

SBML Model Report

Model name: “Dwivedi2014 - Crohns IL6 Disease model - sgp130 activity”



May 6, 2016

1 General Overview

This is a document in SBML Level 2 Version 4 format. This model was created by Vincent Knight-Schrijver¹ at August sixth 2014 at 10:45 a.m. and last time modified at September eighth 2014 at 2:15 p.m. Table 1 gives an overview of the quantities of all components of this model.

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

| Element | Quantity | Element | Quantity |
|-------------------|----------|----------------------|----------|
| compartment types | 0 | compartments | 4 |
| species types | 0 | species | 39 |
| events | 13 | constraints | 0 |
| reactions | 66 | function definitions | 50 |
| global parameters | 53 | unit definitions | 2 |
| rules | 3 | initial assignments | 10 |

Model Notes

Dwivedi2014 - Crohns IL6 Disease model -sgp130 activityThis model is comprised of four models:

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- [\[BIOMD0000000534\]](#) Healthy Volunteer model
- [\[BIOMD0000000535\]](#) Crohn's Disease - IL-6 Antibody
- [\[BIOMD0000000536\]](#) Crohn's Disease - sgp130FC
- [\[BIOMD0000000537\]](#) Crohn's Disease - IL-6Ra Antibody

Possible avenues for Interleukin-6 (IL-6) inhibition in treating Crohn's disease are compared here. Each model refers to separate ligands. The system simulates differential activity of the ligands on the signalling of IL-6. This affects Signal Transducer and Activator of Transcription 3 (STAT3) activity on the production of biomarker C-Reactive Protein (CRP) expression. The figure referring to this Crohn's Disease model is 6b.

This model is described in the article: [A multiscale model of interleukin-6-mediated immune regulation in Crohn's disease and its application in drug discovery and development](#). Dwivedi G, Fitz L, Hegen M, Martin SW, Harrold J, Heatherington A, Li C. CPT Pharmacometrics Syst Pharmacol 2014; 3: e89

Abstract:

In this study, we have developed a multiscale systems model of interleukin (IL)-6-mediated immune regulation in Crohn's disease, by integrating intracellular signaling with organ-level dynamics of pharmacological markers underlying the disease. This model was linked to a general pharmacokinetic model for therapeutic monoclonal antibodies and used to comparatively study various biotherapeutic strategies targeting IL-6-mediated signaling in Crohn's disease. Our work illustrates techniques to develop mechanistic models of disease biology to study drug-system interaction. Despite a sparse training data set, predictions of the model were qualitatively validated by clinical biomarker data from a pilot trial with tocilizumab. Model-based analysis suggests that strategies targeting IL-6, IL-6R, or the IL-6/sIL-6R complex are less effective at suppressing pharmacological markers of Crohn's than dual targeting the IL-6/sIL-6R complex in addition to IL-6 or IL-6R. The potential value of multiscale system pharmacology modeling in drug discovery and development is also discussed. CPT: Pharmacometrics & Systems Pharmacology (2014) 3, e89; doi:10.1038/psp.2013.64; advance online publication 8 January 2014.

This model is hosted on [BioModels Database](#) and identified by: [BIOMD0000000536](#).

To cite BioModels Database, please use: [BioModels Database: An enhanced, curated and annotated resource for published quantitative kinetic models](#).

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2 Unit Definitions

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

2.1 Unit time

Name time

Definition 3600 s

2.2 Unit substance

Name substance

Definition nmol

2.3 Unit volume

Notes Litre is the predefined SBML unit for volume.

Definition l

2.4 Unit area

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

Definition m²

2.5 Unit length

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

Definition m

3 Compartments

This model contains four compartments.

Table 2: Properties of all compartments.

| Id | Name | SBO | Spatial Dimensions | Size | Unit | Constant | Outflow |
|--|------------|-----|-----------------------|------|-------|----------|---------|
| mw53ffe9e6_beef_45c4_90a5_a79197ed506e | serum | | 3 | 1 | litre | ✓ | |
| mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e | liver | | 3 | 1 | litre | ✓ | |
| mwe9501423_9fb4_494b_b5b6_288f3fcb17b5 | gut | | 3 | 1 | litre | ✓ | |
| mw8fbcbf3b_47d8_4adc_8ad4_f9fc547d3e87 | peripheral | | 3 | 1 | litre | ✓ | |

3.1 Compartment [mw53ffe9e6_beef_45c4_90a5_a79197ed506e](#)

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

Name serum

3.2 Compartment [mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e](#)

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

Name liver

3.3 Compartment [mwe9501423_9fb4_494b_b5b6_288f3fcb17b5](#)

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

Name gut

3.4 Compartment [mw8fbcbf3b_47d8_4adc_8ad4_f9fc547d3e87](#)

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

Name peripheral

4 Species

This model contains 39 species. The boundary condition of three of these species is set to `true` so that these species' amount cannot be changed by any reaction. Section 11 provides further details and the derived rates of change of each species.

Table 3: Properties of each species.

| Id | Name | Compartment | Derived Unit | Constant | Boundary Condition |
|--|---------------|---|-----------------------------------|--------------------------|--------------------------|
| mwf626e95e- _543f_41e4_aad4- _c6bf60ab345b | IL6 | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mwbbbce920- _e8dd_4320_9386- _fc94bfb2fc99 | sgp130 | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw810ff751- _fa4e_4143_bd50- _169b3e325e1e | sR_IL6_sgp130 | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw114aa90f- _5f5b_4fe8_9406- _361c8489b6a1 | CRP | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw30ae63db- _6cd3_4b6f_93ad- _3350cd360bcc | sR | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw03db56ac- _8dc6_4931_ae82- _fef706d2ee3d | sR_IL6 | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mwf345ed7a- _0622_403c_b816- _c8749a2c9ded | sgpFc | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |

| Id | Name | Compartment | Derived Unit | Constant | Boundary Condition |
|---|--------------|---|-----------------------------------|-----------|--------------------|
| mwa2d8dd1c- _bb9a_4552.8738- _e24671651c1d | sR_IL6_sgpFc | mw53ffe9e6.beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw80848184- _e2dd_47ce_86d7- _7a21479342bd | gp130 | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw2d2d9d93a- _3bd1_4f17_bac1- _baba9ef2d55a | R_IL6_gp130 | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw4638f126- _8cb8_4021_ab41- _6ae195743ba0 | sR_IL6 | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw10315fa3- _6f13_4618_bda8- _a8694bd3c374 | R | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw0adf3eb4- _a196_4c48_b10d- _4e9e9faaf9e1 | IL6 | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw7d86cc23- _a1af_44c3_bdb9- _71e9b1bb2a83 | R_IL6 | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw0eb6c959- _d408_45a0_a450- _928b8c5876bb | Ractive | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |
| mw42054cd7- _17af_46da_970c- _7f99151906ad | STAT3 | mw88ca8d9a_f5cf_41bf- _9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | \square | \square |

| Id | Name | Compartment | Derived Unit | Constant | Boundary Condition |
|--|------------------|---|-----------------------------------|--------------------------|-------------------------------------|
| mw39c2e431-_fdc3_4964.be29-_6ca856620b1b | pSTAT3 | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mwd5313618-_89eb_4c8c.bc82-_66f10f966349 | CRP | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| mw2e464cf3-_a09c_4b7c.9f3c-_06720016a48e | sR | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw36ea78c1-_ed71_4def_96d3-_857a442d7195 | CRPExtracellular | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw147d30ec-_478e_4090.b496-_128a131d29eb | sgp130 | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mwab41493c-_6349_45f1_a226-_3030cfed0e06 | sR_IL6_sgp130 | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw1d9426a3-_e1e9_49e0.ad77-_eb6833be398a | sR_IL6_sgpFc | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw3667a5e1-_02c9_44a0.acb4-_b0431faa822d | sgpFc | mw88ca8d9a_f5cf_41bf-_9d9d_fc48f6e1a19e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw7becb5fe-_8da8_4285.a821-_0d77ad811b62 | sR_IL6 | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |

| Id | Name | Compartment | Derived Unit | Constant | Boundary Condition |
|---|-------------|---|-----------------------------------|--------------------------|-------------------------------------|
| mw8c9107e6-_f51d_442d_b2dc-_2bfdbb8482ca | gp130 | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw824bc3d4-_1ac3_4912_9b51-_8f14ff1c96b9 | R_IL6_gp130 | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw6cce2109-_0e32_4dd9_98ec-_41173e8ef07d | Ractive | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw2b255f94-_8018_4b99_bde8-_918eeac45446 | STAT3 | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw48867e93-_f170_44e8_ac7a-_185b23e1bf3b | pSTAT3 | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw0083d743-_836f_4238_a17f-_4602193d5bc0 | geneProduct | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| mw d31f52cc-_04e7_40e0_885f-_c7b2d9e62215 | sR | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw2c9b0499-_3325_4394_8af3-_bbf653a944a0 | IL6 | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw d65b5b39-_dc1b_4e77_a999-_67277a880e5e | sgp130 | mwe9501423_9fb4_494b-_b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |

| Id | Name | Compartment | Derived Unit | Constant | Boundary Condition |
|--|---------------------|---|-----------------------------------|--------------------------|-------------------------------------|
| mw6335d5d7- _c7b0_4bc0_b883- _f7ee4915c2c3 | sR_IL6_sgp130 | mwe9501423_9fb4_494b- _b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mwf7796221- _1fea_4274_a93e- _c00adbf5778c | sgpFc | mwe9501423_9fb4_494b- _b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mw2f3d48e0- _c9c4_4a0e_aca3- _9241eb573296 | sR_IL6_sgpFc | mwe9501423_9fb4_494b- _b5b6_288f3fcb17b5 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| mwbc2f5464- _81e5_43fd_8b39- _f5a2756af72f | sgpFc | mw8fbcbf3b_47d8_4adc- _8ad4_f9fc547d3e87 | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input type="checkbox"/> |
| species_1 | CRP Suppression (%) | mw53ffe9e6_beef_45c4- _90a5_a79197ed506e | $\text{nmol} \cdot \text{l}^{-1}$ | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

5 Parameters

This model contains 53 global parameters.

Table 4: Properties of each parameter.

| Id | Name | SBO | Value | Unit | Constant |
|---|--------------|-----|---------|------|----------|
| kRLOn | kRLOn | | 0.384 | | ✓ |
| kRLOff | kRLOff | | 1.920 | | ✓ |
| kgp1300n | kgp1300n | | 20.520 | | ✓ |
| kgp1300ff | kgp1300ff | | 1.026 | | ✓ |
| kRAct | kRAct | | 155.000 | | ✓ |
| kRint | kRint | | 1.960 | | ✓ |
| kRsynth | kRsynth | | 0.069 | | ✓ |
| kRdeg | kRintBasal | | 0.156 | | ✓ |
| kIL6Synth | ksynthIL6 | | 0.006 | | ✓ |
| kIL6Decay | kdegIL6 | | 34.820 | | ✓ |
| kCRPDecay | kdegCRP | | 0.360 | | ✓ |
| mwfd291862- _195f- _4979_94b5- _b4e5ae1b7d52 | KmSTATDephos | | 5.340 | | ✓ |
| mwd36b0261- _2480- _4cab_9222- _2cf8fb0e65dc | VmSTATDephos | | 0.620 | | ✓ |
| mw1667a8e0- _9d20- _4e59_ba51- _596148aba787 | VmRDephos | | 0.525 | | ✓ |
| mwfcf06900- _5f2f- _4bb3_bb1f- _12023612b8a8 | KmRDephos | | 155.300 | | ✓ |
| mw9442cd0e- _4d7c- _4ba6_a695- _f84919bdf569 | kcatSTATPhos | | 145.000 | | ✓ |
| mwe8fc1900- _f07d- _468b_b5c8- _15400a583c3d | KmSTATPhos | | 219.000 | | ✓ |

| Id | Name | SBO | Value | Unit | Constant |
|---|---------------|-----|---------|------|-------------------------------------|
| mw08950572- _81b0- _4570_b2e4- _b9c3462c1425 | KmProtSynth | | 10.000 | | <input checked="" type="checkbox"/> |
| mw92d854a7- _8aaf- _458e_b5e2- _20a63ce9b654 | VmProtSynth | | 330.000 | | <input checked="" type="checkbox"/> |
| mw862f1480- _c60c- _4863_a565- _b2c1c77e238e | kCRPSecretion | | 0.500 | | <input checked="" type="checkbox"/> |
| mw65c85954- _5ca0- _4df2_9e22- _ff2aa3fbe3f1 | ksynthCRP | | 0.420 | | <input checked="" type="checkbox"/> |
| mwc4c58db7- _5535- _4590_aaa5- _bbc8ed53cdab | ksynthsR | | 0.100 | | <input checked="" type="checkbox"/> |
| mw88a75379- _f9a1- _4acc_baeb- _94c32bb736a5 | kdegSR | | 0.300 | | <input checked="" type="checkbox"/> |
| mw1f41474c- _c399- _4a60_a53a- _9926dd092e8d | ksynthsgp130 | | 3.900 | | <input checked="" type="checkbox"/> |
| mwbc5a310- _9b67- _405e_89ec- _43d25e8cc93d | kdegsgp130 | | 1.000 | | <input checked="" type="checkbox"/> |
| mwa8d72918- _f6c2- _4d81_bf3b- _fc2b464d5e69 | ksynthIL6Gut | | 0.036 | | <input checked="" type="checkbox"/> |
| mw06241335- _b5f2- _47ed_bdcc- _ef77b68a2b98 | kdegIL6Gut | | 1.000 | | <input checked="" type="checkbox"/> |

