EGF:ErbB1_h:Inh)-HalfActive k123h kd123h	$c5 + c105 \rightleftharpoons c558$	

### 8.1 Reaction $v_1$

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

**Name**  $v_1$  EGF + ErbB1:ATP  $\rightarrow$  EGF:ErbB1:ATP  $k_1$   $k_{d1}$

#### Reaction equation



#### Reactants

Table 6: Properties of each reactant.

Id	Name	SBO
c1	EGF	
c2	ErbB1:ATP	

#### Product

Table 7: Properties of each product.

Id	Name	SBO
c3	EGF:ErbB1:ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_1 = k_1 \cdot [c_1] \cdot c_2 - k_{d1} \cdot c_3 \quad (24)$$

### 8.2 Reaction $v_2$

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

**Name**  $v_2$  (ErbB2:ErbB3) + EGF  $\rightarrow$  (ErbB3:ErbB2)#P  $k_1c$   $k_{d1}c$

#### Reaction equation



#### Reactants

Table 8: Properties of each reactant.

Id	Name	SBO
c288	(ErbB2:ErbB3)	
c1	EGF	

### Product

Table 9: Properties of each product.

Id	Name	SBO
c335	(ErbB3:ErbB2)_P	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_2 = k1c \cdot c288 \cdot [c1] - kd1c \cdot c335 \quad (26)$$

### 8.3 Reaction v3

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

**Name** v3 ErbB2:ErbB4 + EGF -> (ErbB4:ErbB2)#P k1d kd1d

### Reaction equation



### Reactants

Table 10: Properties of each reactant.

Id	Name	SBO
c117	ErbB2:ErbB4	
c1	EGF	

### Product

Table 11: Properties of each product.

Id	Name	SBO
c336	(ErbB4:ErbB2)_P	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_3 = k1d \cdot c117 \cdot [c1] - kd1d \cdot c336 \quad (28)$$

### 8.4 Reaction v4

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

**Name** v4 EGF + ErbB1:Inh -> EGF:ErbB1:Inh k1 kd1

### Reaction equation



### Reactants

Table 12: Properties of each reactant.

Id	Name	SBO
c1	EGF	
c286	ErbB1:Inh	

### Product

Table 13: Properties of each product.

Id	Name	SBO
c499	EGF:ErbB1:Inh	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_4 = k1 \cdot [c1] \cdot c286 - kd1 \cdot c499 \quad (30)$$

## 8.5 Reaction $v_5$

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

**Name**  $v_5$  EGF:ErbB1:ATP + EGF:ErbB1:Inh  $\rightarrow$  (EGF:ErbB1:ErbB1):Inh  $k_2$   $k_{d2}$

### Reaction equation



### Reactants

Table 14: Properties of each reactant.

Id	Name	SBO
$c_3$	EGF:ErbB1:ATP	
$c_{499}$	EGF:ErbB1:Inh	

### Product

Table 15: Properties of each product.

Id	Name	SBO
$c_{500}$	(EGF:ErbB1:ATP::EGF:ErbB1:Inh)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_5 = k_2 \cdot c_3 \cdot c_{499} - k_{d2} \cdot c_{500} \quad (32)$$

## 8.6 Reaction $v_6$

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

**Name**  $v_6$  EGF:ErbB1:Inh + EGF:ErbB1:Inh  $\rightarrow$  2(EGF:ErbB1:Inh)  $k_2$   $k_{d2}$

### Reaction equation



### Reactants

Table 16: Properties of each reactant.

Id	Name	SBO
c499	EGF:ErbB1:Inh	
c499	EGF:ErbB1:Inh	

Product

Table 17: Properties of each product.

Id	Name	SBO
c501	2(EGF:ErbB1:Inh)	

Kinetic Law

Derived unit contains undeclared units

$$v_6 = k_2 \cdot c_{499} \cdot c_{499} - k_{d2} \cdot c_{501}$$

(34)

8.7 Reaction v7

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

**Name** v7 EGF:ErbB1:ATP + EGF:ErbB1:ATP -> 2(EGF:ErbB1:ATP) k2 kd2

Reaction equation

$$c_3 + c_3 \rightleftharpoons c_4$$

(35)

Reactants

Table 18: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c3	EGF:ErbB1:ATP	

Product

Table 19: Properties of each product.

Id	Name	SBO
c4	2(EGF:ErbB1:ATP)	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_7 = k_2 \cdot c_3 \cdot c_3 - k_{d2} \cdot c_4 \tag{36}$$

**8.8 Reaction v8**

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

**Name** v8 EGF:ErbB1:ATP + EGF:ErbB1:ATP -> 2(EGF:ErbB1:ATP) k2 kd2

**Reaction equation**

$$c_{10} + c_{10} \rightleftharpoons c_{11} \tag{37}$$

**Reactants**

Table 20: Properties of each reactant.

Id	Name	SBO
c10	EGF:ErbB1:ATP	
c10	EGF:ErbB1:ATP	

**Product**

Table 21: Properties of each product.

Id	Name	SBO
c11	2(EGF:ErbB1:ATP)	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_8 = k_2 \cdot c_{10} \cdot c_{10} - k_{d2} \cdot c_{11} \tag{38}$$

## 8.9 Reaction v9

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

**Name** v9 EGF:ErbB1:ATP + ErbB2 -> EGF:ErbB1:ErbB2 k2b kd2b

### Reaction equation



### Reactants

Table 22: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c141	ErbB2	

### Product

Table 23: Properties of each product.

Id	Name	SBO
c145	EGF:ErbB1:ErbB2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_9 = k2b \cdot c3 \cdot c141 - kd2b \cdot c145 \quad (40)$$

## 8.10 Reaction v10

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

**Name** v10 EGF:ErbB1:ATP + ErbB3 -> EGF:ErbB1:ErbB3 k2b kd2b

### Reaction equation



### Reactants



Table 24: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c140	ErbB3	

### Product

Table 25: Properties of each product.

Id	Name	SBO
c146	EGF:ErbB1:ErbB3	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{10} = k_{2b} \cdot c_3 \cdot c_{140} - k_{d2b} \cdot c_{146} \quad (42)$$

### 8.11 Reaction v11

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

**Name** v11 ErbB4 + EGF:ErbB1:ATP -> EGF:ErbB1:ErbB4 k2b kd2b

### Reaction equation



### Reactants

Table 26: Properties of each reactant.

Id	Name	SBO
c143	ErbB4	
c3	EGF:ErbB1:ATP	

### Product

Table 27: Properties of each product.

Id	Name	SBO
c147	EGF:ErbB1:ErbB4	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{11} = k_{2b} \cdot c_{143} \cdot c_3 - k_{d2b} \cdot c_{147} \quad (44)$$

### 8.12 Reaction $v_{12}$

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

**Name**  $v_{12}$  EGF:ErbB1:ATP + ErbB2  $\rightarrow$  (EGF:ErbB1:ErbB2)  $k_{2b}$   $k_{d2b}$

### Reaction equation



### Reactants

Table 28: Properties of each reactant.

Id	Name	SBO
c10	EGF:ErbB1:ATP	
c155	ErbB2	

### Product

Table 29: Properties of each product.

Id	Name	SBO
c159	(EGF:ErbB1:ErbB2)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{12} = k_{2b} \cdot c_{10} \cdot c_{155} - k_{d2b} \cdot c_{159} \quad (46)$$

### 8.13 Reaction v13

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

**Name** v13 EGF:ErbB1:ATP + ErbB3 -> (EGF:ErbB1:ErbB3) k2b kd2b

#### Reaction equation



#### Reactants

Table 30: Properties of each reactant.

Id	Name	SBO
c10	EGF:ErbB1:ATP	
c154	ErbB3	

#### Product

Table 31: Properties of each product.

Id	Name	SBO
c160	(EGF:ErbB1:ErbB3)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{13} = k2b \cdot c10 \cdot c154 - kd2b \cdot c160 \quad (48)$$

### 8.14 Reaction v14

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

**Name** v14 EGF:ErbB1:ATP + ErbB4 -> (EGF:ErbB1:ErbB4) k2b kd2b

#### Reaction equation



#### Reactants

Table 32: Properties of each reactant.

Id	Name	SBO
c10	EGF:ErbB1:ATP	
c156	ErbB4	

## Product

Table 33: Properties of each product.

Id	Name	SBO
c161	(EGF:ErbB1:ErbB4)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{14} = k_{2b} \cdot c_{10} \cdot c_{156} - k_{d2b} \cdot c_{161} \quad (50)$$

## 8.15 Reaction v15

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

**Name** v15 EGF:ErbB1:Inh + ErbB2 -> EGF:ErbB1:Inh:ErB2 k2b kd2b

## Reaction equation



## Reactants

Table 34: Properties of each reactant.

Id	Name	SBO
c499	EGF:ErbB1:Inh	
c141	ErbB2	

## Product

Table 35: Properties of each product.

Id	Name	SBO
c492	EGF:ErbB1:Inh:ErB2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{15} = k_{2b} \cdot c_{499} \cdot c_{141} - k_{d2b} \cdot c_{492} \quad (52)$$

### 8.16 Reaction v16

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

**Name** v16 ErbB3 + EGF:ErbB1:Inh  $\rightarrow$  EGF:ErbB1:Inh:ErB3 k2b kd2b

### Reaction equation



### Reactants

Table 36: Properties of each reactant.

Id	Name	SBO
c140	ErbB3	
c499	EGF:ErbB1:Inh	

### Product

Table 37: Properties of each product.

Id	Name	SBO
c493	EGF:ErbB1:Inh:ErB3	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{16} = k_{2b} \cdot c_{140} \cdot c_{499} - k_{d2b} \cdot c_{493} \quad (54)$$

### 8.17 Reaction v17

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

**Name** v17 ErbB4 + EGF:ErbB1:Inh -> EGF:ErbB1:Inh:ErB4 k2b kd2b

#### Reaction equation



#### Reactants

Table 38: Properties of each reactant.

Id	Name	SBO
c143	ErbB4	
c499	EGF:ErbB1:Inh	

#### Product

Table 39: Properties of each product.

Id	Name	SBO
c494	EGF:ErbB1:Inh:ErB4	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{17} = k2b \cdot c143 \cdot c499 - kd2b \cdot c494 \quad (56)$$

### 8.18 Reaction v18

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

**Name** v18 EGF:ErbB1:ATP + ErbB2:Inh -> (EGF:ErbB1:ErbB2):Inh k2b kd2b

#### Reaction equation



#### Reactants

Table 40: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c502	ErbB2:Inh	

## Product

Table 41: Properties of each product.

Id	Name	SBO
c504	(EGF:ErbB1:ErbB2):Inh	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{18} = k_{2b} \cdot c_3 \cdot c_{502} - k_{d2b} \cdot c_{504} \quad (58)$$

## 8.19 Reaction v19

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

**Name** v19 EGF:ErbB1:ATP + ErbB4:Inh -> (EGF:ErbB1:ErbB3)#P:Inh k2b kd2b

## Reaction equation



## Reactants

Table 42: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c503	ErbB4:Inh	

## Product

Table 43: Properties of each product.

Id	Name	SBO
c505	(EGF:ErbB1:ErbB3)_P:Inh	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{19} = k_{2b} \cdot c_3 \cdot c_{503} - k_{d2b} \cdot c_{505} \quad (60)$$

### 8.20 Reaction v20

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

**Name** v20 EGF:ErbB1:ATP + ErbB3:Inh -> (EGF:ErbB1:ErbB3)#P:Inh k2b kd2b

### Reaction equation



### Reactants

Table 44: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c506	ErbB3:Inh	

### Product

Table 45: Properties of each product.

Id	Name	SBO
c507	(EGF:ErbB1:ErbB3)_P:Inh	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{20} = k_{2b} \cdot c_3 \cdot c_{506} - k_{d2b} \cdot c_{507} \quad (62)$$



### 8.21 Reaction v21

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

**Name** v21 (EGF:ErbB1:ErbB2) + ATP -> (EGF:ErbB1:ErbB2):ATP k122 kd122

#### Reaction equation



#### Reactants

Table 46: Properties of each reactant.

Id	Name	SBO
c159	(EGF:ErbB1:ErbB2)	
c105	ATP 1.2e9	

#### Product

Table 47: Properties of each product.

Id	Name	SBO
c123	(EGF:ErbB1:ErbB2):ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{21} = k122 \cdot c159 \cdot c105 - kd122 \cdot c123 \quad (64)$$

### 8.22 Reaction v22

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

**Name** v22 (EGF:ErbB1:ErbB3) + ATP -> (EGF:ErbB1:ErbB3):ATP k122 kd122

#### Reaction equation



#### Reactants

Table 48: Properties of each reactant.

Id	Name	SBO
c160	(EGF:ErbB1:ErbB3)	
c105	ATP 1.2e9	

### Product

Table 49: Properties of each product.

Id	Name	SBO
c124	(EGF:ErbB1:ErbB3):ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{22} = k_{122} \cdot c_{160} \cdot c_{105} - k_{d122} \cdot c_{124} \quad (66)$$

### 8.23 Reaction v23

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

**Name** v23 (EGF:ErbB1:ErbB4) + ATP -> (EGF:ErbB1:ErbB4):ATP k122 kd122

### Reaction equation



### Reactants

Table 50: Properties of each reactant.

Id	Name	SBO
c161	(EGF:ErbB1:ErbB4)	
c105	ATP 1.2e9	

### Product

Table 51: Properties of each product.

Id	Name	SBO
c125	(EGF:ErbB1:ErbB4):ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{23} = k_{122} \cdot c_{161} \cdot c_{105} - k_{d122} \cdot c_{125} \quad (68)$$

### 8.24 Reaction v24

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

**Name** v24 2(EGF:ErbB1:ATP) + ATP -> 2(EGF:ErbB1):ATP k122 kd122

### Reaction equation



### Reactants

Table 52: Properties of each reactant.

Id	Name	SBO
c11	2(EGF:ErbB1:ATP)	
c105	ATP 1.2e9	

### Product

Table 53: Properties of each product.

Id	Name	SBO
c126	2(EGF:ErbB1):ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{24} = k_{122} \cdot c_{11} \cdot c_{105} - k_{d122} \cdot c_{126} \quad (70)$$

### 8.25 Reaction v25

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

**Name** v25 2(EGF:ErbB1:ATP)) + ATP -> k122 kd122

#### Reaction equation



#### Reactants

Table 54: Properties of each reactant.

Id	Name	SBO
c4	2(EGF:ErbB1:ATP)	
c105	ATP 1.2e9	

#### Product

Table 55: Properties of each product.

Id	Name	SBO
c116	2(EGF:ErbB1:ATP)-FullActive	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{25} = k122 \cdot c4 \cdot c105 - kd122 \cdot c116 \quad (72)$$

### 8.26 Reaction v26

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

**Name** v26 EGF:ErbB1:ErbB2 + ATP -> EGF:ErbB1:ErbB2:ATP k122 kd122

#### Reaction equation



#### Reactants

Table 56: Properties of each reactant.

Id	Name	SBO
c145	EGF:ErbB1:ErbB2	
c105	ATP 1.2e9	

## Product

Table 57: Properties of each product.

Id	Name	SBO
c122	EGF:ErbB1:ErbB2:ATP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{26} = k_{122} \cdot c_{145} \cdot c_{105} - k_{d122} \cdot c_{122} \quad (74)$$

## 8.27 Reaction v27

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

**Name** v27 EGF:ErbB1:ErbB3 + ATP -> EGF:ErbB1:ErbB3:ATP k122 kd122

## Reaction equation



## Reactants

Table 58: Properties of each reactant.

Id	Name	SBO
c146	EGF:ErbB1:ErbB3	
c105	ATP 1.2e9	

## Product

Table 59: Properties of each product.

Id	Name	SBO
c127	EGF:ErbB1:ErbB3:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{27} = k_{122} \cdot c_{146} \cdot c_{105} - k_{d122} \cdot c_{127} \quad (76)$$

### 8.28 Reaction v28

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

**Name** v28 EGF:ErbB1:ErbB4 + ATP -> EGF:ErbB1:ErbB4:ATP k122 kd122

### Reaction equation



### Reactants

Table 60: Properties of each reactant.

Id	Name	SBO
c147	EGF:ErbB1:ErbB4	
c105	ATP 1.2e9	

### Product

Table 61: Properties of each product.

Id	Name	SBO
c128	EGF:ErbB1:ErbB4:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{28} = k_{122} \cdot c_{147} \cdot c_{105} - k_{d122} \cdot c_{128} \quad (78)$$

### 8.29 Reaction v29

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

**Name** v29 ErbB2:ErbB2#P + ATP -> ErbB2:ErbB2#P:ATP k122 kd122

#### Reaction equation



#### Reactants

Table 62: Properties of each reactant.

Id	Name	SBO
c284	ErbB2:ErbB2_P	
c105	ATP 1.2e9	

#### Product

Table 63: Properties of each product.

Id	Name	SBO
c129	ErbB2:ErbB2_P:ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{29} = k122 \cdot c284 \cdot c105 - kd122 \cdot c129 \quad (80)$$

### 8.30 Reaction v30

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

**Name** v30 (ErbB1:ErbB2)#P:GAP:Grb2:Gab1 + ATP -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1:ATP  
k122 kd122

#### Reaction equation



#### Reactants

Table 64: Properties of each reactant.

Id	Name	SBO
c427	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1	
c105	ATP 1.2e9	

### Product

Table 65: Properties of each product.

Id	Name	SBO
c130	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{30} = k_{122} \cdot c_{427} \cdot c_{105} - k_{d122} \cdot c_{130} \quad (82)$$

### 8.31 Reaction v31

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

**Name** v31 (ErbB1:ErbB3)#P:GAP:Grb2:Gab1 + ATP -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1:ATP  
k122 kd122

### Reaction equation



### Reactants

Table 66: Properties of each reactant.

Id	Name	SBO
c428	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1	
c105	ATP 1.2e9	

### Product



Table 67: Properties of each product.

Id	Name	SBO
c131	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{31} = k_{122} \cdot c_{428} \cdot c_{105} - k_{d122} \cdot c_{131} \quad (84)$$

### 8.32 Reaction v32

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

**Name** v32 (ErbB1:ErbB4)#P:GAP:Grb2:Gab1 + ATP -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1:ATP  
k122 kd122

### Reaction equation



### Reactants

Table 68: Properties of each reactant.

Id	Name	SBO
c429	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1	
c105	ATP 1.2e9	

### Product

Table 69: Properties of each product.

Id	Name	SBO
c132	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{32} = k_{122} \cdot c_{429} \cdot c_{105} - k_{d122} \cdot c_{132} \quad (86)$$

### 8.33 Reaction v33

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

**Name** v33 2(ErbB2)#P:GAP:Grb2:Gab1 + ATP -> 2(ErbB2)#P:GAP:Grb2:Gab1:ATP k122  
kd122

#### Reaction equation



#### Reactants

Table 70: Properties of each reactant.

Id	Name	SBO
c436	2(ErbB2)_P:GAP:Grb2:Gab1	
c105	ATP 1.2e9	

#### Product

Table 71: Properties of each product.

Id	Name	SBO
c133	2(ErbB2)_P:GAP:Grb2:Gab1:ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{33} = k122 \cdot c436 \cdot c105 - kd122 \cdot c133 \quad (88)$$

### 8.34 Reaction v34

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

**Name** v34 (ErbB3:ErbB2)#P:GAP:Grb2:Gab1 + ATP -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1:ATP  
k122 kd122

#### Reaction equation



#### Reactants

Table 72: Properties of each reactant.

Id	Name	SBO
c439	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1	
c105	ATP 1.2e9	

## Product

Table 73: Properties of each product.

Id	Name	SBO
c134	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1:ATP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{34} = k_{122} \cdot c_{439} \cdot c_{105} - k_{d122} \cdot c_{134} \quad (90)$$

## 8.35 Reaction v35

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

**Name** v35 (ErbB4:ErbB2)#P:GAP:Grb2:Gab1 + ATP -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:ATP  
k122 kd122

## Reaction equation



## Reactants

Table 74: Properties of each reactant.

Id	Name	SBO
c442	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1	
c105	ATP 1.2e9	

## Product

Table 75: Properties of each product.

Id	Name	SBO
c135	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{35} = k_{122} \cdot c_{442} \cdot c_{105} - k_{d122} \cdot c_{135} \quad (92)$$

### 8.36 Reaction v36

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

**Name** v36 2(EGF:ErbB1)#P:GAP:Grb2:Gab1 + ATP -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1:ATP  
k122 kd122

### Reaction equation



### Reactants

Table 76: Properties of each reactant.

Id	Name	SBO
c483	2(EGF:ErbB1)_P:GAP:Grb2:Gab1	
c105	ATP 1.2e9	

### Product

Table 77: Properties of each product.

Id	Name	SBO
c136	2(EGF:ErbB1)_P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{36} = k_{122} \cdot c_{483} \cdot c_{105} - k_{d122} \cdot c_{136} \quad (94)$$

### 8.37 Reaction v37

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

**Name** v37 (HRG:ErbB3:ErbB1) + ATP -> (HRG:ErbB3:ErbB1):ATP k122 kd122

#### Reaction equation



#### Reactants

Table 78: Properties of each reactant.

Id	Name	SBO
c516	(HRG:ErbB3:ErbB1)	
c105	ATP 1.2e9	

#### Product

Table 79: Properties of each product.

Id	Name	SBO
c137	(HRG:ErbB3:ErbB1):ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{37} = k122 \cdot c516 \cdot c105 - kd122 \cdot c137 \quad (96)$$

### 8.38 Reaction v38

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

**Name** v38 (HRG:ErbB4:ErbB1) + ATP -> (HRG:ErbB4:ErbB1):ATP k122 kd122

#### Reaction equation



#### Reactants

Table 80: Properties of each reactant.

Id	Name	SBO
c517	(HRG:ErbB4:ErbB1)	
c105	ATP 1.2e9	

### Product

Table 81: Properties of each product.

Id	Name	SBO
c138	(HRG:ErbB4:ErbB1):ATP	

### Kinetic Law

**Derived unit** contains undeclared units

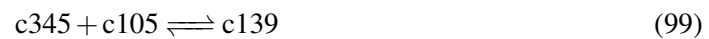
$$v_{38} = k_{122} \cdot c_{517} \cdot c_{105} - k_{d122} \cdot c_{138} \quad (98)$$

### 8.39 Reaction $v_{39}$

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

**Name**  $v_{39}$  (HRG:ErbB4):ErbB2 + ATP -> (HRG:ErbB4):ErbB2:ATP  $k_{122}$   $k_{d122}$

### Reaction equation



### Reactants

Table 82: Properties of each reactant.

Id	Name	SBO
c345	(HRG:ErbB4):ErbB2	
c105	ATP 1.2e9	

### Product

Table 83: Properties of each product.

Id	Name	SBO
c139	(HRG:ErbB4):ErbB2:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{39} = k_{122} \cdot c_{345} \cdot c_{105} - k_{d122} \cdot c_{139} \quad (100)$$

### 8.40 Reaction v40

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

**Name** v40 (HRG:ErbB3):ErbB2 + ATP -> (HRG:ErbB3):ErbB2:ATP k122 kd122

### Reaction equation



### Reactants

Table 84: Properties of each reactant.

Id	Name	SBO
c355	(HRG:ErbB3):ErbB2	
c105	ATP 1.2e9	

### Product

Table 85: Properties of each product.

Id	Name	SBO
c168	(HRG:ErbB3):ErbB2:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{40} = k_{122} \cdot c_{355} \cdot c_{105} - k_{d122} \cdot c_{168} \quad (102)$$

### 8.41 Reaction v41

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

**Name** v41 (HRG:ErbB3):ErbB2 + ATP -> (HRG:ErbB3):ErbB2):ATP k122 kd122

#### Reaction equation



#### Reactants

Table 86: Properties of each reactant.

Id	Name	SBO
c421	(HRG:ErbB3):ErbB2)	
c105	ATP 1.2e9	

#### Product

Table 87: Properties of each product.

Id	Name	SBO
c169	((HRG:ErbB3):ErbB2):ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{41} = k122 \cdot c421 \cdot c105 - kd122 \cdot c169 \quad (104)$$

### 8.42 Reaction v42

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

**Name** v42 (HRG:ErbB4):ErbB2 + ATP -> (HRG:ErbB4):ErbB2):ATP k122 kd122

#### Reaction equation



#### Reactants



Table 88: Properties of each reactant.

Id	Name	SBO
c422	((HRG:ErbB4):ErbB2)	
c105	ATP 1.2e9	

### Product

Table 89: Properties of each product.

Id	Name	SBO
c170	((HRG:ErbB4):ErbB2):ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{42} = k_{122} \cdot c_{422} \cdot c_{105} - k_{d122} \cdot c_{170} \quad (106)$$

### 8.43 Reaction v43

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

**Name** v43 2(EGF:ErbB1)#P:GAP:Grb2 + cPP -> 2(EGF:ErbB1)#P:GAP:Grb2:cPP k4 kd4

### Reaction equation



### Reactants

Table 90: Properties of each reactant.

Id	Name	SBO
c23	2(EGF:ErbB1)_P:GAP:Grb2	
c12	cPP	

### Product

Table 91: Properties of each product.

Id	Name	SBO
c7	2(EGF:ErbB1)_P:GAP:Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{43} = k_4 \cdot c_{23} \cdot c_{12} - k_{d4} \cdot c_7 \quad (108)$$

### 8.44 Reaction v44

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

**Name** v44 2(EGF:ErbB1)#P:GAP:Grb2:Sos + cPP -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:cPP  
k4 kd4

### Reaction equation

$$c_{25} + c_{12} \rightleftharpoons c_{88} \quad (109)$$

### Reactants

Table 92: Properties of each reactant.

Id	Name	SBO
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	
c12	cPP	

### Product

Table 93: Properties of each product.

Id	Name	SBO
c88	2(EGF:ErbB1)_P:GAP:Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{44} = k_4 \cdot c_{25} \cdot c_{12} - k_{d4} \cdot c_{88} \quad (110)$$

8.45 Reaction v45

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

**Name** v45 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k4 kd4

Reaction equation



Reactants

Table 94: Properties of each reactant.		
Id	Name	SBO
c27	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	
c12	cPP	

Product

Table 95: Properties of each product.		
Id	Name	SBO
c89	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{45} = k4 \cdot c27 \cdot c12 - kd4 \cdot c89 \tag{112}$$

8.46 Reaction v46

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

**Name** v46 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k4 kd4

Reaction equation



Reactants

Table 96: Properties of each reactant.

Id	Name	SBO
c29	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	
c12	cPP	

## Product

Table 97: Properties of each product.

Id	Name	SBO
c90	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{46} = k_4 \cdot c_{29} \cdot c_{12} - k_{d4} \cdot c_{90} \quad (114)$$

## 8.47 Reaction v47

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

**Name** v47 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 + cPP -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:cPP  
k4 kd4

## Reaction equation



## Reactants

Table 98: Properties of each reactant.

Id	Name	SBO
c34	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	
c12	cPP	

## Product

Table 99: Properties of each product.

Id	Name	SBO
c91	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{47} = k_4 \cdot c_{34} \cdot c_{12} - k_{d4} \cdot c_{91} \quad (116)$$

### 8.48 Reaction v48

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

**Name** v48 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos + cPP -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:cPP k4 kd4

### Reaction equation



### Reactants

Table 100: Properties of each reactant.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	
c12	cPP	

### Product

Table 101: Properties of each product.

Id	Name	SBO
c92	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{48} = k_4 \cdot c_{35} \cdot c_{12} - k_{d4} \cdot c_{92} \quad (118)$$

### 8.49 Reaction v49

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

**Name** v49 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) + cPP -> 2(EGF:ErbB1)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GDP):cPP k4 kd4

#### Reaction equation



#### Reactants

Table 102: Properties of each reactant.

Id	Name	SBO
c36	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	
c12	cPP	

#### Product

Table 103: Properties of each product.

Id	Name	SBO
c93	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{49} = k4 \cdot c36 \cdot c12 - kd4 \cdot c93 \quad (120)$$

### 8.50 Reaction v50

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

**Name** v50 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> 2(EGF:ErbB1)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GTP):cPP k4 kd4

#### Reaction equation



#### Reactants

Table 104: Properties of each reactant.

Id	Name	SBO
c37	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c12	cPP	

## Product

Table 105: Properties of each product.

Id	Name	SBO
c94	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{50} = k_4 \cdot c_{37} \cdot c_{12} - k_{d4} \cdot c_{94} \quad (122)$$

### 8.51 Reaction v52

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

**Name** v52 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 + cPP -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:cPP  
k4b k4d

## Reaction equation



## Reactants

Table 106: Properties of each reactant.

Id	Name	SBO
c189	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	
c12	cPP	

## Product

Table 107: Properties of each product.

Id	Name	SBO
c195	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{51} = k_{4b} \cdot c_{189} \cdot c_{12} - k_{d4} \cdot c_{195} \quad (124)$$

### 8.52 Reaction v53

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

**Name** v53 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 + cPP -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:cPP  
k<sub>4b</sub> k<sub>d4</sub>

### Reaction equation



### Reactants

Table 108: Properties of each reactant.

Id	Name	SBO
c190	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	
c12	cPP	

### Product

Table 109: Properties of each product.

Id	Name	SBO
c196	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{52} = k_{4b} \cdot c_{190} \cdot c_{12} - k_{d4} \cdot c_{196} \quad (126)$$



### 8.53 Reaction v54

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

**Name** v54 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 + cPP -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:cPP  
k4b kd4

#### Reaction equation



#### Reactants

Table 110: Properties of each reactant.

Id	Name	SBO
c191	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	
c12	cPP	

#### Product

Table 111: Properties of each product.

Id	Name	SBO
c197	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{53} = k4b \cdot c191 \cdot c12 - kd4 \cdot c197 \quad (128)$$

### 8.54 Reaction v55

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

**Name** v55 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + cPP -> (ErbB1:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:cPP k4b kd4

#### Reaction equation



#### Reactants

Table 112: Properties of each reactant.

Id	Name	SBO
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c12	cPP	

## Product

Table 113: Properties of each product.

Id	Name	SBO
c204	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{54} = k_{4b} \cdot c_{198} \cdot c_{12} - k_{d4} \cdot c_{204} \quad (130)$$

## 8.55 Reaction v56

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

**Name** v56 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos + cPP -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos:cPP k4b kd4

## Reaction equation

$$c_{199} + c_{12} \rightleftharpoons c_{205} \quad (131)$$

## Reactants

Table 114: Properties of each reactant.

Id	Name	SBO
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	
c12	cPP	

## Product

Table 115: Properties of each product.

Id	Name	SBO
c205	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{55} = k_{4b} \cdot c_{199} \cdot c_{12} - k_{d4} \cdot c_{205} \quad (132)$$

### 8.56 Reaction v57

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

**Name** v57 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos + cPP -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:cPP k4b k4d

### Reaction equation



### Reactants

Table 116: Properties of each reactant.

Id	Name	SBO
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	
c12	cPP	

### Product

Table 117: Properties of each product.

Id	Name	SBO
c206	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{56} = k_{4b} \cdot c_{200} \cdot c_{12} - k_{d4} \cdot c_{206} \quad (134)$$

### 8.57 Reaction v58

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

**Name** v58 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 118: Properties of each reactant.

Id	Name	SBO
c207	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	
c12	cPP	

#### Product

Table 119: Properties of each product.

Id	Name	SBO
c213	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{57} = k4b \cdot c207 \cdot c12 - kd4 \cdot c213 \quad (136)$$

### 8.58 Reaction v59

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

**Name** v59 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB3)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 120: Properties of each reactant.

Id	Name	SBO
c208	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	
c12	cPP	

### Product

Table 121: Properties of each product.

Id	Name	SBO
c214	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{58} = k_{4b} \cdot c_{208} \cdot c_{12} - k_{d4} \cdot c_{214} \quad (138)$$

### 8.59 Reaction v60

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

**Name** v60 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB4)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4

### Reaction equation



### Reactants

Table 122: Properties of each reactant.

Id	Name	SBO
c209	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	
c12	cPP	

### Product

Table 123: Properties of each product.

Id	Name	SBO
c215	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{59} = k_{4b} \cdot c_{209} \cdot c_{12} - k_{d4} \cdot c_{215} \quad (140)$$

### 8.60 Reaction v61

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

**Name** v61 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP):cPP  $k_{4b}$   $k_{d4}$

### Reaction equation



### Reactants

Table 124: Properties of each reactant.

Id	Name	SBO
c216	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c12	cPP	

### Product

Table 125: Properties of each product.

Id	Name	SBO
c222	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{60} = k_{4b} \cdot c_{216} \cdot c_{12} - k_{d4} \cdot c_{222} \quad (142)$$

### 8.61 Reaction v62

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

**Name** v62 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 126: Properties of each reactant.

Id	Name	SBO
c217	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c12	cPP	

#### Product

Table 127: Properties of each product.

Id	Name	SBO
c223	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{61} = k4b \cdot c217 \cdot c12 - kd4 \cdot c223 \quad (144)$$

### 8.62 Reaction v63

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

**Name** v63 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 128: Properties of each reactant.

Id	Name	SBO
c218	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c12	cPP	

### Product

Table 129: Properties of each product.

Id	Name	SBO
c224	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{62} = k_{4b} \cdot c_{218} \cdot c_{12} - k_{d4} \cdot c_{224} \quad (146)$$

### 8.63 Reaction $v_{64}$

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

**Name**  $v_{64}$  (ErbB1:ErbB2)#P:GAP:Grb2 + cPP  $\rightarrow$  (ErbB1:ErbB2)#P:GAP:Grb2:cPP  $k_{4b}$   $k_{d4}$

### Reaction equation



### Reactants

Table 130: Properties of each reactant.

Id	Name	SBO
c225	(ErbB1:ErbB2)_P:GAP:Grb2	
c12	cPP	

### Product



Table 131: Properties of each product.

Id	Name	SBO
c231	(ErbB1:ErbB2)_P:GAP:Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{63} = k_{4b} \cdot c_{225} \cdot c_{12} - k_{d4} \cdot c_{231} \quad (148)$$

### 8.64 Reaction v65

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

**Name** v65 (ErbB1:ErbB3)#P:GAP:Grb2 + cPP -> (ErbB1:ErbB3)#P:GAP:Grb2:cPP k4b kd4

### Reaction equation



### Reactants

Table 132: Properties of each reactant.

Id	Name	SBO
c226	(ErbB1:ErbB3)_P:GAP:Grb2	
c12	cPP	

### Product

Table 133: Properties of each product.

Id	Name	SBO
c232	(ErbB1:ErbB3)_P:GAP:Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{64} = k_{4b} \cdot c_{226} \cdot c_{12} - k_{d4} \cdot c_{232} \quad (150)$$

### 8.65 Reaction v66

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

**Name** v66 (ErbB1:ErbB4)#P:GAP:Grb2 + cPP -> (ErbB1:ErbB4)#P:GAP:Grb2:cPP k4b kd4

#### Reaction equation



#### Reactants

Table 134: Properties of each reactant.

Id	Name	SBO
c227	(ErbB1:ErbB4)_P:GAP:Grb2	
c12	cPP	

#### Product

Table 135: Properties of each product.

Id	Name	SBO
c233	(ErbB1:ErbB4)_P:GAP:Grb2:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{65} = k4b \cdot c227 \cdot c12 - kd4 \cdot c233 \quad (152)$$

### 8.66 Reaction v67

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

**Name** v67 (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 136: Properties of each reactant.

Id	Name	SBO
c243	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	
c12	cPP	

## Product

Table 137: Properties of each product.

Id	Name	SBO
c249	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{66} = k_{4b} \cdot c_{243} \cdot c_{12} - k_{d4} \cdot c_{249} \quad (154)$$

## 8.67 Reaction v68

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

**Name** v68 (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k4b kd4

## Reaction equation



## Reactants

Table 138: Properties of each reactant.

Id	Name	SBO
c244	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP)	
c12	cPP	

## Product

Table 139: Properties of each product.

Id	Name	SBO
c250	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{67} = k_{4b} \cdot c_{244} \cdot c_{12} - k_{d4} \cdot c_{250} \quad (156)$$

### 8.68 Reaction v69

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

**Name** v69 (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k4b kd4

### Reaction equation

$$c_{245} + c_{12} \rightleftharpoons c_{251} \quad (157)$$

### Reactants

Table 140: Properties of each reactant.

Id	Name	SBO
c245	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP)	
c12	cPP	

### Product

Table 141: Properties of each product.

Id	Name	SBO
c251	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{68} = k_{4b} \cdot c_{245} \cdot c_{12} - k_{d4} \cdot c_{251} \quad (158)$$

8.69 Reaction v70

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

**Name** v70 (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k4 kd4

Reaction equation



Reactants

Table 142: Properties of each reactant.

Id	Name	SBO
c252	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	
c12	cPP	

Product

Table 143: Properties of each product.

Id	Name	SBO
c258	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{69} = k4 \cdot c252 \cdot c12 - kd4 \cdot c258$$

(160)

8.70 Reaction v71

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

**Name** v71 (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k4 kd4

Reaction equation



Reactants

Table 144: Properties of each reactant.

Id	Name	SBO
c253	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP)	
c12	cPP	

## Product

Table 145: Properties of each product.

Id	Name	SBO
c259	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{70} = k_4 \cdot c_{253} \cdot c_{12} - k_{d4} \cdot c_{259} \quad (162)$$

## 8.71 Reaction v72

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

**Name** v72 (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k4 k<sub>d4</sub>

## Reaction equation



## Reactants

Table 146: Properties of each reactant.

Id	Name	SBO
c254	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP)	
c12	cPP	

## Product

Table 147: Properties of each product.

Id	Name	SBO
c260	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{71} = k_4 \cdot c_{254} \cdot c_{12} - k_{d4} \cdot c_{260} \quad (164)$$

### 8.72 Reaction v75

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

**Name** v75 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + cPP -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:cPP  
k4b k<sub>d4</sub>

### Reaction equation



### Reactants

Table 148: Properties of each reactant.

Id	Name	SBO
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	
c12	cPP	

### Product

Table 149: Properties of each product.

Id	Name	SBO
c240	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{72} = k_{4b} \cdot c_{234} \cdot c_{12} - k_{d4} \cdot c_{240} \quad (166)$$

### 8.73 Reaction v76

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

**Name** v76 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + cPP -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:cPP  
k4b kd4

#### Reaction equation



#### Reactants

Table 150: Properties of each reactant.

Id	Name	SBO
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	
c12	cPP	

#### Product

Table 151: Properties of each product.

Id	Name	SBO
c241	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{73} = k4b \cdot c235 \cdot c12 - kd4 \cdot c241 \quad (168)$$

### 8.74 Reaction v77

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

**Name** v77 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + cPP -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:cPP  
k4b kd4

#### Reaction equation



#### Reactants



Table 152: Properties of each reactant.

Id	Name	SBO
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	
c12	cPP	

## Product

Table 153: Properties of each product.

Id	Name	SBO
c242	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{74} = k_{4b} \cdot c_{236} \cdot c_{12} - k_{d4} \cdot c_{242} \quad (170)$$

### 8.75 Reaction v78

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

**Name** v78 2(ErbB2)#P:GAP:(Shc#P):Grb2 + cPP -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:cPP k4b  
kd4

## Reaction equation



## Reactants

Table 154: Properties of each reactant.

Id	Name	SBO
c300	2(ErbB2)_P:GAP:(Shc_P):Grb2	
c12	cPP	

## Product

Table 155: Properties of each product.

Id	Name	SBO
c301	2(ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{75} = k_{4b} \cdot c_{300} \cdot c_{12} - k_{d4} \cdot c_{301} \quad (172)$$

### 8.76 Reaction v79

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

**Name** v79 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos + cPP -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP  
k4b kd4

### Reaction equation



### Reactants

Table 156: Properties of each reactant.

Id	Name	SBO
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c12	cPP	

### Product

Table 157: Properties of each product.

Id	Name	SBO
c304	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{76} = k_{4b} \cdot c_{303} \cdot c_{12} - k_{d4} \cdot c_{304} \quad (174)$$

### 8.77 Reaction v80

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

**Name** v80 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) + cPP -> 2(ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 158: Properties of each reactant.

Id	Name	SBO
c306	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	
c12	cPP	

#### Product

Table 159: Properties of each product.

Id	Name	SBO
c307	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{77} = k4b \cdot c306 \cdot c12 - kd4 \cdot c307 \quad (176)$$

### 8.78 Reaction v81

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

**Name** v81 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> 2(ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 160: Properties of each reactant.

Id	Name	SBO
c309	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c12	cPP	

## Product

Table 161: Properties of each product.

Id	Name	SBO
c310	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{78} = k_{4b} \cdot c_{309} \cdot c_{12} - k_{d4} \cdot c_{310} \quad (178)$$

## 8.79 Reaction v82

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

**Name** v82 2(ErbB2)#P:GAP:Grb2 + cPP -> 2(ErbB2)#P:GAP:Grb2:cPP k4b kd4

## Reaction equation



## Reactants

Table 162: Properties of each reactant.

Id	Name	SBO
c312	2(ErbB2)_P:GAP:Grb2	
c12	cPP	

## Product

Table 163: Properties of each product.

Id	Name	SBO
c313	2(ErbB2)_P:GAP:Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{79} = k_{4b} \cdot c_{312} \cdot c_{12} - k_{d4} \cdot c_{313} \quad (180)$$

### 8.80 Reaction v83

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

**Name** v83 2(ErbB2)#P:GAP:Grb2:Sos + cPP -> 2(ErbB2)#P:GAP:Grb2:Sos:cPP k4b kd4

### Reaction equation



### Reactants

Table 164: Properties of each reactant.

Id	Name	SBO
c315	2(ErbB2)_P:GAP:Grb2:Sos	
c12	cPP	

### Product

Table 165: Properties of each product.

Id	Name	SBO
c316	2(ErbB2)_P:GAP:Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{80} = k_{4b} \cdot c_{315} \cdot c_{12} - k_{d4} \cdot c_{316} \quad (182)$$

8.81 Reaction v84

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

**Name** v84 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k4b kd4

Reaction equation



Reactants

Table 166: Properties of each reactant.		
Id	Name	SBO
c318	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	
c12	cPP	

Product

Table 167: Properties of each product.		
Id	Name	SBO
c319	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{81} = k4b \cdot c318 \cdot c12 - kd4 \cdot c319 \tag{184}$$

8.82 Reaction v85

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

**Name** v85 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k4b kd4

Reaction equation



Reactants

Table 168: Properties of each reactant.

Id	Name	SBO
c321	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	
c12	cPP	

### Product

Table 169: Properties of each product.

Id	Name	SBO
c322	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{82} = k_{4b} \cdot c_{321} \cdot c_{12} - k_{d4} \cdot c_{322} \quad (186)$$

### 8.83 Reaction $v_{87}$

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

**Name**  $v_{87}$  (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 + cPP  $\rightarrow$  (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:cPP  
 $k_{4b}$   $k_{d4}$

### Reaction equation



### Reactants

Table 170: Properties of each reactant.

Id	Name	SBO
c357	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	
c12	cPP	

### Product

Table 171: Properties of each product.

Id	Name	SBO
c358	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{83} = k_{4b} \cdot c_{357} \cdot c_{12} - k_{d4} \cdot c_{358} \quad (188)$$

### 8.84 Reaction v88

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

**Name** v88 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 + cPP -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:cPP  
k<sub>4b</sub> k<sub>d4</sub>

### Reaction equation



### Reactants

Table 172: Properties of each reactant.

Id	Name	SBO
c360	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	
c12	cPP	

### Product

Table 173: Properties of each product.

Id	Name	SBO
c361	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{84} = k_{4b} \cdot c_{360} \cdot c_{12} - k_{d4} \cdot c_{361} \quad (190)$$



### 8.85 Reaction v89

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

**Name** v89 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + cPP -> (ErbB4:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:cPP k4b kd4

#### Reaction equation



#### Reactants

Table 174: Properties of each reactant.

Id	Name	SBO
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c12	cPP	

#### Product

Table 175: Properties of each product.

Id	Name	SBO
c367	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{85} = k4b \cdot c366 \cdot c12 - kd4 \cdot c367 \quad (192)$$

### 8.86 Reaction v90

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

**Name** v90 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) + cPP -> (ErbB3:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 176: Properties of each reactant.

Id	Name	SBO
c369	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	
c12	cPP	

## Product

Table 177: Properties of each product.

Id	Name	SBO
c370	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{86} = k_{4b} \cdot c_{369} \cdot c_{12} - k_{d4} \cdot c_{370} \quad (194)$$

## 8.87 Reaction v91

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

**Name** v91 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) + cPP -> (ErbB4:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k4b kd4

## Reaction equation



## Reactants

Table 178: Properties of each reactant.

Id	Name	SBO
c372	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	
c12	cPP	

## Product

Table 179: Properties of each product.

Id	Name	SBO
c373	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

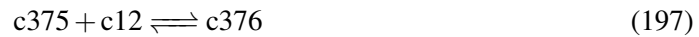
$$v_{87} = k_{4b} \cdot c_{372} \cdot c_{12} - k_{d4} \cdot c_{373} \quad (196)$$

### 8.88 Reaction v92

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

**Name** v92 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> (ErbB3:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP):cPP  $k_{4b}$   $k_{d4}$

### Reaction equation



### Reactants

Table 180: Properties of each reactant.

Id	Name	SBO
c375	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c12	cPP	

### Product

Table 181: Properties of each product.

Id	Name	SBO
c376	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{88} = k_{4b} \cdot c_{375} \cdot c_{12} - k_{d4} \cdot c_{376} \quad (198)$$

### 8.89 Reaction v93

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

**Name** v93 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> (ErbB4:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP):cPP k4b kd4

#### Reaction equation



#### Reactants

Table 182: Properties of each reactant.

Id	Name	SBO
c378	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c12	cPP	

#### Product

Table 183: Properties of each product.

Id	Name	SBO
c379	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{89} = k4b \cdot c378 \cdot c12 - kd4 \cdot c379 \quad (200)$$

### 8.90 Reaction v94

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

**Name** v94 (ErbB3:ErbB2)#P:GAP:Grb2 + cPP -> (ErbB3:ErbB2)#P:GAP:Grb2:cPP k4b kd4

#### Reaction equation



#### Reactants

Table 184: Properties of each reactant.

Id	Name	SBO
c381	(ErbB3:ErbB2)_P:GAP:Grb2	
c12	cPP	

## Product

Table 185: Properties of each product.

Id	Name	SBO
c382	(ErbB3:ErbB2)_P:GAP:Grb2:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{90} = k_{4b} \cdot c_{381} \cdot c_{12} - k_{d4} \cdot c_{382} \quad (202)$$

### 8.91 Reaction v95

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

**Name** v95 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + cPP -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP k4b kd4

## Reaction equation



## Reactants

Table 186: Properties of each reactant.

Id	Name	SBO
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c12	cPP	

## Product

Table 187: Properties of each product.

Id	Name	SBO
c364	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{91} = k4b \cdot c363 \cdot c12 - kd4 \cdot c364 \quad (204)$$

### 8.92 Reaction v96

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

**Name** v96 (ErbB4:ErbB2)#P:GAP:Grb2 + cPP -> (ErbB4:ErbB2)#P:GAP:Grb2:cPP k4b kd4

### Reaction equation



### Reactants

Table 188: Properties of each reactant.

Id	Name	SBO
c384	(ErbB4:ErbB2)_P:GAP:Grb2	
c12	cPP	

### Product

Table 189: Properties of each product.

Id	Name	SBO
c385	(ErbB4:ErbB2)_P:GAP:Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{92} = k4b \cdot c384 \cdot c12 - kd4 \cdot c385 \quad (206)$$

### 8.93 Reaction v97

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

**Name** v97 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + cPP -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:cPP  
k4b kd4

#### Reaction equation



#### Reactants

Table 190: Properties of each reactant.

Id	Name	SBO
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	
c12	cPP	

#### Product

Table 191: Properties of each product.

Id	Name	SBO
c388	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{93} = k4b \cdot c387 \cdot c12 - kd4 \cdot c388 \quad (208)$$

### 8.94 Reaction v98

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

**Name** v98 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + cPP -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:cPP  
k4b kd4

#### Reaction equation



#### Reactants

Table 192: Properties of each reactant.

Id	Name	SBO
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	
c12	cPP	

## Product

Table 193: Properties of each product.

Id	Name	SBO
c391	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{94} = k_{4b} \cdot c_{390} \cdot c_{12} - k_{d4} \cdot c_{391} \quad (210)$$

## 8.95 Reaction v99

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

**Name** v99 (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cF  
k4b kd4

## Reaction equation



## Reactants

Table 194: Properties of each reactant.

Id	Name	SBO
c393	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	
c12	cPP	

## Product



Table 195: Properties of each product.

Id	Name	SBO
c394	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{95} = k_{4b} \cdot c_{393} \cdot c_{12} - k_{d4} \cdot c_{394} \quad (212)$$

### 8.96 Reaction v100

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

**Name** v100 (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) + cPP -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k4b kd4

### Reaction equation



### Reactants

Table 196: Properties of each reactant.

Id	Name	SBO
c396	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	
c12	cPP	

### Product

Table 197: Properties of each product.

Id	Name	SBO
c397	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{96} = k_{4b} \cdot c_{396} \cdot c_{12} - k_{d4} \cdot c_{397} \quad (214)$$

8.97 Reaction v101

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

**Name** v101 (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k4b kd4

Reaction equation



Reactants

Table 198: Properties of each reactant.		
Id	Name	SBO
c399	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	
c12	cPP	

Product

Table 199: Properties of each product.		
Id	Name	SBO
c400	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{97} = k4b \cdot c399 \cdot c12 - kd4 \cdot c400 \tag{216}$$

8.98 Reaction v102

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

**Name** v102 (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) + cPP -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k4b kd4

Reaction equation



Reactants

Table 200: Properties of each reactant.

Id	Name	SBO
c402	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	
c12	cPP	

## Product

Table 201: Properties of each product.

Id	Name	SBO
c403	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{98} = k_{4b} \cdot c_{402} \cdot c_{12} - k_{d4} \cdot c_{403} \quad (218)$$

## 8.99 Reaction v103

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

**Name** v103 cPP + (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k5b kd5b

## Reaction equation



## Reactants

Table 202: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c404	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 203: Properties of each product.

Id	Name	SBO
c403	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{99} = k_{5b} \cdot c_9 \cdot c_{404} - k_{d5b} \cdot c_{403} \quad (220)$$

### 8.100 Reaction v104

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

**Name** v104 cPP + (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k5b kd5b

### Reaction equation



### Reactants

Table 204: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c401	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Product

Table 205: Properties of each product.

Id	Name	SBO
c400	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{100} = k_{5b} \cdot c_9 \cdot c_{401} - k_{d5b} \cdot c_{400} \quad (222)$$

8.101 Reaction v105

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

**Name** v105 cPP + (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k5b kd5b

Reaction equation



Reactants

Table 206: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c398	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

Product

Table 207: Properties of each product.

Id	Name	SBO
c397	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{101} = k5b \cdot c9 \cdot c398 - kd5b \cdot c397$$

(224)

8.102 Reaction v106

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

**Name** v106 cPP + (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k5b kd5b

Reaction equation



Reactants

Table 208: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c395	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Product

Table 209: Properties of each product.

Id	Name	SBO
c394	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{102} = k_{5b} \cdot c_9 \cdot c_{395} - k_{d5b} \cdot c_{394} \quad (226)$$

### 8.103 Reaction $v_{107}$

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

**Name**  $v_{107}$  cPP + (ErbB4:ErbB2)#P:GAP:Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:cPP  
 $k_{5b}$   $k_{d5b}$

## Reaction equation



## Reactants

Table 210: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 211: Properties of each product.

Id	Name	SBO
c391	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{103} = k5b \cdot c9 \cdot c392 - kd5b \cdot c391 \quad (228)$$

### 8.104 Reaction v108

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

**Name** v108 cPP + (ErbB3:ErbB2)#P:GAP:Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:cPP  
k5b kd5b

### Reaction equation



### Reactants

Table 212: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

### Product

Table 213: Properties of each product.

Id	Name	SBO
c388	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{104} = k5b \cdot c9 \cdot c389 - kd5b \cdot c388 \quad (230)$$

### 8.105 Reaction v109

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

**Name** v109 cPP + (ErbB4:ErbB2)#P:GAP:Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2:cPP k5b kd5b

#### Reaction equation



#### Reactants

Table 214: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c386	(ErbB4:ErbB2)_P:GAP:Grb2	

#### Product

Table 215: Properties of each product.

Id	Name	SBO
c385	(ErbB4:ErbB2)_P:GAP:Grb2:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{105} = k5b \cdot c9 \cdot c386 - kd5b \cdot c385 \quad (232)$$

### 8.106 Reaction v110

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

**Name** v110 cPP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:cPP k5b kd5b

#### Reaction equation



#### Reactants



Table 216: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 217: Properties of each product.

Id	Name	SBO
c364	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{106} = k5b \cdot c9 \cdot c365 - kd5b \cdot c364 \quad (234)$$

### 8.107 Reaction v111

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

**Name** v111 cPP + (ErbB3:ErbB2)#P:GAP:Grb2 -> (ErbB3:ErbB2)#P:GAP:Grb2:cPP k5b kd5b

## Reaction equation



## Reactants

Table 218: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c383	(ErbB3:ErbB2)_P:GAP:Grb2	

## Product

Table 219: Properties of each product.

Id	Name	SBO
c382	(ErbB3:ErbB2)_P:GAP:Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{107} = k5b \cdot c9 \cdot c383 - kd5b \cdot c382 \quad (236)$$

### 8.108 Reaction v112

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

**Name** v112 cPP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> (ErbB4:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5b kd5b

### Reaction equation



### Reactants

Table 220: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c380	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Product

Table 221: Properties of each product.

Id	Name	SBO
c379	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{108} = k5b \cdot c9 \cdot c380 - kd5b \cdot c379 \quad (238)$$

### 8.109 Reaction v113

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

**Name** v113 cPP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> (ErbB3:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5b kd5b

#### Reaction equation



#### Reactants

Table 222: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c377	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

#### Product

Table 223: Properties of each product.

Id	Name	SBO
c376	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{109} = k5b \cdot c9 \cdot c377 - kd5b \cdot c376 \quad (240)$$

### 8.110 Reaction v114

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

**Name** v114 cPP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> (ErbB4:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5b kd5b

#### Reaction equation



#### Reactants

Table 224: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c374	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 225: Properties of each product.

Id	Name	SBO
c373	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{110} = k_{5b} \cdot c_9 \cdot c_{374} - k_{d5b} \cdot c_{373} \quad (242)$$

### 8.111 Reaction v115

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

**Name** v115 cPP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> (ErbB3:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5b kd5b

## Reaction equation



## Reactants

Table 226: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c371	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 227: Properties of each product.

Id	Name	SBO
c370	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{111} = k5b \cdot c9 \cdot c371 - kd5b \cdot c370 \quad (244)$$

### 8.112 Reaction v116

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

**Name** v116 cPP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP k5b kd5b

### Reaction equation



### Reactants

Table 228: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 229: Properties of each product.

Id	Name	SBO
c367	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{112} = k5b \cdot c9 \cdot c368 - kd5b \cdot c367 \quad (246)$$

### 8.113 Reaction v117

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

**Name** v117 cPP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:cPP  
k5b kd5b

#### Reaction equation



#### Reactants

Table 230: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c362	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

#### Product

Table 231: Properties of each product.

Id	Name	SBO
c361	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{113} = k5b \cdot c9 \cdot c362 - kd5b \cdot c361 \quad (248)$$

### 8.114 Reaction v118

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

**Name** v118 cPP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:cPP  
k5b kd5b

#### Reaction equation



#### Reactants

Table 232: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c359	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

## Product

Table 233: Properties of each product.

Id	Name	SBO
c358	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

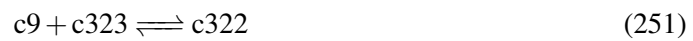
$$v_{114} = k5b \cdot c9 \cdot c359 - kd5b \cdot c358 \quad (250)$$

### 8.115 Reaction v120

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

**Name** v120 cPP + 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k5 kd5b

## Reaction equation



## Reactants

Table 234: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c323	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 235: Properties of each product.

Id	Name	SBO
c322	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{115} = k5 \cdot c9 \cdot c323 - kd5b \cdot c322 \quad (252)$$

### 8.116 Reaction v121

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

**Name** v121 cPP + 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k5 kd5b

### Reaction equation



### Reactants

Table 236: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c320	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Product

Table 237: Properties of each product.

Id	Name	SBO
c319	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{116} = k5 \cdot c9 \cdot c320 - kd5b \cdot c319 \quad (254)$$



### 8.117 Reaction v122

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

**Name** v122 cPP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:cPP k5 kd5b

#### Reaction equation



#### Reactants

Table 238: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c317	2(ErbB2)_P:GAP:Grb2:Sos	

#### Product

Table 239: Properties of each product.

Id	Name	SBO
c316	2(ErbB2)_P:GAP:Grb2:Sos:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{117} = k5 \cdot c9 \cdot c317 - kd5b \cdot c316 \quad (256)$$

### 8.118 Reaction v123

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

**Name** v123 cPP + 2(ErbB2)#P:GAP:Grb2 -> 2(ErbB2)#P:GAP:Grb2:cPP k5 kd5b

#### Reaction equation



#### Reactants

Table 240: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c314	2(ErbB2)_P:GAP:Grb2	

## Product

Table 241: Properties of each product.

Id	Name	SBO
c313	2(ErbB2)_P:GAP:Grb2:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{118} = k5 \cdot c9 \cdot c314 - kd5b \cdot c313 \quad (258)$$

### 8.119 Reaction v124

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

**Name** v124 cPP + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5b

## Reaction equation



## Reactants

Table 242: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c311	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 243: Properties of each product.

Id	Name	SBO
c310	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{119} = k5 \cdot c9 \cdot c311 - kd5b \cdot c310 \quad (260)$$

### 8.120 Reaction v125

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

**Name** v125 cPP + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5b

### Reaction equation



### Reactants

Table 244: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c308	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Product

Table 245: Properties of each product.

Id	Name	SBO
c307	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{120} = k5 \cdot c9 \cdot c308 - kd5b \cdot c307 \quad (262)$$

### 8.121 Reaction v126

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

**Name** v126 cPP + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP  
k5 kd5b

#### Reaction equation



#### Reactants

Table 246: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 247: Properties of each product.

Id	Name	SBO
c304	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{121} = k5 \cdot c9 \cdot c305 - kd5b \cdot c304 \quad (264)$$

### 8.122 Reaction v127

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

**Name** v127 cPP + 2(ErbB2)#P:GAP:(Shc#P):Grb2 -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:cPP k5  
kd5b

#### Reaction equation



#### Reactants

Table 248: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c302	2(ErbB2)_P:GAP:(Shc_P):Grb2	

## Product

Table 249: Properties of each product.

Id	Name	SBO
c301	2(ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{122} = k5 \cdot c9 \cdot c302 - kd5b \cdot c301 \quad (266)$$

### 8.123 Reaction v128

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

**Name** v128 cPP + (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:cPP  
k5 kd5b

## Reaction equation



## Reactants

Table 250: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

## Product

Table 251: Properties of each product.

Id	Name	SBO
c242	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{123} = k5 \cdot c9 \cdot c239 - kd5b \cdot c242 \quad (268)$$

### 8.124 Reaction v129

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

**Name** v129 cPP + (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:cPP  
k5 kd5b

### Reaction equation



### Reactants

Table 252: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

### Product

Table 253: Properties of each product.

Id	Name	SBO
c241	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{124} = k5 \cdot c9 \cdot c238 - kd5b \cdot c241 \quad (270)$$

8.125 Reaction v130

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

**Name** v130 cPP + (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:cPP  
k5 kd5b

Reaction equation



Reactants

Table 254: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

Product

Table 255: Properties of each product.

Id	Name	SBO
c240	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:cPP	

Kinetic Law

**Derived unit** contains undeclared units

$v_{125} = k5 \cdot c9 \cdot c237 - kd5b \cdot c240$  (272)

8.126 Reaction v133

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

**Name** v133 cPP + (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k5 kd5b

Reaction equation



Reactants

Table 256: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c257	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 257: Properties of each product.

Id	Name	SBO
c260	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{126} = k5 \cdot c9 \cdot c257 - kd5b \cdot c260 \quad (274)$$

## 8.127 Reaction v134

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

**Name** v134 cPP + (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k5 kd5b

## Reaction equation



## Reactants

Table 258: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c256	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product



Table 259: Properties of each product.

Id	Name	SBO
c259	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{127} = k5 \cdot c9 \cdot c256 - kd5b \cdot c259 \quad (276)$$

### 8.128 Reaction v135

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

**Name** v135 cPP + (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k5 kd5b

### Reaction equation



### Reactants

Table 260: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c255	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Product

Table 261: Properties of each product.

Id	Name	SBO
c258	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{128} = k5 \cdot c9 \cdot c255 - kd5b \cdot c258 \quad (278)$$

8.129 Reaction v136

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

**Name** v136 cPP + (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k5 kd5b

Reaction equation



Reactants

Table 262: Properties of each reactant.		
Id	Name	SBO
c9	cPP	
c248	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP)	

Product

Table 263: Properties of each product.		
Id	Name	SBO
c251	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{129} = k5 \cdot c9 \cdot c248 - kd5b \cdot c251 \tag{280}$$

8.130 Reaction v137

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

**Name** v137 cPP + (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k5 kd5b

Reaction equation



Reactants

Table 264: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c247	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Product

Table 265: Properties of each product.

Id	Name	SBO
c250	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{130} = k5 \cdot c9 \cdot c247 - kd5b \cdot c250 \quad (282)$$

### 8.131 Reaction v138

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

**Name** v138 cPP + (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k5 kd5b

## Reaction equation



## Reactants

Table 266: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c246	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Product

Table 267: Properties of each product.

Id	Name	SBO
c249	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{131} = k5 \cdot c9 \cdot c246 - kd5b \cdot c249 \quad (284)$$

### 8.132 Reaction v139

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

**Name** v139 cPP + (ErbB1:ErbB4)#P:GAP:Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2:cPP k5 kd5b

### Reaction equation



### Reactants

Table 268: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c230	(ErbB1:ErbB4)_P:GAP:Grb2	

### Product

Table 269: Properties of each product.

Id	Name	SBO
c233	(ErbB1:ErbB4)_P:GAP:Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{132} = k5 \cdot c9 \cdot c230 - kd5b \cdot c233 \quad (286)$$

### 8.133 Reaction v140

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

**Name** v140 cPP + (ErbB1:ErbB3)#P:GAP:Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2:cPP k5 kd5b

#### Reaction equation



#### Reactants

Table 270: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c229	(ErbB1:ErbB3)_P:GAP:Grb2	

#### Product

Table 271: Properties of each product.

Id	Name	SBO
c232	(ErbB1:ErbB3)_P:GAP:Grb2:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{133} = k5 \cdot c9 \cdot c229 - kd5b \cdot c232 \quad (288)$$

### 8.134 Reaction v141

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

**Name** v141 cPP + (ErbB1:ErbB2)#P:GAP:Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2:cPP k5 kd5b

#### Reaction equation



#### Reactants

Table 272: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c228	(ErbB1:ErbB2)_P:GAP:Grb2	

## Product

Table 273: Properties of each product.

Id	Name	SBO
c231	(ErbB1:ErbB2)_P:GAP:Grb2:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{134} = k5 \cdot c9 \cdot c228 - kd5b \cdot c231 \quad (290)$$

### 8.135 Reaction v142

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

**Name** v142 cPP + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB4)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5b

## Reaction equation



## Reactants

Table 274: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c221	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 275: Properties of each product.

Id	Name	SBO
c224	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{135} = k5 \cdot c9 \cdot c221 - kd5b \cdot c224 \quad (292)$$

### 8.136 Reaction v143

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

**Name** v143 cPP + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB3)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5b

### Reaction equation



### Reactants

Table 276: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c220	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Product

Table 277: Properties of each product.

Id	Name	SBO
c223	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{136} = k5 \cdot c9 \cdot c220 - kd5b \cdot c223 \quad (294)$$

### 8.137 Reaction v144

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

**Name** v144 cPP + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> (ErbB1:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5b

#### Reaction equation



#### Reactants

Table 278: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c219	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

#### Product

Table 279: Properties of each product.

Id	Name	SBO
c222	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{137} = k5 \cdot c9 \cdot c219 - kd5b \cdot c222 \quad (296)$$

### 8.138 Reaction v145

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

**Name** v145 cPP + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB4)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5b

#### Reaction equation



#### Reactants



Table 280: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c212	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 281: Properties of each product.

Id	Name	SBO
c215	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

## Kinetic Law

**Derived unit** contains undeclared units

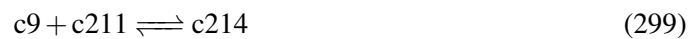
$$v_{138} = k5 \cdot c9 \cdot c212 - kd5b \cdot c215 \quad (298)$$

### 8.139 Reaction v146

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

**Name** v146 cPP + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB3)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5b

## Reaction equation



## Reactants

Table 282: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c211	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 283: Properties of each product.

Id	Name	SBO
c214	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{139} = k5 \cdot c9 \cdot c211 - kd5b \cdot c214 \quad (300)$$

### 8.140 Reaction v147

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

**Name** v147 cPP + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> (ErbB1:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5b

### Reaction equation



### Reactants

Table 284: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c210	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Product

Table 285: Properties of each product.

Id	Name	SBO
c213	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

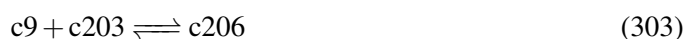
$$v_{140} = k5 \cdot c9 \cdot c210 - kd5b \cdot c213 \quad (302)$$

### 8.141 Reaction v148

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

**Name** v148 cPP + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos:cPP k5 kd5b

#### Reaction equation



#### Reactants

Table 286: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 287: Properties of each product.