| Id | Name | SBO | Value | Unit | Constant |
|---|--------------------|-----|-------|------|-------------------------------------|
| mwce10678d- _8197- _408c_ad47- _1daec8104cd8 | kdistTissueToSerum | | 0.847 | | <input checked="" type="checkbox"/> |
| mwc67e1333- _079a- _4bea_9b4f- _0a1b15ddd7bb | kdistSerumToTissue | | 1.213 | | <input checked="" type="checkbox"/> |
| mw5832a2dc- _ee18- _44df_aa59- _ccb21cb74df2 | kRShedding | | 0.005 | | <input checked="" type="checkbox"/> |
| mwf44f7f27- _5bb1- _4c7f_8964- _560fa5e1743a | kintActiveR | | 0.010 | | <input checked="" type="checkbox"/> |
| mwdc9e2eb7- _c8f4- _4026_a8d0- _eff8ce1f1aea | infusionTime | | 1.000 | | <input checked="" type="checkbox"/> |
| mw640ca705- _e089- _4c64_a5f4- _9562317e8c76 | kAbSerumToLiver | | 0.021 | | <input checked="" type="checkbox"/> |
| mw43ccad8c- _cabf- _4eaf_90d5- _e06ae43be2cb | kAbLiverToSerum | | 0.021 | | <input checked="" type="checkbox"/> |
| mw9f83bdd3- _3aa1- _47ff_abd6- _54e5ce60704a | kAbSerumToGut | | 0.010 | | <input checked="" type="checkbox"/> |
| mwa071fdbe- _d498- _4620_a7a4- _940aa31c8161 | kAbGutToSerum | | 0.021 | | <input checked="" type="checkbox"/> |
| mw2c605ff5- _50f5- _45f2_a70c- _53fcd866d14c | VSerum | | 2.880 | | <input checked="" type="checkbox"/> |

| Id | Name | SBO | Value | Unit | Constant |
|---|------------------|-----|---------------------------------|------|-------------------------------------|
| mwc691d0d1- _8c1b- _4ce4_85c6- _1315c42e97b1 | VLiver | | 2.880 | | <input checked="" type="checkbox"/> |
| mwa8283449- _0e21- _41a1_baac- _ebf697b3555a | VGut | | 1.440 | | <input checked="" type="checkbox"/> |
| mw6729db10- _c577- _4319_b355- _2e3f11c0f942 | VPeriph | | 0.576 | | <input checked="" type="checkbox"/> |
| mw434adaf5- _cef0- _4a33_9ad2- _a4e49e1fd825 | QSerumLiver | | 0.060 | | <input checked="" type="checkbox"/> |
| mw6a5e10a9- _d442- _4dde_8ec3- _6a26c9807374 | QSerumGut | | 0.030 | | <input checked="" type="checkbox"/> |
| mw1366c3b5- _e79b- _44a7_93cc- _ee09d383eabf | QSerumPeriph | | 0.001 | | <input checked="" type="checkbox"/> |
| mwf67caf9d- _2f4b- _4986_abf2- _e6090bbb72ce | kAbSerumToPeriph | | $3.4722222222222 \cdot 10^{-4}$ | | <input checked="" type="checkbox"/> |
| mw4aea26f6- _8860- _414c_97f5- _40d325196f2e | kAbPeriphToSerum | | 0.002 | | <input checked="" type="checkbox"/> |
| mwbd1d5bc3- _d4b9- _4aec_9b86- _6f776da20a30 | kdegAb | | 0.002 | | <input checked="" type="checkbox"/> |
| parameter_1 | Dose Q1W | | 0.000 | | <input checked="" type="checkbox"/> |
| parameter_2 | Dose Q2W | | 0.000 | | <input checked="" type="checkbox"/> |
| parameter_3 | Dose Q4W | | 0.000 | | <input checked="" type="checkbox"/> |
| Metabolite- _80 | Initial for CRP | | 221.064 | | <input checked="" type="checkbox"/> |

| Id | Name | SBO | Value | Unit | Constant |
|--------------|-------------------------|-----|-------|------|-------------------------------------|
| ModelValue_3 | Initial for Dose Q1W | | 0.000 | | <input checked="" type="checkbox"/> |
| ModelValue_4 | Initial for Dose Q2W | | 0.000 | | <input checked="" type="checkbox"/> |
| ModelValue_5 | Initial for Dose Q4W | | 0.000 | | <input checked="" type="checkbox"/> |

6 Initialassignments

This is an overview of ten initialassignments.

6.1 Initialassignment [mw640ca705_e089_4c64_a5f4_9562317e8c76](#)

Derived unit contains undeclared units

Math $\frac{\text{mw434adaf5_cef0_4a33_9ad2_a4e49e1fd825}}{\text{mw2c605ff5_50f5_45f2_a70c_53fcd866d14c}}$

6.2 Initialassignment [mw43ccad8c_cabf_4eaf_90d5_e06ae43be2cb](#)

Derived unit contains undeclared units

Math $\frac{\text{mw434adaf5_cef0_4a33_9ad2_a4e49e1fd825}}{\text{mwc691d0d1_8c1b_4ce4_85c6_1315c42e97b1}}$

6.3 Initialassignment [mw9f83bdd3_3aa1_47ff_abd6_54e5ce60704a](#)

Derived unit contains undeclared units

Math $\frac{\text{mw6a5e10a9_d442_4dde_8ec3_6a26c9807374}}{\text{mw2c605ff5_50f5_45f2_a70c_53fcd866d14c}}$

6.4 Initialassignment [mwa071fdbe_d498_4620_a7a4_940aa31c8161](#)

Derived unit contains undeclared units

Math $\frac{\text{mw6a5e10a9_d442_4dde_8ec3_6a26c9807374}}{\text{mwa8283449_0e21_41a1_baac_ebf697b3555a}}$

6.5 Initialassignment [mwf67caf9d_2f4b_4986_abf2_e6090bbb72ce](#)

Derived unit contains undeclared units

Math $\frac{\text{mw1366c3b5_e79b_44a7_93cc_ee09d383eabf}}{\text{mw2c605ff5_50f5_45f2_a70c_53fcd866d14c}}$

6.6 Initialassignment mw4aea26f6_8860_414c_97f5_40d325196f2e

Derived unit contains undeclared units

Math $\frac{\text{mw1366c3b5_e79b_44a7_93cc_ee09d383eabf}}{\text{mw6729db10_c577_4319_b355_2e3f11c0f942}}$

6.7 Initialassignment Metabolite_80

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

Math [mw114aa90f_5f5b_4fe8_9406_361c8489b6a1]

6.8 Initialassignment ModelValue_3

Derived unit contains undeclared units

Math parameter_1

6.9 Initialassignment ModelValue_4

Derived unit contains undeclared units

Math parameter_2

6.10 Initialassignment ModelValue_5

Derived unit contains undeclared units

Math parameter_3

7 Function definitions

This is an overview of 50 function definitions.

7.1 Function definition function_4

Name Function for reaction_4_4

Arguments kIL6Decay, vol(mw53ffe9e6_beef_45c4_90a5_a79197ed506e), [mwf626e95e_543f_41e4_aad4_c6bf60ab345b]

Mathematical Expression

$$\frac{\text{kIL6Decay} \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (1)$$

7.2 Function definition [function_5](#)

Name Function for reaction_5_4

Arguments kCRPDecay, [mw114aa90f_5f5b_4fe8_9406_361c8489b6a1], vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e)

Mathematical Expression

$$\frac{\text{kCRPDecay} \cdot [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (2)$$

7.3 Function definition [function_9](#)

Name Function for reaction_16_4

Arguments kRAct, vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e), [mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a]

Mathematical Expression

$$\frac{\text{kRAct} \cdot [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (3)$$

7.4 Function definition [function_1](#)

Name Function for reaction_1_4

Arguments kRLOff, kRLOn, [mw03db56ac_8dc6_4931_ae82_fef706d2ee3d], [mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc], vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e), [mwf626e95e_543f_41e4_aad4_c6bf60ab345b]

Mathematical Expression

$$\frac{\text{kRLOn} \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}] \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}] - \text{kRLOff} \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (4)$$

7.5 Function definition [function_3](#)

Name Function for reaction_3_4

Arguments kIL6Synth, vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e)

Mathematical Expression

$$\frac{\text{kIL6Synth}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (5)$$

7.6 Function definition `function_6`

Name Function for reaction_6_4

Arguments kgp130Off, kgp130On, [mw4638f126_8cb8_4021_ab41_6ae195743ba0], [mw80848184_e2dd_47ce_86d7_7a21479342bd],
vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e), [mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a]

Mathematical Expression

$$\frac{\text{kgp130On} \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}] - \text{kgp130Off} \cdot \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (6)$$

7.7 Function definition `function_18`

Name Function for reaction_46_4

Arguments kRAct, [mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9], vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{\text{kRAct} \cdot [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (7)$$

7.8 Function definition `function_19`

Name Function for reaction_42_4

Arguments [mw2b255f94_8018_4b99_bde8_918eeac45446], [mw6cce2109_0e32_4dd9_98ec_41173e8ef07d],
mw9442cd0e_4d7c_4ba6_a695_f84919bdf569, mwe8fc1900_f07d_468b_b5c8_15400a583c3d,
vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{\text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}] \cdot [\text{mw2b255f94_8018_4b99_bde8_918eeac45446}] - \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d} + [\text{mw2b255f94_8018_4b99_bde8_918eeac45446}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (8)$$

7.9 Function definition `function_20`

Name Function for reaction_43_4

Arguments [mw48867e93_f170_44e8_ac7a_185b23e1bf3b], mwd36b0261_2480_4cab_9222_2cf8fb0e65dc,
vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5), mwfd291862_195f_4979_94b5_b4e5ae1b7d52

Mathematical Expression

$$\frac{\text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc} \cdot [\text{mw48867e93_f170_44e8_ac7a_185b23e1bf3b}] - \text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52} + [\text{mw48867e93_f170_44e8_ac7a_185b23e1bf3b}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (9)$$

7.10 Function definition [function_21](#)

Name Function for reaction_44_4

Arguments kRint, [mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9], vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{\text{kRint} \cdot [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (10)$$

7.11 Function definition [function_22](#)

Name Function for reaction_45_4

Arguments [mw6cce2109_0e32_4dd9_98ec_41173e8ef07d], vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5), mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a

Mathematical Expression

$$\frac{\text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (11)$$

7.12 Function definition [function_23](#)

Name Function for mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4_4

Arguments [mw0eb6c959_d408_45a0_a450_928b8c5876bb], mw1667a8e0_9d20_4e59_ba51_596148aba787, vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e), mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8

Mathematical Expression

$$\frac{\frac{\text{mw1667a8e0_9d20_4e59_ba51_596148aba787} \cdot [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}]}{\text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8} + [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (12)$$

7.13 Function definition [function_24](#)

Name Function for mw64df7c9e_35da_4c7f_be56_c5dabfb060b6_4

Arguments mw1667a8e0_9d20_4e59_ba51_596148aba787, [mw6cce2109_0e32_4dd9_98ec_41173e8ef07d], vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5), mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8

Mathematical Expression

$$\frac{\frac{\text{mw1667a8e0_9d20_4e59_ba51_596148aba787} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]}{\text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8} + [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (13)$$

7.14 Function definition [function_25](#)

Name Function for mw391f3b8e_5649_4851_b2e2_782cb3e015b6_4

Arguments kRsynth, vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)

Mathematical Expression

$$\frac{kRsynth}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (14)$$

7.15 Function definition [function_26](#)

Name Function for mw4a00a3a4_778f_4952_8100_2dc3cc2b7046_4

Arguments kRdeg, [mw80848184_e2dd_47ce_86d7_7a21479342bd], vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)

Mathematical Expression

$$\frac{kRdeg \cdot [mw80848184_e2dd_47ce_86d7_7a21479342bd]}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (15)$$

7.16 Function definition [function_2](#)

Name Function for reaction_2_4

Arguments kgp130Off, kgp130On, [mw03db56ac_8dc6_4931_ae82_fef706d2ee3d], vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e), [mw810ff751_fa4e_4143_bd50_169b3e325e1e], [mwbbbce920_e8dd_4320_9386_fc94bfb2fc99]

Mathematical Expression

$$\frac{kgp130On \cdot [mw03db56ac_8dc6_4931_ae82_fef706d2ee3d] \cdot [mwbbbce920_e8dd_4320_9386_fc94bfb2fc99] - kgp130Off \cdot [mw810ff751_fa4e_4143_bd50_169b3e325e1e]}{vol(mw53ffe9e6_beef_45c4_90a5_a79197ed506e)} \quad (16)$$

7.17 Function definition [function_7](#)

Name Function for reaction_7_4

Arguments kRLOff, kRLOn, [mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1], [mw10315fa3_6f13_4618_bda8_a8694bd3c374], [mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83], vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)

Mathematical Expression

$$\frac{kRLOn \cdot [mw10315fa3_6f13_4618_bda8_a8694bd3c374] \cdot [mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1] - kRLOff \cdot [mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83]}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (17)$$

7.18 Function definition [function_27](#)

Name Function for mw6db30657_4e56_4c3a_8575_9c67393dde4f_4

Arguments kRsynth, vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{kRsynth}{vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)} \quad (18)$$

7.19 Function definition [function_28](#)

Name Function for mw6f470e13_f0e4_4294_83d8_59dd5670d10c_4

Arguments kRdeg, [mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca], vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{kRdeg \cdot [mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca]}{vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)} \quad (19)$$

7.20 Function definition [function_29](#)

Name Function for mw4c099d5c_200f_474e_8ec1_59e9223a8afd_4

Arguments kRLOff, kRLOn, [mw2c9b0499_3325_4394_8af3_bbf653a944a0], [mw7becb5fe_8da8_4285_a821_0d7b_59e9223a8afd_4], [mwd31f52cc_04e7_40e0_885f_c7b2d9e62215], vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{kRLOn \cdot [mwd31f52cc_04e7_40e0_885f_c7b2d9e62215] \cdot [mw2c9b0499_3325_4394_8af3_bbf653a944a0] - kRLOff \cdot [mw7becb5fe_8da8_4285_a821_0d7b_59e9223a8afd_4]}{vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)} \quad (20)$$

7.21 Function definition [function_30](#)

Name Function for mwa812f08f_1035_42bd_82d2_72d691308f88_4

Arguments kRLOff, kRLOn, [mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1], [mw2e464cf3_a09c_4b7c_9f3c_06720016a48e], [mw4638f126_8cb8_4021_ab41_6ae195743ba0], vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)

Mathematical Expression

$$\frac{kRLOn \cdot [mw2e464cf3_a09c_4b7c_9f3c_06720016a48e] \cdot [mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1] - kRLOff \cdot [mw4638f126_8cb8_4021_ab41_6ae195743ba0]}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (21)$$

7.26 Function definition `function_14`

Name Function for reaction_12_4

Arguments `kRint`, `vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)`, `[mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a]`

Mathematical Expression

$$\frac{kRint \cdot [mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a]}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (26)$$

7.27 Function definition `function_15`

Name Function for reaction_13_4

Arguments `[mw0eb6c959_d408_45a0_a450_928b8c5876bb]`, `vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)`, `mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a`

Mathematical Expression

$$\frac{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a \cdot [mw0eb6c959_d408_45a0_a450_928b8c5876bb]}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (27)$$

7.28 Function definition `function_16`

Name Function for reaction_14_4

Arguments `kRsynth`, `vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)`

Mathematical Expression

$$\frac{kRsynth}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (28)$$

7.29 Function definition `function_17`

Name Function for reaction_41_4

Arguments `kgp130Off`, `kgp130On`, `[mw7becb5fe_8da8_4285_a821_0d77ad811b62]`, `[mw824bc3d4_1ac3_4912_9b5[mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca]`, `vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)`

Mathematical Expression

$$\frac{kgp130On \cdot [mw7becb5fe_8da8_4285_a821_0d77ad811b62] \cdot [mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca] - kgp130Off \cdot [mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca]}{vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)} \quad (29)$$

7.30 Function definition `function_43`

Name Function for mw14d351b9_623a_48e8_a21c_854411039120_3

Arguments `vol(mw53ffe9e6_beef_45c4_90a5_a79197ed506e)`, `[mwa2d8dd1c_bb9a_4552_8738_e24671651c1d]`,
`mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30`

Mathematical Expression

$$\frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (30)$$

7.31 Function definition `function_44`

Name Function for mwba7f4605_8571_439b_b3ab_eb0b43808db8_4

Arguments `vol(mw53ffe9e6_beef_45c4_90a5_a79197ed506e)`, `mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30`,
`[mwf345ed7a_0622_403c_b816_c8749a2c9ded]`

Mathematical Expression

$$\frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (31)$$

7.32 Function definition `function_45`

Name Function for mw5be6711a_526a_4a58_80c6_d353dcabdf87_3

Arguments `[mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296]`, `mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30`,
`vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)`

Mathematical Expression

$$\frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (32)$$

7.33 Function definition `function_46`

Name Function for mw1d3068d7_5679_41ee_9892_984e33012070_1

Arguments `kgp130Off`, `kgp130On`, `[mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296]`, `[mw7becb5fe_8da8_4285_a821_0d77ad811b62]`,
`vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)`, `[mwf7796221_1fea_4274_a93e_c00adbf5778c]`

Mathematical Expression

$$\frac{\text{kgp130On} \cdot [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] - \text{kgp130Off}}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (33)$$

7.34 Function definition [function_47](#)

Name Function for mw341c690_7147_46a1_8577_201598de3bf1_1

Arguments kgp130Off, kgp130On, [mw1d9426a3_e1e9_49e0_ad77_eb6833be398a], [mw3667a5e1_02c9_44a0_acb4_b0431faa822d], [mw4638f126_8cb8_4021_ab41_6ae195743ba0], vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)

Mathematical Expression

$$\frac{\text{kgp130On} \cdot [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}] \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] - \text{kgp130Off} \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (34)$$

7.35 Function definition [function_48](#)

Name Function for mw5d9fcd0c_ca08_4444_b509_2ea4777e0025_3

Arguments [mw1d9426a3_e1e9_49e0_ad77_eb6833be398a], vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e), mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30

Mathematical Expression

$$\frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (35)$$

7.36 Function definition [function_49](#)

Name Function for mw2ae288ab_7d03_4a84_a024_c711ad2b77e6_4

Arguments [mw3667a5e1_02c9_44a0_acb4_b0431faa822d], vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e), mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30

Mathematical Expression

$$\frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (36)$$

7.37 Function definition [function_50](#)

Name Function for mw9629d028_fcc0_4886_9e4d_36eecd0381d_4

Arguments mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30, vol(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5), [mwf7796221_1fea_4274_a93e_c00adbf5778c]

Mathematical Expression

$$\frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (37)$$

7.38 Function definition `function_33`

Name Function for mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c_4

Arguments kgp130Off, kgp130On, [mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3], [mw7becb5fe_8da8_4285_a821_0d77ad811b62] – kgp130On · [mwd65b5b39_dc1b_4e77_a999_67277a880e5e], vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{\text{kgp130On} \cdot [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] - \text{kgp130Off}}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (38)$$

7.39 Function definition `function_34`

Name Function for mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6_4

Arguments kgp130Off, kgp130On, [mw147d30ec_478e_4090_b496_128a131d29eb], [mw4638f126_8cb8_4021_ab41_6ae195743ba0] · [mw147d30ec_478e_4090_b496_128a131d29eb] – kgp130On · [mw4638f126_8cb8_4021_ab41_6ae195743ba0], [mwab41493c_6349_45f1_a226_3030cfed0e06]

Mathematical Expression

$$\frac{\text{kgp130On} \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] \cdot [\text{mw147d30ec_478e_4090_b496_128a131d29eb}] - \text{kgp130Off}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (39)$$

7.40 Function definition `function_35`

Name Function for mw432fde6e_59ab_47f0_9fb1_086433a602e3_4

Arguments vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e), mwc4c58db7_5535_4590_aaa5_bbc8ed53cdab

Mathematical Expression

$$\frac{\text{mwc4c58db7_5535_4590_aaa5_bbc8ed53cdab}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (40)$$

7.41 Function definition `function_36`

Name Function for mw41c27823_d7ee_4554_9eac_3d5beec8e854_4

Arguments [mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc], vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e), mw88a75379_f9a1_4acc_baeb_94c32bb736a5

Mathematical Expression

$$\frac{\text{mw88a75379_f9a1_4acc_baeb_94c32bb736a5} \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (41)$$

7.42 Function definition `function_37`

Name Function for mw50c6744c_e883_4612_8663_e38750cbad1b_4

Arguments mw1f41474c_c399_4a60_a53a_9926dd092e8d, vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e)

Mathematical Expression

$$\frac{\text{mw1f41474c_c399_4a60_a53a_9926dd092e8d}}{\text{vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e)}} \quad (42)$$

7.43 Function definition `function_38`

Name Function for mwb6a99eb5_ea4c_4733_98dd_1daf5ec6b0db_4

Arguments vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e), [mwbbbce920_e8dd_4320_9386_fc94bfb2fc99],
mwbc5a310_9b67_405e_89ec_43d25e8cc93d

Mathematical Expression

$$\frac{\text{mwbc5a310_9b67_405e_89ec_43d25e8cc93d} \cdot [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}]}{\text{vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e)}} \quad (43)$$

7.44 Function definition `function_39`

Name Function for mw1ce0c484_681f_4d85_8ffe_392d0c100cfa_4

Arguments mwa8d72918_f6c2_4d81_bf3b_fc2b464d5e69, vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{\text{mwa8d72918_f6c2_4d81_bf3b_fc2b464d5e69}}{\text{vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)}} \quad (44)$$

7.45 Function definition `function_40`

Name Function for mwf913ea0b_785a_4701_ac91_b18ab5dd5a89_4

Arguments mw06241335_b5f2_47ed_bdcc_ef77b68a2b98, [mw2c9b0499_3325_4394_8af3_bbf653a944a0],
vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)

Mathematical Expression

$$\frac{\text{mw06241335_b5f2_47ed_bdcc_ef77b68a2b98} \cdot [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}]}{\text{vol (mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)}} \quad (45)$$

7.46 Function definition [function_41](#)

Name Function for mw71d90b81_8211_4039_8807_12a7fe03206c_4

Arguments [mw114aa90f_5f5b_4fe8_9406_361c8489b6a1], vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e),
mw5832a2dc_ee18_44df_aa59_ccb21cb74df2

Mathematical Expression

$$\frac{\text{mw5832a2dc_ee18_44df_aa59_ccb21cb74df2} \cdot [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (46)$$

7.47 Function definition [function_42](#)

Name Function for mwc32a28fa_525c_44af_8d2c_e728c21eb90a_1

Arguments kgp130Off, kgp130On, [mw03db56ac_8dc6_4931_ae82_fef706d2ee3d], vol (mw53ffe9e6_beef_45c4_90a5_a79197ed506e),
[mwa2d8dd1c_bb9a_4552_8738_e24671651c1d], [mwf345ed7a_0622_403c_b816_c8749a2c9ded]

Mathematical Expression

$$\frac{\text{kgp130On} \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}] - \text{kgp130Off}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \quad (47)$$

7.48 Function definition [function_10](#)

Name Function for reaction_9_4

Arguments [mw0eb6c959_d408_45a0_a450_928b8c5876bb], [mw42054cd7_17af_46da_970c_7f99151906ad],
vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e), mw9442cd0e_4d7c_4ba6_a695_f84919bdf569,
mwe8fc1900_f07d_468b_b5c8_15400a583c3d

Mathematical Expression

$$\frac{\text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569} \cdot [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}] \cdot [\text{mw42054cd7_17af_46da_970c_7f99151906ad}] - \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (48)$$

7.49 Function definition [function_11](#)

Name Function for reaction_10_4

Arguments [mw39c2e431_fdc3_4964_be29_6ca856620b1b], vol (mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e),
mwd36b0261_2480_4cab_9222_2cf8fb0e65dc, mwfd291862_195f_4979_94b5_b4e5ae1b7d52

Mathematical Expression

$$\frac{\text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc} \cdot [\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}] - \text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \quad (49)$$

7.50 Function definition `function_12`

Name Function for reaction_15_4

Arguments `kRdeg`, `[mw10315fa3_6f13_4618_bda8_a8694bd3c374]`, `vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a1)`

Mathematical Expression

$$\frac{kRdeg \cdot [mw10315fa3_6f13_4618_bda8_a8694bd3c374]}{vol(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)} \quad (50)$$

8 Rules

This is an overview of three rules.

8.1 Rule `species_1`

Rule `species_1` is an assignment rule for species `species_1`:

$$species_1 = \frac{[mw114aa90f_5f5b_4fe8_9406_361c8489b6a1] - Metabolite_80}{\frac{Metabolite_80}{100}} \quad (51)$$

8.2 Rule `mw0083d743_836f_4238_a17f_4602193d5bc0`

Rule `mw0083d743_836f_4238_a17f_4602193d5bc0` is an assignment rule for species `mw0083d743_836f_4238_a17f_4602193d5bc0`:

$$\begin{aligned} &mw0083d743_836f_4238_a17f_4602193d5bc0 \quad (52) \\ &= \frac{mw92d854a7_8aaf_458e_b5e2_20a63ce9b654 \cdot [mw48867e93_f170_44e8_ac7a_185b23e1bf3b]}{mw08950572_81b0_4570_b2e4_b9c3462c1425 + [mw48867e93_f170_44e8_ac7a_185b23e1bf3b]} \end{aligned}$$

8.3 Rule `mwd5313618_89eb_4c8c_bc82_66f10f966349`

Rule `mwd5313618_89eb_4c8c_bc82_66f10f966349` is an assignment rule for species `mwd5313618_89eb_4c8c_bc82_66f10f966349`:

$$\begin{aligned} &mwd5313618_89eb_4c8c_bc82_66f10f966349 \quad (53) \\ &= \frac{mw92d854a7_8aaf_458e_b5e2_20a63ce9b654 \cdot [mw39c2e431_fdc3_4964_be29_6ca856620b1b]}{mw08950572_81b0_4570_b2e4_b9c3462c1425 + [mw39c2e431_fdc3_4964_be29_6ca856620b1b]} \end{aligned}$$

9 Events

This is an overview of 13 events. Each event is initiated whenever its trigger condition switches from `false` to `true`. A delay function postpones the effects of an event to a later time point. At the time of execution, an event can assign values to species, parameters or compartments if these are not set to constant.