Id	Name	SBO
c206	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{141} = k5 \cdot c9 \cdot c203 - kd5b \cdot c206 \quad (304)$$

### 8.142 Reaction v149

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

**Name** v149 cPP + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos:cPP k5 kd5b

#### Reaction equation



#### Reactants

Table 288: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 289: Properties of each product.

Id	Name	SBO
c205	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{142} = k5 \cdot c9 \cdot c202 - kd5b \cdot c205 \quad (306)$$

### 8.143 Reaction v150

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

**Name** v150 cPP + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:cPP k5 kd5b

## Reaction equation



## Reactants

Table 290: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 291: Properties of each product.

Id	Name	SBO
c204	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{143} = k5 \cdot c9 \cdot c201 - kd5b \cdot c204 \quad (308)$$

### 8.144 Reaction v151

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

**Name** v151 cPP + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:cPP  
k5 kd5b

### Reaction equation



### Reactants

Table 292: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c194	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

### Product

Table 293: Properties of each product.

Id	Name	SBO
c197	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{144} = k5 \cdot c9 \cdot c194 - kd5b \cdot c197 \quad (310)$$

### 8.145 Reaction v152

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

**Name** v152 cPP + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:cPP  
k5 kd5b

#### Reaction equation



#### Reactants

Table 294: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c193	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

#### Product

Table 295: Properties of each product.

Id	Name	SBO
c196	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{145} = k5 \cdot c9 \cdot c193 - kd5b \cdot c196 \quad (312)$$

### 8.146 Reaction v153

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

**Name** v153 cPP + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:cPP  
k5 kd5b

#### Reaction equation



#### Reactants

Table 296: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c192	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

## Product

Table 297: Properties of each product.

Id	Name	SBO
c195	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{146} = k5 \cdot c9 \cdot c192 - kd5b \cdot c195 \quad (314)$$

### 8.147 Reaction v155

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

**Name** v155 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + cPP -> 2(EGF:ErbB1)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP k5 kd5

## Reaction equation



## Reactants

Table 298: Properties of each reactant.

Id	Name	SBO
c68	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	
c9	cPP	

## Product

Table 299: Properties of each product.

Id	Name	SBO
c94	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{147} = k5 \cdot c68 \cdot c9 - kd5 \cdot c94 \quad (316)$$

### 8.148 Reaction v156

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

**Name** v156 cPP + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP k5 kd5

### Reaction equation



### Reactants

Table 300: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c67	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Product

Table 301: Properties of each product.

Id	Name	SBO
c93	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{148} = k5 \cdot c9 \cdot c67 - kd5 \cdot c93 \quad (318)$$



### 8.149 Reaction v157

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

**Name** v157 cPP + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2:Sos:cPP k5 kd5

#### Reaction equation



#### Reactants

Table 302: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 303: Properties of each product.

Id	Name	SBO
c92	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{149} = k5 \cdot c9 \cdot c66 - kd5 \cdot c92 \quad (320)$$

### 8.150 Reaction v158

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

**Name** v158 cPP + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:cPP k5 kd5

#### Reaction equation



#### Reactants

Table 304: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

## Product

Table 305: Properties of each product.

Id	Name	SBO
c91	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{150} = k5 \cdot c9 \cdot c65 - kd5 \cdot c91 \quad (322)$$

### 8.151 Reaction v159

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

**Name** v159 cPP + 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP):cPP  
k5 kd5

## Reaction equation



## Reactants

Table 306: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c21	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 307: Properties of each product.

Id	Name	SBO
c90	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{151} = k5 \cdot c9 \cdot c21 - kd5 \cdot c90 \quad (324)$$

### 8.152 Reaction v160

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

**Name** v160 cPP + 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP):cPP  
k5 kd5

### Reaction equation



### Reactants

Table 308: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c20	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Product

Table 309: Properties of each product.

Id	Name	SBO
c89	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP):cPP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{152} = k5 \cdot c9 \cdot c20 - kd5 \cdot c89 \quad (326)$$

### 8.153 Reaction v161

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

**Name** v161 2(EGF:ErbB1)#P:GAP:Grb2 + cPP -> 2(EGF:ErbB1)#P:GAP:Grb2:cPP k5 kd5

#### Reaction equation



#### Reactants

Table 310: Properties of each reactant.

Id	Name	SBO
c18	2(EGF:ErbB1)_P:GAP:Grb2	
c9	cPP	

#### Product

Table 311: Properties of each product.

Id	Name	SBO
c7	2(EGF:ErbB1)_P:GAP:Grb2:cPP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{153} = k5 \cdot c18 \cdot c9 - kd5 \cdot c7 \quad (328)$$

### 8.154 Reaction v162

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

**Name** v162 cPP + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:cPP  
k5 kd5

#### Reaction equation



#### Reactants

Table 312: Properties of each reactant.

Id	Name	SBO
c9	cPP	
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Product

Table 313: Properties of each product.

Id	Name	SBO
c88	2(EGF:ErbB1)_P:GAP:Grb2:Sos:cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{154} = k5 \cdot c9 \cdot c19 - kd5 \cdot c88 \quad (330)$$

### 8.155 Reaction v163

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

**Name** v163 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP)  
k6 kd6

## Reaction equation



## Reactant

Table 314: Properties of each reactant.

Id	Name	SBO
c27	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Product

Table 315: Properties of each product.

Id	Name	SBO
c20	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{155} = k_6 \cdot c_{27} - k_{d6} \cdot c_{20} \quad (332)$$

**8.156 Reaction v164**

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

**Name** v164 ErbB1:ATP -> ErbB1:ATP k6 kd6**Reaction equation****Reactant**

Table 316: Properties of each reactant.

Id	Name	SBO
c2	ErbB1:ATP	

**Product**

Table 317: Properties of each product.

Id	Name	SBO
c6	ErbB1:ATP	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{156} = k_6 \cdot c_2 - k_{d6} \cdot c_6 \quad (334)$$

8.157 Reaction v165

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

**Name** v165 2(EGF:ErbB1)#P -> 2(EGF:ErbB1)#P k6 kd6

Reaction equation



Reactant

Table 318: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	

Product

Table 319: Properties of each product.

Id	Name	SBO
c8	2(EGF:ErbB1)_P	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{157} = k6 \cdot c5 - kd6 \cdot c8$$

(336)

8.158 Reaction v166

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

**Name** v166 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP k6 kd6

Reaction equation



Reactant

Table 320: Properties of each reactant.

Id	Name	SBO
c15	2(EGF:ErbB1)_P:GAP	

### Product

Table 321: Properties of each product.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{158} = k6 \cdot c15 - kd6 \cdot c17 \quad (338)$$

### 8.159 Reaction v167

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

**Name** v167 2(EGF:ErbB1)#P:GAP:Shc -> 2(EGF:ErbB1)#P:GAP:Shc k6 kd6

### Reaction equation



### Reactant

Table 322: Properties of each reactant.

Id	Name	SBO
c32	2(EGF:ErbB1)_P:GAP:Shc	

### Product

Table 323: Properties of each product.

Id	Name	SBO
c63	2(EGF:ErbB1)_P:GAP:Shc	



## Kinetic Law

**Derived unit** contains undeclared units

$$v_{159} = k_6 \cdot c_{32} - k_{d6} \cdot c_{63} \quad (340)$$

### 8.160 Reaction v168

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

**Name** v168 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P) k6 kd6

## Reaction equation



## Reactant

Table 324: Properties of each reactant.

Id	Name	SBO
c33	2(EGF:ErbB1)_P:GAP:(Shc_P)	

## Product

Table 325: Properties of each product.

Id	Name	SBO
c64	2(EGF:ErbB1)_P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{160} = k_6 \cdot c_{33} - k_{d6} \cdot c_{64} \quad (342)$$

### 8.161 Reaction v169

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

**Name** v169 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k6 kd6

## Reaction equation



## Reactant

Table 326: Properties of each reactant.

Id	Name	SBO
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Product

Table 327: Properties of each product.

Id	Name	SBO
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{161} = k_6 \cdot c_{25} - k_{d6} \cdot c_{19} \quad (344)$$

### 8.162 Reaction v170

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

**Name** v170 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP)  
k6 kd6

## Reaction equation



## Reactant

Table 328: Properties of each reactant.

Id	Name	SBO
c29	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 329: Properties of each product.

Id	Name	SBO
c21	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{162} = k_6 \cdot c_{29} - k_{d6} \cdot c_{21} \quad (346)$$

**8.163 Reaction v171**

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

**Name** v171 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 k6  
kd6**Reaction equation****Reactant**

Table 330: Properties of each reactant.

Id	Name	SBO
c34	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

**Product**

Table 331: Properties of each product.

Id	Name	SBO
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{163} = k_6 \cdot c_{34} - k_{d6} \cdot c_{65} \quad (348)$$

### 8.164 Reaction v172

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

**Name** v172 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos  
k6 kd6

#### Reaction equation



#### Reactant

Table 332: Properties of each reactant.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 333: Properties of each product.

Id	Name	SBO
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{164} = k6 \cdot c35 - kd6 \cdot c66 \quad (350)$$

### 8.165 Reaction v173

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

**Name** v173 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> 2(EGF:ErbB1)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GDP) k6 kd6

#### Reaction equation



#### Reactant

Table 334: Properties of each reactant.

Id	Name	SBO
c36	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 335: Properties of each product.

Id	Name	SBO
c67	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{165} = k_6 \cdot c_{36} - k_{d6} \cdot c_{67} \quad (352)$$

## 8.166 Reaction v174

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

**Name** v174 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k6 kd6

## Reaction equation



## Reactant

Table 336: Properties of each reactant.

Id	Name	SBO
c37	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 337: Properties of each product.

Id	Name	SBO
c68	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

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

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{166} = k_6 \cdot c_{37} - k_{d6} \cdot c_{68} \quad (354)$$

### 8.167 Reaction v175

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

**Name** v175 2(EGF:ErbB1)#P:GAP:Grb2 + -> 2(EGF:ErbB1)#P:GAP:Grb2 k6 kd6

### Reaction equation



### Reactant

Table 338: Properties of each reactant.

Id	Name	SBO
c23	2(EGF:ErbB1)_P:GAP:Grb2	

### Product

Table 339: Properties of each product.

Id	Name	SBO
c18	2(EGF:ErbB1)_P:GAP:Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{167} = k_6 \cdot c_{23} - k_{d6} \cdot c_{18} \quad (356)$$

### 8.168 Reaction v176

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

**Name** v176 ErbB3 -> ErbB3 k6b kd6b

Reaction equation



Reactant

Table 340: Properties of each reactant.

Id	Name	SBO
c140	ErbB3	

Product

Table 341: Properties of each product.

Id	Name	SBO
c154	ErbB3	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{168} = k6b \cdot c140 - kd6b \cdot c154$$

(358)

8.169 Reaction v177

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

**Name** v177 ErbB2 -> ErbB2 k6b kd6b

Reaction equation



Reactant

Table 342: Properties of each reactant.

Id	Name	SBO
c141	ErbB2	

Product

Table 343: Properties of each product.

Id	Name	SBO
c155	ErbB2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{169} = k6b \cdot c141 - kd6b \cdot c155 \quad (360)$$

### 8.170 Reaction v178

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

**Name** v178 ErbB4 -> ErbB4 k6b kd6b

### Reaction equation



### Reactant

Table 344: Properties of each reactant.

Id	Name	SBO
c143	ErbB4	

### Product

Table 345: Properties of each product.

Id	Name	SBO
c156	ErbB4	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{170} = k6b \cdot c143 - kd6b \cdot c156 \quad (362)$$



### 8.171 Reaction v179

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

**Name** v179 (ErbB3:ErbB2)#P:GAP:Shc ->(ErbB3:ErbB2)#P:GAP:Shc k6b kd6b

#### Reaction equation



#### Reactant

Table 346: Properties of each reactant.

Id	Name	SBO
c347	(ErbB3:ErbB2)_P:GAP:Shc	

#### Product

Table 347: Properties of each product.

Id	Name	SBO
c349	(ErbB3:ErbB2)_P:GAP:Shc	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{171} = k6b \cdot c347 - kd6b \cdot c349 \quad (364)$$

### 8.172 Reaction v180

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

**Name** v180 (ErbB4:ErbB2)#P:GAP:Shc -> (ErbB4:ErbB2)#P:GAP:Shc k6 kd6

#### Reaction equation



#### Reactant

Table 348: Properties of each reactant.

Id	Name	SBO
c348	(ErbB4:ErbB2)_P:GAP:Shc	

### Product

Table 349: Properties of each product.

Id	Name	SBO
c350	(ErbB4:ErbB2)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{172} = k_6 \cdot c_{348} - k_{d6} \cdot c_{350} \quad (366)$$

### 8.173 Reaction v181

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

**Name** v181 (ErbB3:ErbB2)#P:GAP:(Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P) k6b kd6b

### Reaction equation



### Reactant

Table 350: Properties of each reactant.

Id	Name	SBO
c351	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

### Product

Table 351: Properties of each product.

Id	Name	SBO
c353	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{173} = k6b \cdot c351 - kd6b \cdot c353 \tag{368}$$

**8.174 Reaction v182**

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

**Name** v182 ErbB2:Inh -> ErbB2:Inh k6b kd6b

**Reaction equation**



**Reactant**

Table 352: Properties of each reactant.

Id	Name	SBO
c502	ErbB2:Inh	

**Product**

Table 353: Properties of each product.

Id	Name	SBO
c508	ErbB2:Inh	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{174} = k6b \cdot c502 - kd6b \cdot c508 \tag{370}$$

**8.175 Reaction v183**

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

**Name** v183 ErbB4:Inh -> ErbB4:Inh k6b kd6b

**Reaction equation**



## Reactant

Table 354: Properties of each reactant.

Id	Name	SBO
c503	ErbB4:Inh	

## Product

Table 355: Properties of each product.

Id	Name	SBO
c512	ErbB4:Inh	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{175} = k6b \cdot c503 - kd6b \cdot c512 \quad (372)$$

### 8.176 Reaction v184

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

**Name** v184 (ErbB4:ErbB2)#P:GAP:(Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P) k6b kd6b

## Reaction equation



## Reactant

Table 356: Properties of each reactant.

Id	Name	SBO
c354	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

## Product

Table 357: Properties of each product.

Id	Name	SBO
c356	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{176} = k6b \cdot c354 - kd6b \cdot c356 \quad (374)$$

**8.177 Reaction v185**

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

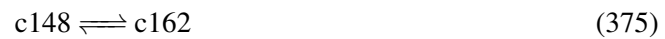
**Name** v185 (ErbB1:ErbB2)#P -> (ErbB1:ErbB2)#P k7 kd7**Reaction equation****Reactant**

Table 358: Properties of each reactant.

Id	Name	SBO
c148	(ErbB1:ErbB2)_P	

**Product**

Table 359: Properties of each product.

Id	Name	SBO
c162	(ErbB1:ErbB2)_P	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{177} = k7 \cdot c148 - kd7 \cdot c162 \quad (376)$$

8.178 Reaction v186

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

**Name** v186 (ErbB1:ErbB3)#P -> (ErbB1:ErbB3)#P k7 kd7

Reaction equation



Reactant

Table 360: Properties of each reactant.

Id	Name	SBO
c149	(ErbB1:ErbB3)_P	

Product

Table 361: Properties of each product.

Id	Name	SBO
c163	(ErbB1:ErbB3)_P	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{178} = k7 \cdot c149 - kd7 \cdot c163$$

(378)

8.179 Reaction v187

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

**Name** v187 (ErbB1:ErbB4)#P -> (ErbB1:ErbB4)#P k7 kd7

Reaction equation



Reactant

Table 362: Properties of each reactant.

Id	Name	SBO
c150	(ErbB1:ErbB4)_P	

### Product

Table 363: Properties of each product.

Id	Name	SBO
c164	(ErbB1:ErbB4)_P	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{179} = k7 \cdot c150 - kd7 \cdot c164 \quad (380)$$

### 8.180 Reaction v188

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

**Name** v188 2(ErbB2)#P -> 2(ErbB2)#P k7 kd7

### Reaction equation



### Reactant

Table 364: Properties of each reactant.

Id	Name	SBO
c289	2(ErbB2)_P	

### Product

Table 365: Properties of each product.

Id	Name	SBO
c290	2(ErbB2)_P	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{180} = k_7 \cdot c_{289} - k_{d7} \cdot c_{290} \quad (382)$$

### 8.181 Reaction $v_{189}$

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

**Name**  $v_{189}$  (ErbB3:ErbB2)#P  $\rightarrow$  (ErbB3:ErbB2)#P  $k_7$   $k_{d7}$

## Reaction equation



## Reactant

Table 366: Properties of each reactant.

Id	Name	SBO
c335	(ErbB3:ErbB2).P	

## Product

Table 367: Properties of each product.

Id	Name	SBO
c337	(ErbB3:ErbB2).P	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{181} = k_7 \cdot c_{335} - k_{d7} \cdot c_{337} \quad (384)$$

### 8.182 Reaction $v_{190}$

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

**Name**  $v_{190}$  (ErbB4:ErbB2)#P  $\rightarrow$  (ErbB4:ErbB2)#P  $k_7$   $k_{d7}$

## Reaction equation





Reactant

Table 368: Properties of each reactant.

Id	Name	SBO
c336	(ErbB4:ErbB2)_P	

Product

Table 369: Properties of each product.

Id	Name	SBO
c338	(ErbB4:ErbB2)_P	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{182} = k7 \cdot c336 - kd7 \cdot c338 \tag{386}$$

8.183 Reaction v191

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

**Name** v191 2(ErbB2)#P:GAP -> 2(ErbB2)#P:GAP k7 kd7

Reaction equation



Reactant

Table 370: Properties of each reactant.

Id	Name	SBO
c291	2(ErbB2)_P:GAP	

Product

Table 371: Properties of each product.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{183} = k7 \cdot c291 - kd7 \cdot c293 \quad (388)$$

**8.184 Reaction v192**

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

**Name** v192 2(ErbB2)#P:GAP:Shc -> 2(ErbB2)#P:GAP:Shc k7 kd7**Reaction equation****Reactant**

Table 372: Properties of each reactant.

Id	Name	SBO
c294	2(ErbB2)_P:GAP:Shc	

**Product**

Table 373: Properties of each product.

Id	Name	SBO
c296	2(ErbB2)_P:GAP:Shc	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{184} = k7 \cdot c294 - kd7 \cdot c296 \quad (390)$$

### 8.185 Reaction v193

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

**Name** v193 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P) k7 kd7

#### Reaction equation



#### Reactant

Table 374: Properties of each reactant.

Id	Name	SBO
c297	2(ErbB2)_P:GAP:(Shc_P)	

#### Product

Table 375: Properties of each product.

Id	Name	SBO
c299	2(ErbB2)_P:GAP:(Shc_P)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{185} = k7 \cdot c297 - kd7 \cdot c299 \quad (392)$$

### 8.186 Reaction v194

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

**Name** v194 (ErbB1:ErbB2)#P + GAP -> (ErbB1:ErbB2)#P:GAP k8b kd8b

#### Reaction equation



#### Reactants

Table 376: Properties of each reactant.

Id	Name	SBO
c162	(ErbB1:ErbB2)_P	
c14	GAP	

### Product

Table 377: Properties of each product.

Id	Name	SBO
c165	(ErbB1:ErbB2)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{186} = k_{8b} \cdot c_{162} \cdot c_{14} - k_{d8b} \cdot c_{165} \quad (394)$$

### 8.187 Reaction v195

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

**Name** v195 (ErbB1:ErbB3)#P + GAP -> (ErbB1:ErbB3)#P:GAP k8b kd8b

### Reaction equation



### Reactants

Table 378: Properties of each reactant.

Id	Name	SBO
c163	(ErbB1:ErbB3)_P	
c14	GAP	

### Product

Table 379: Properties of each product.

Id	Name	SBO
c166	(ErbB1:ErbB3)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{187} = k_{8b} \cdot c_{163} \cdot c_{14} - k_{d8b} \cdot c_{166} \quad (396)$$

### 8.188 Reaction v196

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

**Name** v196 (ErbB1:ErbB4)#P + GAP -> (ErbB1:ErbB4)#P:GAP k8b kd8b

### Reaction equation



### Reactants

Table 380: Properties of each reactant.

Id	Name	SBO
c164	(ErbB1:ErbB4)_P	
c14	GAP	

### Product

Table 381: Properties of each product.

Id	Name	SBO
c167	(ErbB1:ErbB4)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{188} = k_{8b} \cdot c_{164} \cdot c_{14} - k_{d8b} \cdot c_{167} \quad (398)$$

8.189 Reaction v197

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

**Name** v197 2(EGF:ErbB1)#P + GAP -> 2(EGF:ErbB1)#P:GAP k8 kd8

Reaction equation



Reactants

Table 382: Properties of each reactant.

Id	Name	SBO
c8	2(EGF:ErbB1)_P	
c14	GAP	

Product

Table 383: Properties of each product.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{189} = k8 \cdot c8 \cdot c14 - kd8 \cdot c17 \tag{400}$$

8.190 Reaction v198

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

**Name** v198 2(EGF:ErbB1)#P + GAP -> 2(EGF:ErbB1)#P:GAP k8 kd8

Reaction equation



Reactants

Table 384: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	
c14	GAP	

## Product

Table 385: Properties of each product.

Id	Name	SBO
c15	2(EGF:ErbB1)_P:GAP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{190} = k8 \cdot c5 \cdot c14 - kd8 \cdot c15 \quad (402)$$

### 8.191 Reaction v199

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

**Name** v199 (ErbB1:ErbB2)#P + GAP -> (ErbB1:ErbB2)#P:GAP k8 kd8

## Reaction equation



## Reactants

Table 386: Properties of each reactant.

Id	Name	SBO
c148	(ErbB1:ErbB2)_P	
c14	GAP	

## Product

Table 387: Properties of each product.

Id	Name	SBO
c151	(ErbB1:ErbB2)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{191} = k8 \cdot c148 \cdot c14 - kd8 \cdot c151 \quad (404)$$

### 8.192 Reaction v200

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

**Name** v200 (ErbB1:ErbB3)#P + GAP -> (ErbB1:ErbB3)#P:GAP k8b kd8b

### Reaction equation



### Reactants

Table 388: Properties of each reactant.

Id	Name	SBO
c149	(ErbB1:ErbB3)_P	
c14	GAP	

### Product

Table 389: Properties of each product.

Id	Name	SBO
c152	(ErbB1:ErbB3)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{192} = k8b \cdot c149 \cdot c14 - kd8b \cdot c152 \quad (406)$$

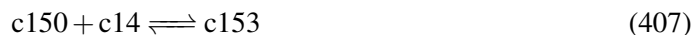


### 8.193 Reaction v201

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

**Name** v201 (ErbB1:ErbB4)#P + GAP -> (ErbB1:ErbB4)#P:GAP k8b kd8b

#### Reaction equation



#### Reactants

Table 390: Properties of each reactant.

Id	Name	SBO
c150	(ErbB1:ErbB4)_P	
c14	GAP	

#### Product

Table 391: Properties of each product.

Id	Name	SBO
c153	(ErbB1:ErbB4)_P:GAP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{193} = k8b \cdot c150 \cdot c14 - kd8b \cdot c153 \quad (408)$$

### 8.194 Reaction v202

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

**Name** v202 GAP + (ErbB3:ErbB2)#P -> (ErbB3:ErbB2)#P:GAP k8 kd8

#### Reaction equation



#### Reactants

Table 392: Properties of each reactant.

Id	Name	SBO
c14	GAP	
c335	(ErbB3:ErbB2)_P	

## Product

Table 393: Properties of each product.

Id	Name	SBO
c341	(ErbB3:ErbB2)_P:GAP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{194} = k8 \cdot c14 \cdot c335 - kd8 \cdot c341 \quad (410)$$

### 8.195 Reaction v203

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

**Name** v203 GAP + (ErbB4:ErbB2)#P -> (ErbB4:ErbB2)#P:GAP k8 kd8

## Reaction equation



## Reactants

Table 394: Properties of each reactant.

Id	Name	SBO
c14	GAP	
c336	(ErbB4:ErbB2)_P	

## Product

Table 395: Properties of each product.

Id	Name	SBO
c344	(ErbB4:ErbB2)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{195} = k8 \cdot c14 \cdot c336 - kd8 \cdot c344 \quad (412)$$

### 8.196 Reaction v204

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

**Name** v204 GAP + (ErbB3:ErbB2)#P -> (ErbB3:ErbB2)#P:GAP k8 kd8

### Reaction equation



### Reactants

Table 396: Properties of each reactant.

Id	Name	SBO
c14	GAP	
c337	(ErbB3:ErbB2)_P	

### Product

Table 397: Properties of each product.

Id	Name	SBO
c343	(ErbB3:ErbB2)_P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{196} = k8 \cdot c14 \cdot c337 - kd8 \cdot c343 \quad (414)$$

### 8.197 Reaction v205

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

**Name** v205 GAP + (ErbB4:ErbB2)#P -> (ErbB4:ErbB2)#P:GAP k8 kd8

#### Reaction equation



#### Reactants

Table 398: Properties of each reactant.

Id	Name	SBO
c14	GAP	
c338	(ErbB4:ErbB2)_P	

#### Product

Table 399: Properties of each product.

Id	Name	SBO
c346	(ErbB4:ErbB2)_P:GAP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{197} = k8 \cdot c14 \cdot c338 - kd8 \cdot c346 \quad (416)$$

### 8.198 Reaction v206

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

**Name** v206 2(ErbB2)#P + GAP -> 2(ErbB2)#P:GAP k8 kd8

#### Reaction equation



#### Reactants

Table 400: Properties of each reactant.

Id	Name	SBO
c290	2(ErbB2)_P	
c14	GAP	

## Product

Table 401: Properties of each product.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{198} = k8 \cdot c290 \cdot c14 - kd8 \cdot c293 \quad (418)$$

### 8.199 Reaction v207

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

**Name** v207 2(ErbB2)#P + GAP -> 2(ErbB2)#P:GAP k8 kd8

## Reaction equation



## Reactants

Table 402: Properties of each reactant.

Id	Name	SBO
c289	2(ErbB2)_P	
c14	GAP	

## Product

Table 403: Properties of each product.

Id	Name	SBO
c291	2(ErbB2).P:GAP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{199} = k8 \cdot c289 \cdot c14 - kd8 \cdot c291 \quad (420)$$

### 8.200 Reaction v208

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

**Name** v208 ErbB1:ATP + EGF -> EGF:ErbB1:ATP k10b kd10

### Reaction equation



### Reactants

Table 404: Properties of each reactant.

Id	Name	SBO
c6	ErbB1:ATP	
c16	EGF	

### Product

Table 405: Properties of each product.

Id	Name	SBO
c10	EGF:ErbB1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{200} = k10b \cdot c6 \cdot c16 - kd10 \cdot c10 \quad (422)$$

### 8.201 Reaction v209

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

**Name** v209 ErbB3 + -> (HRG:ErbB3) k10b kd10

#### Reaction equation



#### Reactants

Table 406: Properties of each reactant.

Id	Name	SBO
c154	ErbB3	
c515	HRG	

#### Product

Table 407: Properties of each product.

Id	Name	SBO
c157	(HRG:ErbB3)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{201} = k10b \cdot c154 \cdot c515 - kd10 \cdot c157 \quad (424)$$

### 8.202 Reaction v211

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

**Name** v211 cPP + -> cPP k15 kd15

#### Reaction equation



#### Reactant

Table 408: Properties of each reactant.

Id	Name	SBO
c9	cPP	

## Product

Table 409: Properties of each product.

Id	Name	SBO
c12	cPP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{202} = k_{15} \cdot c_9 - k_{d15} \cdot c_{12} \quad (426)$$

### 8.203 Reaction v212

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

**Name** v212 Grb2 + 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP:Grb2 k16 kd63

## Reaction equation



## Reactants

Table 410: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c15	2(EGF:ErbB1)_P:GAP	

## Product

Table 411: Properties of each product.

Id	Name	SBO
c23	2(EGF:ErbB1)_P:GAP:Grb2	



Id	Name	SBO
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### Kinetic Law

**Derived unit** contains undeclared units

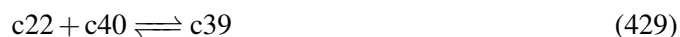
$$v_{203} = k16 \cdot c22 \cdot c15 - kd63 \cdot c23 \quad (428)$$

### 8.204 Reaction v213

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

**Name** v213 Grb2 + (Shc#P) -> (Shc#P):Grb2 k16 kd24

### Reaction equation



### Reactants

Table 412: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c40	(Shc_P)	

### Product

Table 413: Properties of each product.

Id	Name	SBO
c39	(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{204} = k16 \cdot c22 \cdot c40 - kd24 \cdot c39 \quad (430)$$

### 8.205 Reaction v214

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

**Name** v214 Grb2 + 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2  
k16 kd24

### Reaction equation



### Reactants

Table 414: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c33	2(EGF:ErbB1)_P:GAP:(Shc_P)	

### Product

Table 415: Properties of each product.

Id	Name	SBO
c34	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{205} = k16 \cdot c22 \cdot c33 - kd24 \cdot c34 \quad (432)$$

## 8.206 Reaction v215

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

**Name** v215 2(EGF:ErbB1)#P:GAP + Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2 k16 kd63

### Reaction equation



### Reactants

Table 416: Properties of each reactant.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	
c22	Grb2	

## Product

Table 417: Properties of each product.

Id	Name	SBO
c18	2(EGF:ErbB1)_P:GAP:Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{206} = k_{16} \cdot c_{17} \cdot c_{22} - k_{d63} \cdot c_{18} \quad (434)$$

## 8.207 Reaction v216

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

**Name** v216 Grb2 + 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2  
k16 kd24

## Reaction equation



## Reactants

Table 418: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c64	2(EGF:ErbB1)_P:GAP:(Shc_P)	

## Product

Table 419: Properties of each product.

Id	Name	SBO
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{207} = k16 \cdot c22 \cdot c64 - kd24 \cdot c65 \quad (436)$$

### 8.208 Reaction v217

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

**Name** v217 Grb2 + (ErbB1:ErbB2)#P:GAP -> (ErbB1:ErbB2)#P:GAP:Grb2 k16 kd24

### Reaction equation



### Reactants

Table 420: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c151	(ErbB1:ErbB2)_P:GAP	

### Product

Table 421: Properties of each product.

Id	Name	SBO
c225	(ErbB1:ErbB2)_P:GAP:Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{208} = k16 \cdot c22 \cdot c151 - kd24 \cdot c225 \quad (438)$$

### 8.209 Reaction v218

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

**Name** v218 Grb2 + (ErbB1:ErbB3)#P:GAP -> (ErbB1:ErbB3)#P:GAP:Grb2 k16 kd24

#### Reaction equation



#### Reactants

Table 422: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c152	(ErbB1:ErbB3) P:GAP	

#### Product

Table 423: Properties of each product.

Id	Name	SBO
c226	(ErbB1:ErbB3)_P:GAP:Grb2	

#### Kinetic Law

**Derived unit** contains undeclared units

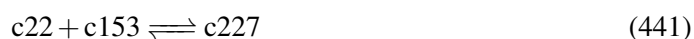
$$v_{209} = k16 \cdot c22 \cdot c152 - kd24 \cdot c226 \quad (440)$$

### 8.210 Reaction v219

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

**Name** v219 Grb2 + (ErbB1:ErbB4)#P:GAP -> (ErbB1:ErbB4)#P:GAP:Grb2 k16 kd24

#### Reaction equation



#### Reactants

Table 424: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c153	(ErbB1:ErbB4)_P:GAP	

## Product

Table 425: Properties of each product.

Id	Name	SBO
c227	(ErbB1:ErbB4)_P:GAP:Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{210} = k_{16} \cdot c_{22} \cdot c_{153} - k_{d24} \cdot c_{227} \quad (442)$$

### 8.211 Reaction v220

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

**Name** v220 (ErbB1:ErbB2)#P:GAP + Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2 k16 kd24

## Reaction equation



## Reactants

Table 426: Properties of each reactant.

Id	Name	SBO
c165	(ErbB1:ErbB2)_P:GAP	
c22	Grb2	

## Product

Table 427: Properties of each product.

Id	Name	SBO
c228	(ErbB1:ErbB2)_P:GAP:Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{211} = k_{16} \cdot c_{165} \cdot c_{22} - k_{d24} \cdot c_{228} \quad (444)$$

### 8.212 Reaction v221

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

**Name** v221 (ErbB1:ErbB3)#P:GAP + Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2 k16 kd24

### Reaction equation



### Reactants

Table 428: Properties of each reactant.

Id	Name	SBO
c166	(ErbB1:ErbB3)_P:GAP	
c22	Grb2	

### Product

Table 429: Properties of each product.

Id	Name	SBO
c229	(ErbB1:ErbB3)_P:GAP:Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{212} = k_{16} \cdot c_{166} \cdot c_{22} - k_{d24} \cdot c_{229} \quad (446)$$

### 8.213 Reaction v222

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

**Name** v222 (ErbB1:ErbB4)#P:GAP + Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2 k16 kd24

#### Reaction equation



#### Reactants

Table 430: Properties of each reactant.

Id	Name	SBO
c167	(ErbB1:ErbB4)_P:GAP	
c22	Grb2	

#### Product

Table 431: Properties of each product.

Id	Name	SBO
c230	(ErbB1:ErbB4)_P:GAP:Grb2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{213} = k16 \cdot c167 \cdot c22 - kd24 \cdot c230 \quad (448)$$

### 8.214 Reaction v223

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

**Name** v223 Grb2 + (ErbB1:ErbB2)#P:GAP:(Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2  
k16 kd24

#### Reaction equation



#### Reactants



Table 432: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c180	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

## Product

Table 433: Properties of each product.

Id	Name	SBO
c189	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{214} = k_{16} \cdot c_{22} \cdot c_{180} - k_{d24} \cdot c_{189} \quad (450)$$

### 8.215 Reaction v224

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

**Name** v224 Grb2 + (ErbB1:ErbB3)#P:GAP:(Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2  
k16 kd24

## Reaction equation



## Reactants

Table 434: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c181	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

## Product

Table 435: Properties of each product.

Id	Name	SBO
c190	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{215} = k_{16} \cdot c_{22} \cdot c_{181} - k_{d24} \cdot c_{190} \quad (452)$$

### 8.216 Reaction v225

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

**Name** v225 Grb2 + (ErbB1:ErbB4)#P:GAP:(Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2  
k<sub>16</sub> k<sub>d24</sub>

### Reaction equation



### Reactants

Table 436: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c182	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

### Product

Table 437: Properties of each product.

Id	Name	SBO
c191	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{216} = k_{16} \cdot c_{22} \cdot c_{182} - k_{d24} \cdot c_{191} \quad (454)$$

### 8.217 Reaction v226

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

**Name** v226 Grb2 + (ErbB1:ErbB2)#P:GAP:(Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2  
k16 kd24

#### Reaction equation



#### Reactants

Table 438: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c183	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

#### Product

Table 439: Properties of each product.

Id	Name	SBO
c192	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{217} = k16 \cdot c22 \cdot c183 - kd24 \cdot c192 \quad (456)$$

### 8.218 Reaction v227

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

**Name** v227 Grb2 + (ErbB1:ErbB3)#P:GAP:(Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2  
k16 kd24

#### Reaction equation



#### Reactants

Table 440: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c184	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

## Product

Table 441: Properties of each product.

Id	Name	SBO
c193	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{218} = k_{16} \cdot c_{22} \cdot c_{184} - k_{d24} \cdot c_{193} \quad (458)$$

### 8.219 Reaction v228

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

**Name** v228 Grb2 + (ErbB1:ErbB4)#P:GAP:(Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2  
k16 kd24

## Reaction equation



## Reactants

Table 442: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c185	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

## Product

Table 443: Properties of each product.

Id	Name	SBO
c194	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{219} = k_{16} \cdot c_{22} \cdot c_{185} - k_{d24} \cdot c_{194} \quad (460)$$

### 8.220 Reaction v229

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

**Name** v229 Grb2 + 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2 k16 kd24

### Reaction equation



### Reactants

Table 444: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c297	2(ErbB2)_P:GAP:(Shc_P)	

### Product

Table 445: Properties of each product.

Id	Name	SBO
c300	2(ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{220} = k_{16} \cdot c_{22} \cdot c_{297} - k_{d24} \cdot c_{300} \quad (462)$$

### 8.221 Reaction v230

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

**Name** v230 Grb2 + 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2 k16 kd24

#### Reaction equation



#### Reactants

Table 446: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c299	2(ErbB2)_P:GAP:(Shc_P)	

#### Product

Table 447: Properties of each product.

Id	Name	SBO
c302	2(ErbB2)_P:GAP:(Shc_P):Grb2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{221} = k16 \cdot c22 \cdot c299 - kd24 \cdot c302 \quad (464)$$

### 8.222 Reaction v231

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

**Name** v231 2(ErbB2)#P:GAP + Grb2 -> 2(ErbB2)#P:GAP:Grb2 k16 kd63

#### Reaction equation



#### Reactants

Table 448: Properties of each reactant.

Id	Name	SBO
c291	2(ErbB2)_P:GAP	
c22	Grb2	

## Product

Table 449: Properties of each product.

Id	Name	SBO
c312	2(ErbB2)_P:GAP:Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{222} = k_{16} \cdot c_{291} \cdot c_{22} - k_{d63} \cdot c_{312} \quad (466)$$

### 8.223 Reaction v232

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

**Name** v232 2(ErbB2)#P:GAP + Grb2 -> 2(ErbB2)#P:GAP:Grb2 k16 kd63

## Reaction equation



## Reactants

Table 450: Properties of each reactant.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	
c22	Grb2	

## Product

Table 451: Properties of each product.

Id	Name	SBO
c314	2(ErbB2)_P:GAP:Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{223} = k_{16} \cdot c_{293} \cdot c_{22} - k_{d63} \cdot c_{314} \quad (468)$$

### 8.224 Reaction v233

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

**Name** v233 Grb2 + (ErbB3:ErbB2)#P:GAP:(Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2  
k<sub>16</sub> k<sub>d24</sub>

### Reaction equation



### Reactants

Table 452: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c351	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

### Product

Table 453: Properties of each product.

Id	Name	SBO
c357	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{224} = k_{16} \cdot c_{22} \cdot c_{351} - k_{d24} \cdot c_{357} \quad (470)$$



### 8.225 Reaction v234

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

**Name** v234 Grb2 + (ErbB3:ErbB2)#P:GAP:(Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2  
k16 kd24

#### Reaction equation



#### Reactants

Table 454: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c353	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

#### Product

Table 455: Properties of each product.

Id	Name	SBO
c359	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{225} = k16 \cdot c22 \cdot c353 - kd24 \cdot c359 \quad (472)$$

### 8.226 Reaction v235

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

**Name** v235 Grb2 + (ErbB4:ErbB2)#P:GAP:(Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2  
k16 kd24

#### Reaction equation



#### Reactants

Table 456: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c354	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

## Product

Table 457: Properties of each product.

Id	Name	SBO
c360	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{226} = k_{16} \cdot c_{22} \cdot c_{354} - k_{d24} \cdot c_{360} \quad (474)$$

## 8.227 Reaction v236

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

**Name** v236 Grb2 + (ErbB4:ErbB2)#P:GAP:(Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2  
k16 kd24

## Reaction equation



## Reactants

Table 458: Properties of each reactant.

Id	Name	SBO
c22	Grb2	
c356	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

## Product

Table 459: Properties of each product.

Id	Name	SBO
c362	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{227} = k_{16} \cdot c_{22} \cdot c_{356} - k_{d24} \cdot c_{362} \quad (476)$$

### 8.228 Reaction v237

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

**Name** v237 (ErbB3:ErbB2)#P:GAP + Grb2 -> (ErbB3:ErbB2)#P:GAP:Grb2 k16 kd63

### Reaction equation



### Reactants

Table 460: Properties of each reactant.

Id	Name	SBO
c341	(ErbB3:ErbB2)_P:GAP	
c22	Grb2	

### Product

Table 461: Properties of each product.

Id	Name	SBO
c381	(ErbB3:ErbB2)_P:GAP:Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{228} = k_{16} \cdot c_{341} \cdot c_{22} - k_{d63} \cdot c_{381} \quad (478)$$

### 8.229 Reaction v238

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

**Name** v238 (ErbB3:ErbB2)#P:GAP + Grb2 -> (ErbB3:ErbB2)#P:GAP:Grb2 k16 kd24

#### Reaction equation



#### Reactants

Table 462: Properties of each reactant.

Id	Name	SBO
c343	(ErbB3:ErbB2)_P:GAP	
c22	Grb2	

#### Product

Table 463: Properties of each product.

Id	Name	SBO
c383	(ErbB3:ErbB2)_P:GAP:Grb2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{229} = k16 \cdot c343 \cdot c22 - kd24 \cdot c383 \quad (480)$$

### 8.230 Reaction v239

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

**Name** v239 (ErbB4:ErbB2)#P:GAP + Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2 k16 kd24

#### Reaction equation



#### Reactants

Table 464: Properties of each reactant.

Id	Name	SBO
c344	(ErbB4:ErbB2)_P:GAP	
c22	Grb2	

## Product

Table 465: Properties of each product.

Id	Name	SBO
c384	(ErbB4:ErbB2)_P:GAP:Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{230} = k_{16} \cdot c_{344} \cdot c_{22} - k_{d24} \cdot c_{384} \quad (482)$$

### 8.231 Reaction $v_{240}$

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

**Name**  $v_{240}$  (ErbB4:ErbB2)#P:GAP + Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2  $k_{16}$   $k_{d63}$

## Reaction equation



## Reactants

Table 466: Properties of each reactant.

Id	Name	SBO
c346	(ErbB4:ErbB2)_P:GAP	
c22	Grb2	

## Product

Table 467: Properties of each product.

Id	Name	SBO
c386	(ErbB4:ErbB2)_P:GAP:Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{231} = k_{16} \cdot c_{346} \cdot c_{22} - k_{d63} \cdot c_{386} \quad (484)$$

### 8.232 Reaction v241

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

**Name** v241 Sos + (ErbB3:ErbB2)#P:GAP:Grb2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos k17 kd17

### Reaction equation



### Reactants

Table 468: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c381	(ErbB3:ErbB2)_P:GAP:Grb2	

### Product

Table 469: Properties of each product.

Id	Name	SBO
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{232} = k_{17} \cdot c_{24} \cdot c_{381} - k_{d17} \cdot c_{387} \quad (486)$$

### 8.233 Reaction v242

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

**Name** v242 Sos + (ErbB3:ErbB2)#P:GAP:Grb2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos k17 kd17

#### Reaction equation



#### Reactants

Table 470: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c383	(ErbB3:ErbB2)_P:GAP:Grb2	

#### Product

Table 471: Properties of each product.

Id	Name	SBO
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{233} = k17 \cdot c24 \cdot c383 - kd17 \cdot c389 \quad (488)$$

### 8.234 Reaction v243

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

**Name** v243 Sos + (ErbB4:ErbB2)#P:GAP:Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos k17 kd17

#### Reaction equation



#### Reactants

Table 472: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c384	(ErbB4:ErbB2)_P:GAP:Grb2	

## Product

Table 473: Properties of each product.

Id	Name	SBO
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{234} = k_{17} \cdot c_{24} \cdot c_{384} - k_{d17} \cdot c_{390} \quad (490)$$

### 8.235 Reaction v244

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

**Name** v244 Sos + (ErbB4:ErbB2)#P:GAP:Grb2 -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos k17 kd17

## Reaction equation



## Reactants

Table 474: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c386	(ErbB4:ErbB2)_P:GAP:Grb2	

## Product



Table 475: Properties of each product.

Id	Name	SBO
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{235} = k_{17} \cdot c_{24} \cdot c_{386} - k_{d17} \cdot c_{392} \quad (492)$$

### 8.236 Reaction $v_{245}$

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

**Name**  $v_{245}$  Sos + 2(ErbB2)#P:GAP:Grb2 -> 2(ErbB2)#P:GAP:Grb2:Sos  $k_{17}$   $k_{d17}$

### Reaction equation



### Reactants

Table 476: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c312	2(ErbB2)_P:GAP:Grb2	

### Product

Table 477: Properties of each product.

Id	Name	SBO
c315	2(ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{236} = k_{17} \cdot c_{24} \cdot c_{312} - k_{d17} \cdot c_{315} \quad (494)$$

### 8.237 Reaction v246

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

**Name** v246 Sos + 2(ErbB2)#P:GAP:Grb2 -> 2(ErbB2)#P:GAP:Grb2:Sos k17 kd17

#### Reaction equation



#### Reactants

Table 478: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c314	2(ErbB2)_P:GAP:Grb2	

#### Product

Table 479: Properties of each product.

Id	Name	SBO
c317	2(ErbB2)_P:GAP:Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{237} = k17 \cdot c24 \cdot c314 - kd17 \cdot c317 \quad (496)$$

### 8.238 Reaction v247

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

**Name** v247 Sos + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k17 kd17

#### Reaction equation



#### Reactants

Table 480: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c18	2(EGF:ErbB1)_P:GAP:Grb2	

### Product

Table 481: Properties of each product.

Id	Name	SBO
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{238} = k17 \cdot c24 \cdot c18 - kd17 \cdot c19 \quad (498)$$

### 8.239 Reaction v248

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

**Name** v248 Sos + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k17 kd17

### Reaction equation



### Reactants

Table 482: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c23	2(EGF:ErbB1)_P:GAP:Grb2	

### Product

Table 483: Properties of each product.

Id	Name	SBO
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{239} = k_{17} \cdot c_{24} \cdot c_{23} - k_{d17} \cdot c_{25} \quad (500)$$

### 8.240 Reaction v249

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

**Name** v249 Sos + (ErbB1:ErbB2)#P:GAP:Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k17 kd17

### Reaction equation



### Reactants

Table 484: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c225	(ErbB1:ErbB2)_P:GAP:Grb2	

### Product

Table 485: Properties of each product.

Id	Name	SBO
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{240} = k_{17} \cdot c_{24} \cdot c_{225} - k_{d17} \cdot c_{234} \quad (502)$$

### 8.241 Reaction v250

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

**Name** v250 Sos + (ErbB1:ErbB3)#P:GAP:Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k17 kd17

#### Reaction equation



#### Reactants

Table 486: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c226	(ErbB1:ErbB3)_P:GAP:Grb2	

#### Product

Table 487: Properties of each product.

Id	Name	SBO
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{241} = k17 \cdot c24 \cdot c226 - kd17 \cdot c235 \quad (504)$$

### 8.242 Reaction v251

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

**Name** v251 Sos + (ErbB1:ErbB4)#P:GAP:Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k17 kd17

#### Reaction equation



#### Reactants

Table 488: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c227	(ErbB1:ErbB4)_P:GAP:Grb2	

## Product

Table 489: Properties of each product.

Id	Name	SBO
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{242} = k_{17} \cdot c_{24} \cdot c_{227} - k_{d17} \cdot c_{236} \quad (506)$$

### 8.243 Reaction v252

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

**Name** v252 Sos + (ErbB1:ErbB2)#P:GAP:Grb2 -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k17 kd17

## Reaction equation



## Reactants

Table 490: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c228	(ErbB1:ErbB2)_P:GAP:Grb2	

## Product

Table 491: Properties of each product.

Id	Name	SBO
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{243} = k_{17} \cdot c_{24} \cdot c_{228} - k_{d17} \cdot c_{237} \quad (508)$$

### 8.244 Reaction v253

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

**Name** v253 Sos + (ErbB1:ErbB3)#P:GAP:Grb2 -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k17 kd17

### Reaction equation



### Reactants

Table 492: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c229	(ErbB1:ErbB3)_P:GAP:Grb2	

### Product

Table 493: Properties of each product.

Id	Name	SBO
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{244} = k_{17} \cdot c_{24} \cdot c_{229} - k_{d17} \cdot c_{238} \quad (510)$$

### 8.245 Reaction v254

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

**Name** v254 Sos + (ErbB1:ErbB4)#P:GAP:Grb2 -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k17 kd17

#### Reaction equation



#### Reactants

Table 494: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c230	(ErbB1:ErbB4)_P:GAP:Grb2	

#### Product

Table 495: Properties of each product.

Id	Name	SBO
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{245} = k17 \cdot c24 \cdot c230 - kd17 \cdot c239 \quad (512)$$

### 8.246 Reaction v255

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

**Name** v255 Ras:GDP + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants



Table 496: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Product

Table 497: Properties of each product.

Id	Name	SBO
c27	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{246} = k_{18} \cdot c_{26} \cdot c_{25} - k_{d18} \cdot c_{27} \quad (514)$$

### 8.247 Reaction v256

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

**Name** v256 Ras:GDP + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k18 kd18

## Reaction equation



## Reactants

Table 498: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 499: Properties of each product.

Id	Name	SBO
c36	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{247} = k_{18} \cdot c_{26} \cdot c_{35} - k_{d18} \cdot c_{36} \quad (516)$$

### 8.248 Reaction v257

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

**Name** v257 Ras:GDP + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

### Reaction equation



### Reactants

Table 500: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

### Product

Table 501: Properties of each product.

Id	Name	SBO
c20	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{248} = k_{18} \cdot c_{26} \cdot c_{19} - k_{d18} \cdot c_{20} \quad (518)$$

### 8.249 Reaction v258

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

**Name** v258 Ras:GDP + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants

Table 502: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 503: Properties of each product.

Id	Name	SBO
c67	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{249} = k18 \cdot c26 \cdot c66 - kd18 \cdot c67 \quad (520)$$

### 8.250 Reaction v259

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

**Name** v259 Ras:GDP + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants

Table 504: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 505: Properties of each product.

Id	Name	SBO
c207	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{250} = k_{18} \cdot c_{26} \cdot c_{198} - k_{d18} \cdot c_{207} \quad (522)$$

### 8.251 Reaction v260

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

**Name** v260 Ras:GDP + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k18 kd18

## Reaction equation



## Reactants

Table 506: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 507: Properties of each product.

Id	Name	SBO
c208	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{251} = k_{18} \cdot c_{26} \cdot c_{199} - k_{d18} \cdot c_{208} \quad (524)$$

### 8.252 Reaction v261

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

**Name** v261 Ras:GDP + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k18 kd18

### Reaction equation



### Reactants

Table 508: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 509: Properties of each product.

Id	Name	SBO
c209	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{252} = k_{18} \cdot c_{26} \cdot c_{200} - k_{d18} \cdot c_{209} \quad (526)$$

### 8.253 Reaction v262

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

**Name** v262 Ras:GDP + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants

Table 510: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 511: Properties of each product.

Id	Name	SBO
c210	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{253} = k18 \cdot c26 \cdot c201 - kd18 \cdot c210 \quad (528)$$

### 8.254 Reaction v263

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

**Name** v263 Ras:GDP + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants

Table 512: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 513: Properties of each product.

Id	Name	SBO
c211	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{254} = k_{18} \cdot c_{26} \cdot c_{202} - k_{d18} \cdot c_{211} \quad (530)$$

## 8.255 Reaction v264

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

**Name** v264 Ras:GDP + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k18 kd18

## Reaction equation



## Reactants

Table 514: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 515: Properties of each product.

Id	Name	SBO
c212	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{255} = k_{18} \cdot c_{26} \cdot c_{203} - k_{d18} \cdot c_{212} \quad (532)$$

### 8.256 Reaction v265

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

**Name** v265 Ras:GDP + (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k<sub>18</sub> k<sub>d18</sub>

### Reaction equation



### Reactants

Table 516: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

### Product

Table 517: Properties of each product.

Id	Name	SBO
c243	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{256} = k_{18} \cdot c_{26} \cdot c_{234} - k_{d18} \cdot c_{243} \quad (534)$$



### 8.257 Reaction v266

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

**Name** v266 Ras:GDP + (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

#### Reaction equation



#### Reactants

Table 518: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

#### Product

Table 519: Properties of each product.

Id	Name	SBO
c244	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{257} = k18 \cdot c26 \cdot c235 - kd18 \cdot c244 \quad (536)$$

### 8.258 Reaction v267

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

**Name** v267 Ras:GDP + (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

#### Reaction equation



#### Reactants

Table 520: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

## Product

Table 521: Properties of each product.

Id	Name	SBO
c245	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{258} = k_{18} \cdot c_{26} \cdot c_{236} - k_{d18} \cdot c_{245} \quad (538)$$

### 8.259 Reaction v268

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

**Name** v268 Ras:GDP + (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

## Reaction equation



## Reactants

Table 522: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 523: Properties of each product.

Id	Name	SBO
c246	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{259} = k_{18} \cdot c_{26} \cdot c_{237} - k_{d18} \cdot c_{246} \quad (540)$$

### 8.260 Reaction v269

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

**Name** v269 Ras:GDP + (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP)  
k<sub>18</sub> k<sub>d18</sub>

### Reaction equation



### Reactants

Table 524: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

### Product

Table 525: Properties of each product.

Id	Name	SBO
c247	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

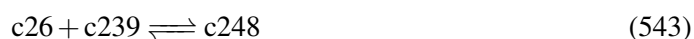
$$v_{260} = k_{18} \cdot c_{26} \cdot c_{238} - k_{d18} \cdot c_{247} \quad (542)$$

### 8.261 Reaction v270

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

**Name** v270 Ras:GDP + (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

#### Reaction equation



#### Reactants

Table 526: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

#### Product

Table 527: Properties of each product.

Id	Name	SBO
c248	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{261} = k18 \cdot c26 \cdot c239 - kd18 \cdot c248 \quad (544)$$

### 8.262 Reaction v271

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

**Name** v271 Ras:GDP + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP)  
k18 kd18

#### Reaction equation



#### Reactants

Table 528: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 529: Properties of each product.

Id	Name	SBO
c306	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{262} = k_{18} \cdot c_{26} \cdot c_{303} - k_{d18} \cdot c_{306} \quad (546)$$

### 8.263 Reaction v272

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

**Name** v272 Ras:GDP + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP)  
k18 kd18

## Reaction equation



## Reactants

Table 530: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 531: Properties of each product.

Id	Name	SBO
c308	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{263} = k_{18} \cdot c_{26} \cdot c_{305} - k_{d18} \cdot c_{308} \quad (548)$$

### 8.264 Reaction v273

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

**Name** v273 Ras:GDP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

### Reaction equation



### Reactants

Table 532: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c315	2(ErbB2)_P:GAP:Grb2:Sos	

### Product

Table 533: Properties of each product.

Id	Name	SBO
c318	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{264} = k_{18} \cdot c_{26} \cdot c_{315} - k_{d18} \cdot c_{318} \quad (550)$$

### 8.265 Reaction v274

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

**Name** v274 Ras:GDP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

#### Reaction equation



#### Reactants

Table 534: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c317	2(ErbB2)_P:GAP:Grb2:Sos	

#### Product

Table 535: Properties of each product.

Id	Name	SBO
c320	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{265} = k18 \cdot c26 \cdot c317 - kd18 \cdot c320 \quad (552)$$

### 8.266 Reaction v275

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

**Name** v275 Ras:GDP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants

Table 536: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 537: Properties of each product.

Id	Name	SBO
c372	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{266} = k_{18} \cdot c_{26} \cdot c_{366} - k_{d18} \cdot c_{372} \quad (554)$$

### 8.267 Reaction v276

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

**Name** v276 Ras:GDP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k18 kd18

## Reaction equation



## Reactants

Table 538: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product



Table 539: Properties of each product.

Id	Name	SBO
c374	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{267} = k_{18} \cdot c_{26} \cdot c_{368} - k_{d18} \cdot c_{374} \quad (556)$$

### 8.268 Reaction v277

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

**Name** v277 Ras:GDP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k18 kd18

### Reaction equation



### Reactants

Table 540: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 541: Properties of each product.

Id	Name	SBO
c369	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{268} = k_{18} \cdot c_{26} \cdot c_{363} - k_{d18} \cdot c_{369} \quad (558)$$

### 8.269 Reaction v278

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

**Name** v278 Ras:GDP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants

Table 542: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 543: Properties of each product.

Id	Name	SBO
c371	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{269} = k18 \cdot c26 \cdot c365 - kd18 \cdot c371 \quad (560)$$

### 8.270 Reaction v279

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

**Name** v279 Ras:GDP + (ErbB4:ErbB2)#P:GAP:Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) k18 kd18

#### Reaction equation



#### Reactants

Table 544: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 545: Properties of each product.

Id	Name	SBO
c396	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{270} = k_{18} \cdot c_{26} \cdot c_{390} - k_{d18} \cdot c_{396} \quad (562)$$

### 8.271 Reaction v280

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

**Name** v280 Ras:GDP + (ErbB4:ErbB2)#P:GAP:Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

## Reaction equation



## Reactants

Table 546: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 547: Properties of each product.

Id	Name	SBO
c398	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{271} = k_{18} \cdot c_{26} \cdot c_{392} - k_{d18} \cdot c_{398} \quad (564)$$

### 8.272 Reaction v281

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

**Name** v281 Ras:GDP + (ErbB3:ErbB2)#P:GAP:Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k<sub>18</sub> k<sub>d18</sub>

### Reaction equation



### Reactants

Table 548: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

### Product

Table 549: Properties of each product.

Id	Name	SBO
c393	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{272} = k_{18} \cdot c_{26} \cdot c_{387} - k_{d18} \cdot c_{393} \quad (566)$$

### 8.273 Reaction v282

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

**Name** v282 Ras:GDP + (ErbB3:ErbB2)#P:GAP:Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k18 kd18

#### Reaction equation



#### Reactants

Table 550: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

#### Product

Table 551: Properties of each product.

Id	Name	SBO
c395	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{273} = k18 \cdot c26 \cdot c389 - kd18 \cdot c395 \quad (568)$$

### 8.274 Reaction v283

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

**Name** v283 Ras:GTP + (ErbB3:ErbB2)#P:GAP:Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

#### Reaction equation



#### Reactants

Table 552: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 553: Properties of each product.

Id	Name	SBO
c393	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

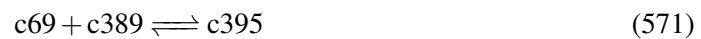
$$v_{274} = k_{19} \cdot c_{28} \cdot c_{387} - k_{d19} \cdot c_{393} \quad (570)$$

### 8.275 Reaction v284

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

**Name** v284 (Ras:GTP).i + (ErbB3:ErbB2)#P:GAP:Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

## Reaction equation



## Reactants

Table 554: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP).i	
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 555: Properties of each product.

Id	Name	SBO
c395	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{275} = k_{19} \cdot c_{69} \cdot c_{389} - k_{d19} \cdot c_{395} \quad (572)$$

### 8.276 Reaction v285

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

**Name** v285 Ras:GTP + (ErbB4:ErbB2)#P:GAP:Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

### Reaction equation



### Reactants

Table 556: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

### Product

Table 557: Properties of each product.

Id	Name	SBO
c396	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{276} = k_{19} \cdot c_{28} \cdot c_{390} - k_{d19} \cdot c_{396} \quad (574)$$

### 8.277 Reaction v286

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

**Name** v286 (Ras:GTP).i + (ErbB4:ErbB2)#P:GAP:Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

#### Reaction equation



#### Reactants

Table 558: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP).i	
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

#### Product

Table 559: Properties of each product.

Id	Name	SBO
c398	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{277} = k19 \cdot c69 \cdot c392 - kd19 \cdot c398 \quad (576)$$

### 8.278 Reaction v287

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

**Name** v287 Ras:GTP + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

#### Reaction equation



#### Reactants



Table 560: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c315	2(ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 561: Properties of each product.

Id	Name	SBO
c318	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{278} = k_{19} \cdot c_{28} \cdot c_{315} - k_{d19} \cdot c_{318} \quad (578)$$

## 8.279 Reaction v288

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

**Name** v288 (Ras:GTP).i + 2(ErbB2)#P:GAP:Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

## Reaction equation



## Reactants

Table 562: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP).i	
c317	2(ErbB2)_P:GAP:Grb2:Sos	

## Product

Table 563: Properties of each product.

Id	Name	SBO
c320	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

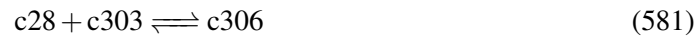
$$v_{279} = k_{19} \cdot c_{69} \cdot c_{317} - k_{d19} \cdot c_{320} \quad (580)$$

### 8.280 Reaction v289

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

**Name** v289 Ras:GTP + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP)  
k19 kd19

### Reaction equation



### Reactants

Table 564: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 565: Properties of each product.

Id	Name	SBO
c306	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{280} = k_{19} \cdot c_{28} \cdot c_{303} - k_{d19} \cdot c_{306} \quad (582)$$

8.281 Reaction v290

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

**Name** v290 (Ras:GTP).i + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k19 kd19

Reaction equation



Reactants

Table 566: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP).i	
c305	2(ErbB2).P:GAP:(Shc.P):Grb2:Sos	

Product

Table 567: Properties of each product.

Id	Name	SBO
c308	2(ErbB2).P:GAP:(Shc.P):Grb2:Sos:(Ras:GDP)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{281} = k19 \cdot c69 \cdot c305 - kd19 \cdot c308 \tag{584}$$

8.282 Reaction v291

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

**Name** v291 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos + (Ras:GTP).i -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k19 kd19

Reaction equation



Reactants

Table 568: Properties of each reactant.

Id	Name	SBO
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	
c69	(Ras:GTP)_i	

## Product

Table 569: Properties of each product.

Id	Name	SBO
c67	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{282} = k_{19} \cdot c_{66} \cdot c_{69} - k_{d19} \cdot c_{67} \quad (586)$$

### 8.283 Reaction v292

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

**Name** v292 (Ras:GTP)\_i + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

## Reaction equation



## Reactants

Table 570: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP)_i	
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Product

Table 571: Properties of each product.

Id	Name	SBO
c20	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{283} = k_{19} \cdot c_{69} \cdot c_{19} - k_{d19} \cdot c_{20} \quad (588)$$

### 8.284 Reaction v293

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

**Name** v293 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos + Ras:GTP -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) k19 kd19

### Reaction equation



### Reactants

Table 572: Properties of each reactant.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	
c28	Ras:GTP	

### Product

Table 573: Properties of each product.

Id	Name	SBO
c36	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{284} = k_{19} \cdot c_{35} \cdot c_{28} - k_{d19} \cdot c_{36} \quad (590)$$

### 8.285 Reaction v294

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

**Name** v294 Ras:GTP + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

#### Reaction equation



#### Reactants

Table 574: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

#### Product

Table 575: Properties of each product.

Id	Name	SBO
c27	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{285} = k19 \cdot c28 \cdot c25 - kd19 \cdot c27 \quad (592)$$

### 8.286 Reaction v295

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

**Name** v295 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GTP -> (ErbB1:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GDP) k19 kd19

#### Reaction equation



#### Reactants

Table 576: Properties of each reactant.

Id	Name	SBO
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c28	Ras:GTP	

## Product

Table 577: Properties of each product.

Id	Name	SBO
c207	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{286} = k_{19} \cdot c_{198} \cdot c_{28} - k_{d19} \cdot c_{207} \quad (594)$$

## 8.287 Reaction v296

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

**Name** v296 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos + Ras:GTP -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

## Reaction equation



## Reactants

Table 578: Properties of each reactant.

Id	Name	SBO
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	
c28	Ras:GTP	

## Product

Table 579: Properties of each product.

Id	Name	SBO
c208	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{287} = k_{19} \cdot c_{199} \cdot c_{28} - k_{d19} \cdot c_{208} \quad (596)$$

### 8.288 Reaction v297

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

**Name** v297 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos + Ras:GTP -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

### Reaction equation



### Reactants

Table 580: Properties of each reactant.

Id	Name	SBO
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	
c28	Ras:GTP	

### Product

Table 581: Properties of each product.

Id	Name	SBO
c209	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{288} = k_{19} \cdot c_{200} \cdot c_{28} - k_{d19} \cdot c_{209} \quad (598)$$

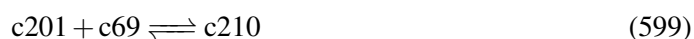


### 8.289 Reaction v298

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

**Name** v298 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + (Ras:GTP).i -> (ErbB1:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

#### Reaction equation



#### Reactants

Table 582: Properties of each reactant.

Id	Name	SBO
c201	(ErbB1:ErbB2).P:GAP:(Shc.P):Grb2:Sos	
c69	(Ras:GTP).i	

#### Product

Table 583: Properties of each product.

Id	Name	SBO
c210	(ErbB1:ErbB2).P:GAP:(Shc.P):Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{289} = k19 \cdot c201 \cdot c69 - kd19 \cdot c210 \quad (600)$$

### 8.290 Reaction v299

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

**Name** v299 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos + (Ras:GTP).i -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

#### Reaction equation



#### Reactants

Table 584: Properties of each reactant.

Id	Name	SBO
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	
c69	(Ras:GTP)_i	

## Product

Table 585: Properties of each product.

Id	Name	SBO
c211	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{290} = k_{19} \cdot c_{202} \cdot c_{69} - k_{d19} \cdot c_{211} \quad (602)$$

### 8.291 Reaction v300

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

**Name** v300 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos + (Ras:GTP)\_i -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

## Reaction equation



## Reactants

Table 586: Properties of each reactant.

Id	Name	SBO
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	
c69	(Ras:GTP)_i	

## Product

Table 587: Properties of each product.

Id	Name	SBO
c212	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{291} = k_{19} \cdot c_{203} \cdot c_{69} - k_{d19} \cdot c_{212} \quad (604)$$

### 8.292 Reaction v301

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

**Name** v301 Ras:GTP + (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k<sub>19</sub> k<sub>d19</sub>

### Reaction equation



### Reactants

Table 588: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

### Product

Table 589: Properties of each product.

Id	Name	SBO
c243	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{292} = k_{19} \cdot c_{28} \cdot c_{234} - k_{d19} \cdot c_{243} \quad (606)$$

### 8.293 Reaction v302

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

**Name** v302 Ras:GTP + (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

#### Reaction equation



#### Reactants

Table 590: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

#### Product

Table 591: Properties of each product.