9.1 Event `event_1`

Name Week1

Trigger condition

$$\text{time} \geq 168 \quad (54)$$

Delay

$$0 \quad (55)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + \text{ModelValue_3} \cdot 2.346 \end{aligned} \quad (56)$$

9.2 Event `event_2`

Name Week2

Trigger condition

$$\text{time} \geq 336 \quad (57)$$

Delay

$$0 \quad (58)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \\ &\quad + \text{ModelValue_3} \cdot 2.346 + \text{ModelValue_4} \cdot 2.346 \end{aligned} \quad (59)$$

9.3 Event `event_3`

Name Week3

Trigger condition

$$\text{time} \geq 504 \quad (60)$$

Delay

$$0 \quad (61)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + \text{ModelValue_3} \cdot 2.346 \end{aligned} \quad (62)$$

9.4 Event `event_4`

Name Week4

Trigger condition

$$\text{time} \geq 672 \quad (63)$$

Delay

$$0 \quad (64)$$

Assignment

$$\begin{aligned} \text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ = [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \\ + (\text{ModelValue_3} + \text{ModelValue_4} + \text{ModelValue_5}) \cdot 2.346 \end{aligned} \quad (65)$$

9.5 Event `event_5`

Name Week5

Trigger condition

$$\text{time} \geq 840 \quad (66)$$

Delay

$$0 \quad (67)$$

Assignment

$$\begin{aligned} \text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ = [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + \text{ModelValue_3} \cdot 2.346 \end{aligned} \quad (68)$$

9.6 Event `event_6`

Name Week6

Trigger condition

$$\text{time} \geq 1008 \quad (69)$$

Delay

$$0 \quad (70)$$

Assignment

$$\begin{aligned} \text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ = [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + (\text{ModelValue_3} + \text{ModelValue_4}) \cdot 2.346 \end{aligned} \quad (71)$$

9.7 Event `event_7`

Name Week7

Trigger condition

$$\text{time} \geq 1176 \quad (72)$$

Delay

$$0 \quad (73)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + \text{ModelValue_3} \cdot 2.346 \end{aligned} \quad (74)$$

9.8 Event `event_8`

Name Week8

Trigger condition

$$\text{time} \geq 1344 \quad (75)$$

Delay

$$0 \quad (76)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \\ &\quad + (\text{ModelValue_3} + \text{ModelValue_4} + \text{ModelValue_5}) \cdot 2.346 \end{aligned} \quad (77)$$

9.9 Event `event_9`

Name Week9

Trigger condition

$$\text{time} \geq 1512 \quad (78)$$

Delay

$$0 \quad (79)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + \text{ModelValue_3} \cdot 2.346 \end{aligned} \quad (80)$$

9.10 Event `event_10`

Name Week10

Trigger condition

$$\text{time} \geq 1680 \quad (81)$$

Delay

$$0 \quad (82)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + (\text{ModelValue_3} + \text{ModelValue_4}) \cdot 2.346 \end{aligned} \quad (83)$$

9.11 Event `event_11`

Name Week11

Trigger condition

$$\text{time} \geq 1848 \quad (84)$$

Delay

$$0 \quad (85)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + \text{ModelValue_3} \cdot 2.346 \end{aligned} \quad (86)$$

9.12 Event `event_12`

Name Week12

Trigger condition

$$\text{time} \geq 2016 \quad (87)$$

Delay

$$0 \quad (88)$$

Assignment

$$\begin{aligned} &\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \\ &\quad + (\text{ModelValue_3} + \text{ModelValue_4} + \text{ModelValue_5}) \cdot 2.346 \end{aligned} \quad (89)$$

9.13 Event `event_13`

Name Week0

Trigger condition

$$\text{time} \geq 0.1 \quad (90)$$

Delay

$$0 \quad (91)$$

Assignment

$$\begin{aligned} & \text{mwf345ed7a_0622_403c_b816_c8749a2c9ded} \\ &= [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] + \text{ModelValue_3} \\ & \quad \cdot 2.346 + \text{ModelValue_4} \cdot 2.346 + \text{ModelValue_5} \cdot 2.346 \end{aligned} \quad (92)$$

10 Reactions

This model contains 66 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 | reaction_1 | reaction_1 | $\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc} + \text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}$ | $\text{mw03db56ac_8dc6_4931_ae82_fef706d2}$ |
| 2 | reaction_2 | reaction_2 | $\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d} + \text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}$ | $\text{mw03db56ac_8dc6_4931_ae82_fef706d2}$ |
| 3 | reaction_3 | reaction_3 | $\emptyset \longrightarrow \text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}$ | |
| 4 | reaction_4 | reaction_4 | $\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}$ | $\text{mwf626e95e_543f_41e4_aad4_c6bf60ab3}$ |
| 5 | reaction_5 | reaction_5 | $\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}$ | $\text{mw114aa90f_5f5b_4fe8_9406_361c8489}$ |
| 6 | reaction_6 | reaction_6 | $\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0} + \text{mw80848184_e2dd_47ce_86d7_7a21479342bd}$ | $\text{mw4638f126_8cb8_4021_ab41_6ae195}$ |
| 7 | reaction_7 | reaction_7 | $\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374} + \text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}$ | $\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf}$ |
| 8 | reaction_8 | reaction_8 | $\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83} + \text{mw80848184_e2dd_47ce_86d7_7a21479342bd}$ | $\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1b}$ |
| 9 | reaction_16 | reaction_16 | $\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}$ | $\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2}$ |
| 10 | reaction_9 | reaction_9 | $\text{mw42054cd7_17af_46da_970c_7f99151906ad} + \text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}$ | $\text{mw0eb6c959_d408_45a0_a450_928b8c5}$ |
| 11 | reaction_10 | reaction_10 | $\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}$ | $\text{mw39c2e431_fdc3_4964_be29_6ca8566}$ |
| 12 | reaction_15 | reaction_15 | $\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}$ | $\text{mw10315fa3_6f13_4618_bda8_a8694bd3}$ |

| Nº | Id | Name | Reaction Equation | SBO |
|----|---|---|---|---|
| 13 | reaction_11 | reaction_11 | $\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}$ | $\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}$ |
| 14 | reaction_12 | reaction_12 | $\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}$ | $\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}$ |
| 15 | reaction_13 | reaction_13 | $\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}$ | $\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}$ |
| 16 | reaction_14 | reaction_14 | $\emptyset \longrightarrow \text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}$ | |
| 17 | reaction_41 | reaction_41 | $\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62} + \text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}$ | $\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62} + \text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}$ |
| 18 | reaction_46 | reaction_46 | $\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}$ | $\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}$ |
| 19 | reaction_42 | reaction_42 | $\text{mw2b255f94_8018_4b99_bde8_918eeac45446} + \text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}$ | $\text{mw2b255f94_8018_4b99_bde8_918eeac45446} + \text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}$ |
| 20 | reaction_43 | reaction_43 | $\text{mw48867e93_f170_44e8_ac7a_185b23e1bf3b}$ | $\text{mw48867e93_f170_44e8_ac7a_185b23e1bf3b}$ |
| 21 | reaction_44 | reaction_44 | $\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}$ | $\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}$ |
| 22 | reaction_45 | reaction_45 | $\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}$ | $\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}$ |
| 23 | $\text{mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4}$ | $\text{mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4}$ | $\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}$ | $\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}$ |
| 24 | $\text{mw64df7c9e_35da_4c7f_be56_c5dabfb060b6}$ | $\text{mw64df7c9e_35da_4c7f_be56_c5dabfb060b6}$ | $\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}$ | $\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}$ |
| 25 | $\text{mw391f3b8e_5649_4851_b2e2_782cb3e015b6}$ | $\text{mw391f3b8e_5649_4851_b2e2_782cb3e015b6}$ | $\emptyset \longrightarrow \text{mw80848184_e2dd_47ce_86d7_7a21479342bd}$ | |

| Nº | Id | Name | Reaction Equation | SBO |
|----|---|---|--|--|
| 26 | mw4a00a3a4- _778f- _4952_8100- _2dc3cc2b7046 | mw4a00a3a4_778f_4952_8100- _2dc3cc2b7046 | mw80848184_e2dd_47ce_86d7_7a21479342bd | <u>mw80848184_e2dd_47ce_86d7_7a21479342bd</u> |
| 27 | mw6db30657- _4e56- _4c3a_8575- _9c67393dde4f | mw6db30657_4e56_4c3a_8575- _9c67393dde4f | $\emptyset \longrightarrow$ mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca | |
| 28 | mw6f470e13- _f0e4- _4294_83d8- _59dd5670d10c | mw6f470e13_f0e4_4294_83d8- _59dd5670d10c | mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca | <u>mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca</u> |
| 29 | mwfb35eca9- _7afc- _4ba8_a46c- _738cab57eb9f | mwfb35eca9_7afc_4ba8_a46c_738cab57eb9f | mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | <u>mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc</u> |
| 30 | mw61d2af92- _6da5- _41ce_b90e- _aa6f430e6ba1 | mw61d2af92_6da5_41ce_b90e_aa6f430e6ba1 | mwf626e95e_543f_41e4_aad4_c6bf60ab345b | <u>mwf626e95e_543f_41e4_aad4_c6bf60ab345b</u> |
| 31 | mw4c099d5c- _200f- _474e_8ec1- _59e9223a8afd | mw4c099d5c_200f_474e_8ec1_59e9223a8afd | mwd31f52cc_04e7_40e0_885f_c7b2d9e62215 mw2c9b0499_3325_4394_8af3_bbf653a944a0 | <u>mw2c9b0499_3325_4394_8af3_bbf653a944a0</u> + <u>mw2c9b0499_3325_4394_8af3_bbf653a944a0</u> |

| Nº | Id | Name | Reaction Equation | SBO |
|----|---|---|--|--|
| 32 | mwbe8567ce- _3349- _4442_8b12- _53cd9bc168e7 | mwbe8567ce_3349_4442_8b12- _53cd9bc168e7 | mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | <u><u>mw03db56ac_8dc6_4931_ae82_fef706d2</u></u> |
| 33 | mw12a9fa7e- _a273- _4c1e_b970- _ed33f3a9a705 | mw12a9fa7e_a273_4c1e_b970_ed33f3a9a705 | mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | <u><u>mw30ae63db_6cd3_4b6f_93ad_3350cd3</u></u> |
| 34 | mw1046000b- _e1e8- _4f6f_82a1- _532d2aa793bb | mw1046000b_e1e8_4f6f_82a1- _532d2aa793bb | mwf626e95e_543f_41e4_aad4_c6bf60ab345b | <u><u>mwf626e95e_543f_41e4_aad4_c6bf60ab3</u></u> |
| 35 | mw8e8b65a8- _6830- _4091_9a40- _19645e8fe554 | mw8e8b65a8_6830_4091_9a40- _19645e8fe554 | mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | <u><u>mw03db56ac_8dc6_4931_ae82_fef706d2</u></u> |
| 36 | mwa812f08f- _1035- _42bd_82d2- _72d691308f88 | mwa812f08f_1035_42bd_82d2- _72d691308f88 | mw2e464cf3_a09c_4b7c_9f3c_06720016a48e mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1 | + <u><u>mw0adf3eb4_a196_4c48_b10d_4e9e9faaf</u></u> |
| 37 | mwab0012ac- _e5f2- _4904_9893- _820fd210402e | mwab0012ac_e5f2_4904_9893- _820fd210402e | mwd5313618_89eb_4c8c_bc82_66f10f966349 | <u><u>mwd5313618_89eb_4c8c_bc82_66f10f96</u></u> |

| Nº | Id | Name | Reaction Equation | SBO |
|----|---|---|---|--|
| 38 | mwcdc24bd4-_d9e4-_47fe_8300-_d222d853111c | mwcdc24bd4_d9e4_47fe_8300-_d222d853111c | mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | <u><u>mw114aa90f_5f5b_4fe8_9406_361c8489b6a1</u></u> |
| 39 | mwff2ebcf1-_dcf1-_47b9_9cac-_7306fc6f7f76 | mwff2ebcf1_dcf1_47b9_9cac_7306fc6f7f76 | $\emptyset \longrightarrow$ mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | |
| 40 | mw1c5a5ff7-_5130-_490f_a740-_6a744ccf8a94 | mw1c5a5ff7_5130_490f_a740_6a744ccf8a94 | mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | <u><u>mwbbbce920_e8dd_4320_9386_fc94bfb2fc99</u></u> |
| 41 | mw7b56053c-_7256-_4703_a8c3-_4fd46b2c23d0 | mw7b56053c_7256_4703_a8c3_4fd46b2c23d0 | mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | <u><u>mwbbbce920_e8dd_4320_9386_fc94bfb2fc99</u></u> |
| 42 | mw8be158f1-_ea81-_45bf_80d4-_6e31cd83fe6c | mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c | $\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e} +$ $\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}$ | <u><u>mw6335d5d7_c7b0_4bc0_b883_f7ee491</u></u> |
| 43 | mwd77df15b-_fed7-_41a8_a3d6-_b0f6c590c5f6 | mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6 | $\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0} +$ $\text{mw147d30ec_478e_4090_b496_128a131d29eb}$ | <u><u>mw147d30ec_478e_4090_b496_128a131d29eb</u></u> |

| Nº | Id | Name | Reaction Equation | SBO |
|----|---|---|--|---|
| 44 | mw01babcdf- _0f03- _46b0_81b1- _201cc846e361 | mw01babcdf_0f03_46b0_81b1- _201cc846e361 | mw810ff751_fa4e_4143_bd50_169b3e325e1e | <u>mw810ff751_fa4e_4143_bd50_169b3e325e1e</u> |
| 45 | mwae5dbb44- _7de5- _46ab_8c20- _ac4f8956b0f0 | mwae5dbb44_7de5_46ab_8c20- _ac4f8956b0f0 | mw810ff751_fa4e_4143_bd50_169b3e325e1e | <u>mw810ff751_fa4e_4143_bd50_169b3e325e1e</u> |
| 46 | mw432fde6e- _59ab- _47f0_9fb1- _086433a602e3 | mw432fde6e_59ab_47f0_9fb1_086433a602e3 | $\emptyset \longrightarrow$ mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | |
| 47 | mw41c27823- _d7ee- _4554_9eac- _3d5beec8e854 | mw41c27823_d7ee_4554_9eac- _3d5beec8e854 | mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | <u>mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc</u> |
| 48 | mw50c6744c- _e883- _4612_8663- _e38750cbad1b | mw50c6744c_e883_4612_8663- _e38750cbad1b | $\emptyset \longrightarrow$ mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | |
| 49 | mw6a99eb5- _ea4c- _4733_98dd- _1daf5ec6b0db | mw6a99eb5_ea4c_4733_98dd- _1daf5ec6b0db | mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | <u>mwbbbce920_e8dd_4320_9386_fc94bfb2fc99</u> |

| Nº | Id | Name | Reaction Equation | SBO |
|----|---|---|--|---|
| 50 | mw1ce0c484- _681f- _4d85_8ffe- _392d0c100cfa | mw1ce0c484_681f_4d85_8ffe_392d0c100cfa | $\emptyset \longrightarrow$ mw2c9b0499_3325_4394_8af3_bbf653a944a0 | |
| 51 | mwf913ea0b- _785a- _4701_ac91- _b18ab5dd5a89 | mwf913ea0b_785a_4701_ac91- _b18ab5dd5a89 | mw2c9b0499_3325_4394_8af3_bbf653a944a0 | <u>mw2c9b0499_3325_4394_8af3_bbf653a944a0</u> |
| 52 | mw71d90b81- _8211- _4039_8807- _12a7fe03206c | mw71d90b81_8211_4039_8807- _12a7fe03206c | mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | <u>mw114aa90f_5f5b_4fe8_9406_361c8489b6a1</u> |
| 53 | mwdf4ba845- _7271- _4ada_b43f- _fdac83df3b5c | mwdf4ba845_7271_4ada_b43f_fdac83df3b5c | mwf345ed7a_0622_403c_b816_c8749a2c9ded | <u>mwf345ed7a_0622_403c_b816_c8749a2c9ded</u> |
| 54 | mwc32a28fa- _525c- _44af_8d2c- _e728c21eb90a | mwc32a28fa_525c_44af_8d2c_e728c21eb90a | mwf345ed7a_0622_403c_b816_c8749a2c9ded + mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | <u>mw03db56ac_8dc6_4931_ae82_fef706d2ee3d</u> |
| 55 | mw14d351b9- _623a- _48e8_a21c- _854411039120 | mw14d351b9_623a_48e8_a21c- _854411039120 | mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | <u>mwa2d8dd1c_bb9a_4552_8738_e24671651c1d</u> |

| Nº | Id | Name | Reaction Equation | SBO |
|----|--|---|--|--|
| 56 | mwba7f4605- _8571- _439b_b3ab- _eb0b43808db8 | mwba7f4605_8571_439b_b3ab- _eb0b43808db8 | mwf345ed7a_0622_403c_b816_c8749a2c9ded | <u>mwf345ed7a_0622_403c_b816_c8749a2c9ded</u> |
| 57 | mw5be6711a- _526a- _4a58_80c6- _d353dcabdf87 | mw5be6711a_526a_4a58_80c6- _d353dcabdf87 | mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296 | <u>mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296</u> |
| 58 | mw1d3068d7- _5679- _41ee_9892- _984e33012070 | mw1d3068d7_5679_41ee_9892- _984e33012070 | mwf7796221_1fea_4274_a93e_c00adbf5778c mw7becb5fe_8da8_4285_a821_0d77ad811b62 | <u>mwf7796221_1fea_4274_a93e_c00adbf5778c + mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296</u> |
| 59 | mw b341c690- _7147- _46a1_8577- _201598de3bf1 | mwb341c690_7147_46a1_8577- _201598de3bf1 | mw3667a5e1_02c9_44a0_acb4_b0431faa822d mw4638f126_8cb8_4021_ab41_6ae195743ba0 | <u>mw3667a5e1_02c9_44a0_acb4_b0431faa822d + mw1d9426a3_e1e9_49e0_ad77_eb6833be398a</u> |
| 60 | mw5d9fcd0c- _ca08- _4444_b509- _2ea4777e0025 | mw5d9fcd0c_ca08_4444_b509- _2ea4777e0025 | mw1d9426a3_e1e9_49e0_ad77_eb6833be398a | <u>mw1d9426a3_e1e9_49e0_ad77_eb6833be398a</u> |
| 61 | mw131e3c9d- _e77d- _48c0_bdbb- _77b2c10aaf3d | mw131e3c9d_e77d_48c0_bdbb- _77b2c10aaf3d | mwf345ed7a_0622_403c_b816_c8749a2c9ded | <u>mwf345ed7a_0622_403c_b816_c8749a2c9ded</u> |

| Nº | Id | Name | Reaction Equation | SBO |
|----|---|---|--|---|
| 62 | mw14940d1f- _6a1f- _47cb_8170- _801ba645f4c1 | mw14940d1f_6a1f_47cb_8170- _801ba645f4c1 | mwf345ed7a_0622_403c_b816_c8749a2c9ded | <u>mwf345ed7a_0622_403c_b816_c8749a2c9ded</u> |
| 63 | mwb62106e7- _e959- _4a1d_9a00- _b36d4e19a48f | mwb62106e7_e959_4a1d_9a00- _b36d4e19a48f | mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | <u>mwa2d8dd1c_bb9a_4552_8738_e24671651c1d</u> |
| 64 | mwad648b6c- _45ca- _4f41_9747- _06db1f6060fc | mwad648b6c_45ca_4f41_9747_06db1f6060fc | mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | <u>mwa2d8dd1c_bb9a_4552_8738_e24671651c1d</u> |
| 65 | mw2ae288ab- _7d03- _4a84_a024- _c711ad2b77e6 | mw2ae288ab_7d03_4a84_a024- _c711ad2b77e6 | mw3667a5e1_02c9_44a0_acb4_b0431faa822d | <u>mw3667a5e1_02c9_44a0_acb4_b0431faa822d</u> |
| 66 | mw9629d028- _fcc0- _4886_9e4d- _36eecdb0381d | mw9629d028_fcc0_4886_9e4d- _36eecdb0381d | mwf7796221_1fea_4274_a93e_c00adbf5778c | <u>mwf7796221_1fea_4274_a93e_c00adbf5778c</u> |

10.1 Reaction `reaction_1`

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name `reaction_1`

Reaction equation

`mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc` + `mwf626e95e_543f_41e4_aad4_c6bf60ab345b` $\xrightleftharpoons[(93)]{\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}}$

Reactants

Table 6: Properties of each reactant.

| Id | Name | SBO |
|---|------|-----|
| <code>mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc</code> | sR | |
| <code>mwf626e95e_543f_41e4_aad4_c6bf60ab345b</code> | IL6 | |

Modifiers

Table 7: Properties of each modifier.

| Id | Name | SBO |
|---|--------|-----|
| <code>mw03db56ac_8dc6_4931_ae82_fef706d2ee3d</code> | sR_IL6 | |
| <code>mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc</code> | sR | |
| <code>mwf626e95e_543f_41e4_aad4_c6bf60ab345b</code> | IL6 | |

Product

Table 8: Properties of each product.

| Id | Name | SBO |
|---|--------|-----|
| <code>mw03db56ac_8dc6_4931_ae82_fef706d2ee3d</code> | sR_IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_1 = & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \\
 & \cdot \text{function_1}(\text{kRLOff}, \text{kRLOn}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \\
 & \quad [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}], \quad (94) \\
 & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & \quad [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]) \\
 & = \frac{\text{kRLOn} \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}] \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}] - \text{kRLOff} \cdot [\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \\
 & \text{function_1}(\text{kRLOff}, \text{kRLOn}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \quad (95) \\
 & \quad [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}], \\
 & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & \quad [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]) \\
 & = \frac{\text{kRLOn} \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}] \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}] - \text{kRLOff} \cdot [\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \\
 & \text{function_1}(\text{kRLOff}, \text{kRLOn}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \quad (96) \\
 & \quad [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}], \\
 & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & \quad [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]) \\
 & = \frac{\text{kRLOn} \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}] \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}] - \text{kRLOff} \cdot [\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})}
 \end{aligned}$$

10.2 Reaction `reaction_2`

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name `reaction_2`

Reaction equation

$$\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d} + \text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99} \xrightleftharpoons{\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}} \text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d} \quad (97)$$

Reactants

Table 9: Properties of each reactant.

| Id | Name | SBO |
|---|---------------------|-----|
| <code>mw03db56ac_8dc6_4931_ae82_fef706d2ee3d</code> | <code>sR_IL6</code> | |
| <code>mwbbbce920_e8dd_4320_9386_fc94bfb2fc99</code> | <code>sgp130</code> | |

Modifiers

Table 10: Properties of each modifier.

| Id | Name | SBO |
|--|---------------|-----|
| mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | sR_IL6 | |
| mw810ff751_fa4e_4143_bd50_169b3e325e1e | sR_IL6_sgp130 | |
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |

Product

Table 11: Properties of each product.

| Id | Name | SBO |
|--|---------------|-----|
| mw810ff751_fa4e_4143_bd50_169b3e325e1e | sR_IL6_sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_2 = & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \\
 & \cdot \text{function_2}(\text{kgp130Off}, \text{kgp130On}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \\
 & \quad \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & \quad [\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e}], \\
 & \quad [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}]) \\
 & \quad (98)
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_2}(\text{kgp130Off}, \text{kgp130On}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \quad (99) \\
 & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & [\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e}], \\
 & [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}] \cdot [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}] - \text{kg}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})}
 \end{aligned}$$

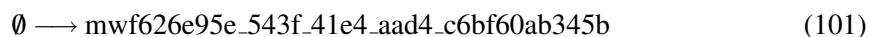
$$\begin{aligned}
 & \text{function_2}(\text{kgp130Off}, \text{kgp130On}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \quad (100) \\
 & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & [\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e}], \\
 & [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}] \cdot [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}] - \text{kg}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})}
 \end{aligned}$$

10.3 Reaction [reaction_3](#)

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

Name `reaction_3`

Reaction equation



Product

Table 12: Properties of each product.

| Id | Name | SBO |
|---|------------------|-----|
| <code>mwf626e95e_543f_41e4_aad4_c6bf60ab345b</code> | <code>IL6</code> | |

Kinetic Law

Derived unit contains undeclared units

$$v_3 = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_3}(\text{kIL6Synth}, \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \quad (102)$$

$$\begin{aligned} & \text{function_3}(\text{kIL6Synth}, \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \\ &= \frac{\text{kIL6Synth}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (103)$$

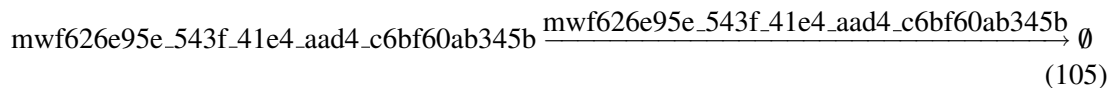
$$\begin{aligned} & \text{function_3}(\text{kIL6Synth}, \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \\ &= \frac{\text{kIL6Synth}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (104)$$

10.4 Reaction [reaction_4](#)

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

Name `reaction_4`

Reaction equation



Reactant

Table 13: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mwf626e95e_543f_41e4_aad4_c6bf60ab345b | IL6 | |

Modifier

Table 14: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mwf626e95e_543f_41e4_aad4_c6bf60ab345b | IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$v_4 = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_4}(\text{kIL6Decay}, \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]) \quad (106)$$

$$\begin{aligned} & \text{function_4}(\text{kIL6Decay}, \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]) \\ &= \frac{\text{kIL6Decay} \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (107)$$

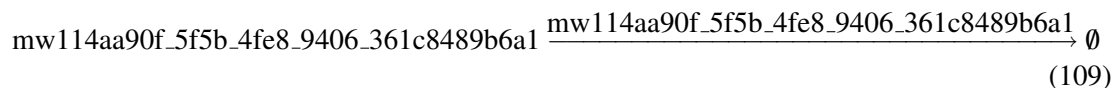
$$\begin{aligned} & \text{function_4}(\text{kIL6Decay}, \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]) \\ &= \frac{\text{kIL6Decay} \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (108)$$

10.5 Reaction [reaction_5](#)

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

Name [reaction_5](#)

Reaction equation



Reactant

Table 15: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |

Modifier

Table 16: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |

Kinetic Law

Derived unit contains undeclared units

$$v_5 = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_5}(\text{kCRPDecay}, [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}], \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \quad (110)$$

$$\begin{aligned} & \text{function_5}(\text{kCRPDecay}, [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}], \\ & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \\ &= \frac{\text{kCRPDecay} \cdot [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (111)$$

$$\begin{aligned} & \text{function_5}(\text{kCRPDecay}, [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}], \\ & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \\ &= \frac{\text{kCRPDecay} \cdot [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (112)$$

10.6 Reaction `reaction_6`

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name `reaction_6`

Reaction equation

$$\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0} + \text{mw80848184_e2dd_47ce_86d7_7a21479342bd} \rightleftharpoons \text{mw4638f126_8cb8_4021_ab41_6ae195743ba0} \quad (113)$$