Id	Name	SBO
c244	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

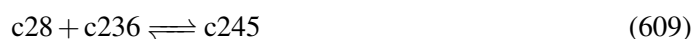
$$v_{293} = k19 \cdot c28 \cdot c235 - kd19 \cdot c244 \quad (608)$$

### 8.294 Reaction v303

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

**Name** v303 Ras:GTP + (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

#### Reaction equation



#### Reactants

Table 592: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

## Product

Table 593: Properties of each product.

Id	Name	SBO
c245	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{294} = k_{19} \cdot c_{28} \cdot c_{236} - k_{d19} \cdot c_{245} \quad (610)$$

## 8.295 Reaction v304

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

**Name** v304 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + (Ras:GTP)\_i -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

## Reaction equation



## Reactants

Table 594: Properties of each reactant.

Id	Name	SBO
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	
c69	(Ras:GTP)_i	

## Product

Table 595: Properties of each product.

Id	Name	SBO
c246	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{295} = k_{19} \cdot c_{237} \cdot c_{69} - k_{d19} \cdot c_{246} \quad (612)$$

### 8.296 Reaction v305

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

**Name** v305 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + (Ras:GTP)<sub>i</sub> -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP)  
k<sub>19</sub> k<sub>d19</sub>

### Reaction equation



### Reactants

Table 596: Properties of each reactant.

Id	Name	SBO
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	
c69	(Ras:GTP) <sub>i</sub>	

### Product

Table 597: Properties of each product.

Id	Name	SBO
c247	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{296} = k_{19} \cdot c_{238} \cdot c_{69} - k_{d19} \cdot c_{247} \quad (614)$$

### 8.297 Reaction v306

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

**Name** v306 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + (Ras:GTP).i -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP)  
k19 kd19

#### Reaction equation



#### Reactants

Table 598: Properties of each reactant.

Id	Name	SBO
c239	(ErbB1:ErbB4).P:GAP:Grb2:Sos	
c69	(Ras:GTP).i	

#### Product

Table 599: Properties of each product.

Id	Name	SBO
c248	(ErbB1:ErbB4).P:GAP:Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{297} = k19 \cdot c239 \cdot c69 - kd19 \cdot c248 \quad (616)$$

### 8.298 Reaction v307

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

**Name** v307 Ras:GTP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GDP) k19 kd19

#### Reaction equation



#### Reactants

Table 600: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 601: Properties of each product.

Id	Name	SBO
c369	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{298} = k_{19} \cdot c_{28} \cdot c_{363} - k_{d19} \cdot c_{369} \quad (618)$$

### 8.299 Reaction v308

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

**Name** v308 (Ras:GTP)\_i + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

## Reaction equation



## Reactants

Table 602: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP)_i	
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product



Table 603: Properties of each product.

Id	Name	SBO
c371	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{299} = k_{19} \cdot c_{69} \cdot c_{365} - k_{d19} \cdot c_{371} \quad (620)$$

### 8.300 Reaction v309

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

**Name** v309 Ras:GTP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

### Reaction equation



### Reactants

Table 604: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 605: Properties of each product.

Id	Name	SBO
c372	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{300} = k_{19} \cdot c_{28} \cdot c_{366} - k_{d19} \cdot c_{372} \quad (622)$$

### 8.301 Reaction v310

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

**Name** v310 (Ras:GTP).i + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GDP) k19 kd19

#### Reaction equation



#### Reactants

Table 606: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP).i	
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 607: Properties of each product.

Id	Name	SBO
c374	(ErbB4:ErbB2).P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{301} = k19 \cdot c69 \cdot c368 - kd19 \cdot c374 \quad (624)$$

### 8.302 Reaction v311

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

**Name** v311 Ras\_activated:GTP + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

#### Reaction equation



#### Reactants

Table 608: Properties of each reactant.

Id	Name	SBO
c43	Ras_activated:GTP	
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 609: Properties of each product.

Id	Name	SBO
c378	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{302} = k_{20} \cdot c_{43} \cdot c_{366} - k_{d20} \cdot c_{378} \quad (626)$$

### 8.303 Reaction v312

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

**Name** v312 (Ras\_activated:GTP).i + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB4:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k<sub>20</sub> k<sub>d20</sub>

## Reaction equation



## Reactants

Table 610: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP).i	
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 611: Properties of each product.

Id	Name	SBO
c380	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{303} = k_{20} \cdot c_{71} \cdot c_{368} - k_{d20} \cdot c_{380} \quad (628)$$

### 8.304 Reaction v313

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

**Name** v313 Ras\_activated:GTP + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

### Reaction equation



### Reactants

Table 612: Properties of each reactant.

Id	Name	SBO
c43	Ras_activated:GTP	
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 613: Properties of each product.

Id	Name	SBO
c375	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{304} = k_{20} \cdot c_{43} \cdot c_{363} - k_{d20} \cdot c_{375} \quad (630)$$

8.305 Reaction v314

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

**Name** v314 (Ras\_activated:GTP)\_i + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB3:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

Reaction equation



Reactants

Table 614: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP)_i	
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

Product

Table 615: Properties of each product.

Id	Name	SBO
c377	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{305} = k20 \cdot c71 \cdot c365 - kd20 \cdot c377$$

(632)

8.306 Reaction v315

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

**Name** v315 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + Ras\_activated:GTP -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) k20 kd20

Reaction equation



Reactants

Table 616: Properties of each reactant.

Id	Name	SBO
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	
c43	Ras_activated:GTP	

## Product

Table 617: Properties of each product.

Id	Name	SBO
c252	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{306} = k_{20} \cdot c_{234} \cdot c_{43} - k_{d20} \cdot c_{252} \quad (634)$$

### 8.307 Reaction v316

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

**Name** v316 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + Ras\_activated:GTP -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP)  
k20 kd20

## Reaction equation



## Reactants

Table 618: Properties of each reactant.

Id	Name	SBO
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	
c43	Ras_activated:GTP	

## Product

Table 619: Properties of each product.

Id	Name	SBO
c253	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{307} = k_{20} \cdot c_{235} \cdot c_{43} - k_{d20} \cdot c_{253} \quad (636)$$

### 8.308 Reaction v317

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

**Name** v317 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + Ras\_activated:GTP -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP)  
k<sub>20</sub> k<sub>d20</sub>

### Reaction equation



### Reactants

Table 620: Properties of each reactant.

Id	Name	SBO
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	
c43	Ras_activated:GTP	

### Product

Table 621: Properties of each product.

Id	Name	SBO
c254	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{308} = k_{20} \cdot c_{236} \cdot c_{43} - k_{d20} \cdot c_{254} \quad (638)$$

8.309 Reaction v318

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

**Name** v318 (Ras\_activated:GTP).i + (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP).i  
k20 kd20

Reaction equation



Reactants

Table 622: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP).i	
c237	(ErbB1:ErbB2).P:GAP:Grb2:Sos	

Product

Table 623: Properties of each product.

Id	Name	SBO
c255	(ErbB1:ErbB2).P:GAP:Grb2:Sos:(Ras:GTP).i	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{309} = k20 \cdot c71 \cdot c237 - kd20 \cdot c255 \tag{640}$$

8.310 Reaction v319

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

**Name** v319 (Ras\_activated:GTP).i + (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP).i  
k20 kd20

Reaction equation



Reactants



Table 624: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP)_i	
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

## Product

Table 625: Properties of each product.

Id	Name	SBO
c256	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{310} = k_{20} \cdot c_{71} \cdot c_{238} - k_{d20} \cdot c_{256} \quad (642)$$

### 8.311 Reaction v320

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

**Name** v320 (Ras\_activated:GTP)\_i + (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP)  
k20 kd20

## Reaction equation



## Reactants

Table 626: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP)_i	
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

## Product

Table 627: Properties of each product.

Id	Name	SBO
c257	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{311} = k_{20} \cdot c_{71} \cdot c_{239} - k_{d20} \cdot c_{257} \quad (644)$$

### 8.312 Reaction v321

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

**Name** v321 2(EGF:ErbB1)#P:GAP:Grb2:Sos + Ras\_activated:GTP -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP)  
k20 kd20

### Reaction equation



### Reactants

Table 628: Properties of each reactant.

Id	Name	SBO
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	
c43	Ras_activated:GTP	

### Product

Table 629: Properties of each product.

Id	Name	SBO
c29	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{312} = k_{20} \cdot c_{25} \cdot c_{43} - k_{d20} \cdot c_{29} \quad (646)$$

8.313 Reaction v322

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

**Name** v322 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos + Ras\_activated:GTP -> 2(EGF:ErbB1)-  
#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

Reaction equation



Reactants

Table 630: Properties of each reactant.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	
c43	Ras_activated:GTP	

Product

Table 631: Properties of each product.

Id	Name	SBO
c37	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{313} = k20 \cdot c35 \cdot c43 - kd20 \cdot c37$$

(648)

8.314 Reaction v323

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

**Name** v323 (Ras\_activated:GTP).i + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:G  
k20 kd20

Reaction equation



Reactants

Table 632: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP).i	
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Product

Table 633: Properties of each product.

Id	Name	SBO
c21	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{314} = k_{20} \cdot c_{71} \cdot c_{19} - k_{d20} \cdot c_{21} \quad (650)$$

### 8.315 Reaction v324

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

**Name** v324 (Ras\_activated:GTP).i + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

## Reaction equation



## Reactants

Table 634: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP).i	
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 635: Properties of each product.

Id	Name	SBO
c68	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{315} = k_{20} \cdot c_{71} \cdot c_{66} - k_{d20} \cdot c_{68} \quad (652)$$

### 8.316 Reaction v325

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

**Name** v325 Ras\_activated:GTP + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

### Reaction equation



### Reactants

Table 636: Properties of each reactant.

Id	Name	SBO
c43	Ras_activated:GTP	
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 637: Properties of each product.

Id	Name	SBO
c216	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{316} = k_{20} \cdot c_{43} \cdot c_{198} - k_{d20} \cdot c_{216} \quad (654)$$

### 8.317 Reaction v326

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

**Name** v326 Ras\_activated:GTP + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB3)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

#### Reaction equation



#### Reactants

Table 638: Properties of each reactant.

Id	Name	SBO
c43	Ras_activated:GTP	
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 639: Properties of each product.

Id	Name	SBO
c217	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

#### Kinetic Law

**Derived unit** contains undeclared units

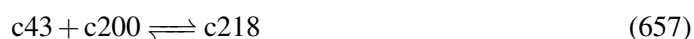
$$v_{317} = k20 \cdot c43 \cdot c199 - kd20 \cdot c217 \quad (656)$$

### 8.318 Reaction v327

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

**Name** v327 Ras\_activated:GTP + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB4)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

#### Reaction equation



#### Reactants

Table 640: Properties of each reactant.

Id	Name	SBO
c43	Ras_activated:GTP	
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 641: Properties of each product.

Id	Name	SBO
c218	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

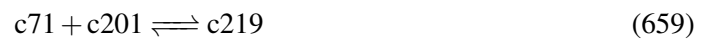
$$v_{318} = k_{20} \cdot c_{43} \cdot c_{200} - k_{d20} \cdot c_{218} \quad (658)$$

### 8.319 Reaction v328

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

**Name** v328 (Ras\_activated:GTP).i + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB2)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

## Reaction equation



## Reactants

Table 642: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP).i	
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 643: Properties of each product.

Id	Name	SBO
c219	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{319} = k_{20} \cdot c_{71} \cdot c_{201} - k_{d20} \cdot c_{219} \quad (660)$$

### 8.320 Reaction v329

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

**Name** v329 (Ras\_activated:GTP)\_i + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB3)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

### Reaction equation



### Reactants

Table 644: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP)_i	
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 645: Properties of each product.

Id	Name	SBO
c220	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{320} = k_{20} \cdot c_{71} \cdot c_{202} - k_{d20} \cdot c_{220} \quad (662)$$



### 8.321 Reaction v330

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

**Name** v330 (Ras\_activated:GTP).i + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos -> (ErbB1:ErbB4)-#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) k20 kd20

#### Reaction equation



#### Reactants

Table 646: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP).i	
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

#### Product

Table 647: Properties of each product.

Id	Name	SBO
c221	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{321} = k20 \cdot c71 \cdot c203 - kd20 \cdot c221 \quad (664)$$

### 8.322 Reaction v331

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

**Name** v331 Ras\_activated:GTP + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k20 kd20

#### Reaction equation



#### Reactants

Table 648: Properties of each reactant.

Id	Name	SBO
c43	Ras_activated:GTP	
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 649: Properties of each product.

Id	Name	SBO
c309	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

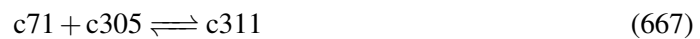
$$v_{322} = k_{20} \cdot c_{43} \cdot c_{303} - k_{d20} \cdot c_{309} \quad (666)$$

### 8.323 Reaction v332

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

**Name** v332 (Ras\_activated:GTP).i + 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k20 kd20

## Reaction equation



## Reactants

Table 650: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP).i	
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 651: Properties of each product.

Id	Name	SBO
c311	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{323} = k_{20} \cdot c_{71} \cdot c_{305} - k_{d20} \cdot c_{311} \quad (668)$$

### 8.324 Reaction v333

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

**Name** v333 2(ErbB2)#P:GAP:Grb2:Sos + Ras\_activated:GTP -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k20 kd20

### Reaction equation



### Reactants

Table 652: Properties of each reactant.

Id	Name	SBO
c315	2(ErbB2)_P:GAP:Grb2:Sos	
c43	Ras_activated:GTP	

### Product

Table 653: Properties of each product.

Id	Name	SBO
c321	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{324} = k_{20} \cdot c_{315} \cdot c_{43} - k_{d20} \cdot c_{321} \quad (670)$$

8.325 Reaction v334

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

**Name** v334 2(ErbB2)#P:GAP:Grb2:Sos + (Ras\_activated:GTP)\_i -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k20 kd20

Reaction equation



Reactants

Table 654: Properties of each reactant.

Id	Name	SBO
c317	2(ErbB2)_P:GAP:Grb2:Sos	
c71	(Ras_activated:GTP)_i	

Product

Table 655: Properties of each product.

Id	Name	SBO
c323	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{325} = k20 \cdot c317 \cdot c71 - kd20 \cdot c323 \tag{672}$$

8.326 Reaction v335

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

**Name** v335 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + Ras\_activated:GTP -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k20 kd20

Reaction equation



Reactants

Table 656: Properties of each reactant.

Id	Name	SBO
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	
c43	Ras_activated:GTP	

## Product

Table 657: Properties of each product.

Id	Name	SBO
c402	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{326} = k_{20} \cdot c_{390} \cdot c_{43} - k_{d20} \cdot c_{402} \quad (674)$$

### 8.327 Reaction v336

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

**Name** v336 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + (Ras\_activated:GTP)\_i -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k20 kd20

## Reaction equation



## Reactants

Table 658: Properties of each reactant.

Id	Name	SBO
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	
c71	(Ras_activated:GTP)_i	

## Product

Table 659: Properties of each product.

Id	Name	SBO
c404	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{327} = k_{20} \cdot c_{392} \cdot c_{71} - k_{d20} \cdot c_{404} \quad (676)$$

### 8.328 Reaction v337

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

**Name** v337 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + Ras\_activated:GTP -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k<sub>20</sub> k<sub>d20</sub>

### Reaction equation



### Reactants

Table 660: Properties of each reactant.

Id	Name	SBO
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	
c43	Ras_activated:GTP	

### Product

Table 661: Properties of each product.

Id	Name	SBO
c399	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{328} = k_{20} \cdot c_{387} \cdot c_{43} - k_{d20} \cdot c_{399} \quad (678)$$

8.329 Reaction v338

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

**Name** v338 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + (Ras\_activated:GTP)\_i -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)\_i  
k20 kd20

Reaction equation



Reactants

Table 662: Properties of each reactant.

Id	Name	SBO
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	
c71	(Ras_activated:GTP)_i	

Product

Table 663: Properties of each product.

Id	Name	SBO
c401	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)_i	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{329} = k20 \cdot c389 \cdot c71 - kd20 \cdot c401 \tag{680}$$

8.330 Reaction v339

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

**Name** v339 2(ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

Reaction equation



Reactants

Table 664: Properties of each reactant.

Id	Name	SBO
c315	2(ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

## Product

Table 665: Properties of each product.

Id	Name	SBO
c321	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{330} = k_{21} \cdot c_{315} \cdot c_{26} - k_{d21} \cdot c_{321} \quad (682)$$

### 8.331 Reaction v340

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

**Name** v340 2(ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k<sub>21</sub> k<sub>d21</sub>

## Reaction equation



## Reactants

Table 666: Properties of each reactant.

Id	Name	SBO
c317	2(ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

## Product



Table 667: Properties of each product.

Id	Name	SBO
c323	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{331} = k_{21} \cdot c_{317} \cdot c_{26} - k_{d21} \cdot c_{323} \quad (684)$$

### 8.332 Reaction v341

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

**Name** v341 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP)  
k21 kd21

### Reaction equation



### Reactants

Table 668: Properties of each reactant.

Id	Name	SBO
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

### Product

Table 669: Properties of each product.

Id	Name	SBO
c309	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{332} = k_{21} \cdot c_{303} \cdot c_{26} - k_{d21} \cdot c_{309} \quad (686)$$

### 8.333 Reaction v342

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

**Name** v342 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP)  
k21 kd21

#### Reaction equation



#### Reactants

Table 670: Properties of each reactant.

Id	Name	SBO
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

#### Product

Table 671: Properties of each product.

Id	Name	SBO
c311	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{333} = k21 \cdot c305 \cdot c26 - kd21 \cdot c311 \quad (688)$$

### 8.334 Reaction v343

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

**Name** v343 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> 2(EGF:ErbB1)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GTP) k21 kd21

#### Reaction equation



#### Reactants

Table 672: Properties of each reactant.

Id	Name	SBO
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

## Product

Table 673: Properties of each product.

Id	Name	SBO
c68	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

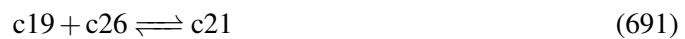
$$v_{334} = k_{21} \cdot c_{66} \cdot c_{26} - k_{d21} \cdot c_{68} \quad (690)$$

### 8.335 Reaction v344

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

**Name** v344 2(EGF:ErbB1)#P:GAP:Grb2:Sos + Ras:GDP -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

## Reaction equation



## Reactants

Table 674: Properties of each reactant.

Id	Name	SBO
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

## Product

Table 675: Properties of each product.

Id	Name	SBO
c21	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{335} = k_{21} \cdot c_{19} \cdot c_{26} - k_{d21} \cdot c_{21} \quad (692)$$

### 8.336 Reaction v345

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

**Name** v345 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> 2(EGF:ErbB1)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k21 kd21

### Reaction equation



### Reactants

Table 676: Properties of each reactant.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

### Product

Table 677: Properties of each product.

Id	Name	SBO
c37	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{336} = k_{21} \cdot c_{35} \cdot c_{26} - k_{d21} \cdot c_{37} \quad (694)$$

### 8.337 Reaction v346

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

**Name** v346 2(EGF:ErbB1)#P:GAP:Grb2:Sos + Ras:GDP -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

#### Reaction equation



#### Reactants

Table 678: Properties of each reactant.

Id	Name	SBO
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

#### Product

Table 679: Properties of each product.

Id	Name	SBO
c29	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{337} = k21 \cdot c25 \cdot c26 - kd21 \cdot c29 \quad (696)$$

### 8.338 Reaction v347

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

**Name** v347 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GTP) k21 kd21

#### Reaction equation



#### Reactants

Table 680: Properties of each reactant.

Id	Name	SBO
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

## Product

Table 681: Properties of each product.

Id	Name	SBO
c216	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{338} = k_{21} \cdot c_{198} \cdot c_{26} - k_{d21} \cdot c_{216} \quad (698)$$

### 8.339 Reaction v348

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

**Name** v348 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB3)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k21 kd21

## Reaction equation



## Reactants

Table 682: Properties of each reactant.

Id	Name	SBO
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

## Product

Table 683: Properties of each product.

Id	Name	SBO
c217	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{339} = k_{21} \cdot c_{199} \cdot c_{26} - k_{d21} \cdot c_{217} \quad (700)$$

### 8.340 Reaction v349

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

**Name** v349 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k21 kd21

### Reaction equation



### Reactants

Table 684: Properties of each reactant.

Id	Name	SBO
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

### Product

Table 685: Properties of each product.

Id	Name	SBO
c218	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{340} = k_{21} \cdot c_{200} \cdot c_{26} - k_{d21} \cdot c_{218} \quad (702)$$

### 8.341 Reaction v350

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

**Name** v350 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GTP) k21 kd21

#### Reaction equation



#### Reactants

Table 686: Properties of each reactant.

Id	Name	SBO
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

#### Product

Table 687: Properties of each product.

Id	Name	SBO
c219	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{341} = k21 \cdot c201 \cdot c26 - kd21 \cdot c219 \quad (704)$$

### 8.342 Reaction v351

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

**Name** v351 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB3)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GTP) k21 kd21

#### Reaction equation



#### Reactants



Table 688: Properties of each reactant.

Id	Name	SBO
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

## Product

Table 689: Properties of each product.

Id	Name	SBO
c220	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

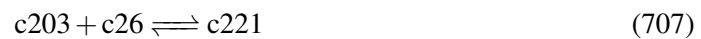
$$v_{342} = k_{21} \cdot c_{202} \cdot c_{26} - k_{d21} \cdot c_{220} \quad (706)$$

### 8.343 Reaction v352

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

**Name** v352 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB1:ErbB4)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k21 kd21

## Reaction equation



## Reactants

Table 690: Properties of each reactant.

Id	Name	SBO
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

## Product

Table 691: Properties of each product.

Id	Name	SBO
c221	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{343} = k_{21} \cdot c_{203} \cdot c_{26} - k_{d21} \cdot c_{221} \quad (708)$$

### 8.344 Reaction v353

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

**Name** v353 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k<sub>21</sub> k<sub>d21</sub>

### Reaction equation



### Reactants

Table 692: Properties of each reactant.

Id	Name	SBO
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

### Product

Table 693: Properties of each product.

Id	Name	SBO
c252	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{344} = k_{21} \cdot c_{234} \cdot c_{26} - k_{d21} \cdot c_{252} \quad (710)$$

### 8.345 Reaction v354

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

**Name** v354 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

#### Reaction equation



#### Reactants

Table 694: Properties of each reactant.

Id	Name	SBO
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

#### Product

Table 695: Properties of each product.

Id	Name	SBO
c253	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{345} = k21 \cdot c235 \cdot c26 - kd21 \cdot c253 \quad (712)$$

### 8.346 Reaction v355

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

**Name** v355 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

#### Reaction equation



#### Reactants

Table 696: Properties of each reactant.

Id	Name	SBO
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

## Product

Table 697: Properties of each product.

Id	Name	SBO
c254	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{346} = k_{21} \cdot c_{236} \cdot c_{26} - k_{d21} \cdot c_{254} \quad (714)$$

### 8.347 Reaction v356

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

**Name** v356 (ErbB1:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

## Reaction equation



## Reactants

Table 698: Properties of each reactant.

Id	Name	SBO
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

## Product

Table 699: Properties of each product.

Id	Name	SBO
c255	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{347} = k_{21} \cdot c_{237} \cdot c_{26} - k_{d21} \cdot c_{255} \quad (716)$$

### 8.348 Reaction v357

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

**Name** v357 (ErbB1:ErbB3)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP)  
k<sub>21</sub> k<sub>d21</sub>

### Reaction equation



### Reactants

Table 700: Properties of each reactant.

Id	Name	SBO
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

### Product

Table 701: Properties of each product.

Id	Name	SBO
c256	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{348} = k_{21} \cdot c_{238} \cdot c_{26} - k_{d21} \cdot c_{256} \quad (718)$$

8.349 Reaction v358

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

**Name** v358 (ErbB1:ErbB4)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

Reaction equation



Reactants

Table 702: Properties of each reactant.

Id	Name	SBO
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

Product

Table 703: Properties of each product.

Id	Name	SBO
c257	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{349} = k21 \cdot c239 \cdot c26 - kd21 \cdot c257 \tag{720}$$

8.350 Reaction v359

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

**Name** v359 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)#P:GAP:(Shc-  
#P):Grb2:Sos:(Ras:GTP) k21 kd21

Reaction equation



Reactants

Table 704: Properties of each reactant.

Id	Name	SBO
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

## Product

Table 705: Properties of each product.

Id	Name	SBO
c375	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{350} = k_{21} \cdot c_{363} \cdot c_{26} - k_{d21} \cdot c_{375} \quad (722)$$

### 8.351 Reaction v360

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

**Name** v360 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k21 kd21

## Reaction equation



## Reactants

Table 706: Properties of each reactant.

Id	Name	SBO
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

## Product

Table 707: Properties of each product.

Id	Name	SBO
c377	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{351} = k_{21} \cdot c_{365} \cdot c_{26} - k_{d21} \cdot c_{377} \quad (724)$$

### 8.352 Reaction v361

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

**Name** v361 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k21 kd21

### Reaction equation



### Reactants

Table 708: Properties of each reactant.

Id	Name	SBO
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

### Product

Table 709: Properties of each product.

Id	Name	SBO
c378	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{352} = k_{21} \cdot c_{366} \cdot c_{26} - k_{d21} \cdot c_{378} \quad (726)$$

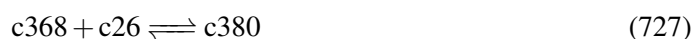


### 8.353 Reaction v362

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

**Name** v362 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)#P:GAP:(Shc-#P):Grb2:Sos:(Ras:GTP) k21 kd21

#### Reaction equation



#### Reactants

Table 710: Properties of each reactant.

Id	Name	SBO
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	
c26	Ras:GDP	

#### Product

Table 711: Properties of each product.

Id	Name	SBO
c380	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

#### Kinetic Law

**Derived unit** contains undeclared units

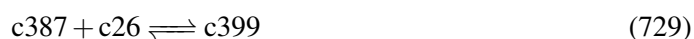
$$v_{353} = k21 \cdot c368 \cdot c26 - kd21 \cdot c380 \quad (728)$$

### 8.354 Reaction v363

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

**Name** v363 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) k21 kd21

#### Reaction equation



#### Reactants

Table 712: Properties of each reactant.

Id	Name	SBO
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

## Product

Table 713: Properties of each product.

Id	Name	SBO
c399	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{354} = k_{21} \cdot c_{387} \cdot c_{26} - k_{d21} \cdot c_{399} \quad (730)$$

## 8.355 Reaction v364

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

**Name** v364 (ErbB3:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

## Reaction equation



## Reactants

Table 714: Properties of each reactant.

Id	Name	SBO
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

## Product

Table 715: Properties of each product.

Id	Name	SBO
c401	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{355} = k_{21} \cdot c_{389} \cdot c_{26} - k_{d21} \cdot c_{401} \quad (732)$$

### 8.356 Reaction v365

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

**Name** v365 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k<sub>21</sub> k<sub>d21</sub>

### Reaction equation



### Reactants

Table 716: Properties of each reactant.

Id	Name	SBO
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

### Product

Table 717: Properties of each product.

Id	Name	SBO
c402	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{356} = k_{21} \cdot c_{390} \cdot c_{26} - k_{d21} \cdot c_{402} \quad (734)$$

8.357 Reaction v366

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

**Name** v366 (ErbB4:ErbB2)#P:GAP:Grb2:Sos + Ras:GDP -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP)  
k21 kd21

Reaction equation



Reactants

Table 718: Properties of each reactant.

Id	Name	SBO
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	
c26	Ras:GDP	

Product

Table 719: Properties of each product.

Id	Name	SBO
c404	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{357} = k21 \cdot c392 \cdot c26 - kd21 \cdot c404 \tag{736}$$

8.358 Reaction v367

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

**Name** v367 Shc + 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP:Shc k22 kd22

Reaction equation



Reactants

Table 720: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c15	2(EGF:ErbB1)_P:GAP	

### Product

Table 721: Properties of each product.

Id	Name	SBO
c32	2(EGF:ErbB1)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{358} = k_{22} \cdot c_{31} \cdot c_{15} - k_{d22} \cdot c_{32} \quad (738)$$

### 8.359 Reaction v368

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

**Name** v368 Shc + 2(EGF:ErbB1)#P:GAP -> 2(EGF:ErbB1)#P:GAP:Shc k22 kd22

### Reaction equation



### Reactants

Table 722: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c17	2(EGF:ErbB1)_P:GAP	

### Product

Table 723: Properties of each product.

Id	Name	SBO
c63	2(EGF:ErbB1)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{359} = k_{22} \cdot c_{31} \cdot c_{17} - k_{d22} \cdot c_{63} \quad (740)$$

### 8.360 Reaction v369

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

**Name** v369 Shc + (ErbB1:ErbB2)#P:GAP -> (ErbB1:ErbB2)#P:GAP:Shc k22 kd22b

### Reaction equation



### Reactants

Table 724: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c151	(ErbB1:ErbB2)_P:GAP	

### Product

Table 725: Properties of each product.

Id	Name	SBO
c171	(ErbB1:ErbB2)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{360} = k_{22} \cdot c_{31} \cdot c_{151} - k_{d22b} \cdot c_{171} \quad (742)$$

### 8.361 Reaction v370

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

**Name** v370 Shc + (ErbB1:ErbB3)#P:GAP -> (ErbB1:ErbB3)#P:GAP:Shc k22 kd22b

#### Reaction equation



#### Reactants

Table 726: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c152	(ErbB1:ErbB3)_P:GAP	

#### Product

Table 727: Properties of each product.

Id	Name	SBO
c172	(ErbB1:ErbB3)_P:GAP:Shc	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{361} = k22 \cdot c31 \cdot c152 - kd22b \cdot c172 \quad (744)$$

### 8.362 Reaction v371

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

**Name** v371 Shc + (ErbB1:ErbB4)#P:GAP -> (ErbB1:ErbB4)#P:GAP:Shc k22 kd22b

#### Reaction equation



#### Reactants

Table 728: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c153	(ErbB1:ErbB4)_P:GAP	

### Product

Table 729: Properties of each product.

Id	Name	SBO
c173	(ErbB1:ErbB4)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{362} = k_{22} \cdot c_{31} \cdot c_{153} - k_{d22b} \cdot c_{173} \quad (746)$$

### 8.363 Reaction v372

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

**Name** v372 Shc + (ErbB1:ErbB2)#P:GAP -> (ErbB1:ErbB2)#P:GAP:Shc k22 kd22b

### Reaction equation



### Reactants

Table 730: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c165	(ErbB1:ErbB2)_P:GAP	

### Product



Table 731: Properties of each product.

Id	Name	SBO
c174	(ErbB1:ErbB2)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{363} = k_{22} \cdot c_{31} \cdot c_{165} - k_{d22b} \cdot c_{174} \quad (748)$$

### 8.364 Reaction v373

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

**Name** v373 Shc + (ErbB1:ErbB3)#P:GAP -> (ErbB1:ErbB3)#P:GAP:Shc k22 kd22b

### Reaction equation



### Reactants

Table 732: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c166	(ErbB1:ErbB3)_P:GAP	

### Product

Table 733: Properties of each product.

Id	Name	SBO
c175	(ErbB1:ErbB3)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{364} = k_{22} \cdot c_{31} \cdot c_{166} - k_{d22b} \cdot c_{175} \quad (750)$$

### 8.365 Reaction v374

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

**Name** v374 Shc + (ErbB1:ErbB4)#P:GAP -> (ErbB1:ErbB4)#P:GAP:Shc k22 kd22b

#### Reaction equation



#### Reactants

Table 734: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c167	(ErbB1:ErbB4)_P:GAP	

#### Product

Table 735: Properties of each product.

Id	Name	SBO
c176	(ErbB1:ErbB4)_P:GAP:Shc	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{365} = k22 \cdot c31 \cdot c167 - kd22b \cdot c176 \quad (752)$$

### 8.366 Reaction v375

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

**Name** v375 Shc + 2(ErbB2)#P:GAP -> 2(ErbB2)#P:GAP:Shc k22 kd22b

#### Reaction equation



#### Reactants

Table 736: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c291	2(ErbB2)_P:GAP	

## Product

Table 737: Properties of each product.

Id	Name	SBO
c294	2(ErbB2)_P:GAP:Shc	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{366} = k_{22} \cdot c_{31} \cdot c_{291} - k_{d22b} \cdot c_{294} \quad (754)$$

## 8.367 Reaction v376

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

**Name** v376 Shc + 2(ErbB2)#P:GAP -> 2(ErbB2)#P:GAP:Shc k22 kd22b

## Reaction equation



## Reactants

Table 738: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c293	2(ErbB2)_P:GAP	

## Product

Table 739: Properties of each product.

Id	Name	SBO
c296	2(ErbB2)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{367} = k_{22} \cdot c_{31} \cdot c_{293} - k_{d22b} \cdot c_{296} \quad (756)$$

### 8.368 Reaction $v_{377}$

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

**Name**  $v_{377}$  Shc + (ErbB3:ErbB2)#P:GAP -> (ErbB3:ErbB2)#P:GAP:Shc  $k_{22}$   $k_{d22b}$

### Reaction equation



### Reactants

Table 740: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c341	(ErbB3:ErbB2)_P:GAP	

### Product

Table 741: Properties of each product.

Id	Name	SBO
c347	(ErbB3:ErbB2)_P:GAP:Shc	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{368} = k_{22} \cdot c_{31} \cdot c_{341} - k_{d22b} \cdot c_{347} \quad (758)$$

### 8.369 Reaction v378

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

**Name** v378 Shc + (ErbB3:ErbB2)#P:GAP -> (ErbB3:ErbB2)#P:GAP:Shc k22 kd22b

#### Reaction equation



#### Reactants

Table 742: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c343	(ErbB3:ErbB2) P:GAP	

#### Product

Table 743: Properties of each product.

Id	Name	SBO
c349	(ErbB3:ErbB2)_P:GAP:Shc	

#### Kinetic Law

**Derived unit** contains undeclared units

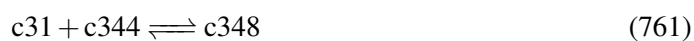
$$v_{369} = k22 \cdot c31 \cdot c343 - kd22b \cdot c349 \quad (760)$$

### 8.370 Reaction v379

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

**Name** v379 Shc + (ErbB4:ErbB2)#P:GAP -> (ErbB4:ErbB2)#P:GAP:Shc k22 kd22

#### Reaction equation



#### Reactants

Table 744: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c344	(ErbB4:ErbB2)_P:GAP	

## Product

Table 745: Properties of each product.

Id	Name	SBO
c348	(ErbB4:ErbB2)_P:GAP:Shc	

## Kinetic Law

**Derived unit** contains undeclared units

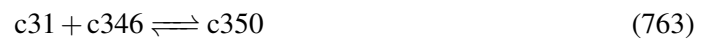
$$v_{370} = k_{22} \cdot c_{31} \cdot c_{344} - k_{d22} \cdot c_{348} \quad (762)$$

### 8.371 Reaction v380

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

**Name** v380 Shc + (ErbB4:ErbB2)#P:GAP -> (ErbB4:ErbB2)#P:GAP:Shc k22 kd22

## Reaction equation



## Reactants

Table 746: Properties of each reactant.

Id	Name	SBO
c31	Shc	
c346	(ErbB4:ErbB2)_P:GAP	

## Product

Table 747: Properties of each product.

Id	Name	SBO
c350	(ErbB4:ErbB2)_P:GAP:Shc	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{371} = k_{22} \cdot c_{31} \cdot c_{346} - k_{d22} \cdot c_{350} \quad (764)$$

**8.372 Reaction v381**

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

**Name** v381 (ErbB3:ErbB2)#P:GAP:Shc + -> (ErbB3:ErbB2)#P:GAP:(Shc#P) k23 kd23**Reaction equation****Reactant**

Table 748: Properties of each reactant.

Id	Name	SBO
c347	(ErbB3:ErbB2)_P:GAP:Shc	

**Product**

Table 749: Properties of each product.

Id	Name	SBO
c351	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{372} = k_{23} \cdot c_{347} - k_{d23} \cdot c_{351} \quad (766)$$

8.373 Reaction v382

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

**Name** v382 (ErbB3:ErbB2)#P:GAP:Shc + -> (ErbB3:ErbB2)#P:GAP:(Shc#P) k23 kd23

Reaction equation



Reactant

Table 750: Properties of each reactant.

Id	Name	SBO
c349	(ErbB3:ErbB2)_P:GAP:Shc	

Product

Table 751: Properties of each product.

Id	Name	SBO
c353	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{373} = k23 \cdot c349 - kd23 \cdot c353 \tag{768}$$

8.374 Reaction v383

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

**Name** v383 (ErbB4:ErbB2)#P:GAP:Shc + -> (ErbB4:ErbB2)#P:GAP:(Shc#P) k23 kd23

Reaction equation



Reactant



Table 752: Properties of each reactant.

Id	Name	SBO
c348	(ErbB4:ErbB2)_P:GAP:Shc	

## Product

Table 753: Properties of each product.

Id	Name	SBO
c354	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{374} = k_{23} \cdot c_{348} - k_{d23} \cdot c_{354} \quad (770)$$

## 8.375 Reaction v384

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

**Name** v384 (ErbB4:ErbB2)#P:GAP:Shc + -> (ErbB4:ErbB2)#P:GAP:(Shc#P) k23 kd23

## Reaction equation



## Reactant

Table 754: Properties of each reactant.

Id	Name	SBO
c350	(ErbB4:ErbB2)_P:GAP:Shc	

## Product

Table 755: Properties of each product.

Id	Name	SBO
c356	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{375} = k_{23} \cdot c_{350} - k_{d23} \cdot c_{356} \quad (772)$$

## 8.376 Reaction $v_{385}$

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

**Name**  $v_{385}$  2(ErbB2)#P:GAP:Shc + -> 2(ErbB2)#P:GAP:(Shc#P)  $k_{23}$   $k_{d23}$

## Reaction equation



## Reactant

Table 756: Properties of each reactant.

Id	Name	SBO
$c_{294}$	2(ErbB2).P:GAP:Shc	

## Product

Table 757: Properties of each product.

Id	Name	SBO
$c_{297}$	2(ErbB2).P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{376} = k_{23} \cdot c_{294} - k_{d23} \cdot c_{297} \quad (774)$$

## 8.377 Reaction $v_{386}$

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

**Name**  $v_{386}$  2(ErbB2)#P:GAP:Shc + -> 2(ErbB2)#P:GAP:(Shc#P)  $k_{23}$   $k_{d23}$

## Reaction equation



Reactant

Table 758: Properties of each reactant.

Id	Name	SBO
c296	2(ErbB2)_P:GAP:Shc	

Product

Table 759: Properties of each product.

Id	Name	SBO
c299	2(ErbB2)_P:GAP:(Shc_P)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{377} = k_{23} \cdot c_{296} - k_{d23} \cdot c_{299} \tag{776}$$

8.378 Reaction v387

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

**Name** v387 2(EGF:ErbB1)#P:GAP:Shc + -> 2(EGF:ErbB1)#P:GAP:(Shc#P) k23 kd23

Reaction equation



Reactant

Table 760: Properties of each reactant.

Id	Name	SBO
c63	2(EGF:ErbB1)_P:GAP:Shc	

Product

Table 761: Properties of each product.

Id	Name	SBO
c64	2(EGF:ErbB1)_P:GAP:(Shc_P)	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{378} = k_{23} \cdot c_{63} - k_{d23} \cdot c_{64} \quad (778)$$

**8.379 Reaction v388**

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

**Name** v388 2(EGF:ErbB1)#P:GAP:Shc + -> 2(EGF:ErbB1)#P:GAP:(Shc#P) k23 kd23**Reaction equation****Reactant**

Table 762: Properties of each reactant.

Id	Name	SBO
c32	2(EGF:ErbB1)_P:GAP:Shc	

**Product**

Table 763: Properties of each product.

Id	Name	SBO
c33	2(EGF:ErbB1)_P:GAP:(Shc_P)	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{379} = k_{23} \cdot c_{32} - k_{d23} \cdot c_{33} \quad (780)$$

8.380 Reaction v389

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

**Name** v389 (ErbB1:ErbB2)#P:GAP:Shc + -> (ErbB1:ErbB2)#P:GAP:(Shc#P) k23 kd23

Reaction equation



Reactant

Table 764: Properties of each reactant.

Id	Name	SBO
c171	(ErbB1:ErbB2)_P:GAP:Shc	

Product

Table 765: Properties of each product.

Id	Name	SBO
c180	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{380} = k23 \cdot c171 - kd23 \cdot c180 \tag{782}$$

8.381 Reaction v390

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

**Name** v390 (ErbB1:ErbB3)#P:GAP:Shc + -> (ErbB1:ErbB3)#P:GAP:(Shc#P) k23 kd23

Reaction equation



Reactant

Table 766: Properties of each reactant.

Id	Name	SBO
c172	(ErbB1:ErbB3)_P:GAP:Shc	

### Product

Table 767: Properties of each product.

Id	Name	SBO
c181	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{381} = k_{23} \cdot c_{172} - k_{d23} \cdot c_{181} \quad (784)$$

### 8.382 Reaction v391

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

**Name** v391 (ErbB1:ErbB4)#P:GAP:Shc + -> (ErbB1:ErbB4)#P:GAP:(Shc#P) k23 kd23

### Reaction equation



### Reactant

Table 768: Properties of each reactant.

Id	Name	SBO
c173	(ErbB1:ErbB4)_P:GAP:Shc	

### Product

Table 769: Properties of each product.

Id	Name	SBO
c182	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{382} = k_{23} \cdot c_{173} - k_{d23} \cdot c_{182} \quad (786)$$

### 8.383 Reaction v392

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

**Name** v392 (ErbB1:ErbB2)#P:GAP:Shc + -> (ErbB1:ErbB2)#P:GAP:(Shc#P) k23 kd23

### Reaction equation



### Reactant

Table 770: Properties of each reactant.

Id	Name	SBO
c174	(ErbB1:ErbB2)_P:GAP:Shc	

### Product

Table 771: Properties of each product.

Id	Name	SBO
c183	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{383} = k_{23} \cdot c_{174} - k_{d23} \cdot c_{183} \quad (788)$$

### 8.384 Reaction v393

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

**Name** v393 (ErbB1:ErbB3)#P:GAP:Shc + -> (ErbB1:ErbB3)#P:GAP:(Shc#P) k23 kd23

### Reaction equation



Reactant

Table 772: Properties of each reactant.

Id	Name	SBO
c175	(ErbB1:ErbB3)_P:GAP:Shc	

Product

Table 773: Properties of each product.

Id	Name	SBO
c184	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{384} = k_{23} \cdot c_{175} - k_{d23} \cdot c_{184} \tag{790}$$

8.385 Reaction v394

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

**Name** v394 (ErbB1:ErbB4)#P:GAP:Shc + -> (ErbB1:ErbB4)#P:GAP:(Shc#P) k23 kd23

Reaction equation



Reactant

Table 774: Properties of each reactant.

Id	Name	SBO
c176	(ErbB1:ErbB4)_P:GAP:Shc	

Product



Table 775: Properties of each product.

Id	Name	SBO
c185	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{385} = k_{23} \cdot c_{176} - k_{d23} \cdot c_{185} \quad (792)$$

### 8.386 Reaction v395

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

**Name** v395 Sos + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

### Reaction equation



### Reactants

Table 776: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c34	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

### Product

Table 777: Properties of each product.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{386} = k_{25} \cdot c_{24} \cdot c_{34} - k_{d25} \cdot c_{35} \quad (794)$$

### 8.387 Reaction v396

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

**Name** v396 Sos + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

#### Reaction equation



#### Reactants

Table 778: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

#### Product

Table 779: Properties of each product.

Id	Name	SBO
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

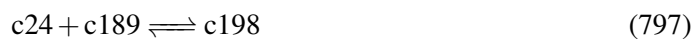
$$v_{387} = k25 \cdot c24 \cdot c65 - kd25 \cdot c66 \quad (796)$$

### 8.388 Reaction v397

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

**Name** v397 Sos + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

#### Reaction equation



#### Reactants

Table 780: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c189	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

## Product

Table 781: Properties of each product.

Id	Name	SBO
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{388} = k_{25} \cdot c_{24} \cdot c_{189} - k_{d25} \cdot c_{198} \quad (798)$$

## 8.389 Reaction v398

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

**Name** v398 Sos + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

## Reaction equation



## Reactants

Table 782: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c190	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

## Product

Table 783: Properties of each product.

Id	Name	SBO
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{389} = k_{25} \cdot c_{24} \cdot c_{190} - k_{d25} \cdot c_{199} \quad (800)$$

### 8.390 Reaction v399

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

**Name** v399 Sos + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

### Reaction equation



### Reactants

Table 784: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c191	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

### Product

Table 785: Properties of each product.

Id	Name	SBO
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{390} = k_{25} \cdot c_{24} \cdot c_{191} - k_{d25} \cdot c_{200} \quad (802)$$

### 8.391 Reaction v400

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

**Name** v400 Sos + (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

#### Reaction equation



#### Reactants

Table 786: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c192	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

#### Product

Table 787: Properties of each product.

Id	Name	SBO
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{391} = k25 \cdot c24 \cdot c192 - kd25 \cdot c201 \quad (804)$$

### 8.392 Reaction v401

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

**Name** v401 Sos + (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

#### Reaction equation



#### Reactants

Table 788: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c193	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

## Product

Table 789: Properties of each product.

Id	Name	SBO
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{392} = k_{25} \cdot c_{24} \cdot c_{193} - k_{d25} \cdot c_{202} \quad (806)$$

### 8.393 Reaction v402

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

**Name** v402 Sos + (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos  
k<sub>25</sub> k<sub>d25</sub>

## Reaction equation



## Reactants

Table 790: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c194	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

## Product

Table 791: Properties of each product.

Id	Name	SBO
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{393} = k_{25} \cdot c_{24} \cdot c_{194} - k_{d25} \cdot c_{203} \quad (808)$$

### 8.394 Reaction v403

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

**Name** v403 Sos + 2(ErbB2)#P:GAP:(Shc#P):Grb2 -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k25  
kd25

### Reaction equation



### Reactants

Table 792: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c300	2(ErbB2)_P:GAP:(Shc_P):Grb2	

### Product

Table 793: Properties of each product.

Id	Name	SBO
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{394} = k_{25} \cdot c_{24} \cdot c_{300} - k_{d25} \cdot c_{303} \quad (810)$$

### 8.395 Reaction v404

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

**Name** v404 Sos + 2(ErbB2)#P:GAP:(Shc#P):Grb2 -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k25  
kd25

#### Reaction equation



#### Reactants

Table 794: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c302	2(ErbB2)_P:GAP:(Shc_P):Grb2	

#### Product

Table 795: Properties of each product.

Id	Name	SBO
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{395} = k25 \cdot c24 \cdot c302 - kd25 \cdot c305 \quad (812)$$

### 8.396 Reaction v405

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

**Name** v405 Sos + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

#### Reaction equation



#### Reactants



Table 796: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c360	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

## Product

Table 797: Properties of each product.

Id	Name	SBO
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{396} = k_{25} \cdot c_{24} \cdot c_{360} - k_{d25} \cdot c_{366} \quad (814)$$

## 8.397 Reaction v406

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

**Name** v406 Sos + (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

## Reaction equation



## Reactants

Table 798: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c362	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

## Product

Table 799: Properties of each product.

Id	Name	SBO
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{397} = k_{25} \cdot c_{24} \cdot c_{362} - k_{d25} \cdot c_{368} \quad (816)$$

### 8.398 Reaction v407

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

**Name** v407 Sos + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k<sub>25</sub> k<sub>d25</sub>

### Reaction equation



### Reactants

Table 800: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c357	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

### Product

Table 801: Properties of each product.

Id	Name	SBO
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{398} = k_{25} \cdot c_{24} \cdot c_{357} - k_{d25} \cdot c_{363} \quad (818)$$

### 8.399 Reaction v408

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

**Name** v408 Sos + (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k25 kd25

#### Reaction equation



#### Reactants

Table 802: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c359	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

#### Product

Table 803: Properties of each product.

Id	Name	SBO
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{399} = k25 \cdot c24 \cdot c359 - kd25 \cdot c365 \quad (820)$$

### 8.400 Reaction v409

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

**Name** v409 Ras:GTP + Raf -> Raf:Ras:GTP k28 kd28

#### Reaction equation



#### Reactants

Table 804: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c41	Raf	

## Product

Table 805: Properties of each product.

Id	Name	SBO
c42	Raf:Ras:GTP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{400} = k_{28} \cdot c_{28} \cdot c_{41} - k_{d28} \cdot c_{42} \quad (822)$$

## 8.401 Reaction v410

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

**Name** v410 (Ras:GTP)<sub>i</sub> + Raf -> (Raf:Ras:GTP)<sub>i</sub> k<sub>28</sub> k<sub>d28</sub>

## Reaction equation



## Reactants

Table 806: Properties of each reactant.

Id	Name	SBO
c69	(Ras:GTP) <sub>i</sub>	
c41	Raf	

## Product

Table 807: Properties of each product.

Id	Name	SBO
c70	(Raf:Ras:GTP)_i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{401} = k_{28} \cdot c_{69} \cdot c_{41} - k_{d28} \cdot c_{70} \quad (824)$$

**8.402 Reaction v411**

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

**Name** v411 (Ras\_activated:GTP)\_i + (Raf#P)\_i -> (Raf:Ras:GTP)\_i k29 kd29**Reaction equation****Reactants**

Table 808: Properties of each reactant.

Id	Name	SBO
c71	(Ras_activated:GTP)_i	
c72	(Raf_P)_i	

**Product**

Table 809: Properties of each product.

Id	Name	SBO
c70	(Raf:Ras:GTP)_i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{402} = k_{29} \cdot c_{71} \cdot c_{72} - k_{d29} \cdot c_{70} \quad (826)$$

8.403 Reaction v412

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

**Name** v412 Ras\_activated:GTP + Raf#P -> Raf:Ras:GTP k29 kd29

Reaction equation



Reactants

Table 810: Properties of each reactant.

Id	Name	SBO
c43	Ras_activated:GTP	
c45	Raf_P	

Product

Table 811: Properties of each product.

Id	Name	SBO
c42	Raf:Ras:GTP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{403} = k29 \cdot c43 \cdot c45 - kd29 \cdot c42$$

(828)

8.404 Reaction v413

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

**Name** v413 2(EGF:ErbB1)#P:GAP + (Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

Reaction equation



Reactants

Table 812: Properties of each reactant.

Id	Name	SBO
c15	2(EGF:ErbB1)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product

Table 813: Properties of each product.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{404} = k_{32} \cdot c_{15} \cdot c_{38} - k_{d32} \cdot c_{35} \quad (830)$$

## 8.405 Reaction [v414](#)

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

**Name** [v414](#) 2(EGF:ErbB1)#P:GAP + (Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos  
 k32 kd32

## Reaction equation



## Reactants

Table 814: Properties of each reactant.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product

Table 815: Properties of each product.

Id	Name	SBO
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{405} = k_{32} \cdot c_{17} \cdot c_{38} - k_{d32} \cdot c_{66} \quad (832)$$

### 8.406 Reaction v415

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

**Name** v415 (ErbB1:ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

### Reaction equation

$$c_{151} + c_{38} \rightleftharpoons c_{198} \quad (833)$$

### Reactants

Table 816: Properties of each reactant.

Id	Name	SBO
c151	(ErbB1:ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

### Product

Table 817: Properties of each product.

Id	Name	SBO
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{406} = k_{32} \cdot c_{151} \cdot c_{38} - k_{d32} \cdot c_{198} \quad (834)$$



### 8.407 Reaction v416

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

**Name** v416 (ErbB1:ErbB3)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

#### Reaction equation



#### Reactants

Table 818: Properties of each reactant.

Id	Name	SBO
c152	(ErbB1:ErbB3)_P:GAP	
c38	(Shc_P):Grb2:Sos	

#### Product

Table 819: Properties of each product.

Id	Name	SBO
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{407} = k32 \cdot c152 \cdot c38 - kd32 \cdot c199 \quad (836)$$

### 8.408 Reaction v417

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

**Name** v417 (ErbB1:ErbB4)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

#### Reaction equation



#### Reactants

Table 820: Properties of each reactant.

Id	Name	SBO
c153	(ErbB1:ErbB4)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product

Table 821: Properties of each product.

Id	Name	SBO
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{408} = k_{32} \cdot c_{153} \cdot c_{38} - k_{d32} \cdot c_{200} \quad (838)$$

### 8.409 Reaction v418

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

**Name** v418 (ErbB1:ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

## Reaction equation



## Reactants

Table 822: Properties of each reactant.

Id	Name	SBO
c165	(ErbB1:ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product

Table 823: Properties of each product.

Id	Name	SBO
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{409} = k_{32} \cdot c_{165} \cdot c_{38} - k_{d32} \cdot c_{201} \quad (840)$$

### 8.410 Reaction v419

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

**Name** v419 (ErbB1:ErbB3)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

### Reaction equation



### Reactants

Table 824: Properties of each reactant.

Id	Name	SBO
c166	(ErbB1:ErbB3)_P:GAP	
c38	(Shc_P):Grb2:Sos	

### Product

Table 825: Properties of each product.

Id	Name	SBO
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{410} = k_{32} \cdot c_{166} \cdot c_{38} - k_{d32} \cdot c_{202} \quad (842)$$

### 8.411 Reaction v420

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

**Name** v420 (ErbB1:ErbB4)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

#### Reaction equation



#### Reactants

Table 826: Properties of each reactant.

Id	Name	SBO
c167	(ErbB1:ErbB4)_P:GAP	
c38	(Shc_P):Grb2:Sos	

#### Product

Table 827: Properties of each product.

Id	Name	SBO
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

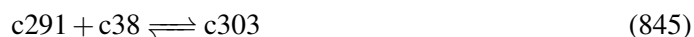
$$v_{411} = k32 \cdot c167 \cdot c38 - kd32 \cdot c203 \quad (844)$$

### 8.412 Reaction v421

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

**Name** v421 2(ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k32  
kd32

#### Reaction equation



#### Reactants

Table 828: Properties of each reactant.

Id	Name	SBO
c291	2(ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product

Table 829: Properties of each product.

Id	Name	SBO
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

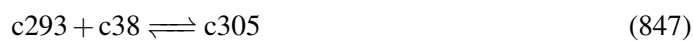
$$v_{412} = k_{32} \cdot c_{291} \cdot c_{38} - k_{d32} \cdot c_{303} \quad (846)$$

### 8.413 Reaction v422

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

**Name** v422 2(ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k32  
kd32

## Reaction equation



## Reactants

Table 830: Properties of each reactant.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product

Table 831: Properties of each product.

Id	Name	SBO
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{413} = k_{32} \cdot c_{293} \cdot c_{38} - k_{d32} \cdot c_{305} \quad (848)$$

### 8.414 Reaction v423

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

**Name** v423 (ErbB3:ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

### Reaction equation



### Reactants

Table 832: Properties of each reactant.

Id	Name	SBO
c341	(ErbB3:ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

### Product

Table 833: Properties of each product.

Id	Name	SBO
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

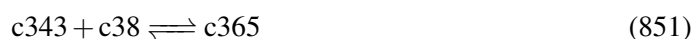
$$v_{414} = k_{32} \cdot c_{341} \cdot c_{38} - k_{d32} \cdot c_{363} \quad (850)$$

### 8.415 Reaction v424

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

**Name** v424 (ErbB3:ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

#### Reaction equation



#### Reactants

Table 834: Properties of each reactant.

Id	Name	SBO
c343	(ErbB3:ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

#### Product

Table 835: Properties of each product.

Id	Name	SBO
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{415} = k32 \cdot c343 \cdot c38 - kd32 \cdot c365 \quad (852)$$

### 8.416 Reaction v425

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

**Name** v425 (ErbB4:ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

#### Reaction equation



#### Reactants

Table 836: Properties of each reactant.

Id	Name	SBO
c344	(ErbB4:ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product

Table 837: Properties of each product.

Id	Name	SBO
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{416} = k_{32} \cdot c_{344} \cdot c_{38} - k_{d32} \cdot c_{366} \quad (854)$$

## 8.417 Reaction v426

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

**Name** v426 (ErbB4:ErbB2)#P:GAP + (Shc#P):Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k32 kd32

## Reaction equation



## Reactants

Table 838: Properties of each reactant.

Id	Name	SBO
c346	(ErbB4:ErbB2)_P:GAP	
c38	(Shc_P):Grb2:Sos	

## Product



Table 839: Properties of each product.

Id	Name	SBO
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{417} = k_{32} \cdot c_{346} \cdot c_{38} - k_{d32} \cdot c_{368} \quad (856)$$

### 8.418 Reaction [v427](#)

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

**Name** [v427](#) (Shc#P) + Grb2:Sos -> (Shc#P):Grb2:Sos [k33](#) [kd33](#)

### Reaction equation



### Reactants

Table 840: Properties of each reactant.

Id	Name	SBO
c40	(Shc_P)	
c30	Grb2:Sos	

### Product

Table 841: Properties of each product.

Id	Name	SBO
c38	(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{418} = k_{33} \cdot c_{40} \cdot c_{30} - k_{d33} \cdot c_{38} \quad (858)$$

8.419 Reaction v428

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

**Name** v428 2(EGF:ErbB1)#P:GAP + Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k34 kd34

Reaction equation



Reactants

Table 842: Properties of each reactant.

Id	Name	SBO
c15	2(EGF:ErbB1)_P:GAP	
c30	Grb2:Sos	

Product

Table 843: Properties of each product.

Id	Name	SBO
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{419} = k34 \cdot c15 \cdot c30 - kd34 \cdot c25$$

(860)

8.420 Reaction v429

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

**Name** v429 2(EGF:ErbB1)#P:GAP + Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos k34 kd34

Reaction equation



Reactants

Table 844: Properties of each reactant.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	
c30	Grb2:Sos	

## Product

Table 845: Properties of each product.

Id	Name	SBO
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{420} = k_{34} \cdot c_{17} \cdot c_{30} - k_{d34} \cdot c_{19} \quad (862)$$

### 8.421 Reaction v430

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

**Name** v430 (ErbB1:ErbB2)#P:GAP + Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k34 kd34

## Reaction equation



## Reactants

Table 846: Properties of each reactant.

Id	Name	SBO
c151	(ErbB1:ErbB2)_P:GAP	
c30	Grb2:Sos	

## Product

Table 847: Properties of each product.

Id	Name	SBO
c234	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{421} = k_{34} \cdot c_{151} \cdot c_{30} - k_{d34} \cdot c_{234} \quad (864)$$

### 8.422 Reaction v431

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

**Name** v431 (ErbB1:ErbB3)#P:GAP + Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k34 kd34

### Reaction equation



### Reactants

Table 848: Properties of each reactant.

Id	Name	SBO
c152	(ErbB1:ErbB3)_P:GAP	
c30	Grb2:Sos	

### Product

Table 849: Properties of each product.

Id	Name	SBO
c235	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{422} = k_{34} \cdot c_{152} \cdot c_{30} - k_{d34} \cdot c_{235} \quad (866)$$

### 8.423 Reaction v432

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

**Name** v432 (ErbB1:ErbB4)#P:GAP + Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k34 kd34

#### Reaction equation



#### Reactants

Table 850: Properties of each reactant.

Id	Name	SBO
c153	(ErbB1:ErbB4)_P:GAP	
c30	Grb2:Sos	

#### Product

Table 851: Properties of each product.

Id	Name	SBO
c236	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{423} = k34 \cdot c153 \cdot c30 - kd34 \cdot c236 \quad (868)$$

### 8.424 Reaction v433

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

**Name** v433 (ErbB1:ErbB2)#P:GAP + Grb2:Sos -> (ErbB1:ErbB2)#P:GAP:Grb2:Sos k34 kd34

#### Reaction equation



#### Reactants

Table 852: Properties of each reactant.

Id	Name	SBO
c165	(ErbB1:ErbB2)_P:GAP	
c30	Grb2:Sos	

### Product

Table 853: Properties of each product.

Id	Name	SBO
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{424} = k_{34} \cdot c_{165} \cdot c_{30} - k_{d34} \cdot c_{237} \quad (870)$$

### 8.425 Reaction v434

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

**Name** v434 (ErbB1:ErbB3)#P:GAP + Grb2:Sos -> (ErbB1:ErbB3)#P:GAP:Grb2:Sos k34 kd34

### Reaction equation



### Reactants

Table 854: Properties of each reactant.

Id	Name	SBO
c166	(ErbB1:ErbB3)_P:GAP	
c30	Grb2:Sos	

### Product

Table 855: Properties of each product.

Id	Name	SBO
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{425} = k_{34} \cdot c_{166} \cdot c_{30} - k_{d34} \cdot c_{238} \quad (872)$$

### 8.426 Reaction v435

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

**Name** v435 (ErbB1:ErbB4)#P:GAP + Grb2:Sos -> (ErbB1:ErbB4)#P:GAP:Grb2:Sos k34 kd34

### Reaction equation



### Reactants

Table 856: Properties of each reactant.

Id	Name	SBO
c167	(ErbB1:ErbB4)_P:GAP	
c30	Grb2:Sos	

### Product

Table 857: Properties of each product.

Id	Name	SBO
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{426} = k_{34} \cdot c_{167} \cdot c_{30} - k_{d34} \cdot c_{239} \quad (874)$$

### 8.427 Reaction v436

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

**Name** v436 2(ErbB2)#P:GAP + Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos k34 kd34

#### Reaction equation



#### Reactants

Table 858: Properties of each reactant.

Id	Name	SBO
c291	2(ErbB2)_P:GAP	
c30	Grb2:Sos	

#### Product

Table 859: Properties of each product.

Id	Name	SBO
c315	2(ErbB2)_P:GAP:Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{427} = k34 \cdot c291 \cdot c30 - kd34 \cdot c315 \quad (876)$$

### 8.428 Reaction v437

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

**Name** v437 2(ErbB2)#P:GAP + Grb2:Sos -> 2(ErbB2)#P:GAP:Grb2:Sos k34 kd34

#### Reaction equation



#### Reactants



Table 860: Properties of each reactant.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	
c30	Grb2:Sos	

### Product

Table 861: Properties of each product.

Id	Name	SBO
c317	2(ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{428} = k_{34} \cdot c_{293} \cdot c_{30} - k_{d34} \cdot c_{317} \quad (878)$$

### 8.429 Reaction v438

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

**Name** v438 (ErbB3:ErbB2)#P:GAP + Grb2:Sos -> (ErbB3:ErbB2)#P:GAP:Grb2:Sos k34 kd34

### Reaction equation



### Reactants

Table 862: Properties of each reactant.

Id	Name	SBO
c341	(ErbB3:ErbB2)_P:GAP	
c30	Grb2:Sos	

### Product

Table 863: Properties of each product.

Id	Name	SBO
c387	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

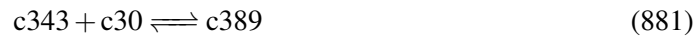
$$v_{429} = k_{34} \cdot c_{341} \cdot c_{30} - k_{d34} \cdot c_{387} \quad (880)$$

### 8.430 Reaction $v_{439}$

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

**Name**  $v_{439}$  (ErbB3:ErbB2)#P:GAP + Grb2:Sos  $\rightarrow$  (ErbB3:ErbB2)#P:GAP:Grb2:Sos  $k_{34}$   $k_{d34}$

### Reaction equation



### Reactants

Table 864: Properties of each reactant.

Id	Name	SBO
c343	(ErbB3:ErbB2)_P:GAP	
c30	Grb2:Sos	

### Product

Table 865: Properties of each product.

Id	Name	SBO
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{430} = k_{34} \cdot c_{343} \cdot c_{30} - k_{d34} \cdot c_{389} \quad (882)$$

### 8.431 Reaction v440

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

**Name** v440 (ErbB4:ErbB2)#P:GAP + Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos k34 kd34

#### Reaction equation



#### Reactants

Table 866: Properties of each reactant.

Id	Name	SBO
c344	(ErbB4:ErbB2)_P:GAP	
c30	Grb2:Sos	

#### Product

Table 867: Properties of each product.

Id	Name	SBO
c390	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{431} = k34 \cdot c344 \cdot c30 - kd34 \cdot c390 \quad (884)$$

### 8.432 Reaction v441

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

**Name** v441 (ErbB4:ErbB2)#P:GAP + Grb2:Sos -> (ErbB4:ErbB2)#P:GAP:Grb2:Sos k34 kd34

#### Reaction equation



#### Reactants

Table 868: Properties of each reactant.

Id	Name	SBO
c346	(ErbB4:ErbB2)_P:GAP	
c30	Grb2:Sos	

## Product

Table 869: Properties of each product.

Id	Name	SBO
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{432} = k_{34} \cdot c_{346} \cdot c_{30} - k_{d34} \cdot c_{392} \quad (886)$$

### 8.433 Reaction $v_{442}$

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

**Name**  $v_{442}$  Sos + Grb2  $\rightarrow$  Grb2:Sos  $k_{35}$   $k_{d35}$

## Reaction equation



## Reactants

Table 870: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c22	Grb2	

## Product

Table 871: Properties of each product.

Id	Name	SBO
c30	Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{433} = k_{35} \cdot c_{24} \cdot c_{22} - k_{d35} \cdot c_{30} \quad (888)$$

#### 8.434 Reaction $v_{443}$

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

**Name**  $v_{443}$  (Shc#P) + -> Shc k36 kd36

#### Reaction equation



#### Reactant

Table 872: Properties of each reactant.

Id	Name	SBO
c40	(Shc_P)	

#### Product

Table 873: Properties of each product.

Id	Name	SBO
c31	Shc	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{434} = k_{36} \cdot c_{40} - k_{d36} \cdot c_{31} \quad (890)$$

### 8.435 Reaction v444

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

**Name** v444 2(EGF:ErbB1)#P:GAP + (Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P) k37 kd37

#### Reaction equation



#### Reactants

Table 874: Properties of each reactant.

Id	Name	SBO
c15	2(EGF:ErbB1)_P:GAP	
c40	(Shc_P)	

#### Product

Table 875: Properties of each product.

Id	Name	SBO
c33	2(EGF:ErbB1)_P:GAP:(Shc_P)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{435} = k37 \cdot c15 \cdot c40 - kd37 \cdot c33 \quad (892)$$

### 8.436 Reaction v445

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

**Name** v445 2(EGF:ErbB1)#P:GAP + (Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2  
k37 kd37

#### Reaction equation



#### Reactants

Table 876: Properties of each reactant.

Id	Name	SBO
c15	2(EGF:ErbB1)_P:GAP	
c39	(Shc_P):Grb2	

## Product

Table 877: Properties of each product.

Id	Name	SBO
c34	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{436} = k_{37} \cdot c_{15} \cdot c_{39} - k_{d37} \cdot c_{34} \quad (894)$$

## 8.437 Reaction v446

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

**Name** v446 2(EGF:ErbB1)#P:GAP + (Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P) k37 kd37

## Reaction equation



## Reactants

Table 878: Properties of each reactant.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	
c40	(Shc_P)	

## Product

Table 879: Properties of each product.

Id	Name	SBO
c64	2(EGF:ErbB1)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{437} = k_{37} \cdot c_{17} \cdot c_{40} - k_{d37} \cdot c_{64} \quad (896)$$

### 8.438 Reaction v447

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

**Name** v447 2(EGF:ErbB1)#P:GAP + (Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2  
k37 kd37

### Reaction equation



### Reactants

Table 880: Properties of each reactant.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	
c39	(Shc_P):Grb2	

### Product

Table 881: Properties of each product.

Id	Name	SBO
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{438} = k_{37} \cdot c_{17} \cdot c_{39} - k_{d37} \cdot c_{65} \quad (898)$$



8.439 Reaction v448

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

**Name** v448 (ErbB1:ErbB2)#P:GAP + (Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P) k37 kd37

Reaction equation



Reactants

Table 882: Properties of each reactant.		
Id	Name	SBO
c151	(ErbB1:ErbB2)_P:GAP	
c40	(Shc_P)	

Product

Table 883: Properties of each product.		
Id	Name	SBO
c180	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{439} = k37 \cdot c151 \cdot c40 - kd37 \cdot c180 \tag{900}$$

8.440 Reaction v449

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

**Name** v449 (ErbB1:ErbB3)#P:GAP + (Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P) k37 kd37

Reaction equation



Reactants

Table 884: Properties of each reactant.

Id	Name	SBO
c152	(ErbB1:ErbB3)_P:GAP	
c40	(Shc_P)	

## Product

Table 885: Properties of each product.

Id	Name	SBO
c181	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{440} = k_{37} \cdot c_{152} \cdot c_{40} - k_{d37} \cdot c_{181} \quad (902)$$

### 8.441 Reaction v450

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

**Name** v450 (ErbB1:ErbB4)#P:GAP + (Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P) k37 kd37

## Reaction equation



## Reactants

Table 886: Properties of each reactant.

Id	Name	SBO
c153	(ErbB1:ErbB4)_P:GAP	
c40	(Shc_P)	

## Product

Table 887: Properties of each product.

Id	Name	SBO
c182	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

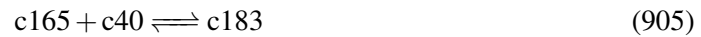
$$v_{441} = k_{37} \cdot c_{153} \cdot c_{40} - k_{d37} \cdot c_{182} \quad (904)$$

### 8.442 Reaction v451

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

**Name** v451 (ErbB1:ErbB2)#P:GAP + (Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P) k37 kd37

### Reaction equation



### Reactants

Table 888: Properties of each reactant.

Id	Name	SBO
c165	(ErbB1:ErbB2)_P:GAP	
c40	(Shc_P)	

### Product

Table 889: Properties of each product.

Id	Name	SBO
c183	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{442} = k_{37} \cdot c_{165} \cdot c_{40} - k_{d37} \cdot c_{183} \quad (906)$$

### 8.443 Reaction v452

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

**Name** v452 (ErbB1:ErbB3)#P:GAP + (Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P) k37 kd37

#### Reaction equation



#### Reactants

Table 890: Properties of each reactant.

Id	Name	SBO
c166	(ErbB1:ErbB3)_P:GAP	
c40	(Shc_P)	

#### Product

Table 891: Properties of each product.

Id	Name	SBO
c184	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{443} = k37 \cdot c166 \cdot c40 - kd37 \cdot c184 \quad (908)$$

### 8.444 Reaction v453

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

**Name** v453 (ErbB1:ErbB4)#P:GAP + (Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P) k37 kd37

#### Reaction equation



#### Reactants

Table 892: Properties of each reactant.

Id	Name	SBO
c167	(ErbB1:ErbB4)_P:GAP	
c40	(Shc_P)	

## Product

Table 893: Properties of each product.

Id	Name	SBO
c185	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{444} = k_{37} \cdot c_{167} \cdot c_{40} - k_{d37} \cdot c_{185} \quad (910)$$

### 8.445 Reaction v454

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

**Name** v454 (ErbB1:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2  
k37 kd37

## Reaction equation

$$c_{151} + c_{39} \rightleftharpoons c_{189} \quad (911)$$

## Reactants

Table 894: Properties of each reactant.

Id	Name	SBO
c151	(ErbB1:ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

## Product

Table 895: Properties of each product.

Id	Name	SBO
c189	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{445} = k_{37} \cdot c_{151} \cdot c_{39} - k_{d37} \cdot c_{189} \quad (912)$$

### 8.446 Reaction v455

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

**Name** v455 (ErbB1:ErbB3)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2  
k37 kd37

### Reaction equation



### Reactants

Table 896: Properties of each reactant.

Id	Name	SBO
c152	(ErbB1:ErbB3)_P:GAP	
c39	(Shc_P):Grb2	

### Product

Table 897: Properties of each product.

Id	Name	SBO
c190	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{446} = k_{37} \cdot c_{152} \cdot c_{39} - k_{d37} \cdot c_{190} \quad (914)$$

8.447 Reaction v456

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

**Name** v456 (ErbB1:ErbB4)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2  
k37 kd37

Reaction equation



Reactants

Table 898: Properties of each reactant.		
Id	Name	SBO
c153	(ErbB1:ErbB4)_P:GAP	
c39	(Shc_P):Grb2	

Product

Table 899: Properties of each product.		
Id	Name	SBO
c191	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{447} = k37 \cdot c153 \cdot c39 - kd37 \cdot c191 \tag{916}$$

8.448 Reaction v457

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

**Name** v457 (ErbB1:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2  
k37 kd37

Reaction equation



Reactants

Table 900: Properties of each reactant.

Id	Name	SBO
c165	(ErbB1:ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

## Product

Table 901: Properties of each product.

Id	Name	SBO
c192	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{448} = k_{37} \cdot c_{165} \cdot c_{39} - k_{d37} \cdot c_{192} \quad (918)$$

### 8.449 Reaction v458

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

**Name** v458 (ErbB1:ErbB3)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2  
k37 kd37

## Reaction equation



## Reactants

Table 902: Properties of each reactant.

Id	Name	SBO
c166	(ErbB1:ErbB3)_P:GAP	
c39	(Shc_P):Grb2	

## Product



Table 903: Properties of each product.

Id	Name	SBO
c193	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{449} = k_{37} \cdot c_{166} \cdot c_{39} - k_{d37} \cdot c_{193} \quad (920)$$

### 8.450 Reaction v459

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

**Name** v459 (ErbB1:ErbB4)#P:GAP + (Shc#P):Grb2 -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2  
k<sub>37</sub> k<sub>d37</sub>

### Reaction equation



### Reactants

Table 904: Properties of each reactant.

Id	Name	SBO
c167	(ErbB1:ErbB4)_P:GAP	
c39	(Shc_P):Grb2	

### Product

Table 905: Properties of each product.

Id	Name	SBO
c194	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{450} = k_{37} \cdot c_{167} \cdot c_{39} - k_{d37} \cdot c_{194} \quad (922)$$

8.451 Reaction v460

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

**Name** v460 2(ErbB2)#P:GAP + (Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P) k37 kd37

Reaction equation



Reactants

Table 906: Properties of each reactant.

Id	Name	SBO
c291	2(ErbB2)_P:GAP	
c40	(Shc_P)	

Product

Table 907: Properties of each product.

Id	Name	SBO
c297	2(ErbB2)_P:GAP:(Shc_P)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{451} = k37 \cdot c291 \cdot c40 - kd37 \cdot c297$$

(924)

8.452 Reaction v461

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

**Name** v461 2(ErbB2)#P:GAP + (Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P) k37 kd37

Reaction equation



Reactants

Table 908: Properties of each reactant.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	
c40	(Shc_P)	

## Product

Table 909: Properties of each product.

Id	Name	SBO
c299	2(ErbB2)_P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{452} = k_{37} \cdot c_{293} \cdot c_{40} - k_{d37} \cdot c_{299} \quad (926)$$

### 8.453 Reaction v462

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

**Name** v462 2(ErbB2)#P:GAP + (Shc#P):Grb2 -> 2(ErbB2)#P:GAP:(Shc#P):Grb2 k37 kd37

## Reaction equation



## Reactants

Table 910: Properties of each reactant.

Id	Name	SBO
c291	2(ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

## Product

Table 911: Properties of each product.

Id	Name	SBO
c300	2(ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{453} = k_{37} \cdot c_{291} \cdot c_{39} - k_{d37} \cdot c_{300} \quad (928)$$

### 8.454 Reaction v463

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

**Name** v463 2(ErbB2)#P:GAP + (Shc#P):Grb2 -> 2(ErbB2)#P:GAP:(Shc#P):Grb2 k37 kd37

### Reaction equation



### Reactants

Table 912: Properties of each reactant.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

### Product

Table 913: Properties of each product.

Id	Name	SBO
c302	2(ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{454} = k_{37} \cdot c_{293} \cdot c_{39} - k_{d37} \cdot c_{302} \quad (930)$$

### 8.455 Reaction v464

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

**Name** v464 (ErbB3:ErbB2)#P:GAP + (Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P) k37 kd37

#### Reaction equation



#### Reactants

Table 914: Properties of each reactant.

Id	Name	SBO
c341	(ErbB3:ErbB2)_P:GAP	
c40	(Shc_P)	

#### Product

Table 915: Properties of each product.

Id	Name	SBO
c351	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{455} = k37 \cdot c341 \cdot c40 - kd37 \cdot c351 \quad (932)$$

### 8.456 Reaction v465

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

**Name** v465 (ErbB3:ErbB2)#P:GAP + (Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P) k37 kd37

#### Reaction equation



#### Reactants

Table 916: Properties of each reactant.

Id	Name	SBO
c343	(ErbB3:ErbB2)_P:GAP	
c40	(Shc_P)	

## Product

Table 917: Properties of each product.

Id	Name	SBO
c353	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{456} = k_{37} \cdot c_{343} \cdot c_{40} - k_{d37} \cdot c_{353} \quad (934)$$

## 8.457 Reaction v466

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

**Name** v466 (ErbB4:ErbB2)#P:GAP + (Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P) k37 kd37

## Reaction equation



## Reactants

Table 918: Properties of each reactant.

Id	Name	SBO
c344	(ErbB4:ErbB2)_P:GAP	
c40	(Shc_P)	

## Product

Table 919: Properties of each product.

Id	Name	SBO
c354	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{457} = k_{37} \cdot c_{344} \cdot c_{40} - k_{d37} \cdot c_{354} \quad (936)$$

### 8.458 Reaction v467

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

**Name** v467 (ErbB4:ErbB2)#P:GAP + (Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P) k37 kd37

### Reaction equation



### Reactants

Table 920: Properties of each reactant.

Id	Name	SBO
c346	(ErbB4:ErbB2)_P:GAP	
c40	(Shc_P)	

### Product

Table 921: Properties of each product.

Id	Name	SBO
c356	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{458} = k_{37} \cdot c_{346} \cdot c_{40} - k_{d37} \cdot c_{356} \quad (938)$$

8.459 Reaction v468

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

**Name** v468 (ErbB3:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2  
k37 kd37

Reaction equation



Reactants

Table 922: Properties of each reactant.		
Id	Name	SBO
c341	(ErbB3:ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

Product

Table 923: Properties of each product.		
Id	Name	SBO
c357	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

Kinetic Law

**Derived unit** contains undeclared units

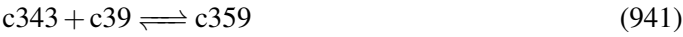
$$v_{459} = k37 \cdot c341 \cdot c39 - kd37 \cdot c357 \tag{940}$$

8.460 Reaction v469

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

**Name** v469 (ErbB3:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2  
k37 kd37

Reaction equation



Reactants



Table 924: Properties of each reactant.

Id	Name	SBO
c343	(ErbB3:ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

## Product

Table 925: Properties of each product.

Id	Name	SBO
c359	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{460} = k_{37} \cdot c_{343} \cdot c_{39} - k_{d37} \cdot c_{359} \quad (942)$$

### 8.461 Reaction v470

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

**Name** v470 (ErbB4:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2  
k37 k<sub>d37</sub>

## Reaction equation



## Reactants

Table 926: Properties of each reactant.

Id	Name	SBO
c344	(ErbB4:ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

## Product

Table 927: Properties of each product.

Id	Name	SBO
c360	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{461} = k_{37} \cdot c_{344} \cdot c_{39} - k_{d37} \cdot c_{360} \quad (944)$$

### 8.462 Reaction v471

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

**Name** v471 (ErbB4:ErbB2)#P:GAP + (Shc#P):Grb2 -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2  
k<sub>37</sub> k<sub>d37</sub>

### Reaction equation



### Reactants

Table 928: Properties of each reactant.

Id	Name	SBO
c346	(ErbB4:ErbB2)_P:GAP	
c39	(Shc_P):Grb2	

### Product

Table 929: Properties of each product.

Id	Name	SBO
c362	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

### Kinetic Law

**Derived unit** contains undeclared units

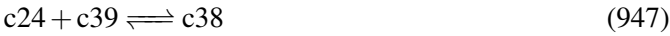
$$v_{462} = k_{37} \cdot c_{346} \cdot c_{39} - k_{d37} \cdot c_{362} \quad (946)$$

8.463 Reaction v472

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

**Name** v472 Sos + (Shc#P):Grb2 -> (Shc#P):Grb2:Sos k40 kd40

Reaction equation



Reactants

Table 930: Properties of each reactant.

Id	Name	SBO
c24	Sos	
c39	(Shc_P):Grb2	

Product

Table 931: Properties of each product.

Id	Name	SBO
c38	(Shc_P):Grb2:Sos	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{463} = k40 \cdot c24 \cdot c39 - kd40 \cdot c38$$

(948)

8.464 Reaction v473

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

**Name** v473 Grb2:Sos + 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

Reaction equation



Reactants

Table 932: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c33	2(EGF:ErbB1)_P:GAP:(Shc_P)	

## Product

Table 933: Properties of each product.

Id	Name	SBO
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{464} = k_{41} \cdot c_{30} \cdot c_{33} - k_{d41} \cdot c_{35} \quad (950)$$

## 8.465 Reaction v474

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

**Name** v474 Grb2:Sos + 2(EGF:ErbB1)#P:GAP:(Shc#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

## Reaction equation



## Reactants

Table 934: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c64	2(EGF:ErbB1)_P:GAP:(Shc_P)	

## Product

Table 935: Properties of each product.

Id	Name	SBO
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{465} = k_{41} \cdot c_{30} \cdot c_{64} - k_{d41} \cdot c_{66} \quad (952)$$

### 8.466 Reaction v475

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

**Name** v475 Grb2:Sos + (ErbB1:ErbB2)#P:GAP:(Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

### Reaction equation



### Reactants

Table 936: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c180	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

### Product

Table 937: Properties of each product.

Id	Name	SBO
c198	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{466} = k_{41} \cdot c_{30} \cdot c_{180} - k_{d41} \cdot c_{198} \quad (954)$$

8.467 Reaction v476

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

**Name** v476 Grb2:Sos + (ErbB1:ErbB3)#P:GAP:(Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

Reaction equation



Reactants

Table 938: Properties of each reactant.		
Id	Name	SBO
c30	Grb2:Sos	
c181	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

Product

Table 939: Properties of each product.		
Id	Name	SBO
c199	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{467} = k41 \cdot c30 \cdot c181 - kd41 \cdot c199 \tag{956}$$

8.468 Reaction v477

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

**Name** v477 Grb2:Sos + (ErbB1:ErbB4)#P:GAP:(Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

Reaction equation



Reactants

Table 940: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c182	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

## Product

Table 941: Properties of each product.

Id	Name	SBO
c200	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{468} = k_{41} \cdot c_{30} \cdot c_{182} - k_{d41} \cdot c_{200} \quad (958)$$

## 8.469 Reaction v478

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

**Name** v478 Grb2:Sos + (ErbB1:ErbB2)#P:GAP:(Shc#P) -> (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

## Reaction equation



## Reactants

Table 942: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c183	(ErbB1:ErbB2)_P:GAP:(Shc_P)	

## Product

Table 943: Properties of each product.

Id	Name	SBO
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{469} = k_{41} \cdot c_{30} \cdot c_{183} - k_{d41} \cdot c_{201} \quad (960)$$

### 8.470 Reaction v479

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

**Name** v479 Grb2:Sos + (ErbB1:ErbB3)#P:GAP:(Shc#P) -> (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

### Reaction equation



### Reactants

Table 944: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c184	(ErbB1:ErbB3)_P:GAP:(Shc_P)	

### Product

Table 945: Properties of each product.

Id	Name	SBO
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{470} = k_{41} \cdot c_{30} \cdot c_{184} - k_{d41} \cdot c_{202} \quad (962)$$



### 8.471 Reaction v480

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

**Name** v480 Grb2:Sos + (ErbB1:ErbB4)#P:GAP:(Shc#P) -> (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

#### Reaction equation



#### Reactants

Table 946: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c185	(ErbB1:ErbB4)_P:GAP:(Shc_P)	

#### Product

Table 947: Properties of each product.

Id	Name	SBO
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{471} = k41 \cdot c30 \cdot c185 - kd41 \cdot c203 \quad (964)$$

### 8.472 Reaction v481

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

**Name** v481 Grb2:Sos + 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k41  
kd41

#### Reaction equation



#### Reactants

Table 948: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c297	2(ErbB2)_P:GAP:(Shc_P)	

## Product

Table 949: Properties of each product.

Id	Name	SBO
c303	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{472} = k_{41} \cdot c_{30} \cdot c_{297} - k_{d41} \cdot c_{303} \quad (966)$$

### 8.473 Reaction v482

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

**Name** v482 Grb2:Sos + 2(ErbB2)#P:GAP:(Shc#P) -> 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos k41  
kd41

## Reaction equation



## Reactants

Table 950: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c299	2(ErbB2)_P:GAP:(Shc_P)	

## Product

Table 951: Properties of each product.

Id	Name	SBO
c305	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{473} = k_{41} \cdot c_{30} \cdot c_{299} - k_{d41} \cdot c_{305} \quad (968)$$

### 8.474 Reaction v483

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

**Name** v483 Grb2:Sos + (ErbB3:ErbB2)#P:GAP:(Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k<sub>41</sub> k<sub>d41</sub>

### Reaction equation



### Reactants

Table 952: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c351	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

### Product

Table 953: Properties of each product.

Id	Name	SBO
c363	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

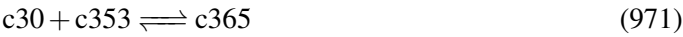
$$v_{474} = k_{41} \cdot c_{30} \cdot c_{351} - k_{d41} \cdot c_{363} \quad (970)$$

8.475 Reaction v484

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

**Name** v484 Grb2:Sos + (ErbB3:ErbB2)#P:GAP:(Shc#P) -> (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

Reaction equation



Reactants

Table 954: Properties of each reactant.		
Id	Name	SBO
c30	Grb2:Sos	
c353	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

Product

Table 955: Properties of each product.		
Id	Name	SBO
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{475} = k41 \cdot c30 \cdot c353 - kd41 \cdot c365 \tag{972}$$

8.476 Reaction v485

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

**Name** v485 Grb2:Sos + (ErbB4:ErbB2)#P:GAP:(Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

Reaction equation



Reactants

Table 956: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c354	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

## Product

Table 957: Properties of each product.

Id	Name	SBO
c366	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{476} = k_{41} \cdot c_{30} \cdot c_{354} - k_{d41} \cdot c_{366} \quad (974)$$

## 8.477 Reaction v486

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

**Name** v486 Grb2:Sos + (ErbB4:ErbB2)#P:GAP:(Shc#P) -> (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos  
k41 kd41

## Reaction equation



## Reactants

Table 958: Properties of each reactant.

Id	Name	SBO
c30	Grb2:Sos	
c356	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

## Product

Table 959: Properties of each product.

Id	Name	SBO
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{477} = k_{41} \cdot c_{30} \cdot c_{356} - k_{d41} \cdot c_{368} \quad (976)$$

### 8.478 Reaction v487

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

**Name** v487 Pase1 + (Raf#P)\_i -> (Raf#P:Pase1)\_i k42 kd42

### Reaction equation



### Reactants

Table 960: Properties of each reactant.

Id	Name	SBO
c44	Pase1	
c72	(Raf_P)_i	

### Product

Table 961: Properties of each product.

Id	Name	SBO
c73	(Raf_P:Pase1)_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{478} = k_{42} \cdot c_{44} \cdot c_{72} - k_{d42} \cdot c_{73} \quad (978)$$

### 8.479 Reaction v488

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

**Name** v488 Pase1 + Raf#P -> Raf#P:Pase1 k42 kd42

#### Reaction equation



#### Reactants

Table 962: Properties of each reactant.

Id	Name	SBO
c44	Pase1	
c45	Raf_P	

#### Product

Table 963: Properties of each product.

Id	Name	SBO
c46	Raf_P:Pase1	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{479} = k42 \cdot c44 \cdot c45 - kd42 \cdot c46 \quad (980)$$

### 8.480 Reaction v489

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

**Name** v489 Raf + Pase1 -> Raf#P:Pase1 k43 kd43

#### Reaction equation



#### Reactants

Table 964: Properties of each reactant.

Id	Name	SBO
c41	Raf	
c44	Pase1	

**Product**

Table 965: Properties of each product.

Id	Name	SBO
c46	Raf_P:Pase1	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{480} = k_{43} \cdot c_{41} \cdot c_{44} - k_{d43} \cdot c_{46} \quad (982)$$

**8.481 Reaction v490**

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

**Name** v490 Raf + Pase1 -> (Raf#P:Pase1).i k43 kd43**Reaction equation****Reactants**

Table 966: Properties of each reactant.

Id	Name	SBO
c41	Raf	
c44	Pase1	

**Product**



Table 967: Properties of each product.

Id	Name	SBO
c73	(Raf_P:Pase1)_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{481} = k_{43} \cdot c_{41} \cdot c_{44} - k_{d43} \cdot c_{73} \quad (984)$$

### 8.482 Reaction v491

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

**Name** v491 (Raf#P)\_i + (MEK#P)\_i -> (MEK#P:Raf#P)\_i k44 kd52

### Reaction equation



### Reactants

Table 968: Properties of each reactant.

Id	Name	SBO
c72	(Raf_P)_i	
c75	(MEK_P)_i	

### Product

Table 969: Properties of each product.

Id	Name	SBO
c76	(MEK_P:Raf_P)_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{482} = k_{44} \cdot c_{72} \cdot c_{75} - k_{d52} \cdot c_{76} \quad (986)$$

8.483 Reaction v492

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

**Name** v492 MEK + (Raf#P).i -> (MEK:Raf#P).i k44 kd52

Reaction equation



Reactants

Table 970: Properties of each reactant.

Id	Name	SBO
c47	MEK	
c72	(Raf_P).i	

Product

Table 971: Properties of each product.

Id	Name	SBO
c74	(MEK:Raf_P).i	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{483} = k44 \cdot c47 \cdot c72 - kd52 \cdot c74$$

(988)

8.484 Reaction v493

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

**Name** v493 MEK + Raf#P -> MEK:Raf#P k44 kd52

Reaction equation



Reactants

Table 972: Properties of each reactant.

Id	Name	SBO
c47	MEK	
c45	Raf_P	

## Product

Table 973: Properties of each product.

Id	Name	SBO
c48	MEK:Raf_P	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{484} = k_{44} \cdot c_{47} \cdot c_{45} - k_{d52} \cdot c_{48} \quad (990)$$

## 8.485 Reaction v494

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

**Name** v494 MEK#P + Raf#P -> MEK#P:Raf#P k44 kd52

## Reaction equation



## Reactants

Table 974: Properties of each reactant.

Id	Name	SBO
c49	MEK_P	
c45	Raf_P	

## Product

Table 975: Properties of each product.

Id	Name	SBO
c50	MEK_P:Raf_P	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{485} = k_{44} \cdot c_{49} \cdot c_{45} - k_{d52} \cdot c_{50} \quad (992)$$

**8.486 Reaction v495**

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

**Name** v495 MEK#P + Raf#P -> MEK:Raf#P k45 kd45**Reaction equation****Reactants**

Table 976: Properties of each reactant.

Id	Name	SBO
c49	MEK_P	
c45	Raf_P	

**Product**

Table 977: Properties of each product.

Id	Name	SBO
c48	MEK:Raf_P	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{486} = k_{45} \cdot c_{49} \cdot c_{45} - k_{d45} \cdot c_{48} \quad (994)$$

8.487 Reaction v496

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

**Name** v496 (MEK#P)\_i + (Raf#P)\_i -> (MEK:Raf#P)\_i k45 kd45

Reaction equation



Reactants

Table 978: Properties of each reactant.

Id	Name	SBO
c75	(MEK_P)_i	
c72	(Raf_P)_i	

Product

Table 979: Properties of each product.

Id	Name	SBO
c74	(MEK:Raf_P)_i	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{487} = k45 \cdot c75 \cdot c72 - kd45 \cdot c74$$

(996)

8.488 Reaction v497

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

**Name** v497 MEK#P#P + Raf#P -> MEK#P:Raf#P k47 kd47

Reaction equation



Reactants

Table 980: Properties of each reactant.

Id	Name	SBO
c51	MEK_PP	
c45	Raf_P	

## Product

Table 981: Properties of each product.

Id	Name	SBO
c50	MEK_P:Raf_P	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{488} = k_{47} \cdot c_{51} \cdot c_{45} - k_{d47} \cdot c_{50} \quad (998)$$

## 8.489 Reaction v498

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

**Name** v498 (Raf#P).i + (MEK#P#P).i -> (MEK#P:Raf#P).i k47 kd47

## Reaction equation



## Reactants

Table 982: Properties of each reactant.

Id	Name	SBO
c72	(Raf_P).i	
c77	(MEK_PP).i	

## Product

Table 983: Properties of each product.

Id	Name	SBO
c76	(MEK_P:Raf_P)_i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{489} = k_{47} \cdot c_{72} \cdot c_{77} - k_{d47} \cdot c_{76} \quad (1000)$$

**8.490 Reaction v499**

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

**Name** v499 (MEK#P#P)\_i + Pase2 -> (MEK#P#P:Pase2)\_i k48 kd48**Reaction equation****Reactants**

Table 984: Properties of each reactant.

Id	Name	SBO
c77	(MEK_PP)_i	
c53	Pase2	

**Product**

Table 985: Properties of each product.

Id	Name	SBO
c78	(MEK_PP:Pase2)_i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{490} = k_{48} \cdot c_{77} \cdot c_{53} - k_{d48} \cdot c_{78} \quad (1002)$$

### 8.491 Reaction v500

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

**Name** v500 MEK#P#P + Pase2 -> MEK#P#P:Pase2 k48 kd48

#### Reaction equation



#### Reactants

Table 986: Properties of each reactant.

Id	Name	SBO
c51	MEK_PP	
c53	Pase2	

#### Product

Table 987: Properties of each product.

Id	Name	SBO
c52	MEK_PP:Pase2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{491} = k48 \cdot c51 \cdot c53 - kd48 \cdot c52 \quad (1004)$$

### 8.492 Reaction v501

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

**Name** v501 MEK#P + Pase2 -> MEK#P#P:Pase2 k49 kd49

#### Reaction equation



#### Reactants



Table 988: Properties of each reactant.

Id	Name	SBO
c49	MEK_P	
c53	Pase2	

**Product**

Table 989: Properties of each product.

Id	Name	SBO
c52	MEK_PP:Pase2	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{492} = k_{49} \cdot c_{49} \cdot c_{53} - k_{d49} \cdot c_{52} \quad (1006)$$

**8.493 Reaction v502**

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

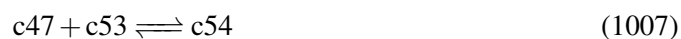
**Name** v502 MEK + Pase2 -> MEK#P:Pase2 k49 kd49**Reaction equation****Reactants**

Table 990: Properties of each reactant.

Id	Name	SBO
c47	MEK	
c53	Pase2	

**Product**

Table 991: Properties of each product.

Id	Name	SBO
c54	MEK_P:Pase2	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{493} = k_{49} \cdot c_{47} \cdot c_{53} - k_{d49} \cdot c_{54} \quad (1008)$$

**8.494 Reaction v503**

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

**Name** v503 MEK + Pase2 -> (MEK#P:Pase2).i k49 kd49**Reaction equation****Reactants**

Table 992: Properties of each reactant.

Id	Name	SBO
c47	MEK	
c53	Pase2	

**Product**

Table 993: Properties of each product.

Id	Name	SBO
c79	(MEK_P:Pase2).i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{494} = k_{49} \cdot c_{47} \cdot c_{53} - k_{d49} \cdot c_{79} \quad (1010)$$

8.495 Reaction v504

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

**Name** v504 (MEK#P)\_i + Pase2 -> (MEK#P#P:Pase2)\_i k49 kd49

Reaction equation



Reactants

Table 994: Properties of each reactant.

Id	Name	SBO
c75	(MEK_P)_i	
c53	Pase2	

Product

Table 995: Properties of each product.

Id	Name	SBO
c78	(MEK_PP:Pase2)_i	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{495} = k49 \cdot c75 \cdot c53 - kd49 \cdot c78$$

(1012)

8.496 Reaction v505

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

**Name** v505 Pase2 + (MEK#P)\_i -> (MEK#P:Pase2)\_i k50 kd50

Reaction equation



Reactants

Table 996: Properties of each reactant.

Id	Name	SBO
c53	Pase2	
c75	(MEK_P)_i	

**Product**

Table 997: Properties of each product.

Id	Name	SBO
c79	(MEK_P:Pase2)_i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{496} = k_{50} \cdot c_{53} \cdot c_{75} - k_{d50} \cdot c_{79} \quad (1014)$$

**8.497 Reaction v506**

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

**Name** v506 Pase2 + MEK#P -> MEK#P:Pase2 k50 kd50**Reaction equation****Reactants**

Table 998: Properties of each reactant.

Id	Name	SBO
c53	Pase2	
c49	MEK_P	

**Product**

Table 999: Properties of each product.

Id	Name	SBO
c54	MEK_P:Pase2	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{497} = k50 \cdot c53 \cdot c49 - kd50 \cdot c54 \quad (1016)$$

**8.498 Reaction v507**

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

**Name** v507 ERK + MEK#P#P -> ERK:MEK#P#P k52 kd44**Reaction equation****Reactants**

Table 1000: Properties of each reactant.

Id	Name	SBO
c55	ERK	
c51	MEK_PP	

**Product**

Table 1001: Properties of each product.

Id	Name	SBO
c56	ERK:MEK_PP	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{498} = k52 \cdot c55 \cdot c51 - kd44 \cdot c56 \quad (1018)$$

8.499 Reaction v508

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

**Name** v508 MEK#P#P + ERK#P -> ERK#P:MEK#P#P k52 kd44

Reaction equation



Reactants

Table 1002: Properties of each reactant.

Id	Name	SBO
c51	MEK_PP	
c57	ERK_P	

Product

Table 1003: Properties of each product.

Id	Name	SBO
c58	ERK_P:MEK_PP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{499} = k52 \cdot c51 \cdot c57 - kd44 \cdot c58$$

(1020)

8.500 Reaction v509

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

**Name** v509 ERK + (MEK#P#P).i -> MEK#P#P:ERK k52 kd44

Reaction equation



Reactants

Table 1004: Properties of each reactant.

Id	Name	SBO
c55	ERK	
c77	(MEK_PP)_i	

Product

Table 1005: Properties of each product.

Id	Name	SBO
c80	MEK_PP:ERK	

Kinetic Law

Derived unit contains undeclared units

$$v_{500} = k52 \cdot c55 \cdot c77 - kd44 \cdot c80$$

(1022)

8.501 Reaction v510

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

**Name** v510 (MEK#P#P)\_i + (ERK#P)\_i -> MEK#P#P:ERK#P k52 kd44

Reaction equation



Reactants

Table 1006: Properties of each reactant.

Id	Name	SBO
c77	(MEK_PP)_i	
c81	(ERK_P)_i	

Product

Table 1007: Properties of each product.

Id	Name	SBO
c82	MEK_PP:ERK_P	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{501} = k_{52} \cdot c_{77} \cdot c_{81} - k_{d44} \cdot c_{82} \quad (1024)$$

**8.502 Reaction v511**

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

**Name** v511 (ERK#P)\_i + (MEK#P#P)\_i -> MEK#P#P:ERK k53 kd53**Reaction equation****Reactants**

Table 1008: Properties of each reactant.

Id	Name	SBO
c81	(ERK_P)_i	
c77	(MEK_PP)_i	

**Product**

Table 1009: Properties of each product.

Id	Name	SBO
c80	MEK_PP:ERK	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{502} = k_{53} \cdot c_{81} \cdot c_{77} - k_{d53} \cdot c_{80} \quad (1026)$$



### 8.503 Reaction v512

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

**Name** v512 MEK#P#P + ERK#P -> ERK:MEK#P#P k53 kd53

#### Reaction equation



#### Reactants

Table 1010: Properties of each reactant.

Id	Name	SBO
c51	MEK_PP	
c57	ERK_P	

#### Product

Table 1011: Properties of each product.

Id	Name	SBO
c56	ERK:MEK_PP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{503} = k53 \cdot c51 \cdot c57 - kd53 \cdot c56 \quad (1028)$$

### 8.504 Reaction v513

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

**Name** v513 ERK#P#P + MEK#P#P -> ERK#P:MEK#P#P k55 kd55

#### Reaction equation



#### Reactants

Table 1012: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c51	MEK_PP	

Product

Table 1013: Properties of each product.

Id	Name	SBO
c58	ERK_P:MEK_PP	

Kinetic Law

Derived unit contains undeclared units

$$v_{504} = k55 \cdot c59 \cdot c51 - kd55 \cdot c58$$

(1030)

8.505 Reaction v514

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

**Name** v514 (ERK#P#P)\_i + (MEK#P#P)\_i -> MEK#P#P:ERK#P k55 kd55

Reaction equation



Reactants

Table 1014: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c77	(MEK_PP)_i	

Product

Table 1015: Properties of each product.

Id	Name	SBO
c82	MEK_PP:ERK_P	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{505} = k_{55} \cdot c_{83} \cdot c_{77} - k_{d55} \cdot c_{82} \quad (1032)$$

**8.506 Reaction v515**

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

**Name** v515 ERK#P#P + Pase3 -> ERK#P#P:Pase3 k56 kd56**Reaction equation****Reactants**

Table 1016: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c60	Pase3	

**Product**

Table 1017: Properties of each product.

Id	Name	SBO
c61	ERK_PP:Pase3	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{506} = k_{56} \cdot c_{59} \cdot c_{60} - k_{d56} \cdot c_{61} \quad (1034)$$

8.507 Reaction v516

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

**Name** v516 (ERK#P#P)\_i + Pase3 -> (ERK#P#P:Pase3)\_i k56 kd56

Reaction equation



Reactants

Table 1018: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c60	Pase3	

Product

Table 1019: Properties of each product.

Id	Name	SBO
c84	(ERK_PP:Pase3)_i	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{507} = k56 \cdot c83 \cdot c60 - kd56 \cdot c84$$

(1036)

8.508 Reaction v517

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

**Name** v517 (ERK#P)\_i + Pase3 -> (ERK#P#P:Pase3)\_i k57 kd57

Reaction equation



Reactants

Table 1020: Properties of each reactant.

Id	Name	SBO
c81	(ERK_P)_i	
c60	Pase3	

Product

Table 1021: Properties of each product.

Id	Name	SBO
c84	(ERK_PP:Pase3)_i	

Kinetic Law

Derived unit contains undeclared units

$$v_{508} = k57 \cdot c81 \cdot c60 - kd57 \cdot c84$$

(1038)

8.509 Reaction v518

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

Name v518 ERK#P + Pase3 -> ERK#P#P:Pase3 k57 kd57

Reaction equation



Reactants

Table 1022: Properties of each reactant.

Id	Name	SBO
c57	ERK_P	
c60	Pase3	

Product

Table 1023: Properties of each product.

Id	Name	SBO
c61	ERK_PP:Pase3	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{509} = k_{57} \cdot c_{57} \cdot c_{60} - k_{d57} \cdot c_{61} \quad (1040)$$

**8.510 Reaction v519**

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

**Name** v519 ERK + Pase3 -> ERK#P:Pase3 k57 kd57**Reaction equation****Reactants**

Table 1024: Properties of each reactant.

Id	Name	SBO
c55	ERK	
c60	Pase3	

**Product**

Table 1025: Properties of each product.

Id	Name	SBO
c62	ERK_P:Pase3	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{510} = k_{57} \cdot c_{55} \cdot c_{60} - k_{d57} \cdot c_{62} \quad (1042)$$

### 8.511 Reaction v520

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

**Name** v520 ERK + Pase3 -> (ERK#P:Pase3)\_i k57 kd57

#### Reaction equation



#### Reactants

Table 1026: Properties of each reactant.

Id	Name	SBO
c55	ERK	
c60	Pase3	

#### Product

Table 1027: Properties of each product.

Id	Name	SBO
c85	(ERK_P:Pase3)_i	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{511} = k57 \cdot c55 \cdot c60 - kd57 \cdot c85 \quad (1044)$$

### 8.512 Reaction v521

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

**Name** v521 Pase3 + ERK#P -> ERK#P:Pase3 k58 kd58

#### Reaction equation



#### Reactants

Table 1028: Properties of each reactant.

Id	Name	SBO
c60	Pase3	
c57	ERK_P	

Product

Table 1029: Properties of each product.

Id	Name	SBO
c62	ERK_P:Pase3	

Kinetic Law

Derived unit contains undeclared units

$$v_{512} = k58 \cdot c60 \cdot c57 - kd58 \cdot c62$$

(1046)

8.513 Reaction v522

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

**Name** v522 Pase3 + (ERK#P)\_i -> (ERK#P:Pase3)\_i k58 kd58

Reaction equation



Reactants

Table 1030: Properties of each reactant.

Id	Name	SBO
c60	Pase3	
c81	(ERK_P)_i	

Product



Table 1031: Properties of each product.

Id	Name	SBO
c85	(ERK_P:Pase3).i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{513} = k58 \cdot c60 \cdot c81 - kd58 \cdot c85 \quad (1048)$$

**8.514 Reaction v523**

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

**Name** v523 ErbB1:ATP -> R\_degraded k60 kd60**Reaction equation****Reactant**

Table 1032: Properties of each reactant.

Id	Name	SBO
c6	ErbB1:ATP	

**Product**

Table 1033: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{514} = k60 \cdot c6 - kd60 \cdot c86 \quad (1050)$$

8.515 Reaction v524

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

**Name** v524 2(EGF:ErbB1:ATP) -> R\_degraded k60 kd60

Reaction equation



Reactant

Table 1034: Properties of each reactant.

Id	Name	SBO
c11	2(EGF:ErbB1:ATP)	

Product

Table 1035: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{515} = k60 \cdot c11 - kd60 \cdot c86$$

(1052)

8.516 Reaction v525

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

**Name** v525 2(EGF:ErbB1)#P:GAP -> R\_degraded k60 kd60

Reaction equation



Reactant

Table 1036: Properties of each reactant.

Id	Name	SBO
c17	2(EGF:ErbB1)_P:GAP	

Product

Table 1037: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

Derived unit contains undeclared units

$$v_{516} = k60 \cdot c17 - kd60 \cdot c86$$

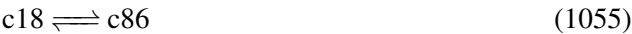
(1054)

8.517 Reaction v526

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

Name v526 2(EGF:ErbB1)#P:GAP:Grb2 -> R\_degraded k60 kd60

Reaction equation



Reactant

Table 1038: Properties of each reactant.

Id	Name	SBO
c18	2(EGF:ErbB1)_P:GAP:Grb2	

Product

Table 1039: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{517} = k60 \cdot c18 - kd60 \cdot c86 \quad (1056)$$

### 8.518 Reaction v527

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

**Name** v527 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> R\_degraded k60 kd60

### Reaction equation



### Reactant

Table 1040: Properties of each reactant.

Id	Name	SBO
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

### Product

Table 1041: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{518} = k60 \cdot c19 - kd60 \cdot c86 \quad (1058)$$

### 8.519 Reaction v528

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

**Name** v528 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) -> R\_degraded k60 kd60

### Reaction equation



## Reactant

Table 1042: Properties of each reactant.

Id	Name	SBO
c20	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Product

Table 1043: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{519} = k_{60} \cdot c_{20} - k_{d60} \cdot c_{86} \quad (1060)$$

## 8.520 Reaction v529

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

**Name** v529 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) -> R\_degraded k60 kd60

## Reaction equation



## Reactant

Table 1044: Properties of each reactant.

Id	Name	SBO
c21	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 1045: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{520} = k60 \cdot c21 - kd60 \cdot c86 \quad (1062)$$

### 8.521 Reaction v530

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

**Name** v530 2(EGF:ErbB1)#P:GAP:Shc -> R\_degraded k60 kd60

### Reaction equation



### Reactant

Table 1046: Properties of each reactant.

Id	Name	SBO
c63	2(EGF:ErbB1)_P:GAP:Shc	

### Product

Table 1047: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{521} = k60 \cdot c63 - kd60 \cdot c86 \quad (1064)$$

### 8.522 Reaction v531

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

**Name** v531 2(EGF:ErbB1)#P:GAP:(Shc#P) -> R\_degraded k60 kd60

#### Reaction equation



#### Reactant

Table 1048: Properties of each reactant.

Id	Name	SBO
c64	2(EGF:ErbB1)_P:GAP:(Shc_P)	

#### Product

Table 1049: Properties of each product.

Id	Name	SBO
c86	R_degraded	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{522} = k60 \cdot c64 - kd60 \cdot c86 \quad (1066)$$

### 8.523 Reaction v532

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

**Name** v532 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> R\_degraded k60 kd60

#### Reaction equation



#### Reactant

Table 1050: Properties of each reactant.

Id	Name	SBO
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

### Product

Table 1051: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{523} = k60 \cdot c65 - kd60 \cdot c86 \quad (1068)$$

### 8.524 Reaction v533

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

**Name** v533 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> R\_degraded k60 kd60

### Reaction equation



### Reactant

Table 1052: Properties of each reactant.

Id	Name	SBO
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

### Product

Table 1053: Properties of each product.

Id	Name	SBO
c86	R_degraded	



### Kinetic Law

**Derived unit** contains undeclared units

$$v_{524} = k60 \cdot c66 - kd60 \cdot c86 \quad (1070)$$

### 8.525 Reaction v534

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

**Name** v534 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R\_degraded k60 kd60

### Reaction equation



### Reactant

Table 1054: Properties of each reactant.

Id	Name	SBO
c67	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Product

Table 1055: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{525} = k60 \cdot c67 - kd60 \cdot c86 \quad (1072)$$

### 8.526 Reaction v535

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

**Name** v535 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) + -> R\_degraded k60 kd60

### Reaction equation



## Reactant

Table 1056: Properties of each reactant.

Id	Name	SBO
c68	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 1057: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{526} = k_{60} \cdot c_{68} - k_{d60} \cdot c_{86} \quad (1074)$$

### 8.527 Reaction v537

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

**Name** v537 ErbB3 -> R\_degraded k60b kd60b

## Reaction equation



## Reactant

Table 1058: Properties of each reactant.

Id	Name	SBO
c154	ErbB3	

## Product

Table 1059: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{527} = k_{60b} \cdot c_{154} - k_{d60b} \cdot c_{86} \quad (1076)$$

### 8.528 Reaction v538

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

**Name** v538 ErbB2 -> R\_degraded k60b kd60b

### Reaction equation



### Reactant

Table 1060: Properties of each reactant.

Id	Name	SBO
c155	ErbB2	

### Product

Table 1061: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{528} = k_{60b} \cdot c_{155} - k_{d60b} \cdot c_{86} \quad (1078)$$

8.529 Reaction v539

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

**Name** v539 ErbB4 -> R\_degraded k60b kd60b

Reaction equation



Reactant

Table 1062: Properties of each reactant.

Id	Name	SBO
c156	ErbB4	

Product

Table 1063: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{529} = k60b \cdot c156 - kd60b \cdot c86$$

(1080)

8.530 Reaction v540

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

**Name** v540 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1064: Properties of each reactant.

Id	Name	SBO
c192	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2	

### Product

Table 1065: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{530} = k_{60b} \cdot c_{192} - k_{d60} \cdot c_{86} \quad (1082)$$

### 8.531 Reaction v541

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

**Name** v541 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 -> R\_degraded k60b kd60

### Reaction equation



### Reactant

Table 1066: Properties of each reactant.

Id	Name	SBO
c193	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2	

### Product

Table 1067: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{531} = k60b \cdot c193 - kd60 \cdot c86 \tag{1084}$$

**8.532 Reaction v542**

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

**Name** v542 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 -> R\_degraded k60b kd60

**Reaction equation**



**Reactant**

Table 1068: Properties of each reactant.		
Id	Name	SBO
c194	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2	

**Product**

Table 1069: Properties of each product.		
Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{532} = k60b \cdot c194 - kd60 \cdot c86 \tag{1086}$$

**8.533 Reaction v543**

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

**Name** v543 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> R\_degraded k60b kd60

**Reaction equation**



Reactant

Table 1070: Properties of each reactant.		
Id	Name	SBO
c201	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

Product

Table 1071: Properties of each product.		
Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{533} = k60b \cdot c201 - kd60 \cdot c86 \tag{1088}$$

8.534 Reaction v544

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

**Name** v544 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1072: Properties of each reactant.		
Id	Name	SBO
c202	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos	

Product

Table 1073: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{534} = k_{60b} \cdot c_{202} - k_{d60} \cdot c_{86} \quad (1090)$$

**8.535 Reaction v545**

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

**Name** v545 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos -> R\_degraded k60b kd60**Reaction equation****Reactant**

Table 1074: Properties of each reactant.

Id	Name	SBO
c203	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos	

**Product**

Table 1075: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{535} = k_{60b} \cdot c_{203} - k_{d60} \cdot c_{86} \quad (1092)$$



### 8.536 Reaction v546

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

**Name** v546 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

#### Reaction equation



#### Reactant

Table 1076: Properties of each reactant.

Id	Name	SBO
c210	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

#### Product

Table 1077: Properties of each product.

Id	Name	SBO
c86	R_degraded	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{536} = k60b \cdot c210 - kd60 \cdot c86 \quad (1094)$$

### 8.537 Reaction v547

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

**Name** v547 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

#### Reaction equation



#### Reactant

Table 1078: Properties of each reactant.

Id	Name	SBO
c211	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Product

Table 1079: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{537} = k_{60b} \cdot c_{211} - k_{d60} \cdot c_{86} \quad (1096)$$

### 8.538 Reaction v548

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

**Name** v548 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

### Reaction equation



### Reactant

Table 1080: Properties of each reactant.

Id	Name	SBO
c212	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

### Product

Table 1081: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{538} = k60b \cdot c212 - kd60 \cdot c86 \quad (1098)$$

### 8.539 Reaction v549

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

**Name** v549 (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60

### Reaction equation



### Reactant

Table 1082: Properties of each reactant.

Id	Name	SBO
c219	(ErbB1:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

### Product

Table 1083: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{539} = k60b \cdot c219 - kd60 \cdot c86 \quad (1100)$$

### 8.540 Reaction v550

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

**Name** v550 (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60

### Reaction equation



## Reactant

Table 1084: Properties of each reactant.

Id	Name	SBO
c220	(ErbB1:ErbB3)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 1085: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{540} = k_{60b} \cdot c_{220} - k_{d60} \cdot c_{86} \quad (1102)$$

### 8.541 Reaction v551

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

**Name** v551 (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60

## Reaction equation



## Reactant

Table 1086: Properties of each reactant.

Id	Name	SBO
c221	(ErbB1:ErbB4)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 1087: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{541} = k_{60b} \cdot c_{221} - k_{d60} \cdot c_{86} \quad (1104)$$

**8.542 Reaction v552**

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

**Name** v552 (ErbB1:ErbB2)#P:GAP:Grb2 -> R\_degraded k60b kd60**Reaction equation****Reactant**

Table 1088: Properties of each reactant.

Id	Name	SBO
c228	(ErbB1:ErbB2).P:GAP:Grb2	

**Product**

Table 1089: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{542} = k_{60b} \cdot c_{228} - k_{d60} \cdot c_{86} \quad (1106)$$

### 8.543 Reaction v553

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

**Name** v553 (ErbB1:ErbB3)#P:GAP:Grb2 -> R\_degraded k60b kd60

#### Reaction equation



#### Reactant

Table 1090: Properties of each reactant.

Id	Name	SBO
c229	(ErbB1:ErbB3)_P:GAP:Grb2	

#### Product

Table 1091: Properties of each product.

Id	Name	SBO
c86	R_degraded	

#### Kinetic Law

**Derived unit** contains undeclared units

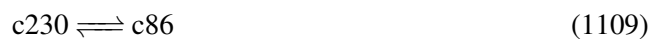
$$v_{543} = k60b \cdot c229 - kd60 \cdot c86 \quad (1108)$$

### 8.544 Reaction v554

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

**Name** v554 (ErbB1:ErbB4)#P:GAP:Grb2 -> R\_degraded k60b kd60

#### Reaction equation



#### Reactant

Table 1092: Properties of each reactant.

Id	Name	SBO
c230	(ErbB1:ErbB4)_P:GAP:Grb2	

### Product

Table 1093: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{544} = k_{60b} \cdot c_{230} - k_{d60} \cdot c_{86} \quad (1110)$$

### 8.545 Reaction v555

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

**Name** v555 (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

### Reaction equation



### Reactant

Table 1094: Properties of each reactant.

Id	Name	SBO
c246	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Product

Table 1095: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{545} = k60b \cdot c246 - kd60 \cdot c86 \quad (1112)$$

### 8.546 Reaction v556

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

**Name** v556 (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

### Reaction equation



### Reactant

Table 1096: Properties of each reactant.

Id	Name	SBO
c247	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Product

Table 1097: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{546} = k60b \cdot c247 - kd60 \cdot c86 \quad (1114)$$

### 8.547 Reaction v557

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

**Name** v557 (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

### Reaction equation





## Reactant

Table 1098: Properties of each reactant.

Id	Name	SBO
c248	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Product

Table 1099: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{547} = k_{60b} \cdot c_{248} - k_{d60} \cdot c_{86} \quad (1116)$$

## 8.548 Reaction v558

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

**Name** v558 (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60

## Reaction equation



## Reactant

Table 1100: Properties of each reactant.

Id	Name	SBO
c255	(ErbB1:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 1101: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{548} = k_{60b} \cdot c_{255} - k_{d60} \cdot c_{86} \quad (1118)$$

**8.549 Reaction v559**

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

**Name** v559 (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60**Reaction equation****Reactant**

Table 1102: Properties of each reactant.

Id	Name	SBO
c256	(ErbB1:ErbB3)_P:GAP:Grb2:Sos:(Ras:GTP)	

**Product**

Table 1103: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{549} = k_{60b} \cdot c_{256} - k_{d60} \cdot c_{86} \quad (1120)$$

8.550 Reaction v560

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

**Name** v560 (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1104: Properties of each reactant.

Id	Name	SBO
c257	(ErbB1:ErbB4)_P:GAP:Grb2:Sos:(Ras:GTP)	

Product

Table 1105: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{550} = k60b \cdot c257 - kd60 \cdot c86$$

(1122)

8.551 Reaction v563

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

**Name** v563 (ErbB1:ErbB2)#P:GAP:Grb2:Sos -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1106: Properties of each reactant.

Id	Name	SBO
c237	(ErbB1:ErbB2)_P:GAP:Grb2:Sos	

### Product

Table 1107: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{551} = k_{60b} \cdot c_{237} - k_{d60} \cdot c_{86} \quad (1124)$$

### 8.552 Reaction v564

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

**Name** v564 (ErbB1:ErbB3)#P:GAP:Grb2:Sos -> R\_degraded k60b kd60

### Reaction equation



### Reactant

Table 1108: Properties of each reactant.

Id	Name	SBO
c238	(ErbB1:ErbB3)_P:GAP:Grb2:Sos	

### Product

Table 1109: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{552} = k_{60b} \cdot c_{238} - k_{d60} \cdot c_{86} \quad (1126)$$

### 8.553 Reaction v565

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

**Name** v565 (ErbB1:ErbB4)#P:GAP:Grb2:Sos -> R\_degraded k60b kd60

## Reaction equation



## Reactant

Table 1110: Properties of each reactant.

Id	Name	SBO
c239	(ErbB1:ErbB4)_P:GAP:Grb2:Sos	

## Product

Table 1111: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{553} = k_{60b} \cdot c_{239} - k_{d60} \cdot c_{86} \quad (1128)$$

### 8.554 Reaction v566

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

**Name** v566 2(ErbB2) -> R\_degraded k60b kd60

## Reaction equation



Reactant

Table 1112: Properties of each reactant.

Id	Name	SBO
c425	2(ErbB2)	

Product

Table 1113: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{554} = k60b \cdot c425 - kd60 \cdot c86 \tag{1130}$$

8.555 Reaction v567

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

**Name** v567 2(ErbB2)#P:GAP -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1114: Properties of each reactant.

Id	Name	SBO
c293	2(ErbB2)_P:GAP	

Product

Table 1115: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{555} = k_{60b} \cdot c_{293} - k_{d60} \cdot c_{86} \quad (1132)$$

**8.556 Reaction v568**

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

**Name** v568 2(ErbB2)#P:GAP:Shc -> R\_degraded k60b kd60**Reaction equation****Reactant**

Table 1116: Properties of each reactant.

Id	Name	SBO
c296	2(ErbB2)_P:GAP:Shc	

**Product**

Table 1117: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{556} = k_{60b} \cdot c_{296} - k_{d60} \cdot c_{86} \quad (1134)$$

8.557 Reaction v569

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

**Name** v569 2(ErbB2)#P:GAP:(Shc#P) -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1118: Properties of each reactant.

Id	Name	SBO
c299	2(ErbB2)_P:GAP:(Shc_P)	

Product

Table 1119: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{557} = k60b \cdot c299 - kd60 \cdot c86$$

(1136)

8.558 Reaction v570

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

**Name** v570 2(ErbB2)#P:GAP:(Shc#P):Grb2 -> R\_degraded k60b kd60

Reaction equation



Reactant



Table 1120: Properties of each reactant.

Id	Name	SBO
c302	2(ErbB2)_P:GAP:(Shc_P):Grb2	

## Product

Table 1121: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{558} = k_{60b} \cdot c_{302} - k_{d60} \cdot c_{86} \quad (1138)$$

## 8.559 Reaction v572

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

**Name** v572 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

## Reaction equation



## Reactant

Table 1122: Properties of each reactant.

Id	Name	SBO
c308	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 1123: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{559} = k60b \cdot c308 - kd60 \cdot c86 \tag{1140}$$

**8.560 Reaction v573**

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

**Name** v573 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60

**Reaction equation**



**Reactant**

Table 1124: Properties of each reactant.		
Id	Name	SBO
c311	2(ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

**Product**

Table 1125: Properties of each product.		
Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{560} = k60b \cdot c311 - kd60 \cdot c86 \tag{1142}$$

**8.561 Reaction v574**

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

**Name** v574 2(ErbB2)#P:GAP:Grb2 -> R\_degraded k60b kd60

**Reaction equation**



Reactant

Table 1126: Properties of each reactant.

Id	Name	SBO
c314	2(ErbB2)_P:GAP:Grb2	

Product

Table 1127: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{561} = k_{60b} \cdot c_{314} - k_{d60} \cdot c_{86} \tag{1144}$$

8.562 Reaction v575

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

**Name** v575 2(ErbB2)#P:GAP:Grb2:Sos -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1128: Properties of each reactant.

Id	Name	SBO
c317	2(ErbB2)_P:GAP:Grb2:Sos	

Product

Table 1129: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{562} = k60b \cdot c317 - kd60 \cdot c86 \quad (1146)$$

### 8.563 Reaction v576

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

**Name** v576 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> R\_degraded k60b kd60

### Reaction equation



### Reactant

Table 1130: Properties of each reactant.

Id	Name	SBO
c320	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Product

Table 1131: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{563} = k60b \cdot c320 - kd60 \cdot c86 \quad (1148)$$

8.564 Reaction v577

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

**Name** v577 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> R\_degraded k60b kd60

Reaction equation



Reactant

Table 1132: Properties of each reactant.

Id	Name	SBO
c323	2(ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

Product

Table 1133: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{564} = k60b \cdot c323 - kd60 \cdot c86$$

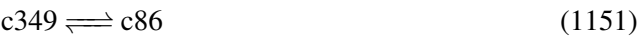
(1150)

8.565 Reaction v579

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

**Name** v579 (ErbB3:ErbB2)#P:GAP:Shc -> R\_degraded k60c kd60

Reaction equation



Reactant

Table 1134: Properties of each reactant.

Id	Name	SBO
c349	(ErbB3:ErbB2)_P:GAP:Shc	

## Product

Table 1135: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

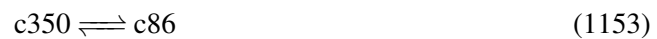
$$v_{565} = k_{60c} \cdot c_{349} - k_{d60} \cdot c_{86} \quad (1152)$$

## 8.566 Reaction v580

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

**Name** v580 (ErbB4:ErbB2)#P:GAP:Shc -> R\_degraded k60c kd60

## Reaction equation



## Reactant

Table 1136: Properties of each reactant.

Id	Name	SBO
c350	(ErbB4:ErbB2)_P:GAP:Shc	

## Product

Table 1137: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{566} = k60c \cdot c350 - kd60 \cdot c86$$

(1154)

**8.567 Reaction v581**

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

**Name** v581 (ErbB3:ErbB2)#P:GAP:(Shc#P) -> R\_degraded k60c kd60

**Reaction equation**



**Reactant**

Table 1138: Properties of each reactant.

Id	Name	SBO
c353	(ErbB3:ErbB2)_P:GAP:(Shc_P)	

**Product**

Table 1139: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{567} = k60c \cdot c353 - kd60 \cdot c86$$

(1156)

**8.568 Reaction v582**

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

**Name** v582 (ErbB4:ErbB2)#P:GAP:(Shc#P) -> R\_degraded k60c kd60

**Reaction equation**



Reactant

Table 1140: Properties of each reactant.

Id	Name	SBO
c356	(ErbB4:ErbB2)_P:GAP:(Shc_P)	

Product

Table 1141: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{568} = k_{60c} \cdot c_{356} - k_{d60} \cdot c_{86} \tag{1158}$$

8.569 Reaction v583

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

**Name** v583 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 -> R\_degraded k60c kd60

Reaction equation



Reactant

Table 1142: Properties of each reactant.

Id	Name	SBO
c359	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2	

Product



Table 1143: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{569} = k_{60c} \cdot c_{359} - k_{d60} \cdot c_{86} \quad (1160)$$

**8.570 Reaction v584**

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

**Name** v584 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> R\_degraded k60c kd60**Reaction equation****Reactant**

Table 1144: Properties of each reactant.

Id	Name	SBO
c368	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

**Product**

Table 1145: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{570} = k_{60c} \cdot c_{368} - k_{d60} \cdot c_{86} \quad (1162)$$

8.571 Reaction v585

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

**Name** v585 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 -> R\_degraded k60c kd60

Reaction equation



Reactant

Table 1146: Properties of each reactant.

Id	Name	SBO
c362	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2	

Product

Table 1147: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{571} = k60c \cdot c362 - kd60 \cdot c86$$

(1164)

8.572 Reaction v586

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

**Name** v586 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos -> R\_degraded k60c kd60

Reaction equation



Reactant

Table 1148: Properties of each reactant.

Id	Name	SBO
c365	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 1149: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{572} = k_{60c} \cdot c_{365} - k_{d60} \cdot c_{86} \quad (1166)$$

## 8.573 Reaction v587

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

**Name** v587 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> R\_degraded k60c kd60

## Reaction equation



## Reactant

Table 1150: Properties of each reactant.

Id	Name	SBO
c377	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 1151: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{573} = k60c \cdot c377 - kd60 \cdot c86 \quad (1168)$$

## 8.574 Reaction v588

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

**Name** v588 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) -> R\_degraded k60c kd60

## Reaction equation



## Reactant

Table 1152: Properties of each reactant.

Id	Name	SBO
c380	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GTP)	

## Product

Table 1153: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{574} = k60c \cdot c380 - kd60 \cdot c86 \quad (1170)$$

## 8.575 Reaction v589

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

**Name** v589 (ErbB4:ErbB2)#P:GAP:Grb2 -> R\_degraded k60c kd60

## Reaction equation



Reactant

Table 1154: Properties of each reactant.

Id	Name	SBO
c386	(ErbB4:ErbB2)_P:GAP:Grb2	

Product

Table 1155: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{575} = k60c \cdot c386 - kd60 \cdot c86 \tag{1172}$$

8.576 Reaction v590

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

**Name** v590 (ErbB3:ErbB2)#P:GAP:Grb2 -> R\_degraded k60c kd60

Reaction equation



Reactant

Table 1156: Properties of each reactant.

Id	Name	SBO
c383	(ErbB3:ErbB2)_P:GAP:Grb2	

Product

Table 1157: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{576} = k60c \cdot c383 - kd60 \cdot c86 \quad (1174)$$

**8.577 Reaction v591**

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

**Name** v591 (ErbB3:ErbB2)#P:GAP:Grb2:Sos -> R\_degraded k60c kd60**Reaction equation****Reactant**

Table 1158: Properties of each reactant.

Id	Name	SBO
c389	(ErbB3:ErbB2)_P:GAP:Grb2:Sos	

**Product**

Table 1159: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{577} = k60c \cdot c389 - kd60 \cdot c86 \quad (1176)$$

8.578 Reaction v592

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

**Name** v592 (ErbB4:ErbB2)#P:GAP:Grb2:Sos -> R\_degraded k60c kd60

Reaction equation



Reactant

Table 1160: Properties of each reactant.

Id	Name	SBO
c392	(ErbB4:ErbB2)_P:GAP:Grb2:Sos	

Product

Table 1161: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{578} = k60c \cdot c392 - kd60 \cdot c86$$

(1178)

8.579 Reaction v593

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

**Name** v593 (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R\_degraded k60c kd60

Reaction equation



Reactant

Table 1162: Properties of each reactant.

Id	Name	SBO
c371	(ErbB3:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 1163: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{579} = k_{60c} \cdot c_{371} - k_{d60} \cdot c_{86} \quad (1180)$$

## 8.580 Reaction v594

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

**Name** v594 (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) -> R\_degraded k60c kd60

## Reaction equation



## Reactant

Table 1164: Properties of each reactant.

Id	Name	SBO
c374	(ErbB4:ErbB2)_P:GAP:(Shc_P):Grb2:Sos:(Ras:GDP)	

## Product

Table 1165: Properties of each product.

Id	Name	SBO
c86	R_degraded	



### Kinetic Law

**Derived unit** contains undeclared units

$$v_{580} = k60c \cdot c374 - kd60 \cdot c86 \quad (1182)$$

### 8.581 Reaction v595

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

**Name** v595 (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> R\_degraded k60c kd60

### Reaction equation



### Reactant

Table 1166: Properties of each reactant.

Id	Name	SBO
c395	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

### Product

Table 1167: Properties of each product.

Id	Name	SBO
c86	R_degraded	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{581} = k60c \cdot c395 - kd60 \cdot c86 \quad (1184)$$

### 8.582 Reaction v596

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

**Name** v596 (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) -> R\_degraded k60c kd60

### Reaction equation



## Reactant

Table 1168: Properties of each reactant.

Id	Name	SBO
c398	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GDP)	

## Product

Table 1169: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

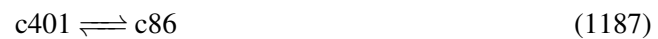
$$v_{582} = k_{60c} \cdot c_{398} - k_{d60} \cdot c_{86} \quad (1186)$$

## 8.583 Reaction v597

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

**Name** v597 (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> R\_degraded k60c kd60

## Reaction equation



## Reactant

Table 1170: Properties of each reactant.

Id	Name	SBO
c401	(ErbB3:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

## Product

Table 1171: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{583} = k60c \cdot c401 - kd60 \cdot c86 \quad (1188)$$

**8.584 Reaction v598**

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

**Name** v598 (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) -> R\_degraded k60c kd60**Reaction equation****Reactant**

Table 1172: Properties of each reactant.

Id	Name	SBO
c404	(ErbB4:ErbB2)_P:GAP:Grb2:Sos:(Ras:GTP)	

**Product**

Table 1173: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{584} = k60c \cdot c404 - kd60 \cdot c86 \quad (1190)$$

8.585 Reaction v599

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

**Name** v599 EGF -> EGF\_degraded k61 kd61

Reaction equation



Reactant

Table 1174: Properties of each reactant.

Id	Name	SBO
c16	EGF	

Product

Table 1175: Properties of each product.

Id	Name	SBO
c13	EGF_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{585} = k61 \cdot c16 - kd61 \cdot c13$$

(1192)

8.586 Reaction v600

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

**Name** v600 (EGF:ErbB1:ErbB2) -> R\_degraded k62b kd60b

Reaction equation



Reactant

Table 1176: Properties of each reactant.