Reactants

Table 17: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |
| mw80848184_e2dd_47ce_86d7_7a21479342bd | gp130 | |

Modifiers

Table 18: Properties of each modifier.

| Id | Name | SBO |
|--|-------------|-----|
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |
| mw80848184_e2dd_47ce_86d7_7a21479342bd | gp130 | |
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Product

Table 19: Properties of each product.

| Id | Name | SBO |
|--|-------------|-----|
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_6 = & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \\
 & \cdot \text{function_6}(\text{kgp130Off}, \text{kgp130On}, [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\
 & \quad [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\
 & \quad (114)
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_6}(\text{kgp130Off}, \text{kgp130On}, [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \quad (115) \\
 & \quad [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}] - 1}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})}
 \end{aligned}$$

$$\begin{aligned} & \text{function_6}(\text{kgp130Off}, \text{kgp130On}, [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \quad (116) \\ & [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\ & = \frac{\text{kgp130On} \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}] - 1}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned}$$

10.7 Reaction `reaction_7`

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name `reaction_7`

Reaction equation

$$\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374} + \text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1} \xrightleftharpoons{\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}} \text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83} \quad (117)$$

Reactants

Table 20: Properties of each reactant.

| Id | Name | SBO |
|---|------|-----|
| <code>mw10315fa3_6f13_4618_bda8_a8694bd3c374</code> | R | |
| <code>mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1</code> | IL6 | |

Modifiers

Table 21: Properties of each modifier.

| Id | Name | SBO |
|---|-------|-----|
| <code>mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1</code> | IL6 | |
| <code>mw10315fa3_6f13_4618_bda8_a8694bd3c374</code> | R | |
| <code>mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83</code> | R_IL6 | |

Product

Table 22: Properties of each product.

| Id | Name | SBO |
|---|-------|-----|
| <code>mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83</code> | R_IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$v_7 = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_7}(\text{kRLOff}, \text{kRLOn}, [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}], [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}], [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \quad (118)$$

$$\begin{aligned} & \text{function_7}(\text{kRLOff}, \text{kRLOn}, [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}], [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}], [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRLOn} \cdot [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}] \cdot [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}] - \text{kRLOff} \cdot [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}] \cdot [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (119)$$

$$\begin{aligned} & \text{function_7}(\text{kRLOff}, \text{kRLOn}, [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}], [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}], [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRLOn} \cdot [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}] \cdot [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}] - \text{kRLOff} \cdot [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}] \cdot [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (120)$$

10.8 Reaction `reaction_8`

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name `reaction_8`

Reaction equation

$$\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83} + \text{mw80848184_e2dd_47ce_86d7_7a21479342bd} \xrightleftharpoons{\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}} \text{mw80848184_e2dd_47ce_86d7_7a21479342bd} \quad (121)$$

Reactants

Table 23: Properties of each reactant.

| Id | Name | SBO |
|---|--------------------|-----|
| <code>mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83</code> | <code>R_IL6</code> | |
| <code>mw80848184_e2dd_47ce_86d7_7a21479342bd</code> | <code>gp130</code> | |

Modifiers

Table 24: Properties of each modifier.

| Id | Name | SBO |
|--|-------------|-----|
| mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83 | R_IL6 | |
| mw80848184_e2dd_47ce_86d7_7a21479342bd | gp130 | |
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Product

Table 25: Properties of each product.

| Id | Name | SBO |
|--|-------------|-----|
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_8 = & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \\
 & \cdot \text{function_8}(\text{kgp130Off}, \text{kgp130On}, [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \\
 & \quad [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\
 & \quad (122)
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_8}(\text{kgp130Off}, \text{kgp130On}, [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \quad (123) \\
 & \quad [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}] \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}] - \text{kgp130Off} \cdot [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}] \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})}
 \end{aligned}$$

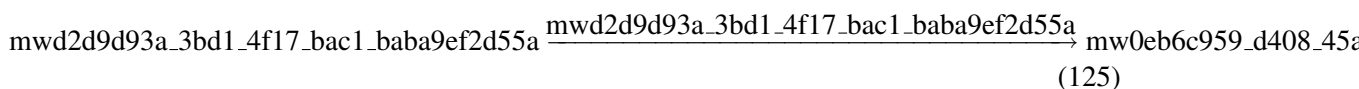
$$\begin{aligned}
 & \text{function_8}(\text{kgp130Off}, \text{kgp130On}, [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \quad (124) \\
 & \quad [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}] \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}] - \text{kgp130Off} \cdot [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}] \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})}
 \end{aligned}$$

10.9 Reaction reaction_16

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

Name reaction_16

Reaction equation



Reactant

Table 26: Properties of each reactant.

| Id | Name | SBO |
|--|-------------|-----|
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Modifier

Table 27: Properties of each modifier.

| Id | Name | SBO |
|--|-------------|-----|
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Product

Table 28: Properties of each product.

| Id | Name | SBO |
|--|---------|-----|
| mw0eb6c959_d408_45a0_a450_928b8c5876bb | Ractive | |

Kinetic Law

Derived unit contains undeclared units

$$v_9 = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_9}(\text{kRAct}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \quad (126)$$

$$\begin{aligned} & \text{function_9}(\text{kRAct}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \quad [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\ &= \frac{\text{kRAct} \cdot [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \tag{127}$$

$$\begin{aligned} & \text{function_9}(\text{kRAct}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \quad [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\ &= \frac{\text{kRAct} \cdot [\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \tag{128}$$

10.10 Reaction `reaction_9`

This is an irreversible reaction of two reactants forming two products influenced by two modifiers.

Name `reaction_9`

Reaction equation

$$\text{mw42054cd7_17af_46da_970c_7f99151906ad} + \text{mw0eb6c959_d408_45a0_a450_928b8c5876bb} \xrightarrow{\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}} \text{mw42054cd7_17af_46da_970c_7f99151906ad} + \text{mw0eb6c959_d408_45a0_a450_928b8c5876bb} \tag{129}$$

Reactants

Table 29: Properties of each reactant.

| Id | Name | SBO |
|---|---------|-----|
| <code>mw42054cd7_17af_46da_970c_7f99151906ad</code> | STAT3 | |
| <code>mw0eb6c959_d408_45a0_a450_928b8c5876bb</code> | Ractive | |

Modifiers

Table 30: Properties of each modifier.

| Id | Name | SBO |
|---|---------|-----|
| <code>mw0eb6c959_d408_45a0_a450_928b8c5876bb</code> | Ractive | |
| <code>mw42054cd7_17af_46da_970c_7f99151906ad</code> | STAT3 | |

Products

Table 31: Properties of each product.

| Id | Name | SBO |
|--|---------|-----|
| mw39c2e431_fdc3_4964_be29_6ca856620b1b | pSTAT3 | |
| mw0eb6c959_d408_45a0_a450_928b8c5876bb | Ractive | |

Kinetic Law

Derived unit contains undeclared units

$$v_{10} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_10}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], [\text{mw42054cd7_17af_46da_970c_7f99151906ad}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569}, \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d}) \quad (130)$$

$$\begin{aligned} & \text{function_10}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], \quad (131) \\ & [\text{mw42054cd7_17af_46da_970c_7f99151906ad}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569}, \\ & \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d}) \\ & = \frac{\text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569} \cdot [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}] \cdot [\text{mw42054cd7_17af_46da_970c_7f99151906ad}]}{\text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d} + [\text{mw42054cd7_17af_46da_970c_7f99151906ad}]} \\ & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \end{aligned}$$

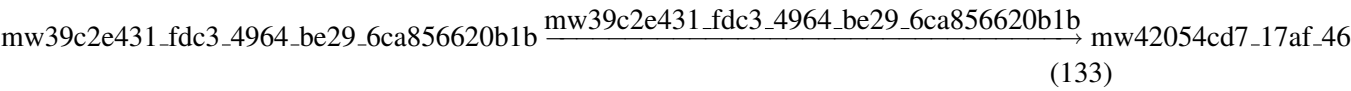
$$\begin{aligned} & \text{function_10}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], \quad (132) \\ & [\text{mw42054cd7_17af_46da_970c_7f99151906ad}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569}, \\ & \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d}) \\ & = \frac{\text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569} \cdot [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}] \cdot [\text{mw42054cd7_17af_46da_970c_7f99151906ad}]}{\text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d} + [\text{mw42054cd7_17af_46da_970c_7f99151906ad}]} \\ & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \end{aligned}$$

10.11 Reaction `reaction_10`

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

Name `reaction_10`

Reaction equation



Reactant

Table 32: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw39c2e431_fdc3_4964_be29_6ca856620b1b | pSTAT3 | |

Modifier

Table 33: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mw39c2e431_fdc3_4964_be29_6ca856620b1b | pSTAT3 | |

Product

Table 34: Properties of each product.

| Id | Name | SBO |
|--|-------|-----|
| mw42054cd7_17af_46da_970c_7f99151906ad | STAT3 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{11} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})$$
$$\cdot \text{function_11}([\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}],$$
$$\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}),$$
$$\text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc},$$
$$\text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52})$$

(134)

$$\begin{aligned}
& \text{function_11} ([\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}], \\
& \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
& \quad \text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc}, \\
& \quad \text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52}) \\
& = \frac{\text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc} \cdot [\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}]}{\text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52} + [\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}]} \\
& \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})
\end{aligned}
\tag{135}$$

$$\begin{aligned}
& \text{function_11} ([\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}], \\
& \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
& \quad \text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc}, \\
& \quad \text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52}) \\
& = \frac{\text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc} \cdot [\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}]}{\text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52} + [\text{mw39c2e431_fdc3_4964_be29_6ca856620b1b}]} \\
& \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})
\end{aligned}
\tag{136}$$

10.12 Reaction `reaction_15`

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

Name `reaction_15`

Reaction equation

$$\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374} \xrightarrow{\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}} \emptyset
\tag{137}$$

Reactant

Table 35: Properties of each reactant.

| Id | Name | SBO |
|---|------|-----|
| <code>mw10315fa3_6f13_4618_bda8_a8694bd3c374</code> | R | |

Modifier

Table 36: Properties of each modifier.

| Id | Name | SBO |
|---|------|-----|
| <code>mw10315fa3_6f13_4618_bda8_a8694bd3c374</code> | R | |

Kinetic Law

Derived unit contains undeclared units

$$v_{12} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_12}(\text{kRdeg}, [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \quad (138)$$

$$\begin{aligned} & \text{function_12}(\text{kRdeg}, [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRdeg} \cdot [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (139)$$

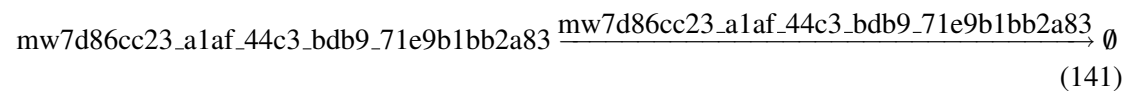
$$\begin{aligned} & \text{function_12}(\text{kRdeg}, [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRdeg} \cdot [\text{mw10315fa3_6f13_4618_bda8_a8694bd3c374}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (140)$$

10.13 Reaction `reaction_11`

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

Name `reaction_11`

Reaction equation



Reactant

Table 37: Properties of each reactant.

| Id | Name | SBO |
|---|--------------------|-----|
| <code>mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83</code> | <code>R_IL6</code> | |

Modifier

Table 38: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83 | R_IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{13} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_13}(\text{kRint}, [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \quad (142)$$

$$\begin{aligned} & \text{function_13}(\text{kRint}, [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRint} \cdot [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (143)$$

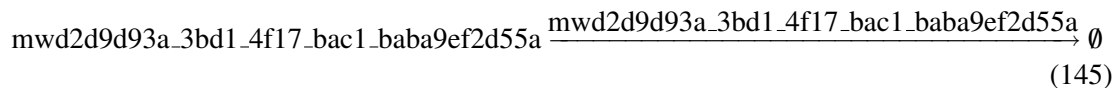
$$\begin{aligned} & \text{function_13}(\text{kRint}, [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRint} \cdot [\text{mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (144)$$

10.14 Reaction [reaction_12](#)

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

Name reaction_12

Reaction equation



Reactant

Table 39: Properties of each reactant.

| Id | Name | SBO |
|--|-------------|-----|
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Modifier

Table 40: Properties of each modifier.

| Id | Name | SBO |
|---------------------------------------|-------------|-----|
| mw2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{14} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_14}(\text{kRint}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), [\text{mw2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \quad (146)$$

$$\begin{aligned} & \text{function_14}(\text{kRint}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), [\text{mw2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\ &= \frac{\text{kRint} \cdot [\text{mw2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (147)$$

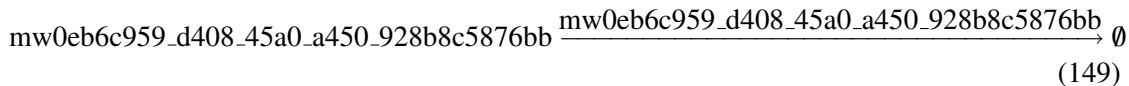
$$\begin{aligned} & \text{function_14}(\text{kRint}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), [\text{mw2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]) \\ &= \frac{\text{kRint} \cdot [\text{mw2d9d93a_3bd1_4f17_bac1_baba9ef2d55a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (148)$$

10.15 Reaction `reaction_13`

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

Name `reaction_13`

Reaction equation



Reactant

Table 41: Properties of each reactant.