Id	Name	SBO
c159	(EGF:ErbB1:ErbB2)	

Product

Table 1177: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

Derived unit contains undeclared units

$$v_{586} = k_{62b} \cdot c_{159} - k_{d60b} \cdot c_{86} \tag{1194}$$

8.587 Reaction v601

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

Name v601 (EGF:ErbB1:ErbB3) -> R\_degraded k62b kd60b

Reaction equation



Reactant

Table 1178: Properties of each reactant.

Id	Name	SBO
c160	(EGF:ErbB1:ErbB3)	

Product

Table 1179: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{587} = k_{62b} \cdot c_{160} - k_{d60b} \cdot c_{86}$$

(1196)

**8.588 Reaction v602**

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

**Name** v602 (EGF:ErbB1:ErbB4) -> R\_degraded k62b kd60b

**Reaction equation**



**Reactant**

Table 1180: Properties of each reactant.

Id	Name	SBO
c161	(EGF:ErbB1:ErbB4)	

**Product**

Table 1181: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{588} = k_{62b} \cdot c_{161} - k_{d60b} \cdot c_{86}$$

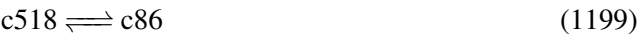
(1198)

**8.589 Reaction v603**

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

**Name** v603 (HRG:ErbB3:ErbB1) -> R\_degraded k62b kd60b

**Reaction equation**



Reactant

Table 1182: Properties of each reactant.

Id	Name	SBO
c518	(HRG:ErbB3:ErbB1)	

Product

Table 1183: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{589} = k_{62b} \cdot c_{518} - k_{d60b} \cdot c_{86}$$

(1200)

8.590 Reaction v604

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

**Name** v604 (HRG:ErbB4:ErbB1) -> R\_degraded k62b kd60b

Reaction equation



Reactant

Table 1184: Properties of each reactant.

Id	Name	SBO
c519	(HRG:ErbB4:ErbB1)	

Product

Table 1185: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{590} = k_{62b} \cdot c_{519} - k_{d60b} \cdot c_{86} \quad (1202)$$

**8.591 Reaction** v605

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

**Name** v605 (HRG:ErbB3):ErbB2) -> R\_degraded k62b kd60b**Reaction equation****Reactant**

Table 1186: Properties of each reactant.

Id	Name	SBO
c421	(HRG:ErbB3):ErbB2)	

**Product**

Table 1187: Properties of each product.

Id	Name	SBO
c86	R_degraded	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{591} = k_{62b} \cdot c_{421} - k_{d60b} \cdot c_{86} \quad (1204)$$



8.592 Reaction v606

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

**Name** v606 (HRG:ErbB4):ErbB2 -> R\_degraded k62b kd60b

Reaction equation



Reactant

Table 1188: Properties of each reactant.

Id	Name	SBO
c422	((HRG:ErbB4):ErbB2)	

Product

Table 1189: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{592} = k62b \cdot c422 - kd60b \cdot c86$$

(1206)

8.593 Reaction v607

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

**Name** v607 (ErbB3:ErbB2) -> R\_degraded k62b kd60b

Reaction equation



Reactant

Table 1190: Properties of each reactant.

Id	Name	SBO
c339	(ErbB3:ErbB2)	

Product

Table 1191: Properties of each product.

Id	Name	SBO
c86	R_degraded	

Kinetic Law

Derived unit contains undeclared units

$$v_{593} = k_{62b} \cdot c_{339} - k_{d60b} \cdot c_{86}$$

(1208)

8.594 Reaction v608

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

Name v608 (ErbB4:ErbB2) -> R\_degraded k62b kd60b

Reaction equation



Reactant

Table 1192: Properties of each reactant.

Id	Name	SBO
c340	(ErbB4:ErbB2)	

Product

Table 1193: Properties of each product.

Id	Name	SBO
c86	R_degraded	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{594} = k_{62b} \cdot c_{340} - k_{d60b} \cdot c_{86} \quad (1210)$$

## 8.595 Reaction v609

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

**Name** v609 ERK#P#P + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK-#P#P) k64 kd64

## Reaction equation



## Reactants

Table 1194: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c25	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

## Product

Table 1195: Properties of each product.

Id	Name	SBO
c95	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(ERK_PP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{595} = k_{64} \cdot c_{59} \cdot c_{25} - k_{d64} \cdot c_{95} \quad (1212)$$

## 8.596 Reaction v610

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

**Name** v610 (ERK#P#P)\_i + 2(EGF:ErbB1)#P:GAP:Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK-#P#P) k64 kd64

Reaction equation



Reactants

Table 1196: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c19	2(EGF:ErbB1)_P:GAP:Grb2:Sos	

Product

Table 1197: Properties of each product.

Id	Name	SBO
c96	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(ERK_PP)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{596} = k64 \cdot c83 \cdot c19 - kd64 \cdot c96$$

(1214)

8.597 Reaction v611

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

**Name** v611 ERK#P#P + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc-  
#P):Grb2:Sos:ERK#P#P k64 kd64

Reaction equation



Reactants

Table 1198: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c35	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 1199: Properties of each product.

Id	Name	SBO
c97	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:ERK_PP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{597} = k_{64} \cdot c_{59} \cdot c_{35} - k_{d64} \cdot c_{97} \quad (1216)$$

## 8.598 Reaction v612

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

**Name** v612 (ERK#P#P)\_i + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(ERK#P#P) k64 kd64

## Reaction equation



## Reactants

Table 1200: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c66	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos	

## Product

Table 1201: Properties of each product.

Id	Name	SBO
c98	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(ERK_PP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{598} = k_{64} \cdot c_{83} \cdot c_{66} - k_{d64} \cdot c_{98} \quad (1218)$$

### 8.599 Reaction v613

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

**Name** v613 ERK#P#P + Sos -> (ERK#P#P):Sos k64 kd64

#### Reaction equation



#### Reactants

Table 1202: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c24	Sos	

#### Product

Table 1203: Properties of each product.

Id	Name	SBO
c101	(ERK_PP):Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{599} = k_{64} \cdot c_{59} \cdot c_{24} - k_{d64} \cdot c_{101} \quad (1220)$$

### 8.600 Reaction v614

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

**Name** v614 (ERK#P#P)\_i + Sos -> ((ERK#P#P):Sos)\_i k64 kd64

#### Reaction equation



#### Reactants

Table 1204: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c24	Sos	

Product

Table 1205: Properties of each product.

Id	Name	SBO
c102	((ERK_PP):Sos)_i	

Kinetic Law

Derived unit contains undeclared units

$$v_{600} = k_{64} \cdot c_{83} \cdot c_{24} - k_{d64} \cdot c_{102} \tag{1222}$$

8.601 Reaction v615

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

**Name** v615 ERK#P#P + 2(EGF:ErbB1)#P:GAP:Grb2:Sos#P -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK-#P#P) k65 kd65

Reaction equation

$$c_{59} + c_{99} \rightleftharpoons c_{95} \tag{1223}$$

Reactants

Table 1206: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c99	2(EGF:ErbB1)_P:GAP:Grb2:Sos_P	

Product

Table 1207: Properties of each product.

Id	Name	SBO
c95	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(ERK_PP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{601} = k_{65} \cdot c_{59} \cdot c_{99} - k_{d65} \cdot c_{95} \quad (1224)$$

### 8.602 Reaction v616

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

**Name** v616 ERK#P#P + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:ERK#P#P k65 kd65

### Reaction equation



### Reactants

Table 1208: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c419	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:(Sos_P)	

### Product

Table 1209: Properties of each product.

Id	Name	SBO
c97	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{602} = k_{65} \cdot c_{59} \cdot c_{419} - k_{d65} \cdot c_{97} \quad (1226)$$



### 8.603 Reaction v617

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

**Name** v617 ERK#P#P + Sos#P -> (ERK#P#P):Sos k65 kd65

#### Reaction equation



#### Reactants

Table 1210: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c103	Sos_P	

#### Product

Table 1211: Properties of each product.

Id	Name	SBO
c101	(ERK_PP):Sos	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{603} = k65 \cdot c59 \cdot c103 - kd65 \cdot c101 \quad (1228)$$

### 8.604 Reaction v618

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

**Name** v618 (ERK#P#P)\_i + 2(EGF:ErbB1)#P:GAP:Grb2:(Sos#P) -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK#P#P) k65 kd65

#### Reaction equation



#### Reactants

Table 1212: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c100	2(EGF:ErbB1)_P:GAP:Grb2:(Sos_P)	

## Product

Table 1213: Properties of each product.

Id	Name	SBO
c96	2(EGF:ErbB1)_P:GAP:Grb2:Sos:(ERK_PP)	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{604} = k_{65} \cdot c_{83} \cdot c_{100} - k_{d65} \cdot c_{96} \quad (1230)$$

## 8.605 Reaction v619

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

**Name** v619 (ERK#P#P)\_i + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) -> 2(EGF:ErbB1)-#P:GAP:(Shc#P):Grb2:Sos:(ERK#P#P) k65 kd65

## Reaction equation



## Reactants

Table 1214: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c420	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:(Sos_P)	

## Product

Table 1215: Properties of each product.

Id	Name	SBO
c98	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:Sos:(ERK_PP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{605} = k_{65} \cdot c_{83} \cdot c_{420} - k_{d65} \cdot c_{98} \quad (1232)$$

### 8.606 Reaction v620

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

**Name** v620 (ERK#P#P)\_i + Sos#P -> ((ERK#P#P):Sos)\_i k65 kd65

### Reaction equation



### Reactants

Table 1216: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c103	Sos_P	

### Product

Table 1217: Properties of each product.

Id	Name	SBO
c102	((ERK_PP):Sos)_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{606} = k_{65} \cdot c_{83} \cdot c_{103} - k_{d65} \cdot c_{102} \quad (1234)$$

### 8.607 Reaction v621

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

**Name** v621 PI3K + 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1-  
#P:PI3K k66 kd66

#### Reaction equation



#### Reactants

Table 1218: Properties of each reactant.

Id	Name	SBO
c287	PI3K	
c486	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P#)	

#### Product

Table 1219: Properties of each product.

Id	Name	SBO
c104	2(EGF:ErbB1)_P:GAP:Grb2:Gab1_P:PI3K	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{607} = k66 \cdot c287 \cdot c486 - kd66 \cdot c104 \quad (1236)$$

### 8.608 Reaction v622

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

**Name** v622 PI3K + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:PI3K k66 kd66

#### Reaction equation



#### Reactants

Table 1220: Properties of each reactant.

Id	Name	SBO
c287	PI3K	
c447	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

Product

Table 1221: Properties of each product.

Id	Name	SBO
c263	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K	

Kinetic Law

Derived unit contains undeclared units

$$v_{608} = k66 \cdot c287 \cdot c447 - kd66 \cdot c263$$

(1238)

8.609 Reaction v623

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

**Name** v623 PI3K + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K k66 kd66

Reaction equation

$$c287 + c445 \rightleftharpoons c261$$

(1239)

Reactants

Table 1222: Properties of each reactant.

Id	Name	SBO
c287	PI3K	
c445	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P	

Product

Table 1223: Properties of each product.

Id	Name	SBO
c261	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{609} = k_{66} \cdot c_{287} \cdot c_{445} - k_{d66} \cdot c_{261} \quad (1240)$$

### 8.610 Reaction v624

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

**Name** v624 PI3K + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:PI3K k67 kd67

### Reaction equation



### Reactants

Table 1224: Properties of each reactant.

Id	Name	SBO
c287	PI3K	
c446	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

### Product

Table 1225: Properties of each product.

Id	Name	SBO
c262	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{610} = k_{67} \cdot c_{287} \cdot c_{446} - k_{d67} \cdot c_{262} \quad (1242)$$

8.611 Reaction v625

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

**Name** v625 PI3K + 2(ErbB2)#P:GAP:Grb2:Gab1#P -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K  
k67 kd67

Reaction equation



Reactants

Table 1226: Properties of each reactant.

Id	Name	SBO
c287	PI3K	
c454	2(ErbB2)_P:GAP:Grb2:Gab1_P	

Product

Table 1227: Properties of each product.

Id	Name	SBO
c324	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{611} = k67 \cdot c287 \cdot c454 - kd67 \cdot c324$$

(1244)

8.612 Reaction v626

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

**Name** v626 PI3K + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K k67 kd67

Reaction equation



Reactants

Table 1228: Properties of each reactant.

Id	Name	SBO
c287	PI3K	
c457	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1229: Properties of each product.

Id	Name	SBO
c405	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{612} = k_{67} \cdot c_{287} \cdot c_{457} - k_{d67} \cdot c_{405} \quad (1246)$$

### 8.613 Reaction v627

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

**Name** v627 PI3K + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K k66 kd66

## Reaction equation



## Reactants

Table 1230: Properties of each reactant.

Id	Name	SBO
c287	PI3K	
c460	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product



Table 1231: Properties of each product.

Id	Name	SBO
c408	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{613} = k_{66} \cdot c_{287} \cdot c_{460} - k_{d66} \cdot c_{408} \quad (1248)$$

### 8.614 Reaction v628

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

**Name** v628 PIP3 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:PIP2 k68 kd68b

### Reaction equation



### Reactants

Table 1232: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c405	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

### Product

Table 1233: Properties of each product.

Id	Name	SBO
c453	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{614} = k_{68} \cdot c_{106} \cdot c_{405} - k_{d68b} \cdot c_{453} \quad (1250)$$

### 8.615 Reaction v629

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

**Name** v629 PIP3 + 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> 2(ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k68 kd68

#### Reaction equation



#### Reactants

Table 1234: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c324	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

#### Product

Table 1235: Properties of each product.

Id	Name	SBO
c452	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{615} = k68 \cdot c106 \cdot c324 - kd68 \cdot c452 \quad (1252)$$

### 8.616 Reaction v630

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

**Name** v630 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K + PIP3 -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k68 kd68

#### Reaction equation



#### Reactants

Table 1236: Properties of each reactant.

Id	Name	SBO
c104	2(EGF:ErbB1)_P:GAP:Grb2:Gab1_P:PI3K	
c106	PIP3	

## Product

Table 1237: Properties of each product.

Id	Name	SBO
c448	2(EGF:ErbB1)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{616} = k_{68} \cdot c_{104} \cdot c_{106} - k_{d68} \cdot c_{448} \quad (1254)$$

### 8.617 Reaction v631

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

**Name** v631 PIP3 + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:PIP2 k68 kd68

## Reaction equation



## Reactants

Table 1238: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c261	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1239: Properties of each product.

Id	Name	SBO
c449	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{617} = k_{68} \cdot c_{106} \cdot c_{261} - k_{d68} \cdot c_{449} \quad (1256)$$

### 8.618 Reaction v632

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

**Name** v632 PIP3 + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k68 k<sub>d68</sub>

### Reaction equation



### Reactants

Table 1240: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c262	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K	

### Product

Table 1241: Properties of each product.

Id	Name	SBO
c450	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

### Kinetic Law

**Derived unit** contains undeclared units

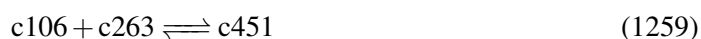
$$v_{618} = k_{68} \cdot c_{106} \cdot c_{262} - k_{d68} \cdot c_{450} \quad (1258)$$

### 8.619 Reaction v633

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

**Name** v633 PIP3 + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k68 kd68

#### Reaction equation



#### Reactants

Table 1242: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c263	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K	

#### Product

Table 1243: Properties of each product.

Id	Name	SBO
c451	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{619} = k68 \cdot c106 \cdot c263 - kd68 \cdot c451 \quad (1260)$$

### 8.620 Reaction v634

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

**Name** v634 PIP3 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:(PIP2)2 k68 kd68b

#### Reaction equation



#### Reactants

Table 1244: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c453	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

## Product

Table 1245: Properties of each product.

Id	Name	SBO
c467	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{620} = k_{68} \cdot c_{106} \cdot c_{453} - k_{d68b} \cdot c_{467} \quad (1262)$$

### 8.621 Reaction v635

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

**Name** v635 PIP3 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)2 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 k68 kd68b

## Reaction equation



## Reactants

Table 1246: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c467	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)2	

## Product

Table 1247: Properties of each product.

Id	Name	SBO
c468	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)3	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{621} = k_{68} \cdot c_{106} \cdot c_{467} - k_{d68b} \cdot c_{468} \quad (1264)$$

### 8.622 Reaction v636

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

**Name** v636 PIP3 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 k68 kd68b

### Reaction equation



### Reactants

Table 1248: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c468	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)3	

### Product

Table 1249: Properties of each product.

Id	Name	SBO
c469	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)4	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{622} = k_{68} \cdot c_{106} \cdot c_{468} - k_{d68b} \cdot c_{469} \quad (1266)$$

### 8.623 Reaction v637

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

**Name** v637 PIP3 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 k68 kd68b

#### Reaction equation



#### Reactants

Table 1250: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c469	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)4	

#### Product

Table 1251: Properties of each product.

Id	Name	SBO
c470	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)5	

#### Kinetic Law

**Derived unit** contains undeclared units

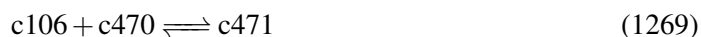
$$v_{623} = k68 \cdot c106 \cdot c469 - kd68b \cdot c470 \quad (1268)$$

### 8.624 Reaction v638

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

**Name** v638 PIP3 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)6 k68 kd68b

#### Reaction equation



#### Reactants



Table 1252: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c470	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)5	

Product

Table 1253: Properties of each product.

Id	Name	SBO
c471	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)6	

Kinetic Law

Derived unit contains undeclared units

$$v_{624} = k_{68} \cdot c_{106} \cdot c_{470} - k_{d68b} \cdot c_{471}$$

(1270)

8.625 Reaction v639

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

Name v639 PIP3 + AKT -> PIP3:AKT k69 kd69

Reaction equation

$$c_{106} + c_{107} \rightleftharpoons c_{108}$$

(1271)

Reactants

Table 1254: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c107	AKT	

Product

Table 1255: Properties of each product.

Id	Name	SBO
c108	PIP3:AKT	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{625} = k_{69} \cdot c_{106} \cdot c_{107} - k_{d69} \cdot c_{108} \quad (1272)$$

**8.626 Reaction v640**

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

**Name** v640 PIP3 + AKT#P -> PIP3:AKT#P k69 kd69**Reaction equation****Reactants**

Table 1256: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c112	AKT_P	

**Product**

Table 1257: Properties of each product.

Id	Name	SBO
c495	PIP3:AKT_P	

**Kinetic Law****Derived unit** contains undeclared units

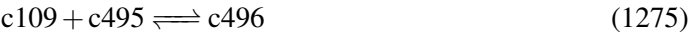
$$v_{626} = k_{69} \cdot c_{106} \cdot c_{112} - k_{d69} \cdot c_{495} \quad (1274)$$

8.627 Reaction v641

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

**Name** v641 PDK1 + PIP3:AKT#P -> PIP3:AKT#P:PDK1 k70 kd70

Reaction equation



Reactants

Table 1258: Properties of each reactant.

Id	Name	SBO
c109	PDK1	
c495	PIP3:AKT_P	

Product

Table 1259: Properties of each product.

Id	Name	SBO
c496	PIP3:AKT_P:PDK1	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{627} = k70 \cdot c109 \cdot c495 - kd70 \cdot c496$$

(1276)

8.628 Reaction v642

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

**Name** v642 PDK1 + PIP3:AKT -> PIP3:AKT:PDK1 k70 kd70

Reaction equation



Reactants

Table 1260: Properties of each reactant.

Id	Name	SBO
c109	PDK1	
c108	PIP3:AKT	

Product

Table 1261: Properties of each product.

Id	Name	SBO
c110	PIP3:AKT:PDK1	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{628} = k70 \cdot c109 \cdot c108 - kd70 \cdot c110 \tag{1278}$$

8.629 Reaction v643

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

**Name** v643 PIP3:PDK1 + AKT#P -> PIP3:AKT:PDK1 k71 kd71

Reaction equation

$$c111 + c112 \rightleftharpoons c110 \tag{1279}$$

Reactants

Table 1262: Properties of each reactant.

Id	Name	SBO
c111	PIP3:PDK1	
c112	AKT_P	

Product

Table 1263: Properties of each product.

Id	Name	SBO
c110	PIP3:AKT:PDK1	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{629} = k_{71} \cdot c_{111} \cdot c_{112} - k_{d71} \cdot c_{110} \quad (1280)$$

**8.630 Reaction v644**

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

**Name** v644 AKT#P#P + PIP3:PDK1 -> PIP3:AKT#P:PDK1 k72 kd72**Reaction equation****Reactants**

Table 1264: Properties of each reactant.

Id	Name	SBO
c497	AKT:P:P	
c111	PIP3:PDK1	

**Product**

Table 1265: Properties of each product.

Id	Name	SBO
c496	PIP3:AKT_P:PDK1	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{630} = k_{72} \cdot c_{497} \cdot c_{111} - k_{d72} \cdot c_{496} \quad (1282)$$

8.631 Reaction v645

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

**Name** v645 AKT#P#P + Pase4 -> AKT#P#P:Pase4 k74 kd74

Reaction equation



Reactants

Table 1266: Properties of each reactant.

Id	Name	SBO
c497	AKT:P:P	
c113	Pase4	

Product

Table 1267: Properties of each product.

Id	Name	SBO
c498	AKT:P:P:Pase4	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{631} = k74 \cdot c497 \cdot c113 - kd74 \cdot c498$$

(1284)

8.632 Reaction v646

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

**Name** v646 AKT#P + Pase4 -> AKT#P:Pase4 k73 kd73

Reaction equation



Reactants

Table 1268: Properties of each reactant.

Id	Name	SBO
c112	AKT_P	
c113	Pase4	

Product

Table 1269: Properties of each product.

Id	Name	SBO
c114	AKT_P:Pase4	

Kinetic Law

Derived unit contains undeclared units

$$v_{632} = k73 \cdot c112 \cdot c113 - kd73 \cdot c114 \tag{1286}$$

8.633 Reaction v647

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

Name v647 AKT + Pase4 -> AKT#P:Pase4 k75 kd75

Reaction equation

$$c107 + c113 \rightleftharpoons c114 \tag{1287}$$

Reactants

Table 1270: Properties of each reactant.

Id	Name	SBO
c107	AKT	
c113	Pase4	

Product

Table 1271: Properties of each product.

Id	Name	SBO
c114	AKT_P:Pase4	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{633} = k75 \cdot c107 \cdot c113 - kd75 \cdot c114 \quad (1288)$$

**8.634 Reaction v648**

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

**Name** v648 AKT#P + Pase4 -> AKT#P#P:Pase4 k75 kd75**Reaction equation****Reactants**

Table 1272: Properties of each reactant.

Id	Name	SBO
c112	AKT_P	
c113	Pase4	

**Product**

Table 1273: Properties of each product.

Id	Name	SBO
c498	AKT:P:P:Pase4	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{634} = k75 \cdot c112 \cdot c113 - kd75 \cdot c498 \quad (1290)$$



### 8.635 Reaction v649

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

**Name** v649 PDK1 + PIP3 -> PIP3:PDK1 k76 kd76

#### Reaction equation



#### Reactants

Table 1274: Properties of each reactant.

Id	Name	SBO
c109	PDK1	
c106	PIP3	

#### Product

Table 1275: Properties of each product.

Id	Name	SBO
c111	PIP3:PDK1	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{635} = k76 \cdot c109 \cdot c106 - kd76 \cdot c111 \quad (1292)$$

### 8.636 Reaction v650

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

**Name** v650 RTK\_Pase + (ErbB1:ErbB3)#P -> (ErbB1:ErbB3)#P:RTK\_Pase k94b kd94

#### Reaction equation



#### Reactants

Table 1276: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c163	(ErbB1:ErbB3)_P	

Product

Table 1277: Properties of each product.

Id	Name	SBO
c281	(ErbB1:ErbB3)_P:RTK_Pase	

Kinetic Law

Derived unit contains undeclared units

$$v_{636} = k_{94b} \cdot c_{280} \cdot c_{163} - k_{d94} \cdot c_{281} \tag{1294}$$

8.637 Reaction v651

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

**Name** v651 RTK\_Pase + (ErbB1:ErbB4)#P -> (ErbB1:ErbB4)#P:RTK\_Pase k94b kd94

Reaction equation



Reactants

Table 1278: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c164	(ErbB1:ErbB4)_P	

Product

Table 1279: Properties of each product.

Id	Name	SBO
c282	(ErbB1:ErbB4)_P:RTK_Pase	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{637} = k_{94b} \cdot c_{280} \cdot c_{164} - k_{d94} \cdot c_{282} \quad (1296)$$

### 8.638 Reaction v652

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

**Name** v652 RTK\_Pase + 2(EGF:ErbB1)#P -> 2(EGF:ErbB1)#P:RTK\_Pase k94 kd94

### Reaction equation



### Reactants

Table 1280: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c8	2(EGF:ErbB1)_P	

### Product

Table 1281: Properties of each product.

Id	Name	SBO
c415	2(EGF:ErbB1)_P:RTK_Pase	

### Kinetic Law

**Derived unit** contains undeclared units

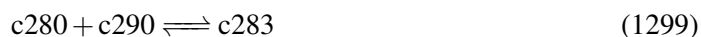
$$v_{638} = k_{94} \cdot c_{280} \cdot c_8 - k_{d94} \cdot c_{415} \quad (1298)$$

### 8.639 Reaction v653

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

**Name** v653 RTK\_Pase + 2(ErbB2)#P -> 2(ErbB2)#P:RTK\_Pase k94 kd94

#### Reaction equation



#### Reactants

Table 1282: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c290	2(ErbB2)_P	

#### Product

Table 1283: Properties of each product.

Id	Name	SBO
c283	2(ErbB2)_P:RTK_Pase	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{639} = k94 \cdot c280 \cdot c290 - kd94 \cdot c283 \quad (1300)$$

### 8.640 Reaction v654

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

**Name** v654 RTK\_Pase + (ErbB3:ErbB2)#P -> (ErbB2:ErbB3)#P:RTK\_Pase k94 kd94

#### Reaction equation



#### Reactants

Table 1284: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c337	(ErbB3:ErbB2)_P	

Product

Table 1285: Properties of each product.

Id	Name	SBO
c417	(ErbB2:ErbB3)_P:RTK_Pase	

Kinetic Law

Derived unit contains undeclared units

$$v_{640} = k_{94} \cdot c_{280} \cdot c_{337} - k_{d94} \cdot c_{417}$$

(1302)

8.641 Reaction v655

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

**Name** v655 RTK\_Pase + (ErbB4:ErbB2)#P -> (ErbB2:ErbB4)#P:RTK\_Pase k94 kd94

Reaction equation



Reactants

Table 1286: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c338	(ErbB4:ErbB2)_P	

Product

Table 1287: Properties of each product.

Id	Name	SBO
c418	(ErbB2:ErbB4)_P:RTK_Pase	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{641} = k_{94} \cdot c_{280} \cdot c_{338} - k_{d94} \cdot c_{418} \quad (1304)$$

### 8.642 Reaction v656

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

**Name** v656 RTK\_Pase + (ErbB1:ErbB2)#P -> (ErbB1:ErbB2)#P:RTK\_Pase k94 kd94

### Reaction equation



### Reactants

Table 1288: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c162	(ErbB1:ErbB2)_P	

### Product

Table 1289: Properties of each product.

Id	Name	SBO
c416	(ErbB1:ErbB2)_P:RTK_Pase	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{642} = k_{94} \cdot c_{280} \cdot c_{162} - k_{d94} \cdot c_{416} \quad (1306)$$

### 8.643 Reaction v657

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

**Name** v657 RTK\_Pase + (EGF:ErbB1:ErbB2) -> (ErbB1:ErbB2)#P:RTK\_Pase k95 kd95

#### Reaction equation



#### Reactants

Table 1290: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c159	(EGF:ErbB1:ErbB2)	

#### Product

Table 1291: Properties of each product.

Id	Name	SBO
c416	(ErbB1:ErbB2)_P:RTK_Pase	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{643} = k95 \cdot c280 \cdot c159 - kd95 \cdot c416 \quad (1308)$$

### 8.644 Reaction v658

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

**Name** v658 RTK\_Pase + (EGF:ErbB1:ErbB3) -> (ErbB1:ErbB3)#P:RTK\_Pase k95 kd95

#### Reaction equation



#### Reactants

Table 1292: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c160	(EGF:ErbB1:ErbB3)	

Product

Table 1293: Properties of each product.

Id	Name	SBO
c281	(ErbB1:ErbB3)_P:RTK_Pase	

Kinetic Law

Derived unit contains undeclared units

$$v_{644} = k_{95} \cdot c_{280} \cdot c_{160} - k_{d95} \cdot c_{281} \tag{1310}$$

8.645 Reaction v659

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

**Name** v659 RTK\_Pase + (EGF:ErbB1:ErbB4) -> (ErbB1:ErbB4)#P:RTK\_Pase k95 kd95

Reaction equation



Reactants

Table 1294: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c161	(EGF:ErbB1:ErbB4)	

Product



Table 1295: Properties of each product.

Id	Name	SBO
c282	(ErbB1:ErbB4)_P:RTK_Pase	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{645} = k_{95} \cdot c_{280} \cdot c_{161} - k_{d95} \cdot c_{282} \quad (1312)$$

### 8.646 Reaction v660

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

**Name** v660 RTK\_Pase + 2(EGF:ErbB1:ATP) -> 2(EGF:ErbB1)#P:RTK\_Pase k95 kd95

### Reaction equation



### Reactants

Table 1296: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c11	2(EGF:ErbB1:ATP)	

### Product

Table 1297: Properties of each product.

Id	Name	SBO
c415	2(EGF:ErbB1)_P:RTK_Pase	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{646} = k_{95} \cdot c_{280} \cdot c_{11} - k_{d95} \cdot c_{415} \quad (1314)$$

8.647 Reaction v661

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

**Name** v661 RTK\_Pase + 2(ErbB2) -> 2(ErbB2)#P:RTK\_Pase k95 kd95

Reaction equation



Reactants

Table 1298: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c425	2(ErbB2)	

Product

Table 1299: Properties of each product.

Id	Name	SBO
c283	2(ErbB2)_P:RTK_Pase	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{647} = k95 \cdot c280 \cdot c425 - kd95 \cdot c283$$

(1316)

8.648 Reaction v662

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

**Name** v662 RTK\_Pase + (ErbB3:ErbB2) -> (ErbB2:ErbB3)#P:RTK\_Pase k95 kd95

Reaction equation



Reactants

Table 1300: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c339	(ErbB3:ErbB2)	

Product

Table 1301: Properties of each product.

Id	Name	SBO
c417	(ErbB2:ErbB3)_P:RTK_Pase	

Kinetic Law

Derived unit contains undeclared units

$$v_{648} = k_{95} \cdot c_{280} \cdot c_{339} - k_{d95} \cdot c_{417}$$

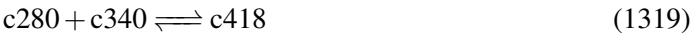
(1318)

8.649 Reaction v663

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

**Name** v663 RTK\_Pase + (ErbB4:ErbB2) -> (ErbB2:ErbB4)#P:RTK\_Pase k95 kd95

Reaction equation



Reactants

Table 1302: Properties of each reactant.

Id	Name	SBO
c280	RTK_Pase	
c340	(ErbB4:ErbB2)	

Product

Table 1303: Properties of each product.		
Id	Name	SBO
c418	(ErbB2:ErbB4)_P:RTK_Pase	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{649} = k_{95} \cdot c_{280} \cdot c_{340} - k_{d95} \cdot c_{418} \tag{1320}$$

### 8.650 Reaction v664

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

**Name** v664 ErbB2#P + ErbB2#P -> 2(ErbB2)#P k96 kd96

### Reaction equation

$$c_{87} + c_{87} \rightleftharpoons c_{289} \tag{1321}$$

### Reactants

Table 1304: Properties of each reactant.		
Id	Name	SBO
c87	ErbB2_P	
c87	ErbB2_P	

### Product

Table 1305: Properties of each product.		
Id	Name	SBO
c289	2(ErbB2)_P	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{650} = k_{96} \cdot c_{87} \cdot c_{87} - k_{d96} \cdot c_{289} \tag{1322}$$

8.651 Reaction v665

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

**Name** v665 ErbB1 + Inh -> ErbB1:Inh k97 kd97

Reaction equation



Reactants

Table 1306: Properties of each reactant.

Id	Name	SBO
c531	ErbB1	
c285	Inh	

Product

Table 1307: Properties of each product.

Id	Name	SBO
c286	ErbB1:Inh	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{651} = k97 \cdot c531 \cdot [c285] - kd97 \cdot c286$$

(1324)

8.652 Reaction v666

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

**Name** v666 ErbB2 + Inh -> ErbB2:Inh k98 kd98

Reaction equation



Reactants

Table 1308: Properties of each reactant.

Id	Name	SBO
c141	ErbB2	
c285	Inh	

Product

Table 1309: Properties of each product.

Id	Name	SBO
c502	ErbB2:Inh	

Kinetic Law

Derived unit contains undeclared units

$$v_{652} = k_{98} \cdot c_{141} \cdot [c_{285}] - k_{d98} \cdot c_{502}$$

(1326)

8.653 Reaction v667

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

Name v667 ErbB4 + Inh -> ErbB4:Inh k99 kd99

Reaction equation

$$c_{143} + c_{285} \rightleftharpoons c_{503}$$

(1327)

Reactants

Table 1310: Properties of each reactant.

Id	Name	SBO
c143	ErbB4	
c285	Inh	

Product

Table 1311: Properties of each product.

Id	Name	SBO
c503	ErbB4:Inh	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{653} = k_{99} \cdot c_{143} \cdot [c_{285}] - k_{d99} \cdot c_{503} \quad (1328)$$

### 8.654 Reaction v668

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

**Name** v668 ErbB3 + Inh -> ErbB3:Inh k100 kd100

### Reaction equation



### Reactants

Table 1312: Properties of each reactant.

Id	Name	SBO
c140	ErbB3	
c285	Inh	

### Product

Table 1313: Properties of each product.

Id	Name	SBO
c506	ErbB3:Inh	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{654} = k_{100} \cdot c_{140} \cdot [c_{285}] - k_{d100} \cdot c_{506} \quad (1330)$$

8.655 Reaction v669

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

**Name** v669 Sos#P + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:Sos#P k101 kd101

Reaction equation



Reactants

Table 1314: Properties of each reactant.

Id	Name	SBO
c103	Sos_P	
c23	2(EGF:ErbB1)_P:GAP:Grb2	

Product

Table 1315: Properties of each product.

Id	Name	SBO
c99	2(EGF:ErbB1)_P:GAP:Grb2:Sos_P	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{655} = k101 \cdot c103 \cdot c23 - kd101 \cdot c99 \tag{1332}$$

8.656 Reaction v670

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

**Name** v670 Sos#P + 2(EGF:ErbB1)#P:GAP:Grb2 -> 2(EGF:ErbB1)#P:GAP:Grb2:(Sos#P) k101 kd101

Reaction equation



Reactants



Table 1316: Properties of each reactant.		
Id	Name	SBO
c103	Sos_P	
c18	2(EGF:ErbB1)_P:GAP:Grb2	

Product

Table 1317: Properties of each product.		
Id	Name	SBO
c100	2(EGF:ErbB1)_P:GAP:Grb2:(Sos_P)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{656} = k_{101} \cdot c_{103} \cdot c_{18} - k_{d101} \cdot c_{100}$$

(1334)

8.657 Reaction v671

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

**Name** v671 Sos#P + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc-  
#P):Grb2:(Sos#P) k101 kd101

Reaction equation

$$c_{103} + c_{34} \rightleftharpoons c_{419}$$

(1335)

Reactants

Table 1318: Properties of each reactant.		
Id	Name	SBO
c103	Sos_P	
c34	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

Product

Table 1319: Properties of each product.

Id	Name	SBO
c419	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:(Sos_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{657} = k_{101} \cdot c_{103} \cdot c_{34} - k_{d101} \cdot c_{419} \quad (1336)$$

### 8.658 Reaction v672

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

**Name** v672 Sos#P + 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 -> 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) k101 k<sub>d101</sub>

### Reaction equation



### Reactants

Table 1320: Properties of each reactant.

Id	Name	SBO
c103	Sos_P	
c65	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2	

### Product

Table 1321: Properties of each product.

Id	Name	SBO
c420	2(EGF:ErbB1)_P:GAP:(Shc_P):Grb2:(Sos_P)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{658} = k_{101} \cdot c_{103} \cdot c_{65} - k_{d101} \cdot c_{420} \quad (1338)$$

### 8.659 Reaction v673

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

**Name** v673 EGF:ErbB1#P + EGF:ErbB1#P -> 2(EGF:ErbB1)#P k102 kd102

#### Reaction equation



#### Reactants

Table 1322: Properties of each reactant.

Id	Name	SBO
c330	EGF:ErbB1_P	
c330	EGF:ErbB1_P	

#### Product

Table 1323: Properties of each product.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{659} = k102 \cdot c330 \cdot c330 - kd102 \cdot c5 \quad (1340)$$

### 8.660 Reaction v674

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

**Name** v674 ErbB2#P + EGF:ErbB1#P -> (ErbB1:ErbB2)#P k102 kd102

#### Reaction equation



#### Reactants

Table 1324: Properties of each reactant.

Id	Name	SBO
c87	ErbB2_P	
c330	EGF:ErbB1_P	

Product

Table 1325: Properties of each product.

Id	Name	SBO
c148	(ErbB1:ErbB2)_P	

Kinetic Law

Derived unit contains undeclared units

$$v_{660} = k_{102} \cdot c_{87} \cdot c_{330} - k_{d102} \cdot c_{148}$$

(1342)

8.661 Reaction v675

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

**Name** v675 EGF:ErbB1#P + ErbB3#P -> (ErbB1:ErbB3)#P k102 kd102

Reaction equation

$$c_{330} + c_{331} \rightleftharpoons c_{149}$$

(1343)

Reactants

Table 1326: Properties of each reactant.

Id	Name	SBO
c330	EGF:ErbB1_P	
c331	ErbB3_P	

Product

Table 1327: Properties of each product.

Id	Name	SBO
c149	(ErbB1:ErbB3)_P	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{661} = k_{102} \cdot c_{330} \cdot c_{331} - k_{d102} \cdot c_{149} \quad (1344)$$

**8.662 Reaction v676**

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

**Name** v676 EGF:ErbB1#P + ErbB4#P -> (ErbB1:ErbB4)#P k102 kd102**Reaction equation****Reactants**

Table 1328: Properties of each reactant.

Id	Name	SBO
c330	EGF:ErbB1_P	
c332	ErbB4_P	

**Product**

Table 1329: Properties of each product.

Id	Name	SBO
c150	(ErbB1:ErbB4)_P	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{662} = k_{102} \cdot c_{330} \cdot c_{332} - k_{d102} \cdot c_{150} \quad (1346)$$

8.663 Reaction v677

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

**Name** v677 ErbB2#P + ErbB2 -> ErbB2:ErbB2#P k103 kd103

Reaction equation



Reactants

Table 1330: Properties of each reactant.

Id	Name	SBO
c87	ErbB2_P	
c141	ErbB2	

Product

Table 1331: Properties of each product.

Id	Name	SBO
c284	ErbB2:ErbB2_P	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{663} = k103 \cdot c87 \cdot c141 - kd103 \cdot c284$$

(1348)

8.664 Reaction v678

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

**Name** v678 ErbB2 + ErbB3 -> (ErbB2:ErbB3) k103 kd103

Reaction equation



Reactants

Table 1332: Properties of each reactant.

Id	Name	SBO
c141	ErbB2	
c140	ErbB3	

Product

Table 1333: Properties of each product.

Id	Name	SBO
c288	(ErbB2:ErbB3)	

Kinetic Law

Derived unit contains undeclared units

$$v_{664} = k_{103} \cdot c_{141} \cdot c_{140} - k_{d103} \cdot c_{288}$$

(1350)

8.665 Reaction v679

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

Name v679 ErbB2 + ErbB4 -> ErbB2:ErbB4 k103 kd103

Reaction equation

$$c_{141} + c_{143} \rightleftharpoons c_{117}$$

(1351)

Reactants

Table 1334: Properties of each reactant.

Id	Name	SBO
c141	ErbB2	
c143	ErbB4	

Product

Table 1335: Properties of each product.

Id	Name	SBO
c117	ErbB2:ErbB4	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{665} = k_{103} \cdot c_{141} \cdot c_{143} - k_{d103} \cdot c_{117} \quad (1352)$$

### 8.666 Reaction v680

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

**Name** v680 ErbB2#P + ErbB3#P -> (ErbB3:ErbB2)#P k103 kd103

### Reaction equation



### Reactants

Table 1336: Properties of each reactant.

Id	Name	SBO
c87	ErbB2_P	
c331	ErbB3_P	

### Product

Table 1337: Properties of each product.

Id	Name	SBO
c335	(ErbB3:ErbB2)_P	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{666} = k_{103} \cdot c_{87} \cdot c_{331} - k_{d103} \cdot c_{335} \quad (1354)$$



8.667 Reaction v681

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

**Name** v681 ErbB2#P + ErbB4#P -> (ErbB4:ErbB2)#P k103 kd103

Reaction equation



Reactants

Table 1338: Properties of each reactant.

Id	Name	SBO
c87	ErbB2_P	
c332	ErbB4_P	

Product

Table 1339: Properties of each product.

Id	Name	SBO
c336	(ErbB4:ErbB2)_P	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{667} = k103 \cdot c87 \cdot c332 - kd103 \cdot c336$$

(1356)

8.668 Reaction v682

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

**Name** v682 ErbB2#P + ErbB2:Inh -> ErbB2:ErbB2:Inh k103 kd103

Reaction equation



Reactants

Table 1340: Properties of each reactant.

Id	Name	SBO
c87	ErbB2_P	
c502	ErbB2:Inh	

Product

Table 1341: Properties of each product.

Id	Name	SBO
c509	ErbB2:ErbB2:Inh	

Kinetic Law

Derived unit contains undeclared units

$$v_{668} = k_{103} \cdot c_{87} \cdot c_{502} - k_{d103} \cdot c_{509}$$

(1358)

8.669 Reaction v683

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

Name v683 ErbB2:Inh + ErbB3 -> ErbB3:ErbB2:Inh k103 kd103

Reaction equation

$$c_{502} + c_{140} \rightleftharpoons c_{510}$$

(1359)

Reactants

Table 1342: Properties of each reactant.

Id	Name	SBO
c502	ErbB2:Inh	
c140	ErbB3	

Product

Table 1343: Properties of each product.

Id	Name	SBO
c510	ErbB3:ErbB2:Inh	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{669} = k_{103} \cdot c_{502} \cdot c_{140} - k_{d103} \cdot c_{510} \quad (1360)$$

**8.670 Reaction v684**

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

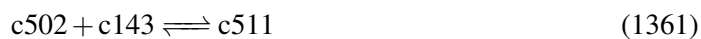
**Name** v684 ErbB2:Inh + ErbB4 -> ErbB4:ErbB2:Inh k103 kd103**Reaction equation****Reactants**

Table 1344: Properties of each reactant.

Id	Name	SBO
c502	ErbB2:Inh	
c143	ErbB4	

**Product**

Table 1345: Properties of each product.

Id	Name	SBO
c511	ErbB4:ErbB2:Inh	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{670} = k_{103} \cdot c_{502} \cdot c_{143} - k_{d103} \cdot c_{511} \quad (1362)$$

8.671 Reaction v685

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

**Name** v685 ErbB2 + ErbB4:Inh -> ErbB4:Inh:ErbB2 k103 kd103

Reaction equation



Reactants

Table 1346: Properties of each reactant.

Id	Name	SBO
c141	ErbB2	
c503	ErbB4:Inh	

Product

Table 1347: Properties of each product.

Id	Name	SBO
c513	ErbB4:Inh:ErbB2	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{671} = k103 \cdot c141 \cdot c503 - kd103 \cdot c513$$

(1364)

8.672 Reaction v686

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

**Name** v686 Shp + PIP2 -> PIP3:Shp k104 kd104

Reaction equation



Reactants

Table 1348: Properties of each reactant.

Id	Name	SBO
c461	Shp	
c444	PIP2	

Product

Table 1349: Properties of each product.

Id	Name	SBO
c462	PIP3:Shp	

Kinetic Law

Derived unit contains undeclared units

$$v_{672} = k_{104} \cdot c_{461} \cdot c_{444} - k_{d104} \cdot c_{462}$$

(1366)

8.673 Reaction v687

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

Name v687 PTEN + PIP2 -> PIP3:PTEN k104 kd104

Reaction equation



Reactants

Table 1350: Properties of each reactant.

Id	Name	SBO
c279	PTEN	
c444	PIP2	

Product

Table 1351: Properties of each product.

Id	Name	SBO
c482	PIP3:PTEN	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{673} = k_{104} \cdot c_{279} \cdot c_{444} - k_{d104} \cdot c_{482} \quad (1368)$$

**8.674 Reaction v688**

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

**Name** v688 2(EGF:ErbB1)#P:GAP:Grb2 + Gab1 -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1 k105 kd105**Reaction equation****Reactants**

Table 1352: Properties of each reactant.

Id	Name	SBO
c23	2(EGF:ErbB1)_P:GAP:Grb2	
c426	Gab1	

**Product**

Table 1353: Properties of each product.

Id	Name	SBO
c483	2(EGF:ErbB1)_P:GAP:Grb2:Gab1	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{674} = k_{105} \cdot c_{23} \cdot c_{426} - k_{d105} \cdot c_{483} \quad (1370)$$

8.675 Reaction v689

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

**Name** v689 (ErbB1:ErbB2)#P:GAP:Grb2 + Gab1 -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1 k105 kd105

Reaction equation



Reactants

Table 1354: Properties of each reactant.

Id	Name	SBO
c225	(ErbB1:ErbB2).P:GAP:Grb2	
c426	Gab1	

Product

Table 1355: Properties of each product.

Id	Name	SBO
c427	(ErbB1:ErbB2).P:GAP:Grb2:Gab1	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{675} = k105 \cdot c225 \cdot c426 - kd105 \cdot c427$$

(1372)

8.676 Reaction v690

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

**Name** v690 (ErbB1:ErbB3)#P:GAP:Grb2 + Gab1 -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1 k105 kd105

Reaction equation



Reactants

Table 1356: Properties of each reactant.

Id	Name	SBO
c226	(ErbB1:ErbB3)_P:GAP:Grb2	
c426	Gab1	

**Product**

Table 1357: Properties of each product.

Id	Name	SBO
c428	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{676} = k_{105} \cdot c_{226} \cdot c_{426} - k_{d105} \cdot c_{428} \quad (1374)$$

**8.677 Reaction v691**

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

**Name** v691 (ErbB1:ErbB4)#P:GAP:Grb2 + Gab1 -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1 k105  
kd105**Reaction equation****Reactants**

Table 1358: Properties of each reactant.

Id	Name	SBO
c227	(ErbB1:ErbB4)_P:GAP:Grb2	
c426	Gab1	

**Product**



Table 1359: Properties of each product.

Id	Name	SBO
c429	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{677} = k_{105} \cdot c_{227} \cdot c_{426} - k_{d105} \cdot c_{429} \quad (1376)$$

### 8.678 Reaction v692

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

**Name** v692 2(ErbB2)#P:GAP:Grb2 + Gab1 -> 2(ErbB2)#P:GAP:Grb2:Gab1 k105 kd105

### Reaction equation



### Reactants

Table 1360: Properties of each reactant.

Id	Name	SBO
c312	2(ErbB2)_P:GAP:Grb2	
c426	Gab1	

### Product

Table 1361: Properties of each product.

Id	Name	SBO
c436	2(ErbB2)_P:GAP:Grb2:Gab1	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{678} = k_{105} \cdot c_{312} \cdot c_{426} - k_{d105} \cdot c_{436} \quad (1378)$$

8.679 Reaction v693

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

**Name** v693 (ErbB3:ErbB2)#P:GAP:Grb2 + Gab1 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1 k105 kd105

Reaction equation



Reactants

Table 1362: Properties of each reactant.		
Id	Name	SBO
c381	(ErbB3:ErbB2).P:GAP:Grb2	
c426	Gab1	

Product

Table 1363: Properties of each product.		
Id	Name	SBO
c439	(ErbB3:ErbB2).P:GAP:Grb2:Gab1	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{679} = k105 \cdot c381 \cdot c426 - kd105 \cdot c439 \tag{1380}$$

8.680 Reaction v694

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

**Name** v694 (ErbB4:ErbB2)#P:GAP:Grb2 + Gab1 -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1 k105 kd105

Reaction equation



Reactants

Table 1364: Properties of each reactant.

Id	Name	SBO
c384	(ErbB4:ErbB2)_P:GAP:Grb2	
c426	Gab1	

## Product

Table 1365: Properties of each product.

Id	Name	SBO
c442	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1	

## Kinetic Law

**Derived unit** contains undeclared units

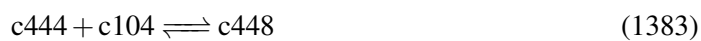
$$v_{680} = k_{105} \cdot c_{384} \cdot c_{426} - k_{d105} \cdot c_{442} \quad (1382)$$

## 8.681 Reaction v695

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

**Name** v695 PIP2 + 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k106b kd106b

## Reaction equation



## Reactants

Table 1366: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c104	2(EGF:ErbB1)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1367: Properties of each product.

Id	Name	SBO
c448	2(EGF:ErbB1)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{681} = k_{106b} \cdot c_{444} \cdot c_{104} - k_{d106b} \cdot c_{448} \quad (1384)$$

### 8.682 Reaction v696

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

**Name** v696 PIP2 + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k106b k<sub>d106b</sub>

### Reaction equation



### Reactants

Table 1368: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c261	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

### Product

Table 1369: Properties of each product.

Id	Name	SBO
c449	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{682} = k_{106b} \cdot c_{444} \cdot c_{261} - k_{d106b} \cdot c_{449} \quad (1386)$$

### 8.683 Reaction v697

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

**Name** v697 PIP2 + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k106b kd106b

#### Reaction equation



#### Reactants

Table 1370: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c262	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K	

#### Product

Table 1371: Properties of each product.

Id	Name	SBO
c450	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{683} = k106b \cdot c444 \cdot c262 - kd106b \cdot c450 \quad (1388)$$

### 8.684 Reaction v698

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

**Name** v698 PIP2 + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k106b kd106b

#### Reaction equation



#### Reactants

Table 1372: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c263	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1373: Properties of each product.

Id	Name	SBO
c451	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{684} = k_{106b} \cdot c_{444} \cdot c_{263} - k_{d106b} \cdot c_{451} \quad (1390)$$

## 8.685 Reaction v699

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

**Name** v699 PIP2 + 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> 2(ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:PIP2 k106 kd106

## Reaction equation



## Reactants

Table 1374: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c324	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1375: Properties of each product.

Id	Name	SBO
c452	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{685} = k_{106} \cdot c_{444} \cdot c_{324} - k_{d106} \cdot c_{452} \quad (1392)$$

### 8.686 Reaction v700

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

**Name** v700 PIP2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:PIP2 k106 k<sub>d106</sub>

### Reaction equation



### Reactants

Table 1376: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c405	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

### Product

Table 1377: Properties of each product.

Id	Name	SBO
c453	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

### Kinetic Law

**Derived unit** contains undeclared units

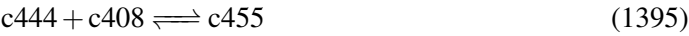
$$v_{686} = k_{106} \cdot c_{444} \cdot c_{405} - k_{d106} \cdot c_{453} \quad (1394)$$

8.687 Reaction v701

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

**Name** v701 PIP2 + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> PI3K k106 kd106

Reaction equation



Reactants

Table 1378: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c408	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

Product

Table 1379: Properties of each product.

Id	Name	SBO
c455	PI3K	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{687} = k106 \cdot c444 \cdot c408 - kd106 \cdot c455$$

(1396)

8.688 Reaction v702

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

**Name** v702 PIP2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:(PIP2)2 k106 kd106

Reaction equation



Reactants



Table 1380: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c453	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:PIP2	

## Product

Table 1381: Properties of each product.

Id	Name	SBO
c467	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{688} = k_{106} \cdot c_{444} \cdot c_{453} - k_{d106} \cdot c_{467} \quad (1398)$$

## 8.689 Reaction v703

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

**Name** v703 PIP2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)2 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 k106 kd106

## Reaction equation



## Reactants

Table 1382: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c467	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)2	

## Product

Table 1383: Properties of each product.

Id	Name	SBO
c468	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)3	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{689} = k_{106} \cdot c_{444} \cdot c_{467} - k_{d106} \cdot c_{468} \quad (1400)$$

### 8.690 Reaction v704

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

**Name** v704 PIP2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 k106 kd106

### Reaction equation



### Reactants

Table 1384: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c468	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)3	

### Product

Table 1385: Properties of each product.

Id	Name	SBO
c469	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)4	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{690} = k_{106} \cdot c_{444} \cdot c_{468} - k_{d106} \cdot c_{469} \quad (1402)$$

### 8.691 Reaction v705

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

**Name** v705 PIP2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 k106 kd106

#### Reaction equation



#### Reactants

Table 1386: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c469	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)4	

#### Product

Table 1387: Properties of each product.

Id	Name	SBO
c470	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)5	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{691} = k106 \cdot c444 \cdot c469 - kd106 \cdot c470 \quad (1404)$$

### 8.692 Reaction v706

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

**Name** v706 PIP2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 -> (ErbB3:ErbB2)-#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)6 k106 kd106

#### Reaction equation



#### Reactants

Table 1388: Properties of each reactant.

Id	Name	SBO
c444	PIP2	
c470	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)5	

## Product

Table 1389: Properties of each product.

Id	Name	SBO
c471	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:(PIP2)6	

## Kinetic Law

**Derived unit** contains undeclared units

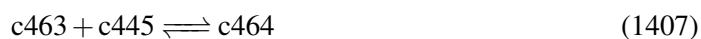
$$v_{692} = k_{106} \cdot c_{444} \cdot c_{470} - k_{d106} \cdot c_{471} \quad (1406)$$

## 8.693 Reaction v707

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

**Name** v707 Shp2 + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-  
#P:Shp2 k107 kd107

## Reaction equation



## Reactants

Table 1390: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c445	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1391: Properties of each product.

Id	Name	SBO
c464	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

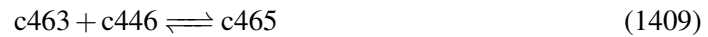
$$v_{693} = k_{107} \cdot c_{463} \cdot c_{445} - k_{d107} \cdot c_{464} \quad (1408)$$

### 8.694 Reaction v708

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

**Name** v708 Shp2 + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-#P:Shp2 k107 kd107

### Reaction equation



### Reactants

Table 1392: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c446	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

### Product

Table 1393: Properties of each product.

Id	Name	SBO
c465	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{694} = k_{107} \cdot c_{463} \cdot c_{446} - k_{d107} \cdot c_{465} \quad (1410)$$

8.695 Reaction v709

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

**Name** v709 Shp2 + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:Shp2 k107 kd107

Reaction equation



Reactants

Table 1394: Properties of each reactant.		
Id	Name	SBO
c463	Shp2	
c447	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

Product

Table 1395: Properties of each product.		
Id	Name	SBO
c466	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:Shp2	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{695} = k107 \cdot c463 \cdot c447 - kd107 \cdot c466 \tag{1412}$$

8.696 Reaction v710

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

**Name** v710 Shp2 + 2(ErbB2)#P:GAP:Grb2:Gab1#P -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:Shp2  
k107 kd107

Reaction equation



Reactants

Table 1396: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c454	2(ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1397: Properties of each product.

Id	Name	SBO
c473	2(ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{696} = k_{107} \cdot c_{463} \cdot c_{454} - k_{d107} \cdot c_{473} \quad (1414)$$

## 8.697 Reaction v711

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

**Name** v711 Shp2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-#P:Shp2 k107 kd107

## Reaction equation



## Reactants

Table 1398: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c457	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1399: Properties of each product.

Id	Name	SBO
c476	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

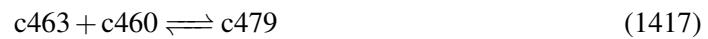
$$v_{697} = k_{107} \cdot c_{463} \cdot c_{457} - k_{d107} \cdot c_{476} \quad (1416)$$

### 8.698 Reaction v712

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

**Name** v712 Shp2 + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-  
#P:Shp2 k107 kd107

### Reaction equation



### Reactants

Table 1400: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c460	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P	

### Product

Table 1401: Properties of each product.

Id	Name	SBO
c479	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{698} = k_{107} \cdot c_{463} \cdot c_{460} - k_{d107} \cdot c_{479} \quad (1418)$$



### 8.699 Reaction v713

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

**Name** v713 Shp2 + 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-#P):Shp2 k107 kd107

#### Reaction equation



#### Reactants

Table 1402: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c486	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P#)	

#### Product

Table 1403: Properties of each product.

Id	Name	SBO
c489	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):Shp2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{699} = k107 \cdot c463 \cdot c486 - kd107 \cdot c489 \quad (1420)$$

### 8.700 Reaction v714

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

**Name** v714 Shp2 + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1 -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-#P:Shp2 k108 kd108

#### Reaction equation



#### Reactants

Table 1404: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c427	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1	

## Product

Table 1405: Properties of each product.

Id	Name	SBO
c464	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{700} = k_{108} \cdot c_{463} \cdot c_{427} - k_{d108} \cdot c_{464} \quad (1422)$$

### 8.701 Reaction v715

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

**Name** v715 Shp2 + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1 -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:Shp2 k108 kd108

## Reaction equation



## Reactants

Table 1406: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c428	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1	

## Product

Table 1407: Properties of each product.

Id	Name	SBO
c465	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{701} = k_{108} \cdot c_{463} \cdot c_{428} - k_{d108} \cdot c_{465} \quad (1424)$$

### 8.702 Reaction v716

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

**Name** v716 Shp2 + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1 -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-#P:Shp2 k108 kd108

### Reaction equation



### Reactants

Table 1408: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c429	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1	

### Product

Table 1409: Properties of each product.

Id	Name	SBO
c466	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{702} = k_{108} \cdot c_{463} \cdot c_{429} - k_{d108} \cdot c_{466} \quad (1426)$$

### 8.703 Reaction v717

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

**Name** v717 Shp2 + 2(ErbB2)#P:GAP:Grb2:Gab1 -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 k108 kd108

#### Reaction equation



#### Reactants

Table 1410: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c436	2(ErbB2)_P:GAP:Grb2:Gab1	

#### Product

Table 1411: Properties of each product.

Id	Name	SBO
c473	2(ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{703} = k108 \cdot c463 \cdot c436 - kd108 \cdot c473 \quad (1428)$$

### 8.704 Reaction v718

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

**Name** v718 Shp2 + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1 -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-#P:Shp2 k108 kd108

#### Reaction equation



#### Reactants

Table 1412: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c439	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1	

## Product

Table 1413: Properties of each product.

Id	Name	SBO
c476	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{704} = k_{108} \cdot c_{463} \cdot c_{439} - k_{d108} \cdot c_{476} \quad (1430)$$

## 8.705 Reaction v719

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

**Name** v719 Shp2 + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1 -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-  
#P:Shp2 k108 kd108

## Reaction equation



## Reactants

Table 1414: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c442	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1	

## Product

Table 1415: Properties of each product.

Id	Name	SBO
c479	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

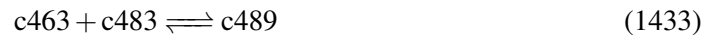
$$v_{705} = k_{108} \cdot c_{463} \cdot c_{442} - k_{d108} \cdot c_{479} \quad (1432)$$

### 8.706 Reaction v720

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

**Name** v720 Shp2 + 2(EGF:ErbB1)#P:GAP:Grb2:Gab1 -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-#P):Shp2 k108 kd108

### Reaction equation



### Reactants

Table 1416: Properties of each reactant.

Id	Name	SBO
c463	Shp2	
c483	2(EGF:ErbB1)_P:GAP:Grb2:Gab1	

### Product

Table 1417: Properties of each product.

Id	Name	SBO
c489	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):Shp2	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{706} = k_{108} \cdot c_{463} \cdot c_{483} - k_{d108} \cdot c_{489} \quad (1434)$$

### 8.707 Reaction v721

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

**Name** v721 PIP3 + PTEN -> PIP3:PTEN k109 kd109

#### Reaction equation



#### Reactants

Table 1418: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c279	PTEN	

#### Product

Table 1419: Properties of each product.

Id	Name	SBO
c482	PIP3:PTEN	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{707} = k109 \cdot c106 \cdot c279 - kd109 \cdot c482 \quad (1436)$$

### 8.708 Reaction v722

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

**Name** v722 PIP3 + Shp -> PIP3:Shp k109 kd109

#### Reaction equation



#### Reactants

Table 1420: Properties of each reactant.

Id	Name	SBO
c106	PIP3	
c461	Shp	

Product

Table 1421: Properties of each product.

Id	Name	SBO
c462	PIP3:Shp	

Kinetic Law

Derived unit contains undeclared units

$$v_{708} = k_{109} \cdot c_{106} \cdot c_{461} - k_{d109} \cdot c_{462}$$

(1438)

8.709 Reaction v723

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

**Name** v723 ERK#P#P + 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-  
#P):ERK#P#P k110 kd110

Reaction equation



Reactants

Table 1422: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c486	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P#)	

Product



Table 1423: Properties of each product.

Id	Name	SBO
c431	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{709} = k_{110} \cdot c_{59} \cdot c_{486} - k_{d110} \cdot c_{431} \quad (1440)$$

### 8.710 Reaction v724

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

**Name** v724 (ERK#P#P)\_i + 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-#P):ERK#P#P\_i k110 kd110

### Reaction equation



### Reactants

Table 1424: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c486	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P#)	

### Product

Table 1425: Properties of each product.

Id	Name	SBO
c432	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):ERK_PP_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{710} = k_{110} \cdot c_{83} \cdot c_{486} - k_{d110} \cdot c_{432} \quad (1442)$$

8.711 Reaction v725

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

**Name** v725 ERK#P#P + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k110 kd110

Reaction equation



Reactants

Table 1426: Properties of each reactant.		
Id	Name	SBO
c59	ERK_PP	
c445	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P	

Product

Table 1427: Properties of each product.		
Id	Name	SBO
c433	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{711} = k110 \cdot c59 \cdot c445 - kd110 \cdot c433 \tag{1444}$$

8.712 Reaction v726

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

**Name** v726 (ERK#P#P)\_i + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k110 kd110

Reaction equation



Reactants

Table 1428: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c445	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1429: Properties of each product.

Id	Name	SBO
c434	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{712} = k_{110} \cdot c_{83} \cdot c_{445} - k_{d110} \cdot c_{434} \quad (1446)$$

### 8.713 Reaction v727

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

**Name** v727 ERK#P#P + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k110 kd110

## Reaction equation



## Reactants

Table 1430: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c446	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

## Product

Table 1431: Properties of each product.

Id	Name	SBO
c435	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{713} = k_{110} \cdot c_{59} \cdot c_{446} - k_{d110} \cdot c_{435} \quad (1448)$$

### 8.714 Reaction v728

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

**Name** v728 (ERK#P#P)\_i + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k110 kd110

### Reaction equation



### Reactants

Table 1432: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c446	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

### Product

Table 1433: Properties of each product.

Id	Name	SBO
c437	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{714} = k_{110} \cdot c_{83} \cdot c_{446} - k_{d110} \cdot c_{437} \quad (1450)$$

### 8.715 Reaction v729

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

**Name** v729 ERK#P#P + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P\_ERK#P#P k110 kd110

#### Reaction equation



#### Reactants

Table 1434: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c447	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

#### Product

Table 1435: Properties of each product.

Id	Name	SBO
c438	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P_ERK_PP	

#### Kinetic Law

**Derived unit** contains undeclared units

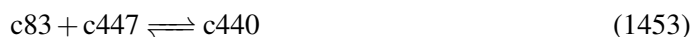
$$v_{715} = k110 \cdot c59 \cdot c447 - kd110 \cdot c438 \quad (1452)$$

### 8.716 Reaction v730

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

**Name** v730 (ERK#P#P)\_i + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k110 kd110

#### Reaction equation



#### Reactants

Table 1436: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c447	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

## Product

Table 1437: Properties of each product.

Id	Name	SBO
c440	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{716} = k_{110} \cdot c_{83} \cdot c_{447} - k_{d110} \cdot c_{440} \quad (1454)$$

### 8.717 Reaction v731

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

**Name** v731 ERK#P#P + 2(ErbB2)#P:GAP:Grb2:Gab1#P -> 2(ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k110 kd110

## Reaction equation



## Reactants

Table 1438: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c454	2(ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1439: Properties of each product.

Id	Name	SBO
c474	2(ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{717} = k_{110} \cdot c_{59} \cdot c_{454} - k_{d110} \cdot c_{474} \quad (1456)$$

### 8.718 Reaction v732

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

**Name** v732 (ERK#P#P)\_i + 2(ErbB2)#P:GAP:Grb2:Gab1#P -> 2(ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k110 kd110

### Reaction equation



### Reactants

Table 1440: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c454	2(ErbB2)_P:GAP:Grb2:Gab1_P	

### Product

Table 1441: Properties of each product.

Id	Name	SBO
c475	2(ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{718} = k_{110} \cdot c_{83} \cdot c_{454} - k_{d110} \cdot c_{475} \quad (1458)$$

8.719 Reaction v733

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

**Name** v733 ERK#P#P + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k110 kd110

Reaction equation



Reactants

Table 1442: Properties of each reactant.		
Id	Name	SBO
c59	ERK_PP	
c457	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P	

Product

Table 1443: Properties of each product.		
Id	Name	SBO
c477	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{719} = k110 \cdot c59 \cdot c457 - kd110 \cdot c477 \tag{1460}$$

8.720 Reaction v734

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

**Name** v734 (ERK#P#P)\_i + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k110 kd110

Reaction equation



Reactants



Table 1444: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c457	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1445: Properties of each product.

Id	Name	SBO
c478	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{720} = k_{110} \cdot c_{83} \cdot c_{457} - k_{d110} \cdot c_{478} \quad (1462)$$

### 8.721 Reaction v735

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

**Name** v735 ERK#P#P + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k110 kd110

## Reaction equation



## Reactants

Table 1446: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c460	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1447: Properties of each product.

Id	Name	SBO
c480	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{721} = k_{110} \cdot c_{59} \cdot c_{460} - k_{d110} \cdot c_{480} \quad (1464)$$

### 8.722 Reaction v736

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

**Name** v736 (ERK#P#P)\_i + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k110 kd110

### Reaction equation



### Reactants

Table 1448: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c460	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P	

### Product

Table 1449: Properties of each product.

Id	Name	SBO
c481	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{722} = k_{110} \cdot c_{83} \cdot c_{460} - k_{d110} \cdot c_{481} \quad (1466)$$

8.723 Reaction v737

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

**Name** v737 ERK#P#P + ErbB3/4:ErbB2:Gab1#P## -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k111 kd111

Reaction equation



Reactants

Table 1450: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c491	ErbB3/4:ErbB2:Gab1_P#	

Product

Table 1451: Properties of each product.

Id	Name	SBO
c477	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{723} = k111 \cdot c59 \cdot c491 - kd111 \cdot c477$$

(1468)

8.724 Reaction v738

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

**Name** v738 (ERK#P#P)\_i + ErbB3/4:ErbB2:Gab1#P## -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k111 kd111

Reaction equation



Reactants

Table 1452: Properties of each reactant.		
Id	Name	SBO
c83	(ERK_PP)_i	
c491	ErbB3/4:ErbB2:Gab1_P#	

Product

Table 1453: Properties of each product.		
Id	Name	SBO
c478	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

Kinetic Law

Derived unit contains undeclared units

$$v_{724} = k_{111} \cdot c_{83} \cdot c_{491} - k_{d111} \cdot c_{478}$$

(1470)

8.725 Reaction v739

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

**Name** v739 ERK#P#P + 2(ErbB2)2:Gab1#P## -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P  
k111 kd111

Reaction equation

$$c_{59} + c_{490} \rightleftharpoons c_{474}$$

(1471)

Reactants

Table 1454: Properties of each reactant.		
Id	Name	SBO
c59	ERK_PP	
c490	2(ErbB2)2:Gab1_P#	

Product

Table 1455: Properties of each product.

Id	Name	SBO
c474	2(ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{725} = k_{111} \cdot c_{59} \cdot c_{490} - k_{d111} \cdot c_{474} \quad (1472)$$

### 8.726 Reaction v740

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

**Name** v740 (ERK#P#P)\_i + 2(ErbB2)2:Gab1#P## -> 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK-#P#P\_i k111 kd111

### Reaction equation



### Reactants

Table 1456: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c490	2(ErbB2)2:Gab1_P#	

### Product

Table 1457: Properties of each product.

Id	Name	SBO
c475	2(ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{726} = k_{111} \cdot c_{83} \cdot c_{490} - k_{d111} \cdot c_{475} \quad (1474)$$

### 8.727 Reaction v741

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

**Name** v741 ERK#P#P + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P\_ERK#P#P k111 kd111

#### Reaction equation



#### Reactants

Table 1458: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c410	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

#### Product

Table 1459: Properties of each product.

Id	Name	SBO
c438	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P_ERK_PP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{727} = k111 \cdot c59 \cdot c410 - kd111 \cdot c438 \quad (1476)$$

### 8.728 Reaction v742

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

**Name** v742 (ERK#P#P)\_i + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k111 kd111

#### Reaction equation



#### Reactants

Table 1460: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c410	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

## Product

Table 1461: Properties of each product.

Id	Name	SBO
c440	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{728} = k_{111} \cdot c_{83} \cdot c_{410} - k_{d111} \cdot c_{440} \quad (1478)$$

### 8.729 Reaction v743

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

**Name** v743 ERK#P#P + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k111 kd111

## Reaction equation



## Reactants

Table 1462: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c409	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

## Product

Table 1463: Properties of each product.

Id	Name	SBO
c435	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{729} = k_{111} \cdot c_{59} \cdot c_{409} - k_{d111} \cdot c_{435} \quad (1480)$$

### 8.730 Reaction v744

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

**Name** v744 (ERK#P#P)\_i + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-#P:ERK#P#P\_i k111 kd111

### Reaction equation



### Reactants

Table 1464: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c409	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

### Product

Table 1465: Properties of each product.

Id	Name	SBO
c437	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{730} = k_{111} \cdot c_{83} \cdot c_{409} - k_{d111} \cdot c_{437} \quad (1482)$$



8.731 Reaction v745

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

**Name** v745 ERK#P#P + ErbB1:ErbB:Gab1#P## -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:ERK-  
#P#P k111 kd111

Reaction equation



Reactants

Table 1466: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c430	ErbB1:ErbB:Gab1_P#	

Product

Table 1467: Properties of each product.

Id	Name	SBO
c433	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{731} = k111 \cdot c59 \cdot c430 - kd111 \cdot c433 \tag{1484}$$

8.732 Reaction v746

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

**Name** v746 (ERK#P#P)\_i + ErbB1:ErbB:Gab1#P## -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k111 kd111

Reaction equation



Reactants

Table 1468: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP).i	
c430	ErbB1:ErbB:Gab1_P#	

Product

Table 1469: Properties of each product.

Id	Name	SBO
c434	(ErbB1:ErbB2).P:GAP:Grb2:Gab1_P:ERK_PP.i	

Kinetic Law

Derived unit contains undeclared units

$$v_{732} = k_{111} \cdot c_{83} \cdot c_{430} - k_{d111} \cdot c_{434}$$

(1486)

8.733 Reaction v747

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

**Name** v747 ERK#P#P + 2(EGF:ErbB1):Gab1#P## -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-  
#P):ERK#P#P k111 kd111

Reaction equation

$$c_{59} + c_{488} \rightleftharpoons c_{431}$$

(1487)

Reactants

Table 1470: Properties of each reactant.

Id	Name	SBO
c59	ERK_PP	
c488	2(EGF:ErbB1):Gab1_P#	

Product

Table 1471: Properties of each product.

Id	Name	SBO
c431	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):ERK_PP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{733} = k_{111} \cdot c_{59} \cdot c_{488} - k_{d111} \cdot c_{431} \quad (1488)$$

### 8.734 Reaction v748

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

**Name** v748 (ERK#P#P)\_i + 2(EGF:ErbB1):Gab1#P## -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-#P):ERK#P#P\_i k111 kd111

### Reaction equation



### Reactants

Table 1472: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c488	2(EGF:ErbB1):Gab1_P#	

### Product

Table 1473: Properties of each product.

Id	Name	SBO
c432	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):ERK_PP_i	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{734} = k_{111} \cdot c_{83} \cdot c_{488} - k_{d111} \cdot c_{432} \quad (1490)$$

8.735 Reaction v749

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

**Name** v749 ERK#P#P + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:#P#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P k111 kd111

Reaction equation



Reactants

Table 1474: Properties of each reactant.		
Id	Name	SBO
c59	ERK_PP	
c487	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:_PP	

Product

Table 1475: Properties of each product.		
Id	Name	SBO
c480	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{735} = k111 \cdot c59 \cdot c487 - kd111 \cdot c480 \tag{1492}$$

8.736 Reaction v750

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

**Name** v750 (ERK#P#P)\_i + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:#P#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-  
#P:ERK#P#P\_i k111 kd111

Reaction equation



Reactants

Table 1476: Properties of each reactant.

Id	Name	SBO
c83	(ERK_PP)_i	
c487	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:_PP	

## Product

Table 1477: Properties of each product.

Id	Name	SBO
c481	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:ERK_PP_i	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{736} = k_{111} \cdot c_{83} \cdot c_{487} - k_{d111} \cdot c_{481} \quad (1494)$$

### 8.737 Reaction v751

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

**Name** v751 Ras:GDP + 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-#P):PI3K:Ras:GDP k112 k112

## Reaction equation



## Reactants

Table 1478: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c104	2(EGF:ErbB1)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1479: Properties of each product.

Id	Name	SBO
c264	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

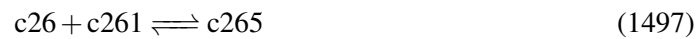
$$v_{737} = k_{112} \cdot c_{26} \cdot c_{104} - k_{d112} \cdot c_{264} \quad (1496)$$

### 8.738 Reaction v752

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

**Name** v752 Ras:GDP + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:Ras:GDP k112 kd112

### Reaction equation



### Reactants

Table 1480: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c261	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

### Product

Table 1481: Properties of each product.

Id	Name	SBO
c265	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{738} = k_{112} \cdot c_{26} \cdot c_{261} - k_{d112} \cdot c_{265} \quad (1498)$$

### 8.739 Reaction v753

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

**Name** v753 Ras:GDP + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-  
#P:PI3K:Ras:GDP k112 kd112

#### Reaction equation



#### Reactants

Table 1482: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c262	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K	

#### Product

Table 1483: Properties of each product.

Id	Name	SBO
c266	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{739} = k112 \cdot c26 \cdot c262 - kd112 \cdot c266 \quad (1500)$$

### 8.740 Reaction v754

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

**Name** v754 Ras:GDP + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:PI3K:Ras:GDP k112 kd112

#### Reaction equation



#### Reactants

Table 1484: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c263	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1485: Properties of each product.

Id	Name	SBO
c267	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{740} = k_{112} \cdot c_{26} \cdot c_{263} - k_{d112} \cdot c_{267} \quad (1502)$$

### 8.741 Reaction v755

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

**Name** v755 Ras:GDP + 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> 2(ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:Ras:GDP k112 kd112

## Reaction equation



## Reactants

Table 1486: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c324	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

## Product



Table 1487: Properties of each product.

Id	Name	SBO
c268	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{741} = k_{112} \cdot c_{26} \cdot c_{324} - k_{d112} \cdot c_{268} \quad (1504)$$

### 8.742 Reaction v756

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

**Name** v756 Ras:GDP + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:Ras:GDP k112 k<sub>d</sub>112

### Reaction equation



### Reactants

Table 1488: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c405	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

### Product

Table 1489: Properties of each product.

Id	Name	SBO
c269	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{742} = k_{112} \cdot c_{26} \cdot c_{405} - k_{d112} \cdot c_{269} \quad (1506)$$

### 8.743 Reaction v757

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

**Name** v757 Ras:GDP + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:Ras:GDP k112 kd112

#### Reaction equation



#### Reactants

Table 1490: Properties of each reactant.

Id	Name	SBO
c26	Ras:GDP	
c408	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

#### Product

Table 1491: Properties of each product.

Id	Name	SBO
c325	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{743} = k112 \cdot c26 \cdot c408 - kd112 \cdot c325 \quad (1508)$$

### 8.744 Reaction v758

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

**Name** v758 Ras:GTP + 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K -> 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1-  
#P):PI3K:Ras:GDP k113 kd113

#### Reaction equation



#### Reactants

Table 1492: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c104	2(EGF:ErbB1)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1493: Properties of each product.

Id	Name	SBO
c264	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P):PI3K:Ras:GDP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{744} = k_{113} \cdot c_{28} \cdot c_{104} - k_{d113} \cdot c_{264} \quad (1510)$$

## 8.745 Reaction v759

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

**Name** v759 Ras:GTP + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:Ras:GDP k113 k<sub>d</sub>113

## Reaction equation



## Reactants

Table 1494: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c261	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1495: Properties of each product.

Id	Name	SBO
c265	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{745} = k_{113} \cdot c_{28} \cdot c_{261} - k_{d113} \cdot c_{265} \quad (1512)$$

### 8.746 Reaction v760

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

**Name** v760 Ras:GTP + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-#P:PI3K:Ras:GDP k113 k<sub>d</sub>113

### Reaction equation



### Reactants

Table 1496: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c262	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K	

### Product

Table 1497: Properties of each product.

Id	Name	SBO
c266	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{746} = k_{113} \cdot c_{28} \cdot c_{262} - k_{d113} \cdot c_{266} \quad (1514)$$

### 8.747 Reaction v761

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

**Name** v761 Ras:GTP + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-  
#P:PI3K:Ras:GDP k113 kd113

#### Reaction equation



#### Reactants

Table 1498: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c263	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K	

#### Product

Table 1499: Properties of each product.

Id	Name	SBO
c267	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{747} = k113 \cdot c28 \cdot c263 - kd113 \cdot c267 \quad (1516)$$

### 8.748 Reaction v762

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

**Name** v762 Ras:GTP + 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> 2(ErbB2)#P:GAP:Grb2:Gab1-  
#P:PI3K:Ras:GDP k113 kd113

#### Reaction equation



#### Reactants

Table 1500: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c324	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1501: Properties of each product.

Id	Name	SBO
c268	2(ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{748} = k_{113} \cdot c_{28} \cdot c_{324} - k_{d113} \cdot c_{268} \quad (1518)$$

### 8.749 Reaction v763

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

**Name** v763 Ras:GTP + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:Ras:GDP k113 kd113

## Reaction equation



## Reactants

Table 1502: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c405	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K	

## Product

Table 1503: Properties of each product.

Id	Name	SBO
c269	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{749} = k_{113} \cdot c_{28} \cdot c_{405} - k_{d113} \cdot c_{269} \quad (1520)$$

### 8.750 Reaction v764

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

**Name** v764 Ras:GTP + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1-#P:PI3K:Ras:GDP k113 k<sub>d</sub>113

### Reaction equation



### Reactants

Table 1504: Properties of each reactant.

Id	Name	SBO
c28	Ras:GTP	
c479	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:Shp2	

### Product

Table 1505: Properties of each product.

Id	Name	SBO
c325	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P:PI3K:Ras:GDP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{750} = k_{113} \cdot c_{28} \cdot c_{479} - k_{d113} \cdot c_{325} \quad (1522)$$

8.751 Reaction v765

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

**Name** v765 AKT#P#P + Raf#P -> AKT:P:P:Raf:P:Ser k114 kd114

Reaction equation



Reactants

Table 1506: Properties of each reactant.

Id	Name	SBO
c497	AKT:P:P	
c45	Raf_P	

Product

Table 1507: Properties of each product.

Id	Name	SBO
c472	AKT:P:P:Raf:P:Ser	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{751} = k114 \cdot c497 \cdot c45 - kd114 \cdot c472$$

(1524)

8.752 Reaction v766

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

**Name** v766 AKT#P#P + (Raf#P)\_i -> AKT:P:P:Raf:P:Ser\_i k114 kd114

Reaction equation



Reactants



Table 1508: Properties of each reactant.

Id	Name	SBO
c497	AKT:P:P	
c72	(Raf_P)_i	

Product

Table 1509: Properties of each product.

Id	Name	SBO
c484	AKT:P:P:Raf:P:Ser_i	

Kinetic Law

Derived unit contains undeclared units

$$v_{752} = k_{114} \cdot c_{497} \cdot c_{72} - k_{d114} \cdot c_{484}$$

(1526)

8.753 Reaction v767

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

**Name** v767 Raf:P:Ser + AKT#P#P -> AKT:P:P:Raf:P:Ser k115 kd115

Reaction equation

$$c_{485} + c_{497} \rightleftharpoons c_{472}$$

(1527)

Reactants

Table 1510: Properties of each reactant.

Id	Name	SBO
c485	Raf:P:Ser	
c497	AKT:P:P	

Product

Table 1511: Properties of each product.

Id	Name	SBO
c472	AKT:P:P:Raf:P:Ser	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{753} = k_{115} \cdot c_{485} \cdot c_{497} - k_{d115} \cdot c_{472} \quad (1528)$$

**8.754 Reaction v768**

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

**Name** v768 Raf:P:Ser + AKT#P#P -> AKT:P:P:Raf:P:Ser.i k115 kd115**Reaction equation****Reactants**

Table 1512: Properties of each reactant.

Id	Name	SBO
c485	Raf:P:Ser	
c497	AKT:P:P	

**Product**

Table 1513: Properties of each product.

Id	Name	SBO
c484	AKT:P:P:Raf:P:Ser.i	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{754} = k_{115} \cdot c_{485} \cdot c_{497} - k_{d115} \cdot c_{484} \quad (1530)$$

8.755 Reaction v769

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

**Name** v769 Pase3 + -> MKP\_deg k116 kd116

Reaction equation



Reactant

Table 1514: Properties of each reactant.

Id	Name	SBO
c60	Pase3	

Product

Table 1515: Properties of each product.

Id	Name	SBO
c520	MKP_deg	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{755} = k116 \cdot c60 - kd116 \cdot c520$$

(1532)

8.756 Reaction v770

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

**Name** v770 Pase9t + 2(EGF:ErbB1):Gab1#P## -> 2(EGF:ErbB1):Gab1#P##:Pase9t k117 kd117

Reaction equation



Reactants

Table 1516: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c488	2(EGF:ErbB1):Gab1_P#	

## Product

Table 1517: Properties of each product.

Id	Name	SBO
c522	2(EGF:ErbB1):Gab1_P#:Pase9t	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{756} = k_{117} \cdot c_{521} \cdot c_{488} - k_{d117} \cdot c_{522} \quad (1534)$$

## 8.757 Reaction v771

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

**Name** v771 Pase9t + 2(ErbB2)2:Gab1#P## -> 2(ErbB2)2:Gab1#P##:Pase9t k117 kd117

## Reaction equation



## Reactants

Table 1518: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c490	2(ErbB2)2:Gab1_P#	

## Product

Table 1519: Properties of each product.

Id	Name	SBO
c523	2(ErbB2)2:Gab1_P#:Pase9t	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{757} = k_{117} \cdot c_{521} \cdot c_{490} - k_{d117} \cdot c_{523} \quad (1536)$$

### 8.758 Reaction v772

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

**Name** v772 Pase9t + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-##P:Pase9t k117 kd117

### Reaction equation



### Reactants

Table 1520: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c409	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

### Product

Table 1521: Properties of each product.

Id	Name	SBO
c411	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:Pase9t	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{758} = k_{117} \cdot c_{521} \cdot c_{409} - k_{d117} \cdot c_{411} \quad (1538)$$

8.759 Reaction v773

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

**Name** v773 Pase9t + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1##P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-##P:Pase9t k117 kd117

Reaction equation



Reactants

Table 1522: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c410	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

Product

Table 1523: Properties of each product.

Id	Name	SBO
c412	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:Pase9t	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{759} = k117 \cdot c521 \cdot c410 - kd117 \cdot c412$$

(1540)

8.760 Reaction v774

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

**Name** v774 Pase9t + ErbB3/4:ErbB2:Gab1#P## -> ErbB3/4:ErbB2:Gab1#P##:Pase9t k117 kd117

Reaction equation



Reactants

Table 1524: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c491	ErbB3/4:ErbB2:Gab1_P#	

## Product

Table 1525: Properties of each product.

Id	Name	SBO
c456	ErbB3/4:ErbB2:Gab1_P#:Pase9t	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{760} = k_{117} \cdot c_{521} \cdot c_{491} - k_{d117} \cdot c_{456} \quad (1542)$$

## 8.761 Reaction v775

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

**Name** v775 Pase9t + ErbB1:ErbB:Gab1#P## -> ErbB1:ErbB:Gab1#P##:Pase9t k117 kd117

## Reaction equation



## Reactants

Table 1526: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c430	ErbB1:ErbB:Gab1_P#	

## Product

Table 1527: Properties of each product.

Id	Name	SBO
c424	ErbB1:ErbB:Gab1_P#:Pase9t	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{761} = k_{117} \cdot c_{521} \cdot c_{430} - k_{d117} \cdot c_{424} \quad (1544)$$

### 8.762 Reaction v776

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

**Name** v776 Pase9t + (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1:#P#P -> (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1:-#P#P:Pase9t k117 kd117

### Reaction equation



### Reactants

Table 1528: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c487	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:_PP	

### Product

Table 1529: Properties of each product.

Id	Name	SBO
c407	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:_PP:Pase9t	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{762} = k_{117} \cdot c_{521} \cdot c_{487} - k_{d117} \cdot c_{407} \quad (1546)$$



### 8.763 Reaction v777

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

**Name** v777 Pase9t + 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) -> 2(EGF:ErbB1):Gab1#P#-# :Pase9t k118 kd118

#### Reaction equation



#### Reactants

Table 1530: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c486	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P#)	

#### Product

Table 1531: Properties of each product.

Id	Name	SBO
c522	2(EGF:ErbB1):Gab1_P#:Pase9t	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{763} = k118 \cdot c521 \cdot c486 - kd118 \cdot c522 \quad (1548)$$

### 8.764 Reaction v778

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

**Name** v778 Pase9t + 2(ErbB2)#P:GAP:Grb2:Gab1#P -> 2(ErbB2)2:Gab1#P##:Pase9t k118 kd118

#### Reaction equation



#### Reactants

Table 1532: Properties of each reactant.		
Id	Name	SBO
c521	Pase9t	
c454	2(ErbB2)_P:GAP:Grb2:Gab1_P	

Product

Table 1533: Properties of each product.		
Id	Name	SBO
c523	2(ErbB2)2:Gab1_P#:Pase9t	

Kinetic Law

Derived unit contains undeclared units

$$v_{764} = k_{118} \cdot c_{521} \cdot c_{454} - k_{d118} \cdot c_{523}$$

(1550)

8.765 Reaction v779

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

**Name** v779 Pase9t + (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1-##P:Pase9t k118 kd118

Reaction equation



Reactants

Table 1534: Properties of each reactant.		
Id	Name	SBO
c521	Pase9t	
c446	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P	

Product

Table 1535: Properties of each product.

Id	Name	SBO
c411	(ErbB1:ErbB3)_P:GAP:Grb2:Gab1_P:Pase9t	

### Kinetic Law

**Derived unit** contains undeclared units

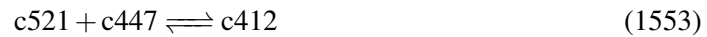
$$v_{765} = k_{118} \cdot c_{521} \cdot c_{446} - k_{d118} \cdot c_{411} \quad (1552)$$

### 8.766 Reaction v780

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

**Name** v780 Pase9t + (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1-##P:Pase9t k118 kd118

### Reaction equation



### Reactants

Table 1536: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c447	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	

### Product

Table 1537: Properties of each product.

Id	Name	SBO
c412	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P:Pase9t	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{766} = k_{118} \cdot c_{521} \cdot c_{447} - k_{d118} \cdot c_{412} \quad (1554)$$

8.767 Reaction v781

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

**Name** v781 Pase9t + (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P -> ErbB3/4:ErbB2:Gab1#P##:Pase9t  
k118 kd118

Reaction equation



Reactants

Table 1538: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c457	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P	

Product

Table 1539: Properties of each product.

Id	Name	SBO
c456	ErbB3/4:ErbB2:Gab1_P#:Pase9t	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{767} = k118 \cdot c521 \cdot c457 - kd118 \cdot c456$$

(1556)

8.768 Reaction v782

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

**Name** v782 Pase9t + (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P -> ErbB1:ErbB:Gab1#P##:Pase9t  
k118 kd118

Reaction equation



Reactants

Table 1540: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c445	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1541: Properties of each product.

Id	Name	SBO
c424	ErbB1:ErbB:Gab1_P#:Pase9t	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{768} = k_{118} \cdot c_{521} \cdot c_{445} - k_{d118} \cdot c_{424} \quad (1558)$$

## 8.769 Reaction v783

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

**Name** v783 Pase9t + (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:-#P#P:Pase9t k118 kd118

## Reaction equation



## Reactants

Table 1542: Properties of each reactant.

Id	Name	SBO
c521	Pase9t	
c460	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1_P	

## Product

Table 1543: Properties of each product.

Id	Name	SBO
c407	(ErbB4:ErbB2)_P:GAP:Grb2:Gab1:_PP:Pase9t	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{769} = k_{118} \cdot c_{521} \cdot c_{460} - k_{d118} \cdot c_{407} \quad (1560)$$

### 8.770 Reaction v784

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

**Name** v784 HRG + ErbB3 -> HRG:ErbB3 k119 kd119

### Reaction equation



### Reactants

Table 1544: Properties of each reactant.

Id	Name	SBO
c514	HRG	
c140	ErbB3	

### Product

Table 1545: Properties of each product.

Id	Name	SBO
c142	HRG:ErbB3	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{770} = k_{119} \cdot [c_{514}] \cdot c_{140} - k_{d119} \cdot c_{142} \quad (1562)$$

8.771 Reaction v785

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

**Name** v785 ErbB4 + HRG -> HRG:ErbB4 k119 kd119

Reaction equation



Reactants

Table 1546: Properties of each reactant.

Id	Name	SBO
c143	ErbB4	
c514	HRG	

Product

Table 1547: Properties of each product.

Id	Name	SBO
c144	HRG:ErbB4	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{771} = k119 \cdot c143 \cdot [c514] - kd119 \cdot c144$$

(1564)

8.772 Reaction v786

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

**Name** v786 HRG:ErbB3 + ErbB2 -> (HRG:ErbB3):ErbB2 k120 kd120

Reaction equation



Reactants

Table 1548: Properties of each reactant.

Id	Name	SBO
c142	HRG:ErbB3	
c141	ErbB2	

Product

Table 1549: Properties of each product.

Id	Name	SBO
c355	(HRG:ErbB3):ErbB2	

Kinetic Law

Derived unit contains undeclared units

$$v_{772} = k_{120} \cdot c_{142} \cdot c_{141} - k_{d120} \cdot c_{355}$$

(1566)

8.773 Reaction v787

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

**Name** v787 (HRG:ErbB3) + ErbB2 -> (HRG:ErbB3):ErbB2 k120 kd120

Reaction equation



Reactants

Table 1550: Properties of each reactant.

Id	Name	SBO
c157	(HRG:ErbB3)	
c155	ErbB2	

Product



Table 1551: Properties of each product.

Id	Name	SBO
c421	(HRG:ErbB3):ErbB2	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{773} = k_{120} \cdot c_{157} \cdot c_{155} - k_{d120} \cdot c_{421} \quad (1568)$$

**8.774 Reaction v788**

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

**Name** v788 + HRG:ErbB4 -> k120 kd120**Reaction equation****Reactants**

Table 1552: Properties of each reactant.

Id	Name	SBO
c141	ErbB2	
c144	HRG:ErbB4	

**Product**

Table 1553: Properties of each product.

Id	Name	SBO
c345	(HRG:ErbB4):ErbB2	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{774} = k_{120} \cdot c_{141} \cdot c_{144} - k_{d120} \cdot c_{345} \quad (1570)$$

8.775 Reaction v789

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

**Name** v789 HRG:ErbB3 + ErbB1:ATP -> (HRG:ErbB3:ErbB1) k120b kd120

Reaction equation



Reactants

Table 1554: Properties of each reactant.

Id	Name	SBO
c142	HRG:ErbB3	
c2	ErbB1:ATP	

Product

Table 1555: Properties of each product.

Id	Name	SBO
c516	(HRG:ErbB3:ErbB1)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{775} = k120b \cdot c142 \cdot c2 - kd120 \cdot c516$$

(1572)

8.776 Reaction v790

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

**Name** v790 HRG:ErbB4 + ErbB1:ATP -> (HRG:ErbB4:ErbB1) k120b kd120

Reaction equation



Reactants

Table 1556: Properties of each reactant.

Id	Name	SBO
c144	HRG:ErbB4	
c2	ErbB1:ATP	

**Product**

Table 1557: Properties of each product.

Id	Name	SBO
c517	(HRG:ErbB4:ErbB1)	

**Kinetic Law**

**Derived unit** contains undeclared units

$$v_{776} = k_{120b} \cdot c_{144} \cdot c_2 - k_{d120} \cdot c_{517} \tag{1574}$$

**8.777 Reaction v791**

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

**Name** v791 + (HRG:ErbB4) -> k120 kd120

**Reaction equation**

$$c_{155} + c_{158} \rightleftharpoons c_{422} \tag{1575}$$

**Reactants**

Table 1558: Properties of each reactant.

Id	Name	SBO
c155	ErbB2	
c158	(HRG:ErbB4)	

**Product**

Table 1559: Properties of each product.

Id	Name	SBO
c422	((HRG:ErbB4):ErbB2)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{777} = k_{120} \cdot c_{155} \cdot c_{158} - k_{d120} \cdot c_{422} \quad (1576)$$

### 8.778 Reaction v792

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

**Name** v792 ErbB1:ATP + (HRG:ErbB3) -> (HRG:ErbB3:ErbB1) k120b k<sub>d120</sub>

### Reaction equation



### Reactants

Table 1560: Properties of each reactant.

Id	Name	SBO
c6	ErbB1:ATP	
c157	(HRG:ErbB3)	

### Product

Table 1561: Properties of each product.

Id	Name	SBO
c518	(HRG:ErbB3:ErbB1)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{778} = k_{120b} \cdot c_6 \cdot c_{157} - k_{d120} \cdot c_{518} \quad (1578)$$

8.779 Reaction v793

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

**Name** v793 ErbB1:ATP + (HRG:ErbB4) -> (HRG:ErbB4:ErbB1) k120b kd120

Reaction equation



Reactants

Table 1562: Properties of each reactant.

Id	Name	SBO
c6	ErbB1:ATP	
c158	(HRG:ErbB4)	

Product

Table 1563: Properties of each product.

Id	Name	SBO
c519	(HRG:ErbB4:ErbB1)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{779} = k120b \cdot c6 \cdot c158 - kd120 \cdot c519$$

(1580)

8.780 Reaction v794

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

**Name** v794 ErbB1\_h + Inh -> ErbB1\_h:Inh k97c kd97c

Reaction equation



Reactants

Table 1564: Properties of each reactant.

Id	Name	SBO
c532	ErbB1_h	
c285	Inh	

Product

Table 1565: Properties of each product.

Id	Name	SBO
c525	ErbB1_h:Inh	

Kinetic Law

Derived unit contains undeclared units

$$v_{780} = k_{97c} \cdot c_{532} \cdot [c_{285}] - k_{d97c} \cdot c_{525}$$

(1582)

8.781 Reaction v795

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

Name v795 EGF + ErbB1\_h:Inh -> EGF:ErbB1\_h:Inh k1 kd1

Reaction equation



Reactants

Table 1566: Properties of each reactant.

Id	Name	SBO
c1	EGF	
c525	ErbB1_h:Inh	

Product

Table 1567: Properties of each product.

Id	Name	SBO
c526	EGF:ErbB1_h:Inh	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{781} = k1 \cdot [c1] \cdot c525 - kd1 \cdot c526 \quad (1584)$$

**8.782 Reaction v796**

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

**Name** v796 EGF:ErbB1:ATP + EGF:ErbB1\_h:Inh -> EGF:ErbB1:ErbB1\_h:Inh k2 kd2**Reaction equation****Reactants**

Table 1568: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c526	EGF:ErbB1_h:Inh	

**Product**

Table 1569: Properties of each product.

Id	Name	SBO
c527	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{782} = k2 \cdot c3 \cdot c526 - kd2 \cdot c527 \quad (1586)$$

8.783 Reaction v797

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

**Name** v797 EGF:ErbB1\_h:Inh + EGF:ErbB1\_h:Inh -> 2(EGF:ErbB1\_h:Inh) k2 kd2

Reaction equation



Reactants

Table 1570: Properties of each reactant.

Id	Name	SBO
c526	EGF:ErbB1_h:Inh	
c526	EGF:ErbB1_h:Inh	

Product

Table 1571: Properties of each product.

Id	Name	SBO
c528	2(EGF:ErbB1_h:Inh)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{783} = k2 \cdot c526 \cdot c526 - kd2 \cdot c528$$

(1588)

8.784 Reaction v798

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

**Name** v798 EGF + ErbB1\_h:ATP -> EGF:ErbB1\_h:ATP k1 kd1

Reaction equation



Reactants



Table 1572: Properties of each reactant.

Id	Name	SBO
c1	EGF	
c524	ErbB1_h:ATP	

Product

Table 1573: Properties of each product.

Id	Name	SBO
c529	EGF:ErbB1_h:ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{784} = k1 \cdot [c1] \cdot c524 - kd1 \cdot c529$$

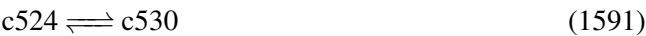
(1590)

8.785 Reaction v799

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

Name v799 ErbB1\_h:ATP + -> ErbB1\_h:ATP k6 kd6

Reaction equation



Reactant

Table 1574: Properties of each reactant.

Id	Name	SBO
c524	ErbB1_h:ATP	

Product

Table 1575: Properties of each product.

Id	Name	SBO
c530	ErbB1_h:ATP	

Id	Name	SBO
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### Kinetic Law

**Derived unit** contains undeclared units

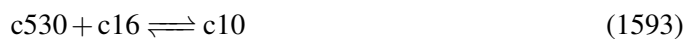
$$v_{785} = k6 \cdot c524 - kd6 \cdot c530 \quad (1592)$$

### 8.786 Reaction v801

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

**Name** v801 ErbB1\_h:ATP + EGF -> EGF:ErbB1:ATP k10b kd10

### Reaction equation



### Reactants

Table 1576: Properties of each reactant.

Id	Name	SBO
c530	ErbB1_h:ATP	
c16	EGF	

### Product

Table 1577: Properties of each product.

Id	Name	SBO
c10	EGF:ErbB1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{786} = k10b \cdot c530 \cdot c16 - kd10 \cdot c10 \quad (1594)$$

### 8.787 Reaction v802

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

**Name** v802 (EGF:ErbB1:ErbB1):Inh + ATP -> (EGF:ErbB1:ErbB1):Inh:ATP k122 kd122

### Reaction equation



### Reactants

Table 1578: Properties of each reactant.

Id	Name	SBO
c500	(EGF:ErbB1:ATP::EGF:ErbB1:Inh)	
c105	ATP 1.2e9	

### Product

Table 1579: Properties of each product.

Id	Name	SBO
c115	(EGF:ErbB1:ATP::EGF:ErbB1:Inh)-HalfActive	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{787} = k_{122} \cdot c500 \cdot c105 - k_{d122} \cdot c115 \quad (1596)$$

### 8.788 Reaction v803

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

**Name** v803 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1:ErbB1):Inh:ATP k123 kd123

### Reaction equation



### Reactants

Table 1580: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	
c105	ATP 1.2e9	

## Product

Table 1581: Properties of each product.

Id	Name	SBO
c115	(EGF:ErbB1:ATP::EGF:ErbB1:Inh)-HalfActive	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{788} = k_{123h} \cdot c_5 \cdot c_{105} - k_{d123h} \cdot c_{115} \quad (1598)$$

## 8.789 Reaction v804

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

**Name** v804 2(EGF:ErbB1)#P + ATP -> k123 kd123

## Reaction equation



## Reactants

Table 1582: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1).P	
c105	ATP 1.2e9	

## Product

Table 1583: Properties of each product.

Id	Name	SBO
c116	2(EGF:ErbB1:ATP)-FullActive	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{789} = k_{123} \cdot c_5 \cdot c_{105} - k_{d123} \cdot c_{116} \quad (1600)$$

### 8.790 Reaction v805

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

**Name** v805 EGF:ErbB1:ErbB1\_h:Inh + ATP -> k122 kd122

#### Reaction equation



#### Reactants

Table 1584: Properties of each reactant.

Id	Name	SBO
c527	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)	
c105	ATP 1.2e9	

#### Product

Table 1585: Properties of each product.

Id	Name	SBO
c121	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{790} = k122 \cdot c527 \cdot c105 - kd122 \cdot c121 \quad (1602)$$

### 8.791 Reaction v806

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

**Name** v806 2(EGF:ErbB1)#P + ATP -> k123 kd123

#### Reaction equation



#### Reactants

Table 1586: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	
c105	ATP 1.2e9	

Product

Table 1587: Properties of each product.

Id	Name	SBO
c121	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive	

Kinetic Law

Derived unit contains undeclared units

$$v_{791} = k_{123h} \cdot c_5 \cdot c_{105} - k_{d123h} \cdot c_{121}$$

(1604)

8.792 Reaction v807

This is a reversible reaction of two reactants forming one product.

**Name** v807 (ErbB1:ErbB2)#P + ATP -> EGF:ErbB1:ErbB2:ATP k123 kd123

Reaction equation



Reactants

Table 1588: Properties of each reactant.

Id	Name	SBO
c148	(ErbB1:ErbB2)_P	
c105	ATP 1.2e9	

Product

Table 1589: Properties of each product.

Id	Name	SBO
c122	EGF:ErbB1:ErbB2:ATP	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{792} = k_{123} \cdot c_{148} \cdot c_{105} - k_{d123} \cdot c_{122} \quad (1606)$$

**8.793 Reaction v808**

This is a reversible reaction of two reactants forming one product.

**Name** v808 (ErbB1:ErbB2)#P + ATP -> (EGF:ErbB1:ErbB2):ATP k123 kd123**Reaction equation****Reactants**

Table 1590: Properties of each reactant.

Id	Name	SBO
c162	(ErbB1:ErbB2)_P	
c105	ATP 1.2e9	

**Product**

Table 1591: Properties of each product.

Id	Name	SBO
c123	(EGF:ErbB1:ErbB2):ATP	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{793} = k_{123} \cdot c_{162} \cdot c_{105} - k_{d123} \cdot c_{123} \quad (1608)$$

### 8.794 Reaction v809

This is a reversible reaction of two reactants forming one product.

**Name** v809 (ErbB1:ErbB3)#P + ATP -> (EGF:ErbB1:ErbB3):ATP k123 kd123

#### Reaction equation



#### Reactants

Table 1592: Properties of each reactant.

Id	Name	SBO
c163	(ErbB1:ErbB3)_P	
c105	ATP 1.2e9	

#### Product

Table 1593: Properties of each product.

Id	Name	SBO
c124	(EGF:ErbB1:ErbB3):ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{794} = k123 \cdot c163 \cdot c105 - kd123 \cdot c124 \quad (1610)$$

### 8.795 Reaction v810

This is a reversible reaction of two reactants forming one product.

**Name** v810 (ErbB1:ErbB4)#P + ATP -> (EGF:ErbB1:ErbB4):ATP k123 kd123

#### Reaction equation



#### Reactants



Table 1594: Properties of each reactant.

Id	Name	SBO
c164	(ErbB1:ErbB4)_P	
c105	ATP 1.2e9	

Product

Table 1595: Properties of each product.

Id	Name	SBO
c125	(EGF:ErbB1:ErbB4):ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{795} = k_{123} \cdot c_{164} \cdot c_{105} - k_{d123} \cdot c_{125} \tag{1612}$$

8.796 Reaction v811

This is a reversible reaction of two reactants forming one product.

**Name** v811 2(EGF:ErbB1)#P + ATP -> 2(EGF:ErbB1):ATP k123 kd123

Reaction equation



Reactants

Table 1596: Properties of each reactant.

Id	Name	SBO
c8	2(EGF:ErbB1)_P	
c105	ATP 1.2e9	

Product

Table 1597: Properties of each product.

Id	Name	SBO
c126	2(EGF:ErbB1):ATP	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{796} = k_{123} \cdot c_8 \cdot c_{105} - k_{d123} \cdot c_{126} \quad (1614)$$

**8.797 Reaction v812**

This is a reversible reaction of two reactants forming one product.

**Name** v812 (ErbB1:ErbB3)#P + ATP -> EGF:ErbB1:ErbB3:ATP k123 kd123**Reaction equation****Reactants**

Table 1598: Properties of each reactant.

Id	Name	SBO
c149	(ErbB1:ErbB3)_P	
c105	ATP 1.2e9	

**Product**

Table 1599: Properties of each product.

Id	Name	SBO
c127	EGF:ErbB1:ErbB3:ATP	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{797} = k_{123} \cdot c_{149} \cdot c_{105} - k_{d123} \cdot c_{127} \quad (1616)$$

### 8.798 Reaction v813

This is a reversible reaction of two reactants forming one product.

**Name** v813 (ErbB1:ErbB4)#P + ATP -> EGF:ErbB1:ErbB4:ATP k123 kd123

#### Reaction equation



#### Reactants

Table 1600: Properties of each reactant.

Id	Name	SBO
c150	(ErbB1:ErbB4)_P	
c105	ATP 1.2e9	

#### Product

Table 1601: Properties of each product.

Id	Name	SBO
c128	EGF:ErbB1:ErbB4:ATP	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{798} = k123 \cdot c150 \cdot c105 - kd123 \cdot c128 \quad (1618)$$

### 8.799 Reaction v814

This is a reversible reaction of two reactants forming one product.

**Name** v814 2(ErbB2)#P + ATP -> ErbB2:ErbB2#P:ATP k123 kd123

#### Reaction equation



#### Reactants

Table 1602: Properties of each reactant.

Id	Name	SBO
c289	2(ErbB2)_P	
c105	ATP 1.2e9	

Product

Table 1603: Properties of each product.

Id	Name	SBO
c129	ErbB2:ErbB2_P:ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{799} = k_{123} \cdot c_{289} \cdot c_{105} - k_{d123} \cdot c_{129}$$

(1620)

8.800 Reaction v815

This is a reversible reaction of two reactants forming one product.

**Name** v815 (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P + ATP -> (ErbB1:ErbB2)#P:GAP:Grb2:Gab1:ATP  
k123 kd123

Reaction equation

$$c_{445} + c_{105} \rightleftharpoons c_{130}$$

(1621)

Reactants

Table 1604: Properties of each reactant.

Id	Name	SBO
c445	(ErbB1:ErbB2)_P:GAP:Grb2:Gab1_P	
c105	ATP 1.2e9	

Product

Table 1605: Properties of each product.

Id	Name	SBO
c130	(ErbB1:ErbB2).P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{800} = k_{123} \cdot c_{445} \cdot c_{105} - k_{d123} \cdot c_{130} \quad (1622)$$

### 8.801 Reaction v816

This is a reversible reaction of two reactants forming one product.

**Name** v816 (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P + ATP -> (ErbB1:ErbB3)#P:GAP:Grb2:Gab1:ATP  
k123 kd123

### Reaction equation



### Reactants

Table 1606: Properties of each reactant.

Id	Name	SBO
c446	(ErbB1:ErbB3).P:GAP:Grb2:Gab1_P	
c105	ATP 1.2e9	

### Product

Table 1607: Properties of each product.

Id	Name	SBO
c131	(ErbB1:ErbB3).P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{801} = k_{123} \cdot c_{446} \cdot c_{105} - k_{d123} \cdot c_{131} \quad (1624)$$

8.802 Reaction v817

This is a reversible reaction of two reactants forming one product.

**Name** v817 (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P + ATP -> (ErbB1:ErbB4)#P:GAP:Grb2:Gab1:ATP  
k123 kd123

Reaction equation



Reactants

Table 1608: Properties of each reactant.		
Id	Name	SBO
c447	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1_P	
c105	ATP 1.2e9	

Product

Table 1609: Properties of each product.		
Id	Name	SBO
c132	(ErbB1:ErbB4)_P:GAP:Grb2:Gab1:ATP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{802} = k123 \cdot c447 \cdot c105 - kd123 \cdot c132 \tag{1626}$$

8.803 Reaction v818

This is a reversible reaction of two reactants forming one product.

**Name** v818 2(ErbB2)#P:GAP:Grb2:Gab1#P + ATP -> 2(ErbB2)#P:GAP:Grb2:Gab1:ATP  
k123 kd123

Reaction equation



Reactants

Table 1610: Properties of each reactant.		
Id	Name	SBO
c454	2(ErbB2)_P:GAP:Grb2:Gab1_P	
c105	ATP 1.2e9	

Product

Table 1611: Properties of each product.		
Id	Name	SBO
c133	2(ErbB2)_P:GAP:Grb2:Gab1:ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{803} = k_{123} \cdot c_{454} \cdot c_{105} - k_{d123} \cdot c_{133}$$

(1628)

8.804 Reaction v819

This is a reversible reaction of two reactants forming one product.

**Name** v819 (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P + ATP -> (ErbB3:ErbB2)#P:GAP:Grb2:Gab1:ATP  
k123 kd123

Reaction equation

$$c_{457} + c_{105} \rightleftharpoons c_{134}$$

(1629)

Reactants

Table 1612: Properties of each reactant.		
Id	Name	SBO
c457	(ErbB3:ErbB2)_P:GAP:Grb2:Gab1_P	
c105	ATP 1.2e9	

Product

Table 1613: Properties of each product.

Id	Name	SBO
c134	(ErbB3:ErbB2).P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{804} = k_{123} \cdot c_{457} \cdot c_{105} - k_{d123} \cdot c_{134} \quad (1630)$$

### 8.805 Reaction v820

This is a reversible reaction of two reactants forming one product.

**Name** v820 (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P + ATP -> (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:ATP  
k123 kd123

### Reaction equation



### Reactants

Table 1614: Properties of each reactant.

Id	Name	SBO
c460	(ErbB4:ErbB2).P:GAP:Grb2:Gab1_P	
c105	ATP 1.2e9	

### Product

Table 1615: Properties of each product.

Id	Name	SBO
c135	(ErbB4:ErbB2).P:GAP:Grb2:Gab1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{805} = k_{123} \cdot c_{460} \cdot c_{105} - k_{d123} \cdot c_{135} \quad (1632)$$



8.806 Reaction v821

This is a reversible reaction of two reactants forming one product.

**Name** v821 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) + ATP -> 2(EGF:ErbB1)#P:GAP:Grb2:Gab1:ATP  
k123 kd123

Reaction equation



Reactants

Table 1616: Properties of each reactant.		
Id	Name	SBO
c486	2(EGF:ErbB1)_P:GAP:Grb2:(Gab1_P#)	
c105	ATP 1.2e9	

Product

Table 1617: Properties of each product.		
Id	Name	SBO
c136	2(EGF:ErbB1)_P:GAP:Grb2:Gab1:ATP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{806} = k123 \cdot c486 \cdot c105 - kd123 \cdot c136 \tag{1634}$$

8.807 Reaction v822

This is a reversible reaction of two reactants forming one product.

**Name** v822 (ErbB1:ErbB3)#P + ATP -> (HRG:ErbB3:ErbB1):ATP k123 kd123

Reaction equation



Reactants

Table 1618: Properties of each reactant.

Id	Name	SBO
c149	(ErbB1:ErbB3)_P	
c105	ATP 1.2e9	

Product

Table 1619: Properties of each product.

Id	Name	SBO
c137	(HRG:ErbB3:ErbB1):ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{807} = k_{123} \cdot c_{149} \cdot c_{105} - k_{d123} \cdot c_{137} \tag{1636}$$

8.808 Reaction v823

This is a reversible reaction of two reactants forming one product.

**Name** v823 (ErbB1:ErbB4)#P + ATP -> (HRG:ErbB4:ErbB1):ATP k123 kd123

Reaction equation

$$c_{150} + c_{105} \rightleftharpoons c_{138} \tag{1637}$$

Reactants

Table 1620: Properties of each reactant.

Id	Name	SBO
c150	(ErbB1:ErbB4)_P	
c105	ATP 1.2e9	

Product

Table 1621: Properties of each product.

Id	Name	SBO
c138	(HRG:ErbB4:ErbB1):ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{808} = k_{123} \cdot c_{150} \cdot c_{105} - k_{d123} \cdot c_{138} \quad (1638)$$

### 8.809 Reaction v824

This is a reversible reaction of two reactants forming one product.

**Name** v824 (ErbB4:ErbB2)#P + ATP -> (HRG:ErbB4):ErbB2:ATP k123 kd123

### Reaction equation



### Reactants

Table 1622: Properties of each reactant.

Id	Name	SBO
c336	(ErbB4:ErbB2)_P	
c105	ATP 1.2e9	

### Product

Table 1623: Properties of each product.

Id	Name	SBO
c139	(HRG:ErbB4):ErbB2:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{809} = k_{123} \cdot c_{336} \cdot c_{105} - k_{d123} \cdot c_{139} \quad (1640)$$

8.810 Reaction v825

This is a reversible reaction of two reactants forming one product.

**Name** v825 (ErbB3:ErbB2)#P + ATP -> (HRG:ErbB3):ErbB2:ATP k123 kd123

Reaction equation



Reactants

Table 1624: Properties of each reactant.

Id	Name	SBO
c335	(ErbB3:ErbB2)_P	
c105	ATP 1.2e9	

Product

Table 1625: Properties of each product.

Id	Name	SBO
c168	(HRG:ErbB3):ErbB2:ATP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{810} = k123 \cdot c335 \cdot c105 - kd123 \cdot c168$$

(1642)

8.811 Reaction v826

This is a reversible reaction of two reactants forming one product.

**Name** v826 (ErbB3:ErbB2)#P + ATP -> (HRG:ErbB3):ErbB2:ATP k123 kd123

Reaction equation



Reactants

Table 1626: Properties of each reactant.

Id	Name	SBO
c337	(ErbB3:ErbB2)_P	
c105	ATP 1.2e9	

Product

Table 1627: Properties of each product.

Id	Name	SBO
c169	((HRG:ErbB3):ErbB2):ATP	

Kinetic Law

Derived unit contains undeclared units

$$v_{811} = k_{123} \cdot c_{337} \cdot c_{105} - k_{d123} \cdot c_{169} \tag{1644}$$

8.812 Reaction v827

This is a reversible reaction of two reactants forming one product.

**Name** v827 (ErbB4:ErbB2)#P + ATP -> (HRG:ErbB4):ErbB2):ATP k123 kd123

Reaction equation



Reactants

Table 1628: Properties of each reactant.

Id	Name	SBO
c338	(ErbB4:ErbB2)_P	
c105	ATP 1.2e9	

Product

Table 1629: Properties of each product.		
Id	Name	SBO
c170	((HRG:ErbB4):ErbB2):ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{812} = k_{123} \cdot c_{338} \cdot c_{105} - k_{d123} \cdot c_{170} \quad (1646)$$

### 8.813 Reaction v828

This is a reversible reaction of two reactants forming one product.

**Name** v828 ErbB1 + ATP -> ErbB1:ATP k122 kd122

### Reaction equation



### Reactants

Table 1630: Properties of each reactant.

Id	Name	SBO
c531	ErbB1	
c105	ATP	1.2e9

### Product

Table 1631: Properties of each product.

Id	Name	SBO
c2	ErbB1:ATP	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{813} = k_{122} \cdot c_{531} \cdot c_{105} - k_{d122} \cdot c_2 \quad (1648)$$

8.814 Reaction v829

This is a reversible reaction of two reactants forming one product.

**Name** v829 ErbB1\_h + ATP -> ErbB1\_h:ATP k122 kd122

Reaction equation



Reactants

Table 1632: Properties of each reactant.

Id	Name	SBO
c532	ErbB1_h	
c105	ATP 1.2e9	

Product

Table 1633: Properties of each product.

Id	Name	SBO
c524	ErbB1_h:ATP	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{814} = k122 \cdot c532 \cdot c105 - kd122 \cdot c524$$

(1650)

8.815 Reaction v850

This is a reversible reaction of two reactants forming one product.

**Name** v850 EGF:ErbB1:ATP + EGF:ErbB1\_h:ATP -> EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP  
k2 kd2

Reaction equation



Reactants

Table 1634: Properties of each reactant.

Id	Name	SBO
c3	EGF:ErbB1:ATP	
c529	EGF:ErbB1_h:ATP	

Product

Table 1635: Properties of each product.

Id	Name	SBO
c550	(EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)	

Kinetic Law

Derived unit contains undeclared units

$$v_{815} = k2 \cdot c3 \cdot c529 - kd2 \cdot c550$$

(1652)

8.816 Reaction v851

This is a reversible reaction of two reactants forming one product.

**Name** v851 EGF:ErbB1:Inh + EGF:ErbB1\_h:ATP -> EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP k2  
kd2

Reaction equation

$$c499 + c529 \rightleftharpoons c551$$

(1653)

Reactants

Table 1636: Properties of each reactant.

Id	Name	SBO
c499	EGF:ErbB1:Inh	
c529	EGF:ErbB1_h:ATP	

Product



Table 1637: Properties of each product.

Id	Name	SBO
c551	(EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{816} = k2 \cdot c499 \cdot c529 - kd2 \cdot c551 \quad (1654)$$

### 8.817 Reaction v852

This is a reversible reaction of two reactants forming one product.

**Name** v852 EGF:ErbB1\_h:ATP + EGF:ErbB1\_h:ATP -> 2(EGF:ErbB1\_h:ATP) k2 kd2

### Reaction equation



### Reactants

Table 1638: Properties of each reactant.

Id	Name	SBO
c529	EGF:ErbB1_h:ATP	
c529	EGF:ErbB1_h:ATP	

### Product

Table 1639: Properties of each product.

Id	Name	SBO
c552	2(EGF:ErbB1_h:ATP)-FullActive	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{817} = k2 \cdot c529 \cdot c529 - kd2 \cdot c552 \quad (1656)$$

### 8.818 Reaction v853

This is a reversible reaction of two reactants forming one product.

**Name** v853 EGF:ErbB1\_h:ATP + EGF:ErbB1\_h:Inh -> EGF:ErbB1\_h:ATP::EGF:ErbB1\_h:Inh  
k2 kd2

#### Reaction equation



#### Reactants

Table 1640: Properties of each reactant.

Id	Name	SBO
c529	EGF:ErbB1_h:ATP	
c526	EGF:ErbB1_h:Inh	

#### Product

Table 1641: Properties of each product.

Id	Name	SBO
c553	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{818} = k2 \cdot c529 \cdot c526 - kd2 \cdot c553 \quad (1658)$$

Table 1642: Properties of each parameter.

Id	Name	SBO	Value	Unit	Constant
kd	kd		1.0		<input checked="" type="checkbox"/>

### 8.819 Reaction v854

This is a reversible reaction of two reactants forming one product.

**Name** v854 EGF:ErbB1\_h:Inh + EGF:ErbB1:Inh -> EGF:ErbB1\_h:Inh::EGF:ErbB1:Inh k2

kd2

Reaction equation



Reactants

Table 1643: Properties of each reactant.

Id	Name	SBO
c526	EGF:ErbB1_h:Inh	
c499	EGF:ErbB1:Inh	

Product

Table 1644: Properties of each product.

Id	Name	SBO
c554	(EGF:ErbB1:Inh::EGF:ErbB1_h:Inh)	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{819} = k2 \cdot c526 \cdot c499 - kd2 \cdot c554$$

(1660)

8.820 Reaction v855

This is a reversible reaction of two reactants forming one product.

**Name** v855 EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP + ATP -> (EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP)-FullActive k122 kd122

Reaction equation



Reactants

Table 1645: Properties of each reactant.

Id	Name	SBO
c550	(EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)	
c105	ATP 1.2e9	

## Product

Table 1646: Properties of each product.

Id	Name	SBO
c555	(EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)-FullActive	

## Kinetic Law

**Derived unit** contains undeclared units

$$v_{820} = k_{122} \cdot c_{550} \cdot c_{105} - k_{d122} \cdot c_{555} \quad (1662)$$

### 8.821 Reaction v856

This is a reversible reaction of two reactants forming one product.

**Name** v856 EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP + ATP -> (EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP)-HalfActive k122 kd122

## Reaction equation



## Reactants

Table 1647: Properties of each reactant.

Id	Name	SBO
c551	(EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)	
c105	ATP 1.2e9	

## Product

Table 1648: Properties of each product.

Id	Name	SBO
c556	(EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)-HalfActive	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{821} = k_{122} \cdot c_{551} \cdot c_{105} - k_{d122} \cdot c_{556} \quad (1664)$$

### 8.822 Reaction v857

This is a reversible reaction of two reactants forming one product.

**Name** v857 2(EGF:ErbB1\_h:ATP) + ATP -> 2(EGF:ErbB1\_h:ATP)-FullActive k122 kd122

### Reaction equation



### Reactants

Table 1649: Properties of each reactant.

Id	Name	SBO
c552	2(EGF:ErbB1_h:ATP)-FullActive	
c105	ATP 1.2e9	

### Product

Table 1650: Properties of each product.

Id	Name	SBO
c557	2(EGF:ErbB1_h:ATP)-FullActive	

### Kinetic Law

**Derived unit** contains undeclared units

$$v_{822} = k_{122} \cdot c_{552} \cdot c_{105} - k_{d122} \cdot c_{557} \quad (1666)$$

8.823 Reaction v858

This is a reversible reaction of two reactants forming one product.

**Name** v858 EGF:ErbB1\_h:ATP::EGF:ErbB1\_h:Inh + ATP -> (EGF:ErbB1\_h:ATP::EGF:ErbB1\_h:Inh)-HalfActive k122 kd122

Reaction equation



Reactants

Table 1651: Properties of each reactant.

Id	Name	SBO
c553	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)	
c105	ATP 1.2e9	

Product

Table 1652: Properties of each product.

Id	Name	SBO
c558	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive	

Kinetic Law

**Derived unit** contains undeclared units

$$v_{823} = k122 \cdot c553 \cdot c105 - kd122 \cdot c558$$

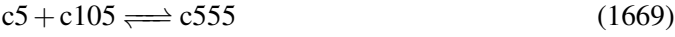
(1668)

8.824 Reaction v859

This is a reversible reaction of two reactants forming one product.

**Name** v859 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP)-FullActive k123 kd123

Reaction equation



Reactants

Table 1653: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	
c105	ATP 1.2e9	

Product

Table 1654: Properties of each product.

Id	Name	SBO
c555	(EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)-FullActive	

Kinetic Law

Derived unit contains undeclared units

$$v_{824} = k_{123} \cdot c_5 \cdot c_{105} - k_{d123} \cdot c_{555}$$

(1670)

8.825 Reaction v860

This is a reversible reaction of two reactants forming one product.

**Name** v860 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP)-HalfActive k123h  
kd123h

Reaction equation



Reactants

Table 1655: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	
c105	ATP 1.2e9	

Product

Table 1656: Properties of each product.

Id	Name	SBO
c556	(EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)-HalfActive	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{825} = k_{123h} \cdot c_5 \cdot c_{105} - k_{d123h} \cdot c_{556} \quad (1672)$$

**8.826 Reaction v861**

This is a reversible reaction of two reactants forming one product.

**Name** v861 2(EGF:ErbB1)#P + ATP -> 2(EGF:ErbB1\_h:ATP)-FullActive k123 kd123**Reaction equation****Reactants**

Table 1657: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1)_P	
c105	ATP 1.2e9	

**Product**

Table 1658: Properties of each product.

Id	Name	SBO
c557	2(EGF:ErbB1_h:ATP)-FullActive	

**Kinetic Law****Derived unit** contains undeclared units

$$v_{826} = k_{123} \cdot c_5 \cdot c_{105} - k_{d123} \cdot c_{557} \quad (1674)$$



### 8.827 Reaction v862

This is a reversible reaction of two reactants forming one product.

**Name** v862 2(EGF:ErbB1)#P + ATP -> (EGF:ErbB1\_h:ATP::EGF:ErbB1\_h:Inh)-HalfActive  
k123h kd123h

#### Reaction equation



#### Reactants

Table 1659: Properties of each reactant.

Id	Name	SBO
c5	2(EGF:ErbB1).P	
c105	ATP 1.2e9	

#### Product

Table 1660: Properties of each product.