| Id | Name | SBO |
|--|---------|-----|
| mw0eb6c959_d408_45a0_a450_928b8c5876bb | Ractive | |

Modifier

Table 42: Properties of each modifier.

| Id | Name | SBO |
|--|---------|-----|
| mw0eb6c959_d408_45a0_a450_928b8c5876bb | Ractive | |

Kinetic Law

Derived unit contains undeclared units

$$v_{15} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_15}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a}) \quad (150)$$

$$\begin{aligned} & \text{function_15}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], \quad (151) \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a}) \\ & = \frac{\text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a} \cdot [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned}$$

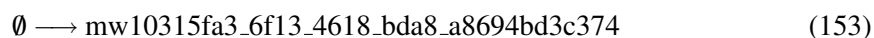
$$\begin{aligned} & \text{function_15}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], \quad (152) \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a}) \\ & = \frac{\text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a} \cdot [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned}$$

10.16 Reaction `reaction_14`

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

Name `reaction_14`

Reaction equation



Product

Table 43: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw10315fa3_6f13_4618_bda8_a8694bd3c374 | R | |

Kinetic Law

Derived unit contains undeclared units

$$v_{16} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_16}(\text{kRsynth}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \quad (154)$$

$$\begin{aligned} & \text{function_16}(\text{kRsynth}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRsynth}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (155)$$

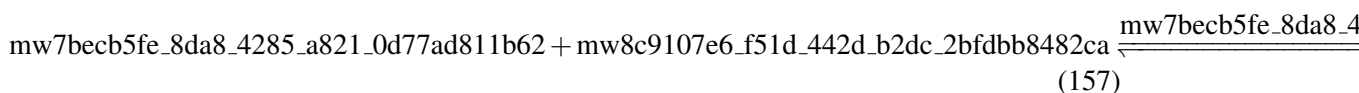
$$\begin{aligned} & \text{function_16}(\text{kRsynth}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRsynth}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (156)$$

10.17 Reaction `reaction_41`

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name `reaction_41`

Reaction equation



Reactants

Table 44: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |
| mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca | gp130 | |

Modifiers

Table 45: Properties of each modifier.

| Id | Name | SBO |
|--|-------------|-----|
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |
| mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9 | R_IL6_gp130 | |
| mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca | gp130 | |

Product

Table 46: Properties of each product.

| Id | Name | SBO |
|--|-------------|-----|
| mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9 | R_IL6_gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{17} = & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \\
 & \cdot \text{function_17}(\text{kgp130Off}, \text{kgp130On}, [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \\
 & \quad [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \\
 & \quad [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}], \\
 & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\
 & \quad (158)
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_17}(\text{kgp130Off}, \text{kgp130On}, [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \quad (159) \\
 & \quad [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \\
 & \quad [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}], \\
 & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] \cdot [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}] - k}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})}
 \end{aligned}$$

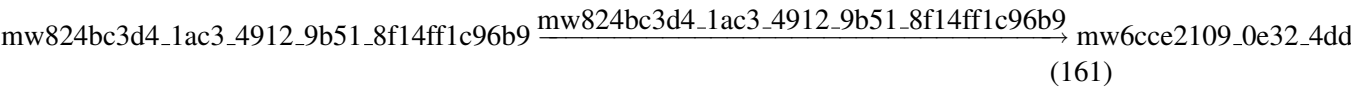
$$\begin{aligned}
 & \text{function_17}(\text{kgp130Off}, \text{kgp130On}, [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \quad (160) \\
 & \quad [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \\
 & \quad [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}], \\
 & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] \cdot [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}] - k}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})}
 \end{aligned}$$

10.18 Reaction reaction_46

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

Name reaction_46

Reaction equation



Reactant

Table 47: Properties of each reactant.

| Id | Name | SBO |
|--|-------------|-----|
| mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9 | R_IL6_gp130 | |

Modifier

Table 48: Properties of each modifier.

| Id | Name | SBO |
|--|-------------|-----|
| mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9 | R_IL6_gp130 | |

Product

Table 49: Properties of each product.

| Id | Name | SBO |
|--|---------|-----|
| mw6cce2109_0e32_4dd9_98ec_41173e8ef07d | Ractive | |

Kinetic Law

Derived unit contains undeclared units

$$v_{18} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})$$
$$\cdot \text{function_18}(\text{kRAct}, [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}],$$
$$\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}))$$
(162)

$$\begin{aligned} & \text{function_18}(\text{kRAct}, [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRAct} \cdot [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (163)$$

$$\begin{aligned} & \text{function_18}(\text{kRAct}, [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRAct} \cdot [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (164)$$

10.19 Reaction `reaction_42`

This is an irreversible reaction of two reactants forming two products influenced by two modifiers.

Name `reaction_42`

Reaction equation

$$\text{mw2b255f94_8018_4b99_bde8_918eeac45446} + \text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d} \xrightarrow{\text{mw2b255f94_8018_4b99_bde8_918eeac45446}} \text{mw2b255f94_8018_4b99_bde8_918eeac45446} + \text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d} \quad (165)$$

Reactants

Table 50: Properties of each reactant.

| Id | Name | SBO |
|---|---------|-----|
| <code>mw2b255f94_8018_4b99_bde8_918eeac45446</code> | STAT3 | |
| <code>mw6cce2109_0e32_4dd9_98ec_41173e8ef07d</code> | Ractive | |

Modifiers

Table 51: Properties of each modifier.

| Id | Name | SBO |
|---|---------|-----|
| <code>mw2b255f94_8018_4b99_bde8_918eeac45446</code> | STAT3 | |
| <code>mw6cce2109_0e32_4dd9_98ec_41173e8ef07d</code> | Ractive | |

Products

Table 52: Properties of each product.

| Id | Name | SBO |
|--|---------|-----|
| mw48867e93_f170_44e8_ac7a_185b23e1bf3b | pSTAT3 | |
| mw6cce2109_0e32_4dd9_98ec_41173e8ef07d | Ractive | |

Kinetic Law

Derived unit contains undeclared units

$$v_{19} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_19}([\text{mw2b255f94_8018_4b99_bde8_918eeac45446}], [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569}, \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \quad (166)$$

$$\begin{aligned} & \text{function_19}([\text{mw2b255f94_8018_4b99_bde8_918eeac45446}], \quad (167) \\ & [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \\ & \text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569}, \\ & \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d}, \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ & = \frac{\text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}] \cdot [\text{mw2b255f94_8018_4b99_bde8_918eeac45446}]}{\text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d} + [\text{mw2b255f94_8018_4b99_bde8_918eeac45446}]} \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \end{aligned}$$

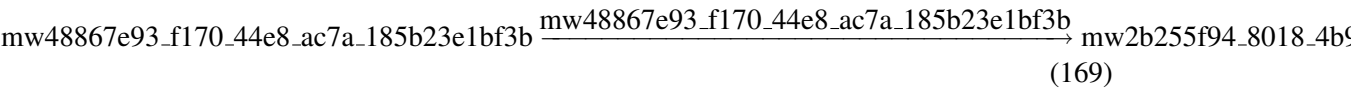
$$\begin{aligned} & \text{function_19}([\text{mw2b255f94_8018_4b99_bde8_918eeac45446}], \quad (168) \\ & [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \\ & \text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569}, \\ & \text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d}, \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ & = \frac{\text{mw9442cd0e_4d7c_4ba6_a695_f84919bdf569} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}] \cdot [\text{mw2b255f94_8018_4b99_bde8_918eeac45446}]}{\text{mwe8fc1900_f07d_468b_b5c8_15400a583c3d} + [\text{mw2b255f94_8018_4b99_bde8_918eeac45446}]} \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \end{aligned}$$

10.20 Reaction reaction_43

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

Name reaction_43

Reaction equation



Reactant

Table 53: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw48867e93_f170_44e8_ac7a_185b23e1bf3b | pSTAT3 | |

Modifier

Table 54: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mw48867e93_f170_44e8_ac7a_185b23e1bf3b | pSTAT3 | |

Product

Table 55: Properties of each product.

| Id | Name | SBO |
|--|-------|-----|
| mw2b255f94_8018_4b99_bde8_918eeac45446 | STAT3 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{20} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})$$
$$\cdot \text{function_20}([\text{mw48867e93_f170_44e8_ac7a_185b23e1bf3b}],$$
$$\text{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc},$$
$$\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}),$$
$$\text{mwfd291862_195f_4979_94b5_b4e5ae1b7d52})$$

(170)

$$\begin{aligned}
& \text{function_20}([mw48867e93_f170_44e8_ac7a_185b23e1bf3b], \\
& \quad mwd36b0261_2480_4cab_9222_2cf8fb0e65dc, \\
& \quad \text{vol}(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5), \\
& \quad mwfd291862_195f_4979_94b5_b4e5ae1b7d52) \\
& = \frac{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc \cdot [mw48867e93_f170_44e8_ac7a_185b23e1bf3b]}{mwfd291862_195f_4979_94b5_b4e5ae1b7d52 + [mw48867e93_f170_44e8_ac7a_185b23e1bf3b]} \\
& \quad \text{vol}(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)
\end{aligned} \tag{171}$$

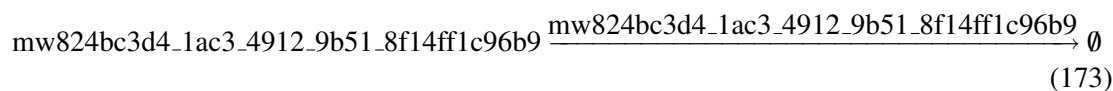
$$\begin{aligned}
& \text{function_20}([mw48867e93_f170_44e8_ac7a_185b23e1bf3b], \\
& \quad mwd36b0261_2480_4cab_9222_2cf8fb0e65dc, \\
& \quad \text{vol}(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5), \\
& \quad mwfd291862_195f_4979_94b5_b4e5ae1b7d52) \\
& = \frac{mwd36b0261_2480_4cab_9222_2cf8fb0e65dc \cdot [mw48867e93_f170_44e8_ac7a_185b23e1bf3b]}{mwfd291862_195f_4979_94b5_b4e5ae1b7d52 + [mw48867e93_f170_44e8_ac7a_185b23e1bf3b]} \\
& \quad \text{vol}(mwe9501423_9fb4_494b_b5b6_288f3fcb17b5)
\end{aligned} \tag{172}$$

10.21 Reaction [reaction_44](#)

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

Name reaction_44

Reaction equation



Reactant

Table 56: Properties of each reactant.

| Id | Name | SBO |
|--|-----------------------------|-----|
| mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9 | R_IL6_gp130 | |

Modifier

Table 57: Properties of each modifier.

| Id | Name | SBO |
|--|-----------------------------|-----|
| mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9 | R_IL6_gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{21} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_21}(\text{kRint}, [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \quad (174)$$

$$\begin{aligned} & \text{function_21}(\text{kRint}, [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRint} \cdot [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (175)$$

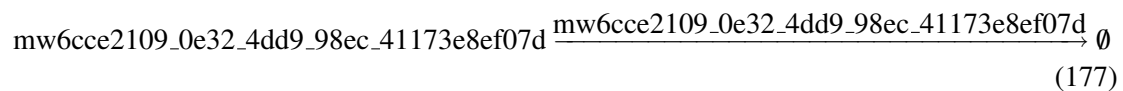
$$\begin{aligned} & \text{function_21}(\text{kRint}, [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRint} \cdot [\text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (176)$$

10.22 Reaction `reaction_45`

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

Name `reaction_45`

Reaction equation



Reactant

Table 58: Properties of each reactant.

| Id | Name | SBO |
|---|---------|-----|
| <code>mw6cce2109_0e32_4dd9_98ec_41173e8ef07d</code> | Ractive | |

Modifier

Table 59: Properties of each modifier.

| Id | Name | SBO |
|--|---------|-----|
| mw6cce2109_0e32_4dd9_98ec_41173e8ef07d | Ractive | |

Kinetic Law

Derived unit contains undeclared units

$$v_{22} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_22}([\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a}) \quad (178)$$

$$\begin{aligned} & \text{function_22}([\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \quad (179) \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \\ & \text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a}) \\ & = \frac{\text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned}$$

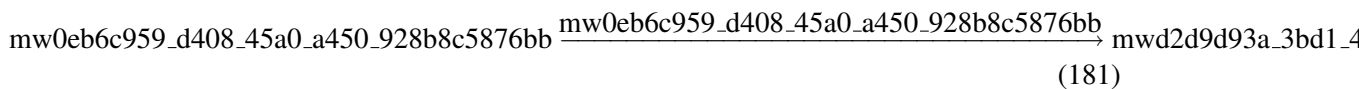
$$\begin{aligned} & \text{function_22}([\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \quad (180) \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \\ & \text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a}) \\ & = \frac{\text{mwf44f7f27_5bb1_4c7f_8964_560fa5e1743a} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned}$$

10.23 Reaction mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4

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

Name mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4

Reaction equation



Reactant

Table 60: Properties of each reactant.

| Id | Name | SBO |
|--|---------|-----|
| mw0eb6c959_d408_45a0_a450_928b8c5876bb | Ractive | |

Modifier

Table 61: Properties of each modifier.

| Id | Name | SBO |
|--|---------|-----|
| mw0eb6c959_d408_45a0_a450_928b8c5876bb | Ractive | |

Product

Table 62: Properties of each product.