Id	Name	SBO
c558	(EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive	

#### Kinetic Law

**Derived unit** contains undeclared units

$$v_{827} = k123h \cdot c5 \cdot c105 - kd123h \cdot c558 \quad (1676)$$

## 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 c1

**Name** EGF

**SBO:0000297** protein complex

**Notes** EGF , medium

**Initial concentration**  $10^{-11} \text{ mol} \cdot \text{l}^{-1}$

This species takes part in six reactions (as a reactant in [v1](#), [v2](#), [v3](#), [v4](#), [v795](#), [v798](#)), which do not influence its rate of change because this species is on the boundary of the reaction system:

$$\frac{d}{dt}c1 = 0 \quad (1677)$$

## 9.2 Species c2

**Name** ErbB1:ATP

**SBO:0000297** protein complex

**Notes** ErbB1:ATP , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in [v1](#), [v164](#), [v789](#), [v790](#) and as a product in [v828](#)).

$$\frac{d}{dt}c2 = v_{813} - v_1 - v_{156} - v_{775} - v_{776} \quad (1678)$$

## 9.3 Species c3

**Name** EGF:ErbB1:ATP

**SBO:0000297** protein complex

**Notes** EGF:ErbB1:ATP , plasma membrane

**Initial amount** 0 item

This species takes part in twelve reactions (as a reactant in [v5](#), [v7](#), [v7](#), [v9](#), [v10](#), [v11](#), [v18](#), [v19](#), [v20](#), [v796](#), [v850](#) and as a product in [v1](#)).

$$\frac{d}{dt}c3 = v_1 - v_5 - v_7 - v_7 - v_9 - v_{10} - v_{11} - v_{18} - v_{19} - v_{20} - v_{782} - v_{815} \quad (1679)$$

#### 9.4 Species c288

**Name** (ErbB2:ErbB3)

**SBO:0000297** protein complex

**Notes** (ErbB2:ErbB3) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v2 and as a product in v678).

$$\frac{d}{dt}c288 = v_{664} - v_2 \quad (1680)$$

#### 9.5 Species c335

**Name** (ErbB3:ErbB2)\_P

**Notes** (ErbB3:ErbB2)#P , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v189, v202, v825 and as a product in v2, v680).

$$\frac{d}{dt}c335 = v_2 + v_{666} - v_{181} - v_{194} - v_{810} \quad (1681)$$

#### 9.6 Species c117

**Name** ErbB2:ErbB4

**Notes** ErbB2:ErbB4 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v3 and as a product in v679).

$$\frac{d}{dt}c117 = v_{665} - v_3 \quad (1682)$$

#### 9.7 Species c336

**Name** (ErbB4:ErbB2)\_P

**Notes** (ErbB4:ErbB2)#P , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v190, v203, v824 and as a product in v3, v681).

$$\frac{d}{dt}c336 = v_3 + v_{667} - v_{182} - v_{195} - v_{809} \quad (1683)$$

## 9.8 Species c286

**Name** ErbB1:Inh

**Notes** ErbB1:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v4 and as a product in v665).

$$\frac{d}{dt}c_{286} = v_{651} - v_4 \quad (1684)$$

## 9.9 Species c499

**Name** EGF:ErbB1:Inh

**Notes** EGF:ErbB1:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v5, v6, v6, v15, v16, v17, v851, v854 and as a product in v4).

$$\frac{d}{dt}c_{499} = v_4 - v_5 - v_6 - v_6 - v_{15} - v_{16} - v_{17} - v_{816} - v_{819} \quad (1685)$$

## 9.10 Species c500

**Name** (EGF:ErbB1:ATP::EGF:ErbB1:Inh)

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1:Inh) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v802 and as a product in v5).

$$\frac{d}{dt}c_{500} = v_5 - v_{787} \quad (1686)$$

## 9.11 Species c501

**Name** 2(EGF:ErbB1:Inh)

**Notes** 2(EGF:ErbB1:Inh) , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v6).

$$\frac{d}{dt}c_{501} = v_6 \quad (1687)$$

### 9.12 Species c4

**Name** 2(EGF:ErbB1:ATP)

**Notes** 2(EGF:ErbB1:ATP) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v25 and as a product in v7).

$$\frac{d}{dt}c4 = v7 - v25 \quad (1688)$$

### 9.13 Species c10

**Name** EGF:ErbB1:ATP

**Notes** EGF:ErbB1:ATP , endosomal membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v8, v8, v12, v13, v14 and as a product in v208, v801).

$$\frac{d}{dt}c10 = v200 + v786 - v8 - v8 - v12 - v13 - v14 \quad (1689)$$

### 9.14 Species c11

**Name** 2(EGF:ErbB1:ATP)

**Notes** 2(EGF:ErbB1:ATP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v24, v524, v660 and as a product in v8).

$$\frac{d}{dt}c11 = v8 - v24 - v515 - v646 \quad (1690)$$

### 9.15 Species c141

**Name** ErbB2

**Notes** ErbB2 , plasma membrane

**Initial amount** 462000 item

This species takes part in ten reactions (as a reactant in v9, v15, v177, v666, v677, v678, v679, v685, v786, v788).

$$\frac{d}{dt}c141 = -v9 - v15 - v169 - v652 - v663 - v664 - v665 - v671 - v772 - v774 \quad (1691)$$

### 9.16 Species c145

**Name** EGF:ErbB1:ErbB2

**Notes** EGF:ErbB1:ErbB2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v26 and as a product in v9).

$$\frac{d}{dt}c145 = v_9 - v_{26} \quad (1692)$$

### 9.17 Species c140

**Name** ErbB3

**Notes** ErbB3 , plasma membrane

**Initial amount** 6230 item

This species takes part in seven reactions (as a reactant in v10, v16, v176, v668, v678, v683, v784).

$$\frac{d}{dt}c140 = -v_{10} - v_{16} - v_{168} - v_{654} - v_{664} - v_{669} - v_{770} \quad (1693)$$

### 9.18 Species c146

**Name** EGF:ErbB1:ErbB3

**Notes** EGF:ErbB1:ErbB3 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v27 and as a product in v10).

$$\frac{d}{dt}c146 = v_{10} - v_{27} \quad (1694)$$

### 9.19 Species c143

**Name** ErbB4

**Notes** ErbB4 , plasma membrane

**Initial amount** 794 item

This species takes part in seven reactions (as a reactant in v11, v17, v178, v667, v679, v684, v785).

$$\frac{d}{dt}c143 = -v_{11} - v_{17} - v_{170} - v_{653} - v_{665} - v_{670} - v_{771} \quad (1695)$$

## 9.20 Species c147

**Name** EGF:ErbB1:ErbB4

**Notes** EGF:ErbB1:ErbB4 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v28 and as a product in v11).

$$\frac{d}{dt}c147 = v_{11} - v_{28} \quad (1696)$$

## 9.21 Species c155

**Name** ErbB2

**Notes** ErbB2 , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v12, v538, v787, v791 and as a product in v177).

$$\frac{d}{dt}c155 = v_{169} - v_{12} - v_{528} - v_{773} - v_{777} \quad (1697)$$

## 9.22 Species c159

**Name** (EGF:ErbB1:ErbB2)

**Notes** (EGF:ErbB1:ErbB2) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v21, v600, v657 and as a product in v12).

$$\frac{d}{dt}c159 = v_{12} - v_{21} - v_{586} - v_{643} \quad (1698)$$

## 9.23 Species c154

**Name** ErbB3

**Notes** ErbB3 , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v13, v209, v537 and as a product in v176).

$$\frac{d}{dt}c154 = v_{168} - v_{13} - v_{201} - v_{527} \quad (1699)$$

### 9.24 Species c160

**Name** (EGF:ErbB1:ErbB3)

**Notes** (EGF:ErbB1:ErbB3) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v22, v601, v658 and as a product in v13).

$$\frac{d}{dt}c160 = v_{13} - v_{22} - v_{587} - v_{644} \quad (1700)$$

### 9.25 Species c156

**Name** ErbB4

**Notes** ErbB4 , endosomal membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v14, v539 and as a product in v178).

$$\frac{d}{dt}c156 = v_{170} - v_{14} - v_{529} \quad (1701)$$

### 9.26 Species c161

**Name** (EGF:ErbB1:ErbB4)

**Notes** (EGF:ErbB1:ErbB4) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v23, v602, v659 and as a product in v14).

$$\frac{d}{dt}c161 = v_{14} - v_{23} - v_{588} - v_{645} \quad (1702)$$

### 9.27 Species c492

**Name** EGF:ErbB1:Inh:ErB2

**Notes** EGF:ErbB1:Inh:ErB2 , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v15).

$$\frac{d}{dt}c492 = v_{15} \quad (1703)$$



### 9.28 Species c493

**Name** EGF:ErbB1:Inh:ErB3

**Notes** EGF:ErbB1:Inh:ErB3 , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v16).

$$\frac{d}{dt}c493 = v_{16} \quad (1704)$$

### 9.29 Species c494

**Name** EGF:ErbB1:Inh:ErB4

**Notes** EGF:ErbB1:Inh:ErB4 , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v17).

$$\frac{d}{dt}c494 = v_{17} \quad (1705)$$

### 9.30 Species c502

**Name** ErbB2:Inh

**Notes** ErbB2:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v18, v182, v682, v683, v684 and as a product in v666).

$$\frac{d}{dt}c502 = v_{652} - v_{18} - v_{174} - v_{668} - v_{669} - v_{670} \quad (1706)$$

### 9.31 Species c504

**Name** (EGF:ErbB1:ErbB2):Inh

**Notes** (EGF:ErbB1:ErbB2):Inh , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v18).

$$\frac{d}{dt}c504 = v_{18} \quad (1707)$$

### 9.32 Species c503

**Name** ErbB4:Inh

**Notes** ErbB4:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v19, v183, v685 and as a product in v667).

$$\frac{d}{dt}c503 = v_{653} - v_{19} - v_{175} - v_{671} \quad (1708)$$

### 9.33 Species c505

**Name** (EGF:ErbB1:ErbB3)\_P:Inh

**Notes** (EGF:ErbB1:ErbB3)#P:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v19).

$$\frac{d}{dt}c505 = v_{19} \quad (1709)$$

### 9.34 Species c506

**Name** ErbB3:Inh

**Notes** ErbB3:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v20 and as a product in v668).

$$\frac{d}{dt}c506 = v_{654} - v_{20} \quad (1710)$$

### 9.35 Species c507

**Name** (EGF:ErbB1:ErbB3)\_P:Inh

**Notes** (EGF:ErbB1:ErbB3)#P:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v20).

$$\frac{d}{dt}c507 = v_{20} \quad (1711)$$

### 9.36 Species c105

**Name** ATP 1.2e9

**Notes** ATP 1.2e9

**Initial amount**  $1.2 \cdot 10^9$  item

This species takes part in 58 reactions (as a reactant in v21, v22, v23, v24, v25, v26, v27, v28, v29, v30, v31, v32, v33, v34, v35, v36, v37, v38, v39, v40, v41, v42, v802, v803, v804, v805, v806, v807, v808, v809, v810, v811, v812, v813, v814, v815, v816, v817, v818, v819, v820, v821, v822, v823, v824, v825, v826, v827, v828, v829, v855, v856, v857, v858, v859, v860, v861, v862).

$$\begin{aligned} \frac{d}{dt}c105 = & -v_{21} - v_{22} - v_{23} - v_{24} - v_{25} - v_{26} - v_{27} - v_{28} - v_{29} - v_{30} - v_{31} \\ & - v_{32} - v_{33} - v_{34} - v_{35} - v_{36} - v_{37} - v_{38} - v_{39} - v_{40} - v_{41} - v_{42} \\ & - v_{787} - v_{788} - v_{789} - v_{790} - v_{791} - v_{792} - v_{793} - v_{794} - v_{795} \\ & - v_{796} - v_{797} - v_{798} - v_{799} - v_{800} - v_{801} - v_{802} - v_{803} - v_{804} \\ & - v_{805} - v_{806} - v_{807} - v_{808} - v_{809} - v_{810} - v_{811} - v_{812} - v_{813} \\ & - v_{814} - v_{820} - v_{821} - v_{822} - v_{823} - v_{824} - v_{825} - v_{826} - v_{827} \end{aligned} \quad (1712)$$

### 9.37 Species c123

**Name** (EGF:ErbB1:ErbB2):ATP

**Notes** (EGF:ErbB1:ErbB2):ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v21, v808).

$$\frac{d}{dt}c123 = v_{21} + v_{793} \quad (1713)$$

### 9.38 Species c124

**Name** (EGF:ErbB1:ErbB3):ATP

**Notes** (EGF:ErbB1:ErbB3):ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v22, v809).

$$\frac{d}{dt}c124 = v_{22} + v_{794} \quad (1714)$$

### 9.39 Species c125

**Name** (EGF:ErbB1:ErbB4):ATP

**Notes** (EGF:ErbB1:ErbB4):ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v23, v810).

$$\frac{d}{dt}c125 = v_{23} + v_{795} \quad (1715)$$

### 9.40 Species c126

**Name** 2(EGF:ErbB1):ATP

**Notes** 2(EGF:ErbB1):ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v24, v811).

$$\frac{d}{dt}c126 = v_{24} + v_{796} \quad (1716)$$

### 9.41 Species c116

**Name** 2(EGF:ErbB1:ATP)-FullActive

**Notes** 2(EGF:ErbB1:ATP)-FullActive , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v25, v804).

$$\frac{d}{dt}c116 = v_{25} + v_{789} \quad (1717)$$

### 9.42 Species c122

**Name** EGF:ErbB1:ErbB2:ATP

**Notes** EGF:ErbB1:ErbB2:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v26, v807).

$$\frac{d}{dt}c122 = v_{26} + v_{792} \quad (1718)$$

### 9.43 Species c127

**Name** EGF:ErbB1:ErbB3:ATP

**Notes** EGF:ErbB1:ErbB3:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v27, v812).

$$\frac{d}{dt}c_{127} = v_{27} + v_{797} \quad (1719)$$

### 9.44 Species c128

**Name** EGF:ErbB1:ErbB4:ATP

**Notes** EGF:ErbB1:ErbB4:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v28, v813).

$$\frac{d}{dt}c_{128} = v_{28} + v_{798} \quad (1720)$$

### 9.45 Species c284

**Name** ErbB2:ErbB2\_P

**Notes** ErbB2:ErbB2#P , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v29 and as a product in v677).

$$\frac{d}{dt}c_{284} = v_{663} - v_{29} \quad (1721)$$

### 9.46 Species c129

**Name** ErbB2:ErbB2\_P:ATP

**Notes** ErbB2:ErbB2#P:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v29, v814).

$$\frac{d}{dt}c_{129} = v_{29} + v_{799} \quad (1722)$$

### 9.47 Species c427

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v30, v714 and as a product in v689).

$$\frac{d}{dt}c427 = v_{675} - v_{30} - v_{700} \quad (1723)$$

### 9.48 Species c130

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1:ATP

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v30, v815).

$$\frac{d}{dt}c130 = v_{30} + v_{800} \quad (1724)$$

### 9.49 Species c428

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v31, v715 and as a product in v690).

$$\frac{d}{dt}c428 = v_{676} - v_{31} - v_{701} \quad (1725)$$

### 9.50 Species c131

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1:ATP

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v31, v816).

$$\frac{d}{dt}c131 = v_{31} + v_{801} \quad (1726)$$

### 9.51 Species c429

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v32, v716 and as a product in v691).

$$\frac{d}{dt}c429 = v_{677} - v_{32} - v_{702} \quad (1727)$$

### 9.52 Species c132

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1:ATP

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v32, v817).

$$\frac{d}{dt}c132 = v_{32} + v_{802} \quad (1728)$$

### 9.53 Species c436

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v33, v717 and as a product in v692).

$$\frac{d}{dt}c436 = v_{678} - v_{33} - v_{703} \quad (1729)$$

### 9.54 Species c133

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1:ATP

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v33, v818).

$$\frac{d}{dt}c133 = v_{33} + v_{803} \quad (1730)$$

### 9.55 Species c439

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v34, v718 and as a product in v693).

$$\frac{d}{dt}c439 = v_{679} - v_{34} - v_{704} \quad (1731)$$

### 9.56 Species c134

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1:ATP

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v34, v819).

$$\frac{d}{dt}c134 = v_{34} + v_{804} \quad (1732)$$

### 9.57 Species c442

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v35, v719 and as a product in v694).

$$\frac{d}{dt}c442 = v_{680} - v_{35} - v_{705} \quad (1733)$$

### 9.58 Species c135

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1:ATP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v35, v820).

$$\frac{d}{dt}c135 = v_{35} + v_{805} \quad (1734)$$



### 9.59 Species c483

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Gab1

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Gab1 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v36, v720 and as a product in v688).

$$\frac{d}{dt}c483 = v_{674} - v_{36} - v_{706} \quad (1735)$$

### 9.60 Species c136

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Gab1:ATP

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Gab1:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v36, v821).

$$\frac{d}{dt}c136 = v_{36} + v_{806} \quad (1736)$$

### 9.61 Species c516

**Name** (HRG:ErbB3:ErbB1)

**Notes** (HRG:ErbB3:ErbB1) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v37 and as a product in v789).

$$\frac{d}{dt}c516 = v_{775} - v_{37} \quad (1737)$$

### 9.62 Species c137

**Name** (HRG:ErbB3:ErbB1):ATP

**Notes** (HRG:ErbB3:ErbB1):ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v37, v822).

$$\frac{d}{dt}c137 = v_{37} + v_{807} \quad (1738)$$

### 9.63 Species c517

**Name** (HRG:ErbB4:ErbB1)

**Notes** (HRG:ErbB4:ErbB1) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v38 and as a product in v790).

$$\frac{d}{dt}c517 = v_{776} - v_{38} \quad (1739)$$

### 9.64 Species c138

**Name** (HRG:ErbB4:ErbB1):ATP

**Notes** (HRG:ErbB4:ErbB1):ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v38, v823).

$$\frac{d}{dt}c138 = v_{38} + v_{808} \quad (1740)$$

### 9.65 Species c345

**Name** (HRG:ErbB4):ErbB2

**Notes** (HRG:ErbB4):ErbB2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v39 and as a product in v788).

$$\frac{d}{dt}c345 = v_{774} - v_{39} \quad (1741)$$

### 9.66 Species c139

**Name** (HRG:ErbB4):ErbB2:ATP

**Notes** (HRG:ErbB4):ErbB2:ATP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v39, v824).

$$\frac{d}{dt}c139 = v_{39} + v_{809} \quad (1742)$$

### 9.67 Species c355

**Name** (HRG:ErbB3):ErbB2

**Notes** (HRG:ErbB3):ErbB2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v40 and as a product in v786).

$$\frac{d}{dt}c355 = v772 - v40 \quad (1743)$$

### 9.68 Species c168

**Name** (HRG:ErbB3):ErbB2:ATP

**Notes** (HRG:ErbB3):ErbB2:ATP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v40, v825).

$$\frac{d}{dt}c168 = v40 + v810 \quad (1744)$$

### 9.69 Species c421

**Name** (HRG:ErbB3):ErbB2)

**Notes** ((HRG:ErbB3):ErbB2) , endosomal membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v41, v605 and as a product in v787).

$$\frac{d}{dt}c421 = v773 - v41 - v591 \quad (1745)$$

### 9.70 Species c169

**Name** ((HRG:ErbB3):ErbB2):ATP

**Notes** ((HRG:ErbB3):ErbB2):ATP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v41, v826).

$$\frac{d}{dt}c169 = v41 + v811 \quad (1746)$$

### 9.71 Species c422

**Name** ((HRG:ErbB4):ErbB2)

**Notes** ((HRG:ErbB4):ErbB2) , endosomal membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v42, v606 and as a product in v791).

$$\frac{d}{dt}c422 = v_{777} - v_{42} - v_{592} \quad (1747)$$

### 9.72 Species c170

**Name** ((HRG:ErbB4):ErbB2):ATP

**Notes** ((HRG:ErbB4):ErbB2):ATP , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v42, v827).

$$\frac{d}{dt}c170 = v_{42} + v_{812} \quad (1748)$$

### 9.73 Species c23

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v43, v175, v248, v669, v688 and as a product in v212).

$$\frac{d}{dt}c23 = v_{203} - v_{43} - v_{167} - v_{239} - v_{655} - v_{674} \quad (1749)$$

### 9.74 Species c12

**Name** cPP

**Notes** cPP , plasma membrane

**Initial amount** 4498.73 item

This species takes part in 57 reactions (as a reactant in v43, v44, v45, v46, v47, v48, v49, v50, v52, v53, v54, v55, v56, v57, v58, v59, v60, v61, v62, v63, v64, v65, v66, v67, v68, v69, v70, v71, v72, v75, v76, v77, v78, v79, v80, v81, v82, v83, v84, v85, v87, v88, v89, v90, v91, v92, v93, v94, v95, v96, v97, v98, v99, v100, v101, v102 and as a product in v211).

$$\begin{aligned} \frac{d}{dt}c12 = & v_{202} - v_{43} - v_{44} - v_{45} - v_{46} - v_{47} - v_{48} - v_{49} - v_{50} - v_{51} - v_{52} - v_{53} \\ & - v_{54} - v_{55} - v_{56} - v_{57} - v_{58} - v_{59} - v_{60} - v_{61} - v_{62} - v_{63} - v_{64} - v_{65} \\ & - v_{66} - v_{67} - v_{68} - v_{69} - v_{70} - v_{71} - v_{72} - v_{73} - v_{74} - v_{75} - v_{76} \\ & - v_{77} - v_{78} - v_{79} - v_{80} - v_{81} - v_{82} - v_{83} - v_{84} - v_{85} - v_{86} - v_{87} \\ & - v_{88} - v_{89} - v_{90} - v_{91} - v_{92} - v_{93} - v_{94} - v_{95} - v_{96} - v_{97} - v_{98} \end{aligned} \quad (1750)$$

### 9.75 Species c7

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:cPP

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v43, v161).

$$\frac{d}{dt}c7 = v_{43} + v_{153} \quad (1751)$$

### 9.76 Species c25

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v44, v169, v255, v294, v321, v346, v609 and as a product in v248, v428).

$$\frac{d}{dt}c25 = v_{239} + v_{419} - v_{44} - v_{161} - v_{246} - v_{285} - v_{312} - v_{337} - v_{595} \quad (1752)$$

### 9.77 Species c88

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:cPP

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v44, v162).

$$\frac{d}{dt}c88 = v_{44} + v_{154} \quad (1753)$$

### 9.78 Species c27

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v45, v163 and as a product in v255, v294).

$$\frac{d}{dt}c27 = v_{246} + v_{285} - v_{45} - v_{155} \quad (1754)$$

### 9.79 Species c89

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(Ras:GDP):cPP

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v45, v160).

$$\frac{d}{dt}c89 = v_{45} + v_{152} \quad (1755)$$

### 9.80 Species c29

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v46, v170 and as a product in v321, v346).

$$\frac{d}{dt}c29 = v_{312} + v_{337} - v_{46} - v_{162} \quad (1756)$$

### 9.81 Species c90

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(Ras:GTP):cPP

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v46, v159).

$$\frac{d}{dt}c90 = v_{46} + v_{151} \quad (1757)$$

### 9.82 Species c34

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v47, v171, v395, v671 and as a product in v214, v445).

$$\frac{d}{dt}c34 = v_{205} + v_{436} - v_{47} - v_{163} - v_{386} - v_{657} \quad (1758)$$

### 9.83 Species c91

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:cPP

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v47, v158).

$$\frac{d}{dt}c91 = v_{47} + v_{150} \quad (1759)$$

### 9.84 Species c35

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in ten reactions (as a reactant in v48, v172, v256, v293, v322, v345, v611 and as a product in v395, v413, v473).

$$\frac{d}{dt}c35 = v_{386} + v_{404} + v_{464} - v_{48} - v_{164} - v_{247} - v_{284} - v_{313} - v_{336} - v_{597} \quad (1760)$$

### 9.85 Species c92

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:cPP

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v48, v157).

$$\frac{d}{dt}c92 = v_{48} + v_{149} \quad (1761)$$

### 9.86 Species c36

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v49, v173 and as a product in v256, v293).

$$\frac{d}{dt}c36 = v_{247} + v_{284} - v_{49} - v_{165} \quad (1762)$$

### 9.87 Species c93

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP):cPP

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v49, v156).

$$\frac{d}{dt}c93 = v_{49} + v_{148} \quad (1763)$$

### 9.88 Species c37

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v50, v174 and as a product in v322, v345).

$$\frac{d}{dt}c37 = v_{313} + v_{336} - v_{50} - v_{166} \quad (1764)$$

### 9.89 Species c94

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP):cPP

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v50, v155).

$$\frac{d}{dt}c94 = v_{50} + v_{147} \quad (1765)$$



### 9.90 Species c189

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v52, v397 and as a product in v223, v454).

$$\frac{d}{dt}c189 = v_{214} + v_{445} - v_{51} - v_{388} \quad (1766)$$

### 9.91 Species c195

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2:cPP

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v52, v153).

$$\frac{d}{dt}c195 = v_{51} + v_{146} \quad (1767)$$

### 9.92 Species c190

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v53, v398 and as a product in v224, v455).

$$\frac{d}{dt}c190 = v_{215} + v_{446} - v_{52} - v_{389} \quad (1768)$$

### 9.93 Species c196

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2:cPP

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v53, v152).

$$\frac{d}{dt}c196 = v_{52} + v_{145} \quad (1769)$$

### 9.94 Species c191

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v54, v399 and as a product in v225, v456).

$$\frac{d}{dt}c191 = v_{216} + v_{447} - v_{53} - v_{390} \quad (1770)$$

### 9.95 Species c197

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2:cPP

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v54, v151).

$$\frac{d}{dt}c197 = v_{53} + v_{144} \quad (1771)$$

### 9.96 Species c198

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v55, v259, v295, v325, v347 and as a product in v397, v415, v475).

$$\frac{d}{dt}c198 = v_{388} + v_{406} + v_{466} - v_{54} - v_{250} - v_{286} - v_{316} - v_{338} \quad (1772)$$

### 9.97 Species c204

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:cPP

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v55, v150).

$$\frac{d}{dt}c204 = v_{54} + v_{143} \quad (1773)$$

### 9.98 Species c199

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v56, v260, v296, v326, v348 and as a product in v398, v416, v476).

$$\frac{d}{dt}c199 = v_{389} + v_{407} + v_{467} - v_{55} - v_{251} - v_{287} - v_{317} - v_{339} \quad (1774)$$

### 9.99 Species c205

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2:Sos:cPP

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v56, v149).

$$\frac{d}{dt}c205 = v_{55} + v_{142} \quad (1775)$$

### 9.100 Species c200

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v57, v261, v297, v327, v349 and as a product in v399, v417, v477).

$$\frac{d}{dt}c200 = v_{390} + v_{408} + v_{468} - v_{56} - v_{252} - v_{288} - v_{318} - v_{340} \quad (1776)$$

### 9.101 Species c206

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2:Sos:cPP

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v57, v148).

$$\frac{d}{dt}c206 = v_{56} + v_{141} \quad (1777)$$

### 9.102 Species c207

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v58 and as a product in v259, v295).

$$\frac{d}{dt}c_{207} = v_{250} + v_{286} - v_{57} \quad (1778)$$

### 9.103 Species c213

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v58, v147).

$$\frac{d}{dt}c_{213} = v_{57} + v_{140} \quad (1779)$$

### 9.104 Species c208

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v59 and as a product in v260, v296).

$$\frac{d}{dt}c_{208} = v_{251} + v_{287} - v_{58} \quad (1780)$$

### 9.105 Species c214

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v59, v146).

$$\frac{d}{dt}c_{214} = v_{58} + v_{139} \quad (1781)$$

### 9.106 Species c209

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v60 and as a product in v261, v297).

$$\frac{d}{dt}c209 = v_{252} + v_{288} - v_{59} \quad (1782)$$

### 9.107 Species c215

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v60, v145).

$$\frac{d}{dt}c215 = v_{59} + v_{138} \quad (1783)$$

### 9.108 Species c216

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v61 and as a product in v325, v347).

$$\frac{d}{dt}c216 = v_{316} + v_{338} - v_{60} \quad (1784)$$

### 9.109 Species c222

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v61, v144).

$$\frac{d}{dt}c222 = v_{60} + v_{137} \quad (1785)$$

### 9.110 Species c217

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v62 and as a product in v326, v348).

$$\frac{d}{dt}c217 = v_{317} + v_{339} - v_{61} \quad (1786)$$

### 9.111 Species c223

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v62, v143).

$$\frac{d}{dt}c223 = v_{61} + v_{136} \quad (1787)$$

### 9.112 Species c218

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v63 and as a product in v327, v349).

$$\frac{d}{dt}c218 = v_{318} + v_{340} - v_{62} \quad (1788)$$

### 9.113 Species c224

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v63, v142).

$$\frac{d}{dt}c224 = v_{62} + v_{135} \quad (1789)$$

### 9.114 Species c225

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v64, v249, v689 and as a product in v217).

$$\frac{d}{dt}c225 = v_{208} - v_{63} - v_{240} - v_{675} \quad (1790)$$

### 9.115 Species c231

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:cPP

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v64, v141).

$$\frac{d}{dt}c231 = v_{63} + v_{134} \quad (1791)$$

### 9.116 Species c226

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v65, v250, v690 and as a product in v218).

$$\frac{d}{dt}c226 = v_{209} - v_{64} - v_{241} - v_{676} \quad (1792)$$

### 9.117 Species c232

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:cPP

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v65, v140).

$$\frac{d}{dt}c232 = v_{64} + v_{133} \quad (1793)$$

### 9.118 Species c227

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v66, v251, v691 and as a product in v219).

$$\frac{d}{dt}c227 = v_{210} - v_{65} - v_{242} - v_{677} \quad (1794)$$

### 9.119 Species c233

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:cPP

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v66, v139).

$$\frac{d}{dt}c233 = v_{65} + v_{132} \quad (1795)$$

### 9.120 Species c243

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v67 and as a product in v265, v301).

$$\frac{d}{dt}c243 = v_{256} + v_{292} - v_{66} \quad (1796)$$

### 9.121 Species c249

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v67, v138).

$$\frac{d}{dt}c249 = v_{66} + v_{131} \quad (1797)$$



### 9.122 Species c244

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v68 and as a product in v266, v302).

$$\frac{d}{dt}c_{244} = v_{257} + v_{293} - v_{67} \quad (1798)$$

### 9.123 Species c250

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v68, v137).

$$\frac{d}{dt}c_{250} = v_{67} + v_{130} \quad (1799)$$

### 9.124 Species c245

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v69 and as a product in v267, v303).

$$\frac{d}{dt}c_{245} = v_{258} + v_{294} - v_{68} \quad (1800)$$

### 9.125 Species c251

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v69, v136).

$$\frac{d}{dt}c_{251} = v_{68} + v_{129} \quad (1801)$$

### 9.126 Species c252

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v70 and as a product in v315, v353).

$$\frac{d}{dt}c_{252} = v_{306} + v_{344} - v_{69} \quad (1802)$$

### 9.127 Species c258

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v70, v135).

$$\frac{d}{dt}c_{258} = v_{69} + v_{128} \quad (1803)$$

### 9.128 Species c253

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v71 and as a product in v316, v354).

$$\frac{d}{dt}c_{253} = v_{307} + v_{345} - v_{70} \quad (1804)$$

### 9.129 Species c259

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v71, v134).

$$\frac{d}{dt}c_{259} = v_{70} + v_{127} \quad (1805)$$

### 9.130 Species c254

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v72 and as a product in v317, v355).

$$\frac{d}{dt}c254 = v_{308} + v_{346} - v_{71} \quad (1806)$$

### 9.131 Species c260

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v72, v133).

$$\frac{d}{dt}c260 = v_{71} + v_{126} \quad (1807)$$

### 9.132 Species c234

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Sos

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v75, v265, v301, v315, v353 and as a product in v249, v430).

$$\frac{d}{dt}c234 = v_{240} + v_{421} - v_{72} - v_{256} - v_{292} - v_{306} - v_{344} \quad (1808)$$

### 9.133 Species c240

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Sos:cPP

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v75, v130).

$$\frac{d}{dt}c240 = v_{72} + v_{125} \quad (1809)$$

### 9.134 Species c235

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Sos

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v76, v266, v302, v316, v354 and as a product in v250, v431).

$$\frac{d}{dt}c_{235} = v_{241} + v_{422} - v_{73} - v_{257} - v_{293} - v_{307} - v_{345} \quad (1810)$$

### 9.135 Species c241

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Sos:cPP

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v76, v129).

$$\frac{d}{dt}c_{241} = v_{73} + v_{124} \quad (1811)$$

### 9.136 Species c236

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Sos

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v77, v267, v303, v317, v355 and as a product in v251, v432).

$$\frac{d}{dt}c_{236} = v_{242} + v_{423} - v_{74} - v_{258} - v_{294} - v_{308} - v_{346} \quad (1812)$$

### 9.137 Species c242

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Sos:cPP

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v77, v128).

$$\frac{d}{dt}c_{242} = v_{74} + v_{123} \quad (1813)$$

### 9.138 Species c300

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v78, v403 and as a product in v229, v462).

$$\frac{d}{dt}c300 = v_{220} + v_{453} - v_{75} - v_{394} \quad (1814)$$

### 9.139 Species c301

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:cPP

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v78, v127).

$$\frac{d}{dt}c301 = v_{75} + v_{122} \quad (1815)$$

### 9.140 Species c303

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v79, v271, v289, v331, v341 and as a product in v403, v421, v481).

$$\frac{d}{dt}c303 = v_{394} + v_{412} + v_{472} - v_{76} - v_{262} - v_{280} - v_{322} - v_{332} \quad (1816)$$

### 9.141 Species c304

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:cPP

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v79, v126).

$$\frac{d}{dt}c304 = v_{76} + v_{121} \quad (1817)$$

### 9.142 Species c306

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v80 and as a product in v271, v289).

$$\frac{d}{dt}c306 = v_{262} + v_{280} - v_{77} \quad (1818)$$

### 9.143 Species c307

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP):cPP

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v80, v125).

$$\frac{d}{dt}c307 = v_{77} + v_{120} \quad (1819)$$

### 9.144 Species c309

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v81 and as a product in v331, v341).

$$\frac{d}{dt}c309 = v_{322} + v_{332} - v_{78} \quad (1820)$$

### 9.145 Species c310

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP):cPP

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v81, v124).

$$\frac{d}{dt}c310 = v_{78} + v_{119} \quad (1821)$$

### 9.146 Species c312

**Name** 2(ErbB2)\_P:GAP:Grb2

**Notes** 2(ErbB2)#P:GAP:Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v82, v245, v692 and as a product in v231).

$$\frac{d}{dt}c312 = v_{222} - v_{79} - v_{236} - v_{678} \quad (1822)$$

### 9.147 Species c313

**Name** 2(ErbB2)\_P:GAP:Grb2:cPP

**Notes** 2(ErbB2)#P:GAP:Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v82, v123).

$$\frac{d}{dt}c313 = v_{79} + v_{118} \quad (1823)$$

### 9.148 Species c315

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v83, v273, v287, v333, v339 and as a product in v245, v436).

$$\frac{d}{dt}c315 = v_{236} + v_{427} - v_{80} - v_{264} - v_{278} - v_{324} - v_{330} \quad (1824)$$

### 9.149 Species c316

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos:cPP

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v83, v122).

$$\frac{d}{dt}c316 = v_{80} + v_{117} \quad (1825)$$

### 9.150 Species c318

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v84 and as a product in v273, v287).

$$\frac{d}{dt}c318 = v_{264} + v_{278} - v_{81} \quad (1826)$$

### 9.151 Species c319

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP):cPP

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v84, v121).

$$\frac{d}{dt}c319 = v_{81} + v_{116} \quad (1827)$$

### 9.152 Species c321

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v85 and as a product in v333, v339).

$$\frac{d}{dt}c321 = v_{324} + v_{330} - v_{82} \quad (1828)$$

### 9.153 Species c322

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP):cPP

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v85, v120).

$$\frac{d}{dt}c322 = v_{82} + v_{115} \quad (1829)$$



### 9.154 Species c357

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v87, v407 and as a product in v233, v468).

$$\frac{d}{dt}c357 = v_{224} + v_{459} - v_{83} - v_{398} \quad (1830)$$

### 9.155 Species c358

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2:cPP

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v87, v118).

$$\frac{d}{dt}c358 = v_{83} + v_{114} \quad (1831)$$

### 9.156 Species c360

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v88, v405 and as a product in v235, v470).

$$\frac{d}{dt}c360 = v_{226} + v_{461} - v_{84} - v_{396} \quad (1832)$$

### 9.157 Species c361

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2:cPP

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v88, v117).

$$\frac{d}{dt}c361 = v_{84} + v_{113} \quad (1833)$$

### 9.158 Species c366

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v89, v275, v309, v311, v361 and as a product in v405, v425, v485).

$$\frac{d}{dt}c366 = v_{396} + v_{416} + v_{476} - v_{85} - v_{266} - v_{300} - v_{302} - v_{352} \quad (1834)$$

### 9.159 Species c367

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:cPP

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v89, v116).

$$\frac{d}{dt}c367 = v_{85} + v_{112} \quad (1835)$$

### 9.160 Species c369

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v90 and as a product in v277, v307).

$$\frac{d}{dt}c369 = v_{268} + v_{298} - v_{86} \quad (1836)$$

### 9.161 Species c370

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v90, v115).

$$\frac{d}{dt}c370 = v_{86} + v_{111} \quad (1837)$$

### 9.162 Species c372

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v91 and as a product in v275, v309).

$$\frac{d}{dt}c372 = v_{266} + v_{300} - v_{87} \quad (1838)$$

### 9.163 Species c373

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v91, v114).

$$\frac{d}{dt}c373 = v_{87} + v_{110} \quad (1839)$$

### 9.164 Species c375

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v92 and as a product in v313, v359).

$$\frac{d}{dt}c375 = v_{304} + v_{350} - v_{88} \quad (1840)$$

### 9.165 Species c376

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v92, v113).

$$\frac{d}{dt}c376 = v_{88} + v_{109} \quad (1841)$$

### 9.166 Species c378

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v93 and as a product in v311, v361).

$$\frac{d}{dt}c378 = v_{302} + v_{352} - v_{89} \quad (1842)$$

### 9.167 Species c379

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v93, v112).

$$\frac{d}{dt}c379 = v_{89} + v_{108} \quad (1843)$$

### 9.168 Species c381

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v94, v241, v693 and as a product in v237).

$$\frac{d}{dt}c381 = v_{228} - v_{90} - v_{232} - v_{679} \quad (1844)$$

### 9.169 Species c382

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:cPP

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v94, v111).

$$\frac{d}{dt}c382 = v_{90} + v_{107} \quad (1845)$$

### 9.170 Species c363

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v95, v277, v307, v313, v359 and as a product in v407, v423, v483).

$$\frac{d}{dt}c363 = v_{398} + v_{414} + v_{474} - v_{91} - v_{268} - v_{298} - v_{304} - v_{350} \quad (1846)$$

### 9.171 Species c364

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:cPP

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v95, v110).

$$\frac{d}{dt}c364 = v_{91} + v_{106} \quad (1847)$$

### 9.172 Species c384

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v96, v243, v694 and as a product in v239).

$$\frac{d}{dt}c384 = v_{230} - v_{92} - v_{234} - v_{680} \quad (1848)$$

### 9.173 Species c385

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:cPP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v96, v109).

$$\frac{d}{dt}c385 = v_{92} + v_{105} \quad (1849)$$

### 9.174 Species c387

**Name** (ErbB3:ErbB2).P:GAP:Grb2:Sos

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v97, v281, v283, v337, v363 and as a product in v241, v438).

$$\frac{d}{dt}c387 = v_{232} + v_{429} - v_{93} - v_{272} - v_{274} - v_{328} - v_{354} \quad (1850)$$

### 9.175 Species c388

**Name** (ErbB3:ErbB2).P:GAP:Grb2:Sos:cPP

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v97, v108).

$$\frac{d}{dt}c388 = v_{93} + v_{104} \quad (1851)$$

### 9.176 Species c390

**Name** (ErbB4:ErbB2).P:GAP:Grb2:Sos

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v98, v279, v285, v335, v365 and as a product in v243, v440).

$$\frac{d}{dt}c390 = v_{234} + v_{431} - v_{94} - v_{270} - v_{276} - v_{326} - v_{356} \quad (1852)$$

### 9.177 Species c391

**Name** (ErbB4:ErbB2).P:GAP:Grb2:Sos:cPP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos:cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v98, v107).

$$\frac{d}{dt}c391 = v_{94} + v_{103} \quad (1853)$$

### 9.178 Species c393

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v99 and as a product in v281, v283).

$$\frac{d}{dt}c393 = v_{272} + v_{274} - v_{95} \quad (1854)$$

### 9.179 Species c394

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v99, v106).

$$\frac{d}{dt}c394 = v_{95} + v_{102} \quad (1855)$$

### 9.180 Species c396

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v100 and as a product in v279, v285).

$$\frac{d}{dt}c396 = v_{270} + v_{276} - v_{96} \quad (1856)$$

### 9.181 Species c397

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP):cPP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v100, v105).

$$\frac{d}{dt}c397 = v_{96} + v_{101} \quad (1857)$$

### 9.182 Species c399

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v101 and as a product in v337, v363).

$$\frac{d}{dt}c399 = v_{328} + v_{354} - v_{97} \quad (1858)$$

### 9.183 Species c400

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v101, v104).

$$\frac{d}{dt}c400 = v_{97} + v_{100} \quad (1859)$$

### 9.184 Species c402

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v102 and as a product in v335, v365).

$$\frac{d}{dt}c402 = v_{326} + v_{356} - v_{98} \quad (1860)$$

### 9.185 Species c403

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP):cPP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v102, v103).

$$\frac{d}{dt}c403 = v_{98} + v_{99} \quad (1861)$$



### 9.186 Species c9

**Name** cPP

**Notes** cPP , endosomal membrane

**Initial amount** 0 item

This species takes part in 57 reactions (as a reactant in v103, v104, v105, v106, v107, v108, v109, v110, v111, v112, v113, v114, v115, v116, v117, v118, v120, v121, v122, v123, v124, v125, v126, v127, v128, v129, v130, v133, v134, v135, v136, v137, v138, v139, v140, v141, v142, v143, v144, v145, v146, v147, v148, v149, v150, v151, v152, v153, v155, v156, v157, v158, v159, v160, v161, v162, v211).

$$\begin{aligned} \frac{d}{dt}c9 = & -v_{99} - v_{100} - v_{101} - v_{102} - v_{103} - v_{104} - v_{105} - v_{106} - v_{107} - v_{108} \\ & - v_{109} - v_{110} - v_{111} - v_{112} - v_{113} - v_{114} - v_{115} - v_{116} - v_{117} - v_{118} \\ & - v_{119} - v_{120} - v_{121} - v_{122} - v_{123} - v_{124} - v_{125} - v_{126} - v_{127} - v_{128} \\ & - v_{129} - v_{130} - v_{131} - v_{132} - v_{133} - v_{134} - v_{135} - v_{136} - v_{137} \\ & - v_{138} - v_{139} - v_{140} - v_{141} - v_{142} - v_{143} - v_{144} - v_{145} - v_{146} \\ & - v_{147} - v_{148} - v_{149} - v_{150} - v_{151} - v_{152} - v_{153} - v_{154} - v_{202} \end{aligned} \quad (1862)$$

### 9.187 Species c404

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v103, v598 and as a product in v336, v366).

$$\frac{d}{dt}c404 = v_{327} + v_{357} - v_{99} - v_{584} \quad (1863)$$

### 9.188 Species c401

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v104, v597 and as a product in v338, v364).

$$\frac{d}{dt}c401 = v_{329} + v_{355} - v_{100} - v_{583} \quad (1864)$$

### 9.189 Species c398

**Name** (ErbB4:ErbB2).P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v105, v596 and as a product in v280, v286).

$$\frac{d}{dt}c398 = v_{271} + v_{277} - v_{101} - v_{582} \quad (1865)$$

### 9.190 Species c395

**Name** (ErbB3:ErbB2).P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v106, v595 and as a product in v282, v284).

$$\frac{d}{dt}c395 = v_{273} + v_{275} - v_{102} - v_{581} \quad (1866)$$

### 9.191 Species c392

**Name** (ErbB4:ErbB2).P:GAP:Grb2:Sos

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v107, v280, v286, v336, v366, v592 and as a product in v244, v441).

$$\frac{d}{dt}c392 = v_{235} + v_{432} - v_{103} - v_{271} - v_{277} - v_{327} - v_{357} - v_{578} \quad (1867)$$

### 9.192 Species c389

**Name** (ErbB3:ErbB2).P:GAP:Grb2:Sos

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v108, v282, v284, v338, v364, v591 and as a product in v242, v439).

$$\frac{d}{dt}c389 = v_{233} + v_{430} - v_{104} - v_{273} - v_{275} - v_{329} - v_{355} - v_{577} \quad (1868)$$

### 9.193 Species c386

**Name** (ErbB4:ErbB2).P:GAP:Grb2

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v109, v244, v589 and as a product in v240).

$$\frac{d}{dt}c386 = v_{231} - v_{105} - v_{235} - v_{575} \quad (1869)$$

### 9.194 Species c365

**Name** (ErbB3:ErbB2).P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v110, v278, v308, v314, v360, v586 and as a product in v408, v424, v484).

$$\frac{d}{dt}c365 = v_{399} + v_{415} + v_{475} - v_{106} - v_{269} - v_{299} - v_{305} - v_{351} - v_{572} \quad (1870)$$

### 9.195 Species c383

**Name** (ErbB3:ErbB2).P:GAP:Grb2

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v111, v242, v590 and as a product in v238).

$$\frac{d}{dt}c383 = v_{229} - v_{107} - v_{233} - v_{576} \quad (1871)$$

### 9.196 Species c380

**Name** (ErbB4:ErbB2).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v112, v588 and as a product in v312, v362).

$$\frac{d}{dt}c380 = v_{303} + v_{353} - v_{108} - v_{574} \quad (1872)$$

### 9.197 Species c377

**Name** (ErbB3:ErbB2).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v113, v587 and as a product in v314, v360).

$$\frac{d}{dt}c377 = v_{305} + v_{351} - v_{109} - v_{573} \quad (1873)$$

### 9.198 Species c374

**Name** (ErbB4:ErbB2).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v114, v594 and as a product in v276, v310).

$$\frac{d}{dt}c374 = v_{267} + v_{301} - v_{110} - v_{580} \quad (1874)$$

### 9.199 Species c371

**Name** (ErbB3:ErbB2).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v115, v593 and as a product in v278, v308).

$$\frac{d}{dt}c371 = v_{269} + v_{299} - v_{111} - v_{579} \quad (1875)$$

### 9.200 Species c368

**Name** (ErbB4:ErbB2).P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v116, v276, v310, v312, v362, v584 and as a product in v406, v426, v486).

$$\frac{d}{dt}c368 = v_{397} + v_{417} + v_{477} - v_{112} - v_{267} - v_{301} - v_{303} - v_{353} - v_{570} \quad (1876)$$

### 9.201 Species c362

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v117, v406, v585 and as a product in v236, v471).

$$\frac{d}{dt}c362 = v_{227} + v_{462} - v_{113} - v_{397} - v_{571} \quad (1877)$$

### 9.202 Species c359

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v118, v408, v583 and as a product in v234, v469).

$$\frac{d}{dt}c359 = v_{225} + v_{460} - v_{114} - v_{399} - v_{569} \quad (1878)$$

### 9.203 Species c323

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v120, v577 and as a product in v334, v340).

$$\frac{d}{dt}c323 = v_{325} + v_{331} - v_{115} - v_{564} \quad (1879)$$

### 9.204 Species c320

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v121, v576 and as a product in v274, v288).

$$\frac{d}{dt}c320 = v_{265} + v_{279} - v_{116} - v_{563} \quad (1880)$$

### 9.205 Species c317

**Name** 2(ErbB2)\_P:GAP:Grb2:Sos

**Notes** 2(ErbB2)#P:GAP:Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v122, v274, v288, v334, v340, v575 and as a product in v246, v437).

$$\frac{d}{dt}c317 = v_{237} + v_{428} - v_{117} - v_{265} - v_{279} - v_{325} - v_{331} - v_{562} \quad (1881)$$

### 9.206 Species c314

**Name** 2(ErbB2)\_P:GAP:Grb2

**Notes** 2(ErbB2)#P:GAP:Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v123, v246, v574 and as a product in v232).

$$\frac{d}{dt}c314 = v_{223} - v_{118} - v_{237} - v_{561} \quad (1882)$$

### 9.207 Species c311

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v124, v573 and as a product in v332, v342).

$$\frac{d}{dt}c311 = v_{323} + v_{333} - v_{119} - v_{560} \quad (1883)$$

### 9.208 Species c308

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v125, v572 and as a product in v272, v290).

$$\frac{d}{dt}c308 = v_{263} + v_{281} - v_{120} - v_{559} \quad (1884)$$

### 9.209 Species c305

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v126, v272, v290, v332, v342 and as a product in v404, v422, v482).

$$\frac{d}{dt}c305 = v_{395} + v_{413} + v_{473} - v_{121} - v_{263} - v_{281} - v_{323} - v_{333} \quad (1885)$$

### 9.210 Species c302

**Name** 2(ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** 2(ErbB2)#P:GAP:(Shc#P):Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v127, v404, v570 and as a product in v230, v463).

$$\frac{d}{dt}c302 = v_{221} + v_{454} - v_{122} - v_{395} - v_{558} \quad (1886)$$

### 9.211 Species c239

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Sos

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v128, v270, v306, v320, v358, v565 and as a product in v254, v435).

$$\frac{d}{dt}c239 = v_{245} + v_{426} - v_{123} - v_{261} - v_{297} - v_{311} - v_{349} - v_{553} \quad (1887)$$

### 9.212 Species c238

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Sos

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v129, v269, v305, v319, v357, v564 and as a product in v253, v434).

$$\frac{d}{dt}c238 = v_{244} + v_{425} - v_{124} - v_{260} - v_{296} - v_{310} - v_{348} - v_{552} \quad (1888)$$

### 9.213 Species c237

**Name** (ErbB1:ErbB2).P:GAP:Grb2:Sos

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v130, v268, v304, v318, v356, v563 and as a product in v252, v433).

$$\frac{d}{dt}c237 = v_{243} + v_{424} - v_{125} - v_{259} - v_{295} - v_{309} - v_{347} - v_{551} \quad (1889)$$

### 9.214 Species c257

**Name** (ErbB1:ErbB4).P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v133, v560 and as a product in v320, v358).

$$\frac{d}{dt}c257 = v_{311} + v_{349} - v_{126} - v_{550} \quad (1890)$$

### 9.215 Species c256

**Name** (ErbB1:ErbB3).P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v134, v559 and as a product in v319, v357).

$$\frac{d}{dt}c256 = v_{310} + v_{348} - v_{127} - v_{549} \quad (1891)$$

### 9.216 Species c255

**Name** (ErbB1:ErbB2).P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v135, v558 and as a product in v318, v356).

$$\frac{d}{dt}c255 = v_{309} + v_{347} - v_{128} - v_{548} \quad (1892)$$



### 9.217 Species c248

**Name** (ErbB1:ErbB4).P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v136, v557 and as a product in v270, v306).

$$\frac{d}{dt}c248 = v_{261} + v_{297} - v_{129} - v_{547} \quad (1893)$$

### 9.218 Species c247

**Name** (ErbB1:ErbB3).P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v137, v556 and as a product in v269, v305).

$$\frac{d}{dt}c247 = v_{260} + v_{296} - v_{130} - v_{546} \quad (1894)$$

### 9.219 Species c246

**Name** (ErbB1:ErbB2).P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v138, v555 and as a product in v268, v304).

$$\frac{d}{dt}c246 = v_{259} + v_{295} - v_{131} - v_{545} \quad (1895)$$

### 9.220 Species c230

**Name** (ErbB1:ErbB4).P:GAP:Grb2

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v139, v254, v554 and as a product in v222).

$$\frac{d}{dt}c230 = v_{213} - v_{132} - v_{245} - v_{544} \quad (1896)$$

### 9.221 Species c229

**Name** (ErbB1:ErbB3).P:GAP:Grb2

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v140, v253, v553 and as a product in v221).

$$\frac{d}{dt}c229 = v_{212} - v_{133} - v_{244} - v_{543} \quad (1897)$$

### 9.222 Species c228

**Name** (ErbB1:ErbB2).P:GAP:Grb2

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v141, v252, v552 and as a product in v220).

$$\frac{d}{dt}c228 = v_{211} - v_{134} - v_{243} - v_{542} \quad (1898)$$

### 9.223 Species c221

**Name** (ErbB1:ErbB4).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v142, v551 and as a product in v330, v352).

$$\frac{d}{dt}c221 = v_{321} + v_{343} - v_{135} - v_{541} \quad (1899)$$

### 9.224 Species c220

**Name** (ErbB1:ErbB3).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v143, v550 and as a product in v329, v351).

$$\frac{d}{dt}c220 = v_{320} + v_{342} - v_{136} - v_{540} \quad (1900)$$

### 9.225 Species c219

**Name** (ErbB1:ErbB2).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v144, v549 and as a product in v328, v350).

$$\frac{d}{dt}c219 = v_{319} + v_{341} - v_{137} - v_{539} \quad (1901)$$

### 9.226 Species c212

**Name** (ErbB1:ErbB4).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v145, v548 and as a product in v264, v300).

$$\frac{d}{dt}c212 = v_{255} + v_{291} - v_{138} - v_{538} \quad (1902)$$

### 9.227 Species c211

**Name** (ErbB1:ErbB3).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v146, v547 and as a product in v263, v299).

$$\frac{d}{dt}c211 = v_{254} + v_{290} - v_{139} - v_{537} \quad (1903)$$

### 9.228 Species c210

**Name** (ErbB1:ErbB2).P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v147, v546 and as a product in v262, v298).

$$\frac{d}{dt}c210 = v_{253} + v_{289} - v_{140} - v_{536} \quad (1904)$$

### 9.229 Species c203

**Name** (ErbB1:ErbB4).P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v148, v264, v300, v330, v352, v545 and as a product in v402, v420, v480).

$$\frac{d}{dt}c_{203} = v_{393} + v_{411} + v_{471} - v_{141} - v_{255} - v_{291} - v_{321} - v_{343} - v_{535} \quad (1905)$$

### 9.230 Species c202

**Name** (ErbB1:ErbB3).P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v149, v263, v299, v329, v351, v544 and as a product in v401, v419, v479).

$$\frac{d}{dt}c_{202} = v_{392} + v_{410} + v_{470} - v_{142} - v_{254} - v_{290} - v_{320} - v_{342} - v_{534} \quad (1906)$$

### 9.231 Species c201

**Name** (ErbB1:ErbB2).P:GAP:(Shc\_P):Grb2:Sos

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v150, v262, v298, v328, v350, v543 and as a product in v400, v418, v478).

$$\frac{d}{dt}c_{201} = v_{391} + v_{409} + v_{469} - v_{143} - v_{253} - v_{289} - v_{319} - v_{341} - v_{533} \quad (1907)$$

### 9.232 Species c194

**Name** (ErbB1:ErbB4).P:GAP:(Shc\_P):Grb2

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v151, v402, v542 and as a product in v228, v459).

$$\frac{d}{dt}c_{194} = v_{219} + v_{450} - v_{144} - v_{393} - v_{532} \quad (1908)$$

### 9.233 Species c193

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v152, v401, v541 and as a product in v227, v458).

$$\frac{d}{dt}c193 = v_{218} + v_{449} - v_{145} - v_{392} - v_{531} \quad (1909)$$

### 9.234 Species c192

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P):Grb2

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v153, v400, v540 and as a product in v226, v457).

$$\frac{d}{dt}c192 = v_{217} + v_{448} - v_{146} - v_{391} - v_{530} \quad (1910)$$

### 9.235 Species c68

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GTP)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v155, v535 and as a product in v174, v324, v343).

$$\frac{d}{dt}c68 = v_{166} + v_{315} + v_{334} - v_{147} - v_{526} \quad (1911)$$

### 9.236 Species c67

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:(Ras:GDP)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v156, v534 and as a product in v173, v258, v291).

$$\frac{d}{dt}c67 = v_{165} + v_{249} + v_{282} - v_{148} - v_{525} \quad (1912)$$

### 9.237 Species c66

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in eleven reactions (as a reactant in v157, v258, v291, v324, v343, v533, v612 and as a product in v172, v396, v414, v474).

$$\frac{d}{dt}c66 = v_{164} + v_{387} + v_{405} + v_{465} - v_{149} - v_{249} - v_{282} - v_{315} - v_{334} - v_{524} - v_{598} \quad (1913)$$

### 9.238 Species c65

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v158, v396, v532, v672 and as a product in v171, v216, v447).

$$\frac{d}{dt}c65 = v_{163} + v_{207} + v_{438} - v_{150} - v_{387} - v_{523} - v_{658} \quad (1914)$$

### 9.239 Species c21

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(Ras:GTP)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v159, v529 and as a product in v170, v323, v344).

$$\frac{d}{dt}c21 = v_{162} + v_{314} + v_{335} - v_{151} - v_{520} \quad (1915)$$

### 9.240 Species c20

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(Ras:GDP)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v160, v528 and as a product in v163, v257, v292).

$$\frac{d}{dt}c20 = v_{155} + v_{248} + v_{283} - v_{152} - v_{519} \quad (1916)$$

### 9.241 Species c18

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2 , endosomal membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v161, v247, v526, v670 and as a product in v175, v215).

$$\frac{d}{dt}c18 = v_{167} + v_{206} - v_{153} - v_{238} - v_{517} - v_{656} \quad (1917)$$

### 9.242 Species c19

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos , endosomal membrane

**Initial amount** 0 item

This species takes part in ten reactions (as a reactant in v162, v257, v292, v323, v344, v527, v610 and as a product in v169, v247, v429).

$$\frac{d}{dt}c19 = v_{161} + v_{238} + v_{420} - v_{154} - v_{248} - v_{283} - v_{314} - v_{335} - v_{518} - v_{596} \quad (1918)$$

### 9.243 Species c6

**Name** ErbB1:ATP

**Notes** ErbB1:ATP , endosomal membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v208, v523, v792, v793 and as a product in v164).

$$\frac{d}{dt}c6 = v_{156} - v_{200} - v_{514} - v_{778} - v_{779} \quad (1919)$$

### 9.244 Species c5

**Name** 2(EGF:ErbB1)\_P

**Notes** 2(EGF:ErbB1)#P , plasma membrane

**Initial amount** 0 item

This species takes part in ten reactions (as a reactant in v165, v198, v803, v804, v806, v859, v860, v861, v862 and as a product in v673).

$$\frac{d}{dt}c5 = v_{659} - v_{157} - v_{190} - v_{788} - v_{789} - v_{791} - v_{824} - v_{825} - v_{826} - v_{827} \quad (1920)$$

### 9.245 Species c8

**Name** 2(EGF:ErbB1)\_P

**Notes** 2(EGF:ErbB1)#P , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v197, v652, v811 and as a product in v165).

$$\frac{d}{dt}c8 = v_{157} - v_{189} - v_{638} - v_{796} \quad (1921)$$

### 9.246 Species c15

**Name** 2(EGF:ErbB1)\_P:GAP

**Notes** 2(EGF:ErbB1)#P:GAP , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v166, v212, v367, v413, v428, v444, v445 and as a product in v198).

$$\frac{d}{dt}c15 = v_{190} - v_{158} - v_{203} - v_{358} - v_{404} - v_{419} - v_{435} - v_{436} \quad (1922)$$

### 9.247 Species c17

**Name** 2(EGF:ErbB1)\_P:GAP

**Notes** 2(EGF:ErbB1)#P:GAP , endosomal membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v215, v368, v414, v429, v446, v447, v525 and as a product in v166, v197).

$$\frac{d}{dt}c17 = v_{158} + v_{189} - v_{206} - v_{359} - v_{405} - v_{420} - v_{437} - v_{438} - v_{516} \quad (1923)$$



### 9.248 Species c32

**Name** 2(EGF:ErbB1)\_P:GAP:Shc

**Notes** 2(EGF:ErbB1)#P:GAP:Shc , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v167, v388 and as a product in v367).

$$\frac{d}{dt}c32 = v_{358} - v_{159} - v_{379} \quad (1924)$$

### 9.249 Species c63

**Name** 2(EGF:ErbB1)\_P:GAP:Shc

**Notes** 2(EGF:ErbB1)#P:GAP:Shc , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v387, v530 and as a product in v167, v368).

$$\frac{d}{dt}c63 = v_{159} + v_{359} - v_{378} - v_{521} \quad (1925)$$

### 9.250 Species c33

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P) , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v168, v214, v473 and as a product in v388, v444).

$$\frac{d}{dt}c33 = v_{379} + v_{435} - v_{160} - v_{205} - v_{464} \quad (1926)$$

### 9.251 Species c64

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v216, v474, v531 and as a product in v168, v387, v446).

$$\frac{d}{dt}c64 = v_{160} + v_{378} + v_{437} - v_{207} - v_{465} - v_{522} \quad (1927)$$

### 9.252 Species c347

**Name** (ErbB3:ErbB2)\_P:GAP:Shc

**Notes** (ErbB3:ErbB2)#P:GAP:Shc , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v179, v381 and as a product in v377).

$$\frac{d}{dt}c347 = v_{368} - v_{171} - v_{372} \quad (1928)$$

### 9.253 Species c349

**Name** (ErbB3:ErbB2)\_P:GAP:Shc

**Notes** (ErbB3:ErbB2)#P:GAP:Shc , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v382, v579 and as a product in v179, v378).

$$\frac{d}{dt}c349 = v_{171} + v_{369} - v_{373} - v_{565} \quad (1929)$$

### 9.254 Species c348

**Name** (ErbB4:ErbB2)\_P:GAP:Shc

**Notes** (ErbB4:ErbB2)#P:GAP:Shc , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v180, v383 and as a product in v379).

$$\frac{d}{dt}c348 = v_{370} - v_{172} - v_{374} \quad (1930)$$

### 9.255 Species c350

**Name** (ErbB4:ErbB2)\_P:GAP:Shc

**Notes** (ErbB4:ErbB2)#P:GAP:Shc , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v384, v580 and as a product in v180, v380).

$$\frac{d}{dt}c350 = v_{172} + v_{371} - v_{375} - v_{566} \quad (1931)$$

### 9.256 Species c351

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P)

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P) , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v181, v233, v483 and as a product in v381, v464).

$$\frac{d}{dt}c351 = v_{372} + v_{455} - v_{173} - v_{224} - v_{474} \quad (1932)$$

### 9.257 Species c353

**Name** (ErbB3:ErbB2)\_P:GAP:(Shc\_P)

**Notes** (ErbB3:ErbB2)#P:GAP:(Shc#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v234, v484, v581 and as a product in v181, v382, v465).

$$\frac{d}{dt}c353 = v_{173} + v_{373} + v_{456} - v_{225} - v_{475} - v_{567} \quad (1933)$$

### 9.258 Species c508

**Name** ErbB2:Inh

**Notes** ErbB2:Inh , endosomal membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v182).

$$\frac{d}{dt}c508 = v_{174} \quad (1934)$$

### 9.259 Species c512

**Name** ErbB4:Inh

**Notes** ErbB4:Inh , endosomal membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v183).

$$\frac{d}{dt}c512 = v_{175} \quad (1935)$$

### 9.260 Species c354

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P)

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P) , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v184, v235, v485 and as a product in v383, v466).

$$\frac{d}{dt}c354 = v_{374} + v_{457} - v_{176} - v_{226} - v_{476} \quad (1936)$$

### 9.261 Species c356

**Name** (ErbB4:ErbB2)\_P:GAP:(Shc\_P)

**Notes** (ErbB4:ErbB2)#P:GAP:(Shc#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v236, v486, v582 and as a product in v184, v384, v467).

$$\frac{d}{dt}c356 = v_{176} + v_{375} + v_{458} - v_{227} - v_{477} - v_{568} \quad (1937)$$

### 9.262 Species c148

**Name** (ErbB1:ErbB2)\_P

**Notes** (ErbB1:ErbB2)#P , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v185, v199, v807 and as a product in v674).

$$\frac{d}{dt}c148 = v_{660} - v_{177} - v_{191} - v_{792} \quad (1938)$$

### 9.263 Species c162

**Name** (ErbB1:ErbB2)\_P

**Notes** (ErbB1:ErbB2)#P , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v194, v656, v808 and as a product in v185).

$$\frac{d}{dt}c162 = v_{177} - v_{186} - v_{642} - v_{793} \quad (1939)$$

### 9.264 Species c149

**Name** (ErbB1:ErbB3)\_P

**Notes** (ErbB1:ErbB3)#P , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v186, v200, v812, v822 and as a product in v675).

$$\frac{d}{dt}c149 = v_{661} - v_{178} - v_{192} - v_{797} - v_{807} \quad (1940)$$

### 9.265 Species c163

**Name** (ErbB1:ErbB3)\_P

**Notes** (ErbB1:ErbB3)#P , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v195, v650, v809 and as a product in v186).

$$\frac{d}{dt}c163 = v_{178} - v_{187} - v_{636} - v_{794} \quad (1941)$$

### 9.266 Species c150

**Name** (ErbB1:ErbB4)\_P

**Notes** (ErbB1:ErbB4)#P , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v187, v201, v813, v823 and as a product in v676).

$$\frac{d}{dt}c150 = v_{662} - v_{179} - v_{193} - v_{798} - v_{808} \quad (1942)$$

### 9.267 Species c164

**Name** (ErbB1:ErbB4)\_P

**Notes** (ErbB1:ErbB4)#P , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v196, v651, v810 and as a product in v187).

$$\frac{d}{dt}c164 = v_{179} - v_{188} - v_{637} - v_{795} \quad (1943)$$

### 9.268 Species c289

**Name** 2(ErbB2)\_P

**Notes** 2(ErbB2)#P , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v188, v207, v814 and as a product in v664).

$$\frac{d}{dt}c289 = v_{650} - v_{180} - v_{199} - v_{799} \quad (1944)$$

### 9.269 Species c290

**Name** 2(ErbB2)\_P

**Notes** 2(ErbB2)#P , endosomal membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v206, v653 and as a product in v188).

$$\frac{d}{dt}c290 = v_{180} - v_{198} - v_{639} \quad (1945)$$

### 9.270 Species c337

**Name** (ErbB3:ErbB2)\_P

**Notes** (ErbB3:ErbB2)#P , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v204, v654, v826 and as a product in v189).

$$\frac{d}{dt}c337 = v_{181} - v_{196} - v_{640} - v_{811} \quad (1946)$$

### 9.271 Species c338

**Name** (ErbB4:ErbB2)\_P

**Notes** (ErbB4:ErbB2)#P , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v205, v655, v827 and as a product in v190).

$$\frac{d}{dt}c338 = v_{182} - v_{197} - v_{641} - v_{812} \quad (1947)$$

### 9.272 Species c291

**Name** 2(ErbB2)\_P:GAP

**Notes** 2(ErbB2)#P:GAP , plasma membrane

**Initial amount** 0 item

This species takes part in eight reactions (as a reactant in v191, v231, v375, v421, v436, v460, v462 and as a product in v207).

$$\frac{d}{dt}c_{291} = v_{199} - v_{183} - v_{222} - v_{366} - v_{412} - v_{427} - v_{451} - v_{453} \quad (1948)$$

### 9.273 Species c293

**Name** 2(ErbB2)\_P:GAP

**Notes** 2(ErbB2)#P:GAP , endosomal membrane

**Initial amount** 0 item

This species takes part in nine reactions (as a reactant in v232, v376, v422, v437, v461, v463, v567 and as a product in v191, v206).

$$\frac{d}{dt}c_{293} = v_{183} + v_{198} - v_{223} - v_{367} - v_{413} - v_{428} - v_{452} - v_{454} - v_{555} \quad (1949)$$

### 9.274 Species c294

**Name** 2(ErbB2)\_P:GAP:Shc

**Notes** 2(ErbB2)#P:GAP:Shc , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v192, v385 and as a product in v375).

$$\frac{d}{dt}c_{294} = v_{366} - v_{184} - v_{376} \quad (1950)$$

### 9.275 Species c296

**Name** 2(ErbB2)\_P:GAP:Shc

**Notes** 2(ErbB2)#P:GAP:Shc , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v386, v568 and as a product in v192, v376).

$$\frac{d}{dt}c_{296} = v_{184} + v_{367} - v_{377} - v_{556} \quad (1951)$$

### 9.276 Species c297

**Name** 2(ErbB2)\_P:GAP:(Shc\_P)

**Notes** 2(ErbB2)#P:GAP:(Shc#P) , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v193, v229, v481 and as a product in v385, v460).

$$\frac{d}{dt}c_{297} = v_{376} + v_{451} - v_{185} - v_{220} - v_{472} \quad (1952)$$

### 9.277 Species c299

**Name** 2(ErbB2)\_P:GAP:(Shc\_P)

**Notes** 2(ErbB2)#P:GAP:(Shc#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v230, v482, v569 and as a product in v193, v386, v461).

$$\frac{d}{dt}c_{299} = v_{185} + v_{377} + v_{452} - v_{221} - v_{473} - v_{557} \quad (1953)$$

### 9.278 Species c14

**Name** GAP

**Notes** GAP , cytoplasm

**Initial amount** 534751 item

This species takes part in 14 reactions (as a reactant in v194, v195, v196, v197, v198, v199, v200, v201, v202, v203, v204, v205, v206, v207).

$$\begin{aligned} \frac{d}{dt}c_{14} = & -v_{186} - v_{187} - v_{188} - v_{189} - v_{190} - v_{191} - v_{192} \\ & - v_{193} - v_{194} - v_{195} - v_{196} - v_{197} - v_{198} - v_{199} \end{aligned} \quad (1954)$$



### 9.279 Species c165

**Name** (ErbB1:ErbB2).P:GAP

**Notes** (ErbB1:ErbB2)#P:GAP , endosomal membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v220, v372, v418, v433, v451, v457 and as a product in v194).

$$\frac{d}{dt}c165 = v_{186} - v_{211} - v_{363} - v_{409} - v_{424} - v_{442} - v_{448} \quad (1955)$$

### 9.280 Species c166

**Name** (ErbB1:ErbB3).P:GAP

**Notes** (ErbB1:ErbB3)#P:GAP , endosomal membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v221, v373, v419, v434, v452, v458 and as a product in v195).

$$\frac{d}{dt}c166 = v_{187} - v_{212} - v_{364} - v_{410} - v_{425} - v_{443} - v_{449} \quad (1956)$$

### 9.281 Species c167

**Name** (ErbB1:ErbB4).P:GAP

**Notes** (ErbB1:ErbB4)#P:GAP , endosomal membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v222, v374, v420, v435, v453, v459 and as a product in v196).

$$\frac{d}{dt}c167 = v_{188} - v_{213} - v_{365} - v_{411} - v_{426} - v_{444} - v_{450} \quad (1957)$$

### 9.282 Species c151

**Name** (ErbB1:ErbB2).P:GAP

**Notes** (ErbB1:ErbB2)#P:GAP , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v217, v369, v415, v430, v448, v454 and as a product in v199).

$$\frac{d}{dt}c151 = v_{191} - v_{208} - v_{360} - v_{406} - v_{421} - v_{439} - v_{445} \quad (1958)$$

### 9.283 Species c152

**Name** (ErbB1:ErbB3).P:GAP

**Notes** (ErbB1:ErbB3)#P:GAP , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v218, v370, v416, v431, v449, v455 and as a product in v200).

$$\frac{d}{dt}c152 = v_{192} - v_{209} - v_{361} - v_{407} - v_{422} - v_{440} - v_{446} \quad (1959)$$

### 9.284 Species c153

**Name** (ErbB1:ErbB4).P:GAP

**Notes** (ErbB1:ErbB4)#P:GAP , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v219, v371, v417, v432, v450, v456 and as a product in v201).

$$\frac{d}{dt}c153 = v_{193} - v_{210} - v_{362} - v_{408} - v_{423} - v_{441} - v_{447} \quad (1960)$$

### 9.285 Species c341

**Name** (ErbB3:ErbB2).P:GAP

**Notes** (ErbB3:ErbB2)#P:GAP , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v237, v377, v423, v438, v464, v468 and as a product in v202).

$$\frac{d}{dt}c341 = v_{194} - v_{228} - v_{368} - v_{414} - v_{429} - v_{455} - v_{459} \quad (1961)$$

### 9.286 Species c344

**Name** (ErbB4:ErbB2).P:GAP

**Notes** (ErbB4:ErbB2)#P:GAP , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v239, v379, v425, v440, v466, v470 and as a product in v203).

$$\frac{d}{dt}c344 = v_{195} - v_{230} - v_{370} - v_{416} - v_{431} - v_{457} - v_{461} \quad (1962)$$

### 9.287 Species c343

**Name** (ErbB3:ErbB2)\_P:GAP

**Notes** (ErbB3:ErbB2)#P:GAP , endosomal membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v238, v378, v424, v439, v465, v469 and as a product in v204).

$$\frac{d}{dt}c343 = v_{196} - v_{229} - v_{369} - v_{415} - v_{430} - v_{456} - v_{460} \quad (1963)$$

### 9.288 Species c346

**Name** (ErbB4:ErbB2)\_P:GAP

**Notes** (ErbB4:ErbB2)#P:GAP , endosomal membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v240, v380, v426, v441, v467, v471 and as a product in v205).

$$\frac{d}{dt}c346 = v_{197} - v_{231} - v_{371} - v_{417} - v_{432} - v_{458} - v_{462} \quad (1964)$$

### 9.289 Species c16

**Name** EGF

**SBO:0000252** polypeptide chain

**Notes** EGF , endosomes

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v208, v599, v801).

$$\frac{d}{dt}c16 = -v_{200} - v_{585} - v_{786} \quad (1965)$$

### 9.290 Species c515

**Name** HRG

**SBO:0000252** polypeptide chain

**Notes** HRG , endosomes

**Initial amount** 0 item

This species takes part in one reaction (as a reactant in v209), which does not influence its rate of change because this species is on the boundary of the reaction system:

$$\frac{d}{dt}c515 = 0 \quad (1966)$$

### 9.291 Species c157

**Name** (HRG:ErbB3)

**Notes** (HRG:ErbB3) , endosomal membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v787, v792 and as a product in v209).

$$\frac{d}{dt}c157 = v_{201} - v_{773} - v_{778} \quad (1967)$$

### 9.292 Species c22

**Name** Grb2

**Notes** Grb2 , cytoplasm

**Initial amount** 1264.91 item

This species takes part in 30 reactions (as a reactant in v212, v213, v214, v215, v216, v217, v218, v219, v220, v221, v222, v223, v224, v225, v226, v227, v228, v229, v230, v231, v232, v233, v234, v235, v236, v237, v238, v239, v240, v442).

$$\begin{aligned} \frac{d}{dt}c22 = & -v_{203} - v_{204} - v_{205} - v_{206} - v_{207} - v_{208} - v_{209} - v_{210} - v_{211} - v_{212} \\ & - v_{213} - v_{214} - v_{215} - v_{216} - v_{217} - v_{218} - v_{219} - v_{220} - v_{221} - v_{222} \\ & - v_{223} - v_{224} - v_{225} - v_{226} - v_{227} - v_{228} - v_{229} - v_{230} - v_{231} - v_{433} \end{aligned} \quad (1968)$$

### 9.293 Species c40

**Name** (Shc\_P)

**Notes** (Shc#P) , cytoplasm

**Initial amount** 0 item

This species takes part in 17 reactions (as a reactant in v213, v427, v443, v444, v446, v448, v449, v450, v451, v452, v453, v460, v461, v464, v465, v466, v467).

$$\frac{d}{dt}c40 = -v_{204} - v_{418} - v_{434} - v_{435} - v_{437} - v_{439} - v_{440} - v_{441} - v_{442} - v_{443} - v_{444} - v_{451} - v_{452} - v_{455} - v_{456} - v_{457} - v_{458} \quad (1969)$$

### 9.294 Species c39

**Name** (Shc\_P):Grb2

**Notes** (Shc#P):Grb2 , cytoplasm

**Initial amount** 0 item

This species takes part in 16 reactions (as a reactant in v445, v447, v454, v455, v456, v457, v458, v459, v462, v463, v468, v469, v470, v471, v472 and as a product in v213).

$$\frac{d}{dt}c39 = v_{204} - v_{436} - v_{438} - v_{445} - v_{446} - v_{447} - v_{448} - v_{449} - v_{450} - v_{453} - v_{454} - v_{459} - v_{460} - v_{461} - v_{462} - v_{463} \quad (1970)$$

### 9.295 Species c180

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P)

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P) , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v223, v475 and as a product in v389, v448).

$$\frac{d}{dt}c180 = v_{380} + v_{439} - v_{214} - v_{466} \quad (1971)$$

### 9.296 Species c181

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P)

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P) , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v224, v476 and as a product in v390, v449).

$$\frac{d}{dt}c181 = v_{381} + v_{440} - v_{215} - v_{467} \quad (1972)$$

### 9.297 Species c182

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P)

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P) , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v225, v477 and as a product in v391, v450).

$$\frac{d}{dt}c182 = v_{382} + v_{441} - v_{216} - v_{468} \quad (1973)$$

### 9.298 Species c183

**Name** (ErbB1:ErbB2)\_P:GAP:(Shc\_P)

**Notes** (ErbB1:ErbB2)#P:GAP:(Shc#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v226, v478 and as a product in v392, v451).

$$\frac{d}{dt}c183 = v_{383} + v_{442} - v_{217} - v_{469} \quad (1974)$$

### 9.299 Species c184

**Name** (ErbB1:ErbB3)\_P:GAP:(Shc\_P)

**Notes** (ErbB1:ErbB3)#P:GAP:(Shc#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v227, v479 and as a product in v393, v452).

$$\frac{d}{dt}c184 = v_{384} + v_{443} - v_{218} - v_{470} \quad (1975)$$

### 9.300 Species c185

**Name** (ErbB1:ErbB4)\_P:GAP:(Shc\_P)

**Notes** (ErbB1:ErbB4)#P:GAP:(Shc#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v228, v480 and as a product in v394, v453).

$$\frac{d}{dt}c185 = v_{385} + v_{444} - v_{219} - v_{471} \quad (1976)$$

### 9.301 Species c24

**Name** Sos

**Notes** Sos , cytoplasm

**Initial amount** 0 item

This species takes part in 32 reactions (as a reactant in v241, v242, v243, v244, v245, v246, v247, v248, v249, v250, v251, v252, v253, v254, v395, v396, v397, v398, v399, v400, v401, v402, v403, v404, v405, v406, v407, v408, v442, v472, v613, v614).

$$\begin{aligned} \frac{d}{dt}c24 = & -v_{232} - v_{233} - v_{234} - v_{235} - v_{236} - v_{237} - v_{238} - v_{239} - v_{240} - v_{241} - v_{242} \\ & - v_{243} - v_{244} - v_{245} - v_{386} - v_{387} - v_{388} - v_{389} - v_{390} - v_{391} - v_{392} - v_{393} \\ & - v_{394} - v_{395} - v_{396} - v_{397} - v_{398} - v_{399} - v_{433} - v_{463} - v_{599} - v_{600} \end{aligned} \quad (1977)$$

### 9.302 Species c26

**Name** Ras:GDP

**Notes** Ras:GDP , cytoplasm

**Initial amount** 58095.2 item

This species takes part in 63 reactions (as a reactant in v255, v256, v257, v258, v259, v260, v261, v262, v263, v264, v265, v266, v267, v268, v269, v270, v271, v272, v273, v274, v275, v276, v277, v278, v279, v280, v281, v282, v339, v340, v341, v342, v343, v344, v345, v346, v347, v348, v349, v350, v351, v352, v353, v354, v355, v356, v357, v358, v359, v360, v361, v362, v363, v364, v365, v366, v751, v752, v753, v754, v755, v756, v757).

$$\begin{aligned} \frac{d}{dt}c_{26} = & -v_{246} - v_{247} - v_{248} - v_{249} - v_{250} - v_{251} - v_{252} - v_{253} - v_{254} - v_{255} - v_{256} \\ & - v_{257} - v_{258} - v_{259} - v_{260} - v_{261} - v_{262} - v_{263} - v_{264} - v_{265} - v_{266} - v_{267} \\ & - v_{268} - v_{269} - v_{270} - v_{271} - v_{272} - v_{273} - v_{330} - v_{331} - v_{332} - v_{333} - v_{334} \\ & - v_{335} - v_{336} - v_{337} - v_{338} - v_{339} - v_{340} - v_{341} - v_{342} - v_{343} - v_{344} \\ & - v_{345} - v_{346} - v_{347} - v_{348} - v_{349} - v_{350} - v_{351} - v_{352} - v_{353} - v_{354} \\ & - v_{355} - v_{356} - v_{357} - v_{737} - v_{738} - v_{739} - v_{740} - v_{741} - v_{742} - v_{743} \end{aligned} \quad (1978)$$

### 9.303 Species $c_{28}$

**Name** Ras:GTP

**Notes** Ras:GTP , cytoplasm

**Initial amount** 0 item

This species takes part in 22 reactions (as a reactant in [v283](#), [v285](#), [v287](#), [v289](#), [v293](#), [v294](#), [v295](#), [v296](#), [v297](#), [v301](#), [v302](#), [v303](#), [v307](#), [v309](#), [v409](#), [v758](#), [v759](#), [v760](#), [v761](#), [v762](#), [v763](#), [v764](#)).

$$\begin{aligned} \frac{d}{dt}c_{28} = & -v_{274} - v_{276} - v_{278} - v_{280} - v_{284} - v_{285} - v_{286} - v_{287} - v_{288} - v_{292} - v_{293} \\ & - v_{294} - v_{298} - v_{300} - v_{400} - v_{744} - v_{745} - v_{746} - v_{747} - v_{748} - v_{749} - v_{750} \end{aligned} \quad (1979)$$

### 9.304 Species $c_{69}$

**Name** (Ras:GTP).i

**Notes** (Ras:GTP).i , cytoplasm

**Initial amount** 0 item

This species takes part in 15 reactions (as a reactant in [v284](#), [v286](#), [v288](#), [v290](#), [v291](#), [v292](#), [v298](#), [v299](#), [v300](#), [v304](#), [v305](#), [v306](#), [v308](#), [v310](#), [v410](#)).

$$\begin{aligned} \frac{d}{dt}c_{69} = & -v_{275} - v_{277} - v_{279} - v_{281} - v_{282} - v_{283} - v_{289} - v_{290} \\ & - v_{291} - v_{295} - v_{296} - v_{297} - v_{299} - v_{301} - v_{401} \end{aligned} \quad (1980)$$



### 9.305 Species c43

**Name** Ras\_activated:GTP

**Notes** Ras\_activated:GTP , cytoplasm

**Initial amount** 0 item

This species takes part in 15 reactions (as a reactant in v311, v313, v315, v316, v317, v321, v322, v325, v326, v327, v331, v333, v335, v337, v412).

$$\frac{d}{dt}c43 = -v_{302} - v_{304} - v_{306} - v_{307} - v_{308} - v_{312} - v_{313} - v_{316} - v_{317} - v_{318} - v_{322} - v_{324} - v_{326} - v_{328} - v_{403} \quad (1981)$$

### 9.306 Species c71

**Name** (Ras\_activated:GTP).i

**Notes** (Ras\_activated:GTP).i , cytoplasm

**Initial amount** 0 item

This species takes part in 15 reactions (as a reactant in v312, v314, v318, v319, v320, v323, v324, v328, v329, v330, v332, v334, v336, v338, v411).

$$\frac{d}{dt}c71 = -v_{303} - v_{305} - v_{309} - v_{310} - v_{311} - v_{314} - v_{315} - v_{319} - v_{320} - v_{321} - v_{323} - v_{325} - v_{327} - v_{329} - v_{402} \quad (1982)$$

### 9.307 Species c31

**Name** Shc

**Notes** Shc , cytoplasm

**Initial amount** 1100000 item

This species takes part in 15 reactions (as a reactant in v367, v368, v369, v370, v371, v372, v373, v374, v375, v376, v377, v378, v379, v380 and as a product in v443).

$$\frac{d}{dt}c31 = v_{434} - v_{358} - v_{359} - v_{360} - v_{361} - v_{362} - v_{363} - v_{364} - v_{365} - v_{366} - v_{367} - v_{368} - v_{369} - v_{370} - v_{371} \quad (1983)$$

### 9.308 Species c171

**Name** (ErbB1:ErbB2)\_P:GAP:Shc

**Notes** (ErbB1:ErbB2)#P:GAP:Shc , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v389 and as a product in v369).

$$\frac{d}{dt}c171 = v_{360} - v_{380} \quad (1984)$$

### 9.309 Species c172

**Name** (ErbB1:ErbB3)\_P:GAP:Shc

**Notes** (ErbB1:ErbB3)#P:GAP:Shc , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v390 and as a product in v370).

$$\frac{d}{dt}c172 = v_{361} - v_{381} \quad (1985)$$

### 9.310 Species c173

**Name** (ErbB1:ErbB4)\_P:GAP:Shc

**Notes** (ErbB1:ErbB4)#P:GAP:Shc , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v391 and as a product in v371).

$$\frac{d}{dt}c173 = v_{362} - v_{382} \quad (1986)$$

### 9.311 Species c174

**Name** (ErbB1:ErbB2)\_P:GAP:Shc

**Notes** (ErbB1:ErbB2)#P:GAP:Shc , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v392 and as a product in v372).

$$\frac{d}{dt}c174 = v_{363} - v_{383} \quad (1987)$$

### 9.312 Species c175

**Name** (ErbB1:ErbB3)\_P:GAP:Shc

**Notes** (ErbB1:ErbB3)#P:GAP:Shc , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v393 and as a product in v373).

$$\frac{d}{dt}c175 = v_{364} - v_{384} \quad (1988)$$

### 9.313 Species c176

**Name** (ErbB1:ErbB4)\_P:GAP:Shc

**Notes** (ErbB1:ErbB4)#P:GAP:Shc , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v394 and as a product in v374).

$$\frac{d}{dt}c176 = v_{365} - v_{385} \quad (1989)$$

### 9.314 Species c41

**Name** Raf

**Notes** Raf , cytoplasm

**Initial amount** 71131.2 item

This species takes part in four reactions (as a reactant in v409, v410, v489, v490).

$$\frac{d}{dt}c41 = -v_{400} - v_{401} - v_{480} - v_{481} \quad (1990)$$

### 9.315 Species c42

**Name** Raf:Ras:GTP

**Notes** Raf:Ras:GTP , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v409, v412).

$$\frac{d}{dt}c42 = v_{400} + v_{403} \quad (1991)$$

### 9.316 Species c70

**Name** (Raf:Ras:GTP)<sub>i</sub>

**Notes** (Raf:Ras:GTP)<sub>i</sub> , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v410, v411).

$$\frac{d}{dt}c70 = v401 + v402 \quad (1992)$$

### 9.317 Species c72

**Name** (Raf\_P)<sub>i</sub>

**Notes** (Raf#P)<sub>i</sub> , cytoplasm

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v411, v487, v491, v492, v496, v498, v766).

$$\frac{d}{dt}c72 = -v402 - v478 - v482 - v483 - v487 - v489 - v752 \quad (1993)$$

### 9.318 Species c45

**Name** Raf\_P

**Notes** Raf#P , cytoplasm

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v412, v488, v493, v494, v495, v497, v765).

$$\frac{d}{dt}c45 = -v403 - v479 - v484 - v485 - v486 - v488 - v751 \quad (1994)$$

### 9.319 Species c38

**Name** (Shc\_P):Grb2:Sos

**Notes** (Shc#P):Grb2:Sos , cytoplasm

**Initial amount** 0 item

This species takes part in 16 reactions (as a reactant in v413, v414, v415, v416, v417, v418, v419, v420, v421, v422, v423, v424, v425, v426 and as a product in v427, v472).

$$\frac{d}{dt}c38 = v_{418} + v_{463} - v_{404} - v_{405} - v_{406} - v_{407} - v_{408} - v_{409} - v_{410} - v_{411} - v_{412} - v_{413} - v_{414} - v_{415} - v_{416} - v_{417} \quad (1995)$$

### 9.320 Species c30

**Name** Grb2:Sos

**Notes** Grb2:Sos , cytoplasm

**Initial amount**  $8.8914 \cdot 10^7$  item

This species takes part in 30 reactions (as a reactant in v427, v428, v429, v430, v431, v432, v433, v434, v435, v436, v437, v438, v439, v440, v441, v473, v474, v475, v476, v477, v478, v479, v480, v481, v482, v483, v484, v485, v486 and as a product in v442).

$$\frac{d}{dt}c30 = v_{433} - v_{418} - v_{419} - v_{420} - v_{421} - v_{422} - v_{423} - v_{424} - v_{425} - v_{426} - v_{427} - v_{428} - v_{429} - v_{430} - v_{431} - v_{432} - v_{464} - v_{465} - v_{466} - v_{467} - v_{468} - v_{469} - v_{470} - v_{471} - v_{472} - v_{473} - v_{474} - v_{475} - v_{476} - v_{477} \quad (1996)$$

### 9.321 Species c44

**Name** Pase1

**Notes** Pase1 , cytoplasm

**Initial amount** 50000 item

This species takes part in four reactions (as a reactant in v487, v488, v489, v490).

$$\frac{d}{dt}c44 = -v_{478} - v_{479} - v_{480} - v_{481} \quad (1997)$$

### 9.322 Species c73

**Name** (Raf\_P:Pase1).i

**Notes** (Raf#P:Pase1).i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v487, v490).

$$\frac{d}{dt}c73 = v_{478} + v_{481} \quad (1998)$$

### 9.323 Species c46

**Name** Raf\_P:Pase1

**Notes** Raf#P:Pase1 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v488, v489).

$$\frac{d}{dt}c46 = v479 + v480 \quad (1999)$$

### 9.324 Species c75

**Name** (MEK\_P)\_i

**Notes** (MEK#P)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v491, v496, v504, v505).

$$\frac{d}{dt}c75 = -v482 - v487 - v495 - v496 \quad (2000)$$

### 9.325 Species c76

**Name** (MEK\_P:Raf\_P)\_i

**Notes** (MEK#P:Raf#P)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v491, v498).

$$\frac{d}{dt}c76 = v482 + v489 \quad (2001)$$

### 9.326 Species c47

**Name** MEK

**Notes** MEK , cytoplasm

**Initial amount** 3020000 item

This species takes part in four reactions (as a reactant in v492, v493, v502, v503).

$$\frac{d}{dt}c47 = -v483 - v484 - v493 - v494 \quad (2002)$$

### 9.327 Species c74

**Name** (MEK:Raf\_P)\_i

**Notes** (MEK:Raf#P)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v492, v496).

$$\frac{d}{dt}c74 = v_{483} + v_{487} \quad (2003)$$

### 9.328 Species c48

**Name** MEK:Raf\_P

**Notes** MEK:Raf#P , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v493, v495).

$$\frac{d}{dt}c48 = v_{484} + v_{486} \quad (2004)$$

### 9.329 Species c49

**Name** MEK\_P

**Notes** MEK#P , cytoplasm

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v494, v495, v501, v506).

$$\frac{d}{dt}c49 = -v_{485} - v_{486} - v_{492} - v_{497} \quad (2005)$$

### 9.330 Species c50

**Name** MEK\_P:Raf\_P

**Notes** MEK#P:Raf#P , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v494, v497).

$$\frac{d}{dt}c50 = v_{485} + v_{488} \quad (2006)$$

### 9.331 Species c51

**Name** MEK\_PP

**Notes** MEK#P#P , cytoplasm

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in [v497](#), [v500](#), [v507](#), [v508](#), [v512](#), [v513](#)).

$$\frac{d}{dt}c51 = -v_{488} - v_{491} - v_{498} - v_{499} - v_{503} - v_{504} \quad (2007)$$

### 9.332 Species c77

**Name** (MEK\_PP)\_i

**Notes** (MEK#P#P)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in [v498](#), [v499](#), [v509](#), [v510](#), [v511](#), [v514](#)).

$$\frac{d}{dt}c77 = -v_{489} - v_{490} - v_{500} - v_{501} - v_{502} - v_{505} \quad (2008)$$

### 9.333 Species c53

**Name** Pase2

**Notes** Pase2 , cytoplasm

**Initial amount** 124480 item

This species takes part in eight reactions (as a reactant in [v499](#), [v500](#), [v501](#), [v502](#), [v503](#), [v504](#), [v505](#), [v506](#)).

$$\frac{d}{dt}c53 = -v_{490} - v_{491} - v_{492} - v_{493} - v_{494} - v_{495} - v_{496} - v_{497} \quad (2009)$$

### 9.334 Species c78

**Name** (MEK\_PP:Pase2)\_i

**Notes** (MEK#P#P:Pase2)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in [v499](#), [v504](#)).

$$\frac{d}{dt}c78 = v_{490} + v_{495} \quad (2010)$$



### 9.335 Species c52

**Name** MEK\_PP:Pase2

**Notes** MEK#P:P:Pase2 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v500, v501).

$$\frac{d}{dt}c52 = v_{491} + v_{492} \quad (2011)$$

### 9.336 Species c54

**Name** MEK\_P:Pase2

**Notes** MEK#P:P:Pase2 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v502, v506).

$$\frac{d}{dt}c54 = v_{493} + v_{497} \quad (2012)$$

### 9.337 Species c79

**Name** (MEK\_P:Pase2)\_i

**Notes** (MEK#P:P:Pase2)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v503, v505).

$$\frac{d}{dt}c79 = v_{494} + v_{496} \quad (2013)$$

### 9.338 Species c55

**Name** ERK

**Notes** ERK , cytoplasm

**Initial amount** 695000 item

This species takes part in four reactions (as a reactant in v507, v509, v519, v520).

$$\frac{d}{dt}c55 = -v_{498} - v_{500} - v_{510} - v_{511} \quad (2014)$$

### 9.339 Species c56

**Name** ERK:MEK\_PP

**Notes** ERK:MEK#P#P , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v507, v512).

$$\frac{d}{dt}c56 = v_{498} + v_{503} \quad (2015)$$

### 9.340 Species c57

**Name** ERK\_P

**Notes** ERK#P , cytoplasm

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v508, v512, v518, v521).

$$\frac{d}{dt}c57 = -v_{499} - v_{503} - v_{509} - v_{512} \quad (2016)$$

### 9.341 Species c58

**Name** ERK\_P:MEK\_PP

**Notes** ERK#P:MEK#P#P , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v508, v513).

$$\frac{d}{dt}c58 = v_{499} + v_{504} \quad (2017)$$

### 9.342 Species c80

**Name** MEK\_PP:ERK

**Notes** MEK#P#P:ERK , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v509, v511).

$$\frac{d}{dt}c80 = v_{500} + v_{502} \quad (2018)$$

### 9.343 Species c81

**Name** (ERK\_P)\_i

**Notes** (ERK#P)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v510, v511, v517, v522).

$$\frac{d}{dt}c81 = -v501 - v502 - v508 - v513 \quad (2019)$$

### 9.344 Species c82

**Name** MEK\_PP:ERK\_P

**Notes** MEK#P#P:ERK#P , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v510, v514).

$$\frac{d}{dt}c82 = v501 + v505 \quad (2020)$$

### 9.345 Species c59

**Name** ERK\_PP

**Notes** ERK#P#P , cytoplasm

**Initial amount** 0 item

This species takes part in 22 reactions (as a reactant in v513, v515, v609, v611, v613, v615, v616, v617, v723, v725, v727, v729, v731, v733, v735, v737, v739, v741, v743, v745, v747, v749).

$$\begin{aligned} \frac{d}{dt}c59 = & -v504 - v506 - v595 - v597 - v599 - v601 - v602 - v603 - v709 - v711 - v713 \\ & - v715 - v717 - v719 - v721 - v723 - v725 - v727 - v729 - v731 - v733 - v735 \end{aligned} \quad (2021)$$

### 9.346 Species c83

**Name** (ERK\_PP)\_i

**Notes** (ERK#P#P)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in 22 reactions (as a reactant in v514, v516, v610, v612, v614, v618, v619, v620, v724, v726, v728, v730, v732, v734, v736, v738, v740, v742, v744, v746, v748, v750).

$$\frac{d}{dt}c83 = -v505 - v507 - v596 - v598 - v600 - v604 - v605 - v606 - v710 - v712 - v714 \\ - v716 - v718 - v720 - v722 - v724 - v726 - v728 - v730 - v732 - v734 - v736 \quad (2022)$$

### 9.347 Species c60

**Name** Pase3

**Notes** Pase3 , cytoplasm

**Initial amount** 16870.2 item

This species takes part in nine reactions (as a reactant in v515, v516, v517, v518, v519, v520, v521, v522, v769).

$$\frac{d}{dt}c60 = -v506 - v507 - v508 - v509 - v510 - v511 - v512 - v513 - v755 \quad (2023)$$

### 9.348 Species c61

**Name** ERK\_PP:Pase3

**Notes** ERK#P#P:Pase3 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v515, v518).

$$\frac{d}{dt}c61 = v506 + v509 \quad (2024)$$

### 9.349 Species c84

**Name** (ERK\_PP:Pase3).i

**Notes** (ERK#P#P:Pase3).i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v516, v517).

$$\frac{d}{dt}c84 = v_{507} + v_{508} \quad (2025)$$

### 9.350 Species c62

**Name** ERK\_P:Pase3

**Notes** ERK#P:Pase3 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v519, v521).

$$\frac{d}{dt}c62 = v_{510} + v_{512} \quad (2026)$$

### 9.351 Species c85

**Name** (ERK\_P:Pase3).i

**Notes** (ERK#P:Pase3).i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v520, v522).

$$\frac{d}{dt}c85 = v_{511} + v_{513} \quad (2027)$$

### 9.352 Species c86

**Name** R\_degraded

**Notes** R\_degraded , lysosomes

**Initial amount** 0 item

This species takes part in 80 reactions (as a product in v523, v524, v525, v526, v527, v528, v529, v530, v531, v532, v533, v534, v535, v537, v538, v539, v540, v541, v542, v543, v544, v545, v546, v547, v548, v549, v550, v551, v552, v553, v554, v555, v556, v557, v558, v559, v560, v563, v564, v565, v566, v567, v568, v569, v570, v572, v573, v574, v575, v576, v577, v579, v580, v581, v582, v583, v584, v585, v586, v587, v588, v589, v590, v591, v592, v593, v594, v595, v596, v597, v598, v600, v601, v602, v603, v604, v605, v606, v607, v608).

$$\begin{aligned} \frac{d}{dt}c86 = & v514 + v515 + v516 + v517 + v518 + v519 + v520 + v521 + v522 + v523 \\ & + v524 + v525 + v526 + v527 + v528 + v529 + v530 + v531 + v532 + v533 \\ & + v534 + v535 + v536 + v537 + v538 + v539 + v540 + v541 + v542 + v543 \\ & + v544 + v545 + v546 + v547 + v548 + v549 + v550 + v551 + v552 + v553 \\ & + v554 + v555 + v556 + v557 + v558 + v559 + v560 + v561 + v562 + v563 \\ & + v564 + v565 + v566 + v567 + v568 + v569 + v570 + v571 + v572 + v573 \\ & + v574 + v575 + v576 + v577 + v578 + v579 + v580 + v581 + v582 + v583 \\ & + v584 + v586 + v587 + v588 + v589 + v590 + v591 + v592 + v593 + v594 \end{aligned} \quad (2028)$$

### 9.353 Species c425

**Name** 2(ErbB2)

**Notes** 2(ErbB2) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v566, v661).

$$\frac{d}{dt}c425 = -v554 - v647 \quad (2029)$$

### 9.354 Species c13

**Name** EGF\_degraded

**Notes** EGF\_degraded , lysosomes

**Initial amount** 0 item

This species takes part in one reaction (as a product in v599).

$$\frac{d}{dt}c13 = v585 \quad (2030)$$

### 9.355 Species c518

**Name** (HRG:ErbB3:ErbB1)

**Notes** (HRG:ErbB3:ErbB1) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v603 and as a product in v792).

$$\frac{d}{dt}c518 = v_{778} - v_{589} \quad (2031)$$

### 9.356 Species c519

**Name** (HRG:ErbB4:ErbB1)

**Notes** (HRG:ErbB4:ErbB1) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v604 and as a product in v793).

$$\frac{d}{dt}c519 = v_{779} - v_{590} \quad (2032)$$

### 9.357 Species c339

**Name** (ErbB3:ErbB2)

**Notes** (ErbB3:ErbB2) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v607, v662).

$$\frac{d}{dt}c339 = -v_{593} - v_{648} \quad (2033)$$

### 9.358 Species c340

**Name** (ErbB4:ErbB2)

**Notes** (ErbB4:ErbB2) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v608, v663).

$$\frac{d}{dt}c340 = -v_{594} - v_{649} \quad (2034)$$

### 9.359 Species c95

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(ERK\_PP)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK#P#P) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v609, v615).

$$\frac{d}{dt}c95 = v_{595} + v_{601} \quad (2035)$$

### 9.360 Species c96

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos:(ERK\_PP)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK#P#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v610, v618).

$$\frac{d}{dt}c96 = v_{596} + v_{604} \quad (2036)$$

### 9.361 Species c97

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:ERK\_PP

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:ERK#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v611, v616).

$$\frac{d}{dt}c97 = v_{597} + v_{602} \quad (2037)$$

### 9.362 Species c98

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:Sos:(ERK\_PP)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(ERK#P#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v612, v619).

$$\frac{d}{dt}c98 = v_{598} + v_{605} \quad (2038)$$



### 9.363 Species c101

**Name** (ERK\_PP):Sos

**Notes** (ERK#P#P):Sos , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v613, v617).

$$\frac{d}{dt}c101 = v_{599} + v_{603} \quad (2039)$$

### 9.364 Species c102

**Name** ((ERK\_PP):Sos)\_i

**Notes** ((ERK#P#P):Sos)\_i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v614, v620).

$$\frac{d}{dt}c102 = v_{600} + v_{606} \quad (2040)$$

### 9.365 Species c99

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Sos\_P

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Sos#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v615 and as a product in v669).

$$\frac{d}{dt}c99 = v_{655} - v_{601} \quad (2041)$$

### 9.366 Species c419

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:(Sos\_P)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v616 and as a product in v671).

$$\frac{d}{dt}c419 = v_{657} - v_{602} \quad (2042)$$

### 9.367 Species c103

**Name** Sos\_P

**Notes** Sos#P , cytoplasm

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in [v617](#), [v620](#), [v669](#), [v670](#), [v671](#), [v672](#)).

$$\frac{d}{dt}c103 = -v_{603} - v_{606} - v_{655} - v_{656} - v_{657} - v_{658} \quad (2043)$$

### 9.368 Species c100

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:(Sos\_P)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:(Sos#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in [v618](#) and as a product in [v670](#)).

$$\frac{d}{dt}c100 = v_{656} - v_{604} \quad (2044)$$

### 9.369 Species c420

**Name** 2(EGF:ErbB1)\_P:GAP:(Shc\_P):Grb2:(Sos\_P)

**Notes** 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in [v619](#) and as a product in [v672](#)).

$$\frac{d}{dt}c420 = v_{658} - v_{605} \quad (2045)$$

### 9.370 Species c287

**Name** PI3K

**Notes** PI3K , cytoplasm

**Initial amount**  $3.55656 \cdot 10^7$  item

This species takes part in seven reactions (as a reactant in [v621](#), [v622](#), [v623](#), [v624](#), [v625](#), [v626](#), [v627](#)).

$$\frac{d}{dt}c287 = -v_{607} - v_{608} - v_{609} - v_{610} - v_{611} - v_{612} - v_{613} \quad (2046)$$

### 9.371 Species c486

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:(Gab1\_P#)

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v621, v713, v723, v724, v777, v821).

$$\frac{d}{dt}c486 = -v_{607} - v_{699} - v_{709} - v_{710} - v_{763} - v_{806} \quad (2047)$$

### 9.372 Species c104

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Gab1\_P:PI3K

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v630, v695, v751, v758 and as a product in v621).

$$\frac{d}{dt}c104 = v_{607} - v_{616} - v_{681} - v_{737} - v_{744} \quad (2048)$$

### 9.373 Species c447

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v622, v709, v729, v730, v780, v817).

$$\frac{d}{dt}c447 = -v_{608} - v_{695} - v_{715} - v_{716} - v_{766} - v_{802} \quad (2049)$$

### 9.374 Species c263

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P:PI3K

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v633, v698, v754, v761 and as a product in v622).

$$\frac{d}{dt}c263 = v_{608} - v_{619} - v_{684} - v_{740} - v_{747} \quad (2050)$$

### 9.375 Species c445

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1\_P

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v623, v707, v725, v726, v782, v815).

$$\frac{d}{dt}c_{445} = -v_{609} - v_{693} - v_{711} - v_{712} - v_{768} - v_{800} \quad (2051)$$

### 9.376 Species c261

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v631, v696, v752, v759 and as a product in v623).

$$\frac{d}{dt}c_{261} = v_{609} - v_{617} - v_{682} - v_{738} - v_{745} \quad (2052)$$

### 9.377 Species c446

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v624, v708, v727, v728, v779, v816).

$$\frac{d}{dt}c_{446} = -v_{610} - v_{694} - v_{713} - v_{714} - v_{765} - v_{801} \quad (2053)$$

### 9.378 Species c262

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P:PI3K

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v632, v697, v753, v760 and as a product in v624).

$$\frac{d}{dt}c_{262} = v_{610} - v_{618} - v_{683} - v_{739} - v_{746} \quad (2054)$$

### 9.379 Species c454

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1\_P

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1#P , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v625, v710, v731, v732, v778, v818).

$$\frac{d}{dt}c_{454} = -v_{611} - v_{696} - v_{717} - v_{718} - v_{764} - v_{803} \quad (2055)$$

### 9.380 Species c324

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v629, v699, v755, v762 and as a product in v625).

$$\frac{d}{dt}c_{324} = v_{611} - v_{615} - v_{685} - v_{741} - v_{748} \quad (2056)$$

### 9.381 Species c457

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v626, v711, v733, v734, v781, v819).

$$\frac{d}{dt}c_{457} = -v_{612} - v_{697} - v_{719} - v_{720} - v_{767} - v_{804} \quad (2057)$$

### 9.382 Species c405

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v628, v700, v756, v763 and as a product in v626).

$$\frac{d}{dt}c_{405} = v_{612} - v_{614} - v_{686} - v_{742} - v_{749} \quad (2058)$$

### 9.383 Species c460

**Name** (ErbB4:ErbB2).P:GAP:Grb2:Gab1\_P

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v627, v712, v735, v736, v783, v820).

$$\frac{d}{dt}c460 = -v_{613} - v_{698} - v_{721} - v_{722} - v_{769} - v_{805} \quad (2059)$$

### 9.384 Species c408

**Name** (ErbB4:ErbB2).P:GAP:Grb2:Gab1\_P:PI3K

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v701, v757 and as a product in v627).

$$\frac{d}{dt}c408 = v_{613} - v_{687} - v_{743} \quad (2060)$$

### 9.385 Species c106

**Name** PIP3

**Notes** PIP3 , cytoplasm

**Initial amount** 0 item

This species takes part in 16 reactions (as a reactant in v628, v629, v630, v631, v632, v633, v634, v635, v636, v637, v638, v639, v640, v649, v721, v722).

$$\begin{aligned} \frac{d}{dt}c106 = & -v_{614} - v_{615} - v_{616} - v_{617} - v_{618} - v_{619} - v_{620} - v_{621} \\ & - v_{622} - v_{623} - v_{624} - v_{625} - v_{626} - v_{635} - v_{707} - v_{708} \end{aligned} \quad (2061)$$

### 9.386 Species c453

**Name** (ErbB3:ErbB2).P:GAP:Grb2:Gab1\_P:PI3K:PIP2

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v634, v702 and as a product in v628, v700).

$$\frac{d}{dt}c453 = v_{614} + v_{686} - v_{620} - v_{688} \quad (2062)$$

### 9.387 Species c452

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:PIP2

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v629, v699).

$$\frac{d}{dt}c452 = v_{615} + v_{685} \quad (2063)$$

### 9.388 Species c448

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:Gab1\_P:PI3K:PIP2

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v630, v695).

$$\frac{d}{dt}c448 = v_{616} + v_{681} \quad (2064)$$

### 9.389 Species c449

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:PIP2

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v631, v696).

$$\frac{d}{dt}c449 = v_{617} + v_{682} \quad (2065)$$

### 9.390 Species c450

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P:PI3K:PIP2

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v632, v697).

$$\frac{d}{dt}c450 = v_{618} + v_{683} \quad (2066)$$

### 9.391 Species c451

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P:PI3K:PIP2

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v633, v698).

$$\frac{d}{dt}c451 = v_{619} + v_{684} \quad (2067)$$

### 9.392 Species c467

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:(PIP2)2

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)2 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v635, v703 and as a product in v634, v702).

$$\frac{d}{dt}c467 = v_{620} + v_{688} - v_{621} - v_{689} \quad (2068)$$

### 9.393 Species c468

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:(PIP2)3

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v636, v704 and as a product in v635, v703).

$$\frac{d}{dt}c468 = v_{621} + v_{689} - v_{622} - v_{690} \quad (2069)$$

### 9.394 Species c469

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:(PIP2)4

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v637, v705 and as a product in v636, v704).

$$\frac{d}{dt}c469 = v_{622} + v_{690} - v_{623} - v_{691} \quad (2070)$$



### 9.395 Species c470

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:(PIP2)5

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 , plasma membrane

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v638, v706 and as a product in v637, v705).

$$\frac{d}{dt}c470 = v_{623} + v_{691} - v_{624} - v_{692} \quad (2071)$$

### 9.396 Species c471

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:(PIP2)6

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)6 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v638, v706).

$$\frac{d}{dt}c471 = v_{624} + v_{692} \quad (2072)$$

### 9.397 Species c107

**Name** AKT

**Notes** AKT , cytoplasm

**Initial amount** 905000 item

This species takes part in two reactions (as a reactant in v639, v647).

$$\frac{d}{dt}c107 = -v_{625} - v_{633} \quad (2073)$$

### 9.398 Species c108

**Name** PIP3:AKT

**Notes** PIP3:AKT , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v642 and as a product in v639).

$$\frac{d}{dt}c108 = v_{625} - v_{628} \quad (2074)$$

### 9.399 Species c112

**Name** AKT\_P

**Notes** AKT#P , cytoplasm

**Initial amount** 0 item

This species takes part in four reactions (as a reactant in v640, v643, v646, v648).

$$\frac{d}{dt}c112 = -v_{626} - v_{629} - v_{632} - v_{634} \quad (2075)$$

### 9.400 Species c495

**Name** PIP3:AKT\_P

**Notes** PIP3:AKT#P , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v641 and as a product in v640).

$$\frac{d}{dt}c495 = v_{626} - v_{627} \quad (2076)$$

### 9.401 Species c109

**Name** PDK1

**Notes** PDK1 , cytoplasm

**Initial amount**  $3.00416 \cdot 10^8$  item

This species takes part in three reactions (as a reactant in v641, v642, v649).

$$\frac{d}{dt}c109 = -v_{627} - v_{628} - v_{635} \quad (2077)$$

### 9.402 Species c496

**Name** PIP3:AKT\_P:PDK1

**Notes** PIP3:AKT#P:PDK1 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v641, v644).

$$\frac{d}{dt}c496 = v_{627} + v_{630} \quad (2078)$$

### 9.403 Species c110

**Name** PIP3:AKT:PDK1

**Notes** PIP3:AKT:PDK1 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v642, v643).

$$\frac{d}{dt}c110 = v_{628} + v_{629} \quad (2079)$$

### 9.404 Species c111

**Name** PIP3:PDK1

**Notes** PIP3:PDK1 , cytoplasm

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v643, v644 and as a product in v649).

$$\frac{d}{dt}c111 = v_{635} - v_{629} - v_{630} \quad (2080)$$

### 9.405 Species c497

**Name** AKT:P:P

**Notes** AKT:P:P , cytoplasm

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v644, v645, v765, v766, v767, v768).

$$\frac{d}{dt}c497 = -v_{630} - v_{631} - v_{751} - v_{752} - v_{753} - v_{754} \quad (2081)$$

### 9.406 Species c113

**Name** Pase4

**Notes** Pase4 , cytoplasm

**Initial amount** 450000 item

This species takes part in four reactions (as a reactant in v645, v646, v647, v648).

$$\frac{d}{dt}c113 = -v_{631} - v_{632} - v_{633} - v_{634} \quad (2082)$$

### 9.407 Species c498

**Name** AKT:P:Pase4

**Notes** AKT:P:Pase4 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v645, v648).

$$\frac{d}{dt}c498 = v_{631} + v_{634} \quad (2083)$$

### 9.408 Species c114

**Name** AKT\_P:Pase4

**Notes** AKT#P:Pase4 , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v646, v647).

$$\frac{d}{dt}c114 = v_{632} + v_{633} \quad (2084)$$

### 9.409 Species c280

**Name** RTK\_Pase

**Notes** RTK\_Pase , cytoplasm

**Initial amount** 70000 item

This species takes part in 14 reactions (as a reactant in v650, v651, v652, v653, v654, v655, v656, v657, v658, v659, v660, v661, v662, v663).

$$\begin{aligned} \frac{d}{dt}c280 = & -v_{636} - v_{637} - v_{638} - v_{639} - v_{640} - v_{641} - v_{642} \\ & - v_{643} - v_{644} - v_{645} - v_{646} - v_{647} - v_{648} - v_{649} \end{aligned} \quad (2085)$$

### 9.410 Species c281

**Name** (ErbB1:ErbB3)\_P:RTK\_Pase

**Notes** (ErbB1:ErbB3)#P:RTK\_Pase , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v650, v658).

$$\frac{d}{dt}c281 = v_{636} + v_{644} \quad (2086)$$

#### 9.411 Species c282

**Name** (ErbB1:ErbB4)\_P:RTK\_Pase

**Notes** (ErbB1:ErbB4)#P:RTK\_Pase , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v651, v659).

$$\frac{d}{dt}c282 = v_{637} + v_{645} \quad (2087)$$

#### 9.412 Species c415

**Name** 2(EGF:ErbB1)\_P:RTK\_Pase

**Notes** 2(EGF:ErbB1)#P:RTK\_Pase , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v652, v660).

$$\frac{d}{dt}c415 = v_{638} + v_{646} \quad (2088)$$

#### 9.413 Species c283

**Name** 2(ErbB2)\_P:RTK\_Pase

**Notes** 2(ErbB2)#P:RTK\_Pase , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v653, v661).

$$\frac{d}{dt}c283 = v_{639} + v_{647} \quad (2089)$$

#### 9.414 Species c417

**Name** (ErbB2:ErbB3)\_P:RTK\_Pase

**Notes** (ErbB2:ErbB3)#P:RTK\_Pase , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v654, v662).

$$\frac{d}{dt}c417 = v_{640} + v_{648} \quad (2090)$$

### 9.415 Species c418

**Name** (ErbB2:ErbB4)\_P:RTK\_Pase

**Notes** (ErbB2:ErbB4)#P:RTK\_Pase , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v655, v663).

$$\frac{d}{dt}c418 = v_{641} + v_{649} \quad (2091)$$

### 9.416 Species c416

**Name** (ErbB1:ErbB2)\_P:RTK\_Pase

**Notes** (ErbB1:ErbB2)#P:RTK\_Pase , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v656, v657).

$$\frac{d}{dt}c416 = v_{642} + v_{643} \quad (2092)$$

### 9.417 Species c87

**Name** ErbB2\_P

**Notes** ErbB2#P , plasma membrane

**Initial amount** 0 item

This species takes part in seven reactions (as a reactant in v664, v664, v674, v677, v680, v681, v682).

$$\frac{d}{dt}c87 = -v_{650} - v_{650} - v_{660} - v_{663} - v_{666} - v_{667} - v_{668} \quad (2093)$$

### 9.418 Species c531

**Name** ErbB1

**Notes** ErbB1 , plasma membrane

**Initial amount** 1080000 item

This species takes part in two reactions (as a reactant in v665, v828).

$$\frac{d}{dt}c531 = -v_{651} - v_{813} \quad (2094)$$

### 9.419 Species c285

**Name** Inh

**Notes** Inh , medium

**Initial concentration** 0 mol · l<sup>-1</sup>

This species takes part in five reactions (as a reactant in v665, v666, v667, v668, v794), which do not influence its rate of change because this species is on the boundary of the reaction system:

$$\frac{d}{dt}c_{285} = 0 \quad (2095)$$

### 9.420 Species c330

**Name** EGF:ErbB1\_P

**Notes** EGF:ErbB1#P , plasma membrane

**Initial amount** 0 item

This species takes part in five reactions (as a reactant in v673, v673, v674, v675, v676).

$$\frac{d}{dt}c_{330} = -v_{659} - v_{659} - v_{660} - v_{661} - v_{662} \quad (2096)$$

### 9.421 Species c331

**Name** ErbB3\_P

**Notes** ErbB3#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v675, v680).

$$\frac{d}{dt}c_{331} = -v_{661} - v_{666} \quad (2097)$$

### 9.422 Species c332

**Name** ErbB4\_P

**Notes** ErbB4#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v676, v681).

$$\frac{d}{dt}c_{332} = -v_{662} - v_{667} \quad (2098)$$

### 9.423 Species c509

**Name** ErbB2:ErbB2:Inh

**Notes** ErbB2:ErbB2:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v682).

$$\frac{d}{dt}c509 = v_{668} \quad (2099)$$

### 9.424 Species c510

**Name** ErbB3:ErbB2:Inh

**Notes** ErbB3:ErbB2:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v683).

$$\frac{d}{dt}c510 = v_{669} \quad (2100)$$

### 9.425 Species c511

**Name** ErbB4:ErbB2:Inh

**Notes** ErbB4:ErbB2:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v684).

$$\frac{d}{dt}c511 = v_{670} \quad (2101)$$

### 9.426 Species c513

**Name** ErbB4:Inh:ErbB2

**Notes** ErbB4:Inh:ErbB2 , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v685).

$$\frac{d}{dt}c513 = v_{671} \quad (2102)$$



### 9.427 Species c461

**Name** Shp

**Notes** Shp , cytoplasm

**Initial amount** 2213.59 item

This species takes part in two reactions (as a reactant in v686, v722).

$$\frac{d}{dt}c461 = -v_{672} - v_{708} \quad (2103)$$

### 9.428 Species c444

**Name** PIP2

**Notes** PIP2 , cytoplasm

**Initial amount** 393639 item

This species takes part in 14 reactions (as a reactant in v686, v687, v695, v696, v697, v698, v699, v700, v701, v702, v703, v704, v705, v706).

$$\begin{aligned} \frac{d}{dt}c444 = & -v_{672} - v_{673} - v_{681} - v_{682} - v_{683} - v_{684} - v_{685} \\ & - v_{686} - v_{687} - v_{688} - v_{689} - v_{690} - v_{691} - v_{692} \end{aligned} \quad (2104)$$

### 9.429 Species c462

**Name** PIP3:Shp

**Notes** PIP3:Shp , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v686, v722).

$$\frac{d}{dt}c462 = v_{672} + v_{708} \quad (2105)$$

### 9.430 Species c279

**Name** PTEN

**Notes** PTEN , cytoplasm

**Initial amount** 56100.9 item

This species takes part in two reactions (as a reactant in v687, v721).

$$\frac{d}{dt}c279 = -v_{673} - v_{707} \quad (2106)$$

### 9.431 Species c482

**Name** PIP3:PTEN

**Notes** PIP3:PTEN , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v687, v721).

$$\frac{d}{dt}c482 = v_{673} + v_{707} \quad (2107)$$

### 9.432 Species c426

**Name** Gab1

**Notes** Gab1 , cytoplasm

**Initial amount** 94868.3 item

This species takes part in seven reactions (as a reactant in v688, v689, v690, v691, v692, v693, v694).

$$\frac{d}{dt}c426 = -v_{674} - v_{675} - v_{676} - v_{677} - v_{678} - v_{679} - v_{680} \quad (2108)$$

### 9.433 Species c455

**Name** PI3K

**Notes** PI3K , cytoplasm

**Initial amount** 0 item

This species takes part in one reaction (as a product in v701).

$$\frac{d}{dt}c455 = v_{687} \quad (2109)$$

### 9.434 Species c463

**Name** Shp2

**Notes** Shp2 , cytoplasm

**Initial amount** 1000000 item

This species takes part in 14 reactions (as a reactant in v707, v708, v709, v710, v711, v712, v713, v714, v715, v716, v717, v718, v719, v720).

$$\begin{aligned} \frac{d}{dt}c463 = & -v_{693} - v_{694} - v_{695} - v_{696} - v_{697} - v_{698} - v_{699} \\ & - v_{700} - v_{701} - v_{702} - v_{703} - v_{704} - v_{705} - v_{706} \end{aligned} \quad (2110)$$

#### 9.435 Species c464

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1\_P:Shp2

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v707, v714).

$$\frac{d}{dt}c464 = v_{693} + v_{700} \quad (2111)$$

#### 9.436 Species c465

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P:Shp2

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:Shp2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v708, v715).

$$\frac{d}{dt}c465 = v_{694} + v_{701} \quad (2112)$$

#### 9.437 Species c466

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P:Shp2

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:Shp2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v709, v716).

$$\frac{d}{dt}c466 = v_{695} + v_{702} \quad (2113)$$

#### 9.438 Species c473

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1\_P:Shp2

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v710, v717).

$$\frac{d}{dt}c473 = v_{696} + v_{703} \quad (2114)$$

### 9.439 Species c476

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:Shp2

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v711, v718).

$$\frac{d}{dt}c476 = v_{697} + v_{704} \quad (2115)$$

### 9.440 Species c479

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1\_P:Shp2

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v764 and as a product in v712, v719).

$$\frac{d}{dt}c479 = v_{698} + v_{705} - v_{750} \quad (2116)$$

### 9.441 Species c489

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:(Gab1\_P):Shp2

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):Shp2 , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v713, v720).

$$\frac{d}{dt}c489 = v_{699} + v_{706} \quad (2117)$$

### 9.442 Species c431

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:(Gab1\_P):ERK\_PP

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):ERK#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v723, v747).

$$\frac{d}{dt}c431 = v_{709} + v_{733} \quad (2118)$$

#### 9.443 Species c432

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:(Gab1\_P):ERK\_PP\_i

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):ERK#P#P\_i , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v724, v748).

$$\frac{d}{dt}c_{432} = v_{710} + v_{734} \quad (2119)$$

#### 9.444 Species c433

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v725, v745).

$$\frac{d}{dt}c_{433} = v_{711} + v_{731} \quad (2120)$$

#### 9.445 Species c434

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP\_i

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P\_i , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v726, v746).

$$\frac{d}{dt}c_{434} = v_{712} + v_{732} \quad (2121)$$

#### 9.446 Species c435

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P:ERK\_PP

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:ERK#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v727, v743).

$$\frac{d}{dt}c_{435} = v_{713} + v_{729} \quad (2122)$$

#### 9.447 Species c437

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P:ERK\_PP\_i

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:ERK#P#P\_i , endosomes

**Initial amount** 0 item

This species takes part in two reactions (as a product in v728, v744).

$$\frac{d}{dt}c_{437} = v_{714} + v_{730} \quad (2123)$$

#### 9.448 Species c438

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P:ERK\_PP

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:ERK#P#P , endosomes

**Initial amount** 0 item

This species takes part in two reactions (as a product in v729, v741).

$$\frac{d}{dt}c_{438} = v_{715} + v_{727} \quad (2124)$$

#### 9.449 Species c440

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P:ERK\_PP\_i

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:ERK#P#P\_i , endosomes

**Initial amount** 0 item

This species takes part in two reactions (as a product in v730, v742).

$$\frac{d}{dt}c_{440} = v_{716} + v_{728} \quad (2125)$$

#### 9.450 Species c474

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v731, v739).

$$\frac{d}{dt}c_{474} = v_{717} + v_{725} \quad (2126)$$

#### 9.451 Species c475

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP\_i

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P\_i , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v732, v740).

$$\frac{d}{dt}c475 = v_{718} + v_{726} \quad (2127)$$

#### 9.452 Species c477

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v733, v737).

$$\frac{d}{dt}c477 = v_{719} + v_{723} \quad (2128)$$

#### 9.453 Species c478

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP\_i

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P\_i , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v734, v738).

$$\frac{d}{dt}c478 = v_{720} + v_{724} \quad (2129)$$

#### 9.454 Species c480

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v735, v749).

$$\frac{d}{dt}c480 = v_{721} + v_{735} \quad (2130)$$

### 9.455 Species c481

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1\_P:ERK\_PP\_i

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P\_i , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v736, v750).

$$\frac{d}{dt}c481 = v722 + v736 \quad (2131)$$

### 9.456 Species c491

**Name** ErbB3/4:ErbB2:Gab1\_P#

**Notes** ErbB3/4:ErbB2:Gab1#P## , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v737, v738, v774).

$$\frac{d}{dt}c491 = -v723 - v724 - v760 \quad (2132)$$

### 9.457 Species c490

**Name** 2(ErbB2)2:Gab1\_P#

**Notes** 2(ErbB2)2:Gab1#P## , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v739, v740, v771).

$$\frac{d}{dt}c490 = -v725 - v726 - v757 \quad (2133)$$

### 9.458 Species c410

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1##P

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v741, v742, v773).

$$\frac{d}{dt}c410 = -v727 - v728 - v759 \quad (2134)$$



### 9.459 Species c409

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1##P

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v743, v744, v772).

$$\frac{d}{dt}c409 = -v_{729} - v_{730} - v_{758} \quad (2135)$$

### 9.460 Species c430

**Name** ErbB1:ErbB:Gab1\_P#

**Notes** ErbB1:ErbB:Gab1#P## , cytoplasm

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v745, v746, v775).

$$\frac{d}{dt}c430 = -v_{731} - v_{732} - v_{761} \quad (2136)$$

### 9.461 Species c488

**Name** 2(EGF:ErbB1):Gab1\_P#

**Notes** 2(EGF:ErbB1):Gab1#P## , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v747, v748, v770).

$$\frac{d}{dt}c488 = -v_{733} - v_{734} - v_{756} \quad (2137)$$

### 9.462 Species c487

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1:\_PP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:#P#P , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v749, v750, v776).

$$\frac{d}{dt}c487 = -v_{735} - v_{736} - v_{762} \quad (2138)$$

### 9.463 Species c264

**Name** 2(EGF:ErbB1)\_P:GAP:Grb2:(Gab1\_P):PI3K:Ras:GDP

**Notes** 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):PI3K:Ras:GDP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v751, v758).

$$\frac{d}{dt}c264 = v_{737} + v_{744} \quad (2139)$$

### 9.464 Species c265

**Name** (ErbB1:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:Ras:GDP

**Notes** (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v752, v759).

$$\frac{d}{dt}c265 = v_{738} + v_{745} \quad (2140)$$

### 9.465 Species c266

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P:PI3K:Ras:GDP

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v753, v760).

$$\frac{d}{dt}c266 = v_{739} + v_{746} \quad (2141)$$

### 9.466 Species c267

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P:PI3K:Ras:GDP

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v754, v761).

$$\frac{d}{dt}c267 = v_{740} + v_{747} \quad (2142)$$

#### 9.467 Species c268

**Name** 2(ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:Ras:GDP

**Notes** 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v755, v762).

$$\frac{d}{dt}c268 = v_{741} + v_{748} \quad (2143)$$

#### 9.468 Species c269

**Name** (ErbB3:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:Ras:GDP

**Notes** (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v756, v763).

$$\frac{d}{dt}c269 = v_{742} + v_{749} \quad (2144)$$

#### 9.469 Species c325

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1\_P:PI3K:Ras:GDP

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP

**Initial amount** 0 item

This species takes part in two reactions (as a product in v757, v764).

$$\frac{d}{dt}c325 = v_{743} + v_{750} \quad (2145)$$

#### 9.470 Species c472

**Name** AKT:P:P:Raf:P:Ser

**Notes** AKT:P:P:Raf:P:Ser , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v765, v767).

$$\frac{d}{dt}c472 = v_{751} + v_{753} \quad (2146)$$

### 9.471 Species c484

**Name** AKT:P:P:Raf:P:Ser.i

**Notes** AKT:P:P:Raf:P:Ser.i , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v766, v768).

$$\frac{d}{dt}c484 = v752 + v754 \quad (2147)$$

### 9.472 Species c485

**Name** Raf:P:Ser

**Notes** Raf:P:Ser , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v767, v768).

$$\frac{d}{dt}c485 = -v753 - v754 \quad (2148)$$

### 9.473 Species c520

**Name** MKP\_deg

**Notes** MKP\_deg , cytoplasm

**Initial amount** 0 item

This species takes part in one reaction (as a product in v769).

$$\frac{d}{dt}c520 = v755 \quad (2149)$$

### 9.474 Species c521

**Name** Pase9t

**Notes** Pase9t , cytoplasm

**Initial amount** 0 item

This species takes part in 14 reactions (as a reactant in v770, v771, v772, v773, v774, v775, v776, v777, v778, v779, v780, v781, v782, v783).

$$\begin{aligned} \frac{d}{dt}c521 = & -v756 - v757 - v758 - v759 - v760 - v761 - v762 \\ & - v763 - v764 - v765 - v766 - v767 - v768 - v769 \end{aligned} \quad (2150)$$

### 9.475 Species c522

**Name** 2(EGF:ErbB1):Gab1\_P#:Pase9t

**Notes** 2(EGF:ErbB1):Gab1#P##:Pase9t , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v770, v777).

$$\frac{d}{dt}c522 = v_{756} + v_{763} \quad (2151)$$

### 9.476 Species c523

**Name** 2(ErbB2)2:Gab1\_P#:Pase9t

**Notes** 2(ErbB2)2:Gab1#P##:Pase9t , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v771, v778).

$$\frac{d}{dt}c523 = v_{757} + v_{764} \quad (2152)$$

### 9.477 Species c411

**Name** (ErbB1:ErbB3)\_P:GAP:Grb2:Gab1\_P:Pase9t

**Notes** (ErbB1:ErbB3)#P:GAP:Grb2:Gab1##P:Pase9t , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v772, v779).

$$\frac{d}{dt}c411 = v_{758} + v_{765} \quad (2153)$$

### 9.478 Species c412

**Name** (ErbB1:ErbB4)\_P:GAP:Grb2:Gab1\_P:Pase9t

**Notes** (ErbB1:ErbB4)#P:GAP:Grb2:Gab1##P:Pase9t , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v773, v780).

$$\frac{d}{dt}c412 = v_{759} + v_{766} \quad (2154)$$

### 9.479 Species c456

**Name** ErbB3/4:ErbB2:Gab1\_P#:Pase9t

**Notes** ErbB3/4:ErbB2:Gab1#P#:Pase9t , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in [v774](#), [v781](#)).

$$\frac{d}{dt}c456 = v_{760} + v_{767} \quad (2155)$$

### 9.480 Species c424

**Name** ErbB1:ErbB:Gab1\_P#:Pase9t

**Notes** ErbB1:ErbB:Gab1#P#:Pase9t , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in [v775](#), [v782](#)).

$$\frac{d}{dt}c424 = v_{761} + v_{768} \quad (2156)$$

### 9.481 Species c407

**Name** (ErbB4:ErbB2)\_P:GAP:Grb2:Gab1:\_PP:Pase9t

**Notes** (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:#P#P:Pase9t

**Initial amount** 0 item

This species takes part in two reactions (as a product in [v776](#), [v783](#)).

$$\frac{d}{dt}c407 = v_{762} + v_{769} \quad (2157)$$

### 9.482 Species c514

**Name** HRG

**Notes** HRG , medium

**Initial concentration** 0 mol · l<sup>-1</sup>

This species takes part in two reactions (as a reactant in [v784](#), [v785](#)), which do not influence its rate of change because this species is on the boundary of the reaction system:

$$\frac{d}{dt}c514 = 0 \quad (2158)$$

### 9.483 Species c142

**Name** HRG:ErbB3

**Notes** HRG:ErbB3 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v786, v789 and as a product in v784).

$$\frac{d}{dt}c142 = v770 - v772 - v775 \quad (2159)$$

### 9.484 Species c144

**Name** HRG:ErbB4

**Notes** HRG:ErbB4 , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v788, v790 and as a product in v785).

$$\frac{d}{dt}c144 = v771 - v774 - v776 \quad (2160)$$

### 9.485 Species c158

**Name** (HRG:ErbB4)

**Notes** (HRG:ErbB4) , endosomal membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v791, v793).

$$\frac{d}{dt}c158 = -v777 - v779 \quad (2161)$$

### 9.486 Species c532

**Name** ErbB1\_h

**Notes** ErbB1\_h , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v794, v829).

$$\frac{d}{dt}c532 = -v780 - v814 \quad (2162)$$

### 9.487 Species c525

**Name** ErbB1\_h:Inh

**Notes** ErbB1\_h:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v795 and as a product in v794).

$$\frac{d}{dt}c525 = v780 - v781 \quad (2163)$$

### 9.488 Species c526

**Name** EGF:ErbB1\_h:Inh

**Notes** EGF:ErbB1\_h:Inh , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v796, v797, v797, v853, v854 and as a product in v795).

$$\frac{d}{dt}c526 = v781 - v782 - v783 - v783 - v818 - v819 \quad (2164)$$

### 9.489 Species c527

**Name** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh)

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v805 and as a product in v796).

$$\frac{d}{dt}c527 = v782 - v790 \quad (2165)$$

### 9.490 Species c528

**Name** 2(EGF:ErbB1\_h:Inh)

**Notes** 2(EGF:ErbB1\_h:Inh) , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v797).

$$\frac{d}{dt}c528 = v783 \quad (2166)$$



### 9.491 Species c524

**Name** ErbB1\_h:ATP

**Notes** ErbB1\_h:ATP , plasma membrane

**Initial amount** 0 item

This species takes part in three reactions (as a reactant in v798, v799 and as a product in v829).

$$\frac{d}{dt}c524 = v_{814} - v_{784} - v_{785} \quad (2167)$$

### 9.492 Species c529

**Name** EGF:ErbB1\_h:ATP

**Notes** EGF:ErbB1\_h:ATP , plasma membrane

**Initial amount** 0 item

This species takes part in six reactions (as a reactant in v850, v851, v852, v852, v853 and as a product in v798).

$$\frac{d}{dt}c529 = v_{784} - v_{815} - v_{816} - v_{817} - v_{817} - v_{818} \quad (2168)$$

### 9.493 Species c530

**Name** ErbB1\_h:ATP

**Notes** ErbB1\_h:ATP , endosomes

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v801 and as a product in v799).

$$\frac{d}{dt}c530 = v_{785} - v_{786} \quad (2169)$$

### 9.494 Species c115

**Name** (EGF:ErbB1:ATP::EGF:ErbB1:Inh)-HalfActive

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1:Inh)-HalfActive , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v802, v803).

$$\frac{d}{dt}c115 = v_{787} + v_{788} \quad (2170)$$

### 9.495 Species c121

**Name** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh)-HalfActive

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh)-HalfActive , cytoplasm

**Initial amount** 0 item

This species takes part in two reactions (as a product in v805, v806).

$$\frac{d}{dt}c121 = v_{790} + v_{791} \quad (2171)$$

### 9.496 Species c550

**Name** (EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP)

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v855 and as a product in v850).

$$\frac{d}{dt}c550 = v_{815} - v_{820} \quad (2172)$$

### 9.497 Species c551

**Name** (EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP)

**Notes** (EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v856 and as a product in v851).

$$\frac{d}{dt}c551 = v_{816} - v_{821} \quad (2173)$$

### 9.498 Species c552

**Name** 2(EGF:ErbB1\_h:ATP)-FullActive

**Notes** 2(EGF:ErbB1\_h:ATP)-FullActive , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v857 and as a product in v852).

$$\frac{d}{dt}c552 = v_{817} - v_{822} \quad (2174)$$

### 9.499 Species c553

**Name** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh)

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh) , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a reactant in v858 and as a product in v853).

$$\frac{d}{dt}c553 = v_{818} - v_{823} \quad (2175)$$

### 9.500 Species c554

**Name** (EGF:ErbB1:Inh::EGF:ErbB1\_h:Inh)

**Notes** (EGF:ErbB1:Inh::EGF:ErbB1\_h:Inh) , plasma membrane

**Initial amount** 0 item

This species takes part in one reaction (as a product in v854).

$$\frac{d}{dt}c554 = v_{819} \quad (2176)$$

### 9.501 Species c555

**Name** (EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP)-FullActive

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1\_h:ATP)-FullActive , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v855, v859).

$$\frac{d}{dt}c555 = v_{820} + v_{824} \quad (2177)$$

### 9.502 Species c556

**Name** (EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP)-HalfActive

**Notes** (EGF:ErbB1:Inh::EGF:ErbB1\_h:ATP)-HalfActive , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v856, v860).

$$\frac{d}{dt}c556 = v_{821} + v_{825} \quad (2178)$$

### 9.503 Species c557

**Name** 2(EGF:ErbB1\_h:ATP)-FullActive

**Notes** 2(EGF:ErbB1\_h:ATP)-FullActive , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v857, v861).

$$\frac{d}{dt}c557 = v_{822} + v_{826} \quad (2179)$$

### 9.504 Species c558

**Name** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh)-HalfActive

**Notes** (EGF:ErbB1:ATP::EGF:ErbB1\_h:Inh)-HalfActive , plasma membrane

**Initial amount** 0 item

This species takes part in two reactions (as a product in v858, v862).

$$\frac{d}{dt}c558 = v_{823} + v_{827} \quad (2180)$$

## A Glossary of Systems Biology Ontology Terms

**SBO:0000252 polypeptide chain:** Naturally occurring macromolecule formed by the repetition of amino-acid residues linked by peptidic bonds. A polypeptide chain is synthesized by the ribosome. CHEBI:1654

**SBO:0000290 physical compartment:** Specific location of space, that can be bounded or not. A physical compartment can have 1, 2 or 3 dimensions

**SBO:0000297 protein complex:** Macromolecular complex containing one or more polypeptide chains possibly associated with simple chemicals. CHEBI:3608

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