| Id | Name | SBO |
|--|-------------|-----|
| mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a | R_IL6_gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{23} = & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \\
 & \cdot \text{function_23}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], \\
 & \quad \text{mw1667a8e0_9d20_4e59_ba51_596148aba787}, \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad \text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8})
 \end{aligned} \tag{182}$$

$$\begin{aligned}
 & \text{function_23}([\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}], \\
 & \quad \text{mw1667a8e0_9d20_4e59_ba51_596148aba787}, \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad \text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8}) \\
 = & \frac{\text{mw1667a8e0_9d20_4e59_ba51_596148aba787} \cdot [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) + [\text{mw0eb6c959_d408_45a0_a450_928b8c5876bb}]}
 \end{aligned} \tag{183}$$

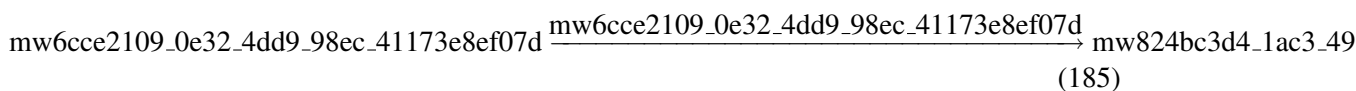
$$\begin{aligned}
& \text{function_23}([mw0eb6c959_d408_45a0_a450_928b8c5876bb], \\
& mw1667a8e0_9d20_4e59_ba51_596148aba787, \\
& \text{vol}(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e), \\
& mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8) \\
& = \frac{mw1667a8e0_9d20_4e59_ba51_596148aba787 \cdot [mw0eb6c959_d408_45a0_a450_928b8c5876bb] \\
& \quad mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8 + [mw0eb6c959_d408_45a0_a450_928b8c5876bb]}{\text{vol}(mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e)}
\end{aligned} \tag{184}$$

10.24 Reaction [mw64df7c9e_35da_4c7f_be56_c5dabfb060b6](#)

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

Name [mw64df7c9e_35da_4c7f_be56_c5dabfb060b6](#)

Reaction equation



Reactant

Table 63: Properties of each reactant.

| Id | Name | SBO |
|--|---------|-----|
| mw6cce2109_0e32_4dd9_98ec_41173e8ef07d | Ractive | |

Modifier

Table 64: Properties of each modifier.

| Id | Name | SBO |
|--|---------|-----|
| mw6cce2109_0e32_4dd9_98ec_41173e8ef07d | Ractive | |

Product

Table 65: Properties of each product.

| Id | Name | SBO |
|--|-------------|-----|
| mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9 | R_IL6_gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{24} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_24}(\text{mw1667a8e0_9d20_4e59_ba51_596148aba787}, [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8}) \quad (186)$$

$$\begin{aligned} & \text{function_24}(\text{mw1667a8e0_9d20_4e59_ba51_596148aba787}, \\ & [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \\ & \text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8}) \\ & = \frac{\text{mw1667a8e0_9d20_4e59_ba51_596148aba787} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]}{\text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8} + [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]} \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \end{aligned} \quad (187)$$

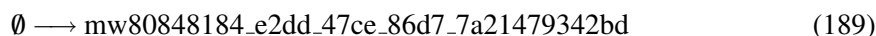
$$\begin{aligned} & \text{function_24}(\text{mw1667a8e0_9d20_4e59_ba51_596148aba787}, \\ & [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \\ & \text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8}) \\ & = \frac{\text{mw1667a8e0_9d20_4e59_ba51_596148aba787} \cdot [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]}{\text{mwfcf06900_5f2f_4bb3_bb1f_12023612b8a8} + [\text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d}]} \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \end{aligned} \quad (188)$$

10.25 Reaction mw391f3b8e_5649_4851_b2e2_782cb3e015b6

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

Name mw391f3b8e_5649_4851_b2e2_782cb3e015b6

Reaction equation



Product

Table 66: Properties of each product.

| Id | Name | SBO |
|--|-------|-----|
| mw80848184_e2dd_47ce_86d7_7a21479342bd | gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{25} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_25}(\text{kRsynth}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \quad (190)$$

$$\begin{aligned} & \text{function_25}(\text{kRsynth}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRsynth}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (191)$$

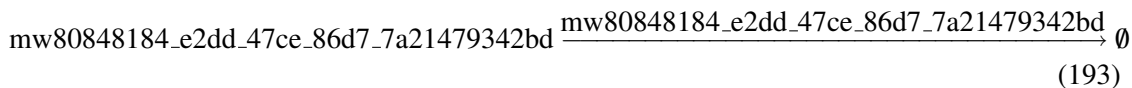
$$\begin{aligned} & \text{function_25}(\text{kRsynth}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRsynth}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (192)$$

10.26 Reaction mw4a00a3a4_778f_4952_8100_2dc3cc2b7046

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

Name mw4a00a3a4_778f_4952_8100_2dc3cc2b7046

Reaction equation



Reactant

Table 67: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mw80848184_e2dd_47ce_86d7_7a21479342bd | gp130 | |

Modifier

Table 68: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mw80848184_e2dd_47ce_86d7_7a21479342bd | gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{26} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_26}(\text{kRdeg}, [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \quad (194)$$

$$\begin{aligned} & \text{function_26}(\text{kRdeg}, [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRdeg} \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (195)$$

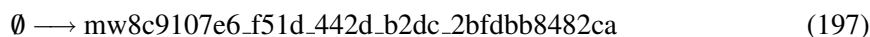
$$\begin{aligned} & \text{function_26}(\text{kRdeg}, [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRdeg} \cdot [\text{mw80848184_e2dd_47ce_86d7_7a21479342bd}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (196)$$

10.27 Reaction [mw6db30657_4e56_4c3a_8575_9c67393dde4f](#)

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

Name [mw6db30657_4e56_4c3a_8575_9c67393dde4f](#)

Reaction equation



Product

Table 69: Properties of each product.

| Id | Name | SBO |
|--|-----------------------|-----|
| mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca | gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{27} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_27}(\text{kRsynth}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \quad (198)$$

$$\begin{aligned} & \text{function_27}(\text{kRsynth}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRsynth}}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (199)$$

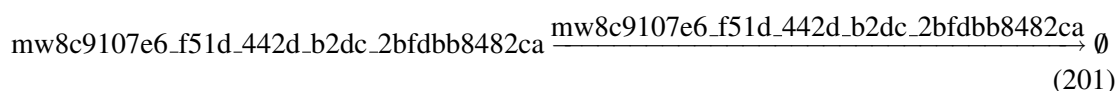
$$\begin{aligned} & \text{function_27}(\text{kRsynth}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRsynth}}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (200)$$

10.28 Reaction mw6f470e13_f0e4_4294_83d8_59dd5670d10c

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

Name mw6f470e13_f0e4_4294_83d8_59dd5670d10c

Reaction equation



Reactant

Table 70: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca | gp130 | |

Modifier

Table 71: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca | gp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{28} &= \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \\ &\quad \cdot \text{function_28}(\text{kRdeg}, [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}], \\ &\quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \end{aligned} \quad (202)$$

$$\begin{aligned} & \text{function_28}(\text{kRdeg}, [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}], \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRdeg} \cdot [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (203)$$

$$\begin{aligned} & \text{function_28}(\text{kRdeg}, [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}], \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRdeg} \cdot [\text{mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (204)$$

10.29 Reaction [mwfb35eca9_7afc_4ba8_a46c_738cab57eb9f](#)

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name [mwfb35eca9_7afc_4ba8_a46c_738cab57eb9f](#)

Reaction equation

$$\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc} \xrightleftharpoons{\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc, mwd31f52cc_04e7_40e0_885f_c7b2d9e62215}} \text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215} \quad (205)$$

Reactant

Table 72: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |

Modifiers

Table 73: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |
| mwd31f52cc_04e7_40e0_885f_c7b2d9e62215 | sR | |

Product

Table 74: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mwd31f52cc_04e7_40e0_885f_c7b2d9e62215 | sR | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{29} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\
 & \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}] \\
 & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\
 & \cdot [\text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215}]
 \end{aligned}
 \tag{206}$$

10.30 Reaction [mw61d2af92_6da5_41ce_b90e_aa6f430e6ba1](#)

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mw61d2af92_6da5_41ce_b90e_aa6f430e6ba1

Reaction equation

$$\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b} \xrightleftharpoons[\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}]{\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}}
 \tag{207}$$

Reactant

Table 75: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mwf626e95e_543f_41e4_aad4_c6bf60ab345b | IL6 | |

Modifiers

Table 76: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mwf626e95e_543f_41e4_aad4_c6bf60ab345b | IL6 | |
| mw2c9b0499_3325_4394_8af3_bbf653a944a0 | IL6 | |

Product

Table 77: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw2c9b0499_3325_4394_8af3_bbf653a944a0 | IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{30} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\
 & \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}] \\
 & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\
 & \cdot [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}]
 \end{aligned}
 \tag{208}$$

10.31 Reaction mw4c099d5c_200f_474e_8ec1_59e9223a8afd

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name mw4c099d5c_200f_474e_8ec1_59e9223a8afd

Reaction equation

$$\text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215} + \text{mw2c9b0499_3325_4394_8af3_bbf653a944a0} \xrightarrow{\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}} \text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}
 \tag{209}$$

Reactants

Table 78: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mwd31f52cc_04e7_40e0_885f_c7b2d9e62215 | sR | |
| mw2c9b0499_3325_4394_8af3_bbf653a944a0 | IL6 | |

Modifiers

Table 79: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mw2c9b0499_3325_4394_8af3_bbf653a944a0 | IL6 | |

| Id | Name | SBO |
|--|--------|-----|
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |
| mwd31f52cc_04e7_40e0_885f_c7b2d9e62215 | sR | |

Product

Table 80: Properties of each product.

| Id | Name | SBO |
|--|--------|-----|
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{31} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_29}(\text{kRLOff}, \text{kRLOn}, [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}], [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], [\text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215}], \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \quad (210)$$

$$\begin{aligned} & \text{function_29}(\text{kRLOff}, \text{kRLOn}, [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}], [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], [\text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215}], \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRLOn} \cdot [\text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215}] \cdot [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}] - \text{kRLOff} \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (211) \end{aligned}$$

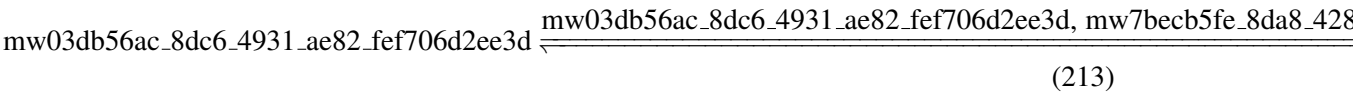
$$\begin{aligned} & \text{function_29}(\text{kRLOff}, \text{kRLOn}, [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}], [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], [\text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215}], \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{kRLOn} \cdot [\text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215}] \cdot [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}] - \text{kRLOff} \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \quad (212) \end{aligned}$$

10.32 Reaction mwbe8567ce_3349_4442_8b12_53cd9bc168e7

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mwbe8567ce_3349_4442_8b12_53cd9bc168e7

Reaction equation



Reactant

Table 81: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | sR_IL6 | |

Modifiers

Table 82: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | sR_IL6 | |
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |

Product

Table 83: Properties of each product.

| Id | Name | SBO |
|--|--------|-----|
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{32} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\ & \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}] \\ & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\ & \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] \end{aligned}$$

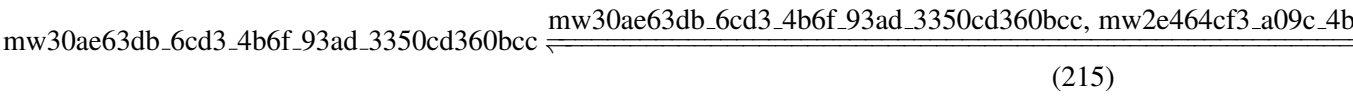
(214)

10.33 Reaction mw12a9fa7e_a273_4c1e_b970_ed33f3a9a705

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mw12a9fa7e_a273_4c1e_b970_ed33f3a9a705

Reaction equation



Reactant

Table 84: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |

Modifiers

Table 85: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |
| mw2e464cf3_a09c_4b7c_9f3c_06720016a48e | sR | |

Product

Table 86: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw2e464cf3_a09c_4b7c_9f3c_06720016a48e | sR | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{33} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\ & \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}] \\ & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\ & \cdot [\text{mw2e464cf3_a09c_4b7c_9f3c_06720016a48e}] \end{aligned}$$

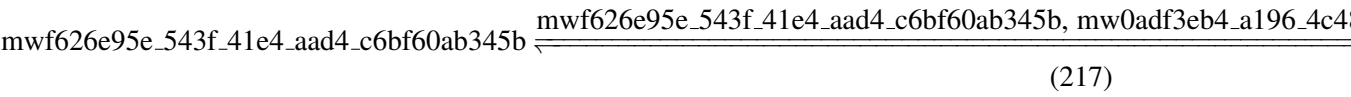
(216)

10.34 Reaction mw1046000b_e1e8_4f6f_82a1_532d2aa793bb

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mw1046000b_e1e8_4f6f_82a1_532d2aa793bb

Reaction equation



Reactant

Table 87: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mwf626e95e_543f_41e4_aad4_c6bf60ab345b | IL6 | |

Modifiers

Table 88: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mwf626e95e_543f_41e4_aad4_c6bf60ab345b | IL6 | |
| mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1 | IL6 | |

Product

Table 89: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1 | IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{34} = \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \cdot [\text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b}] - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \cdot [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}]$$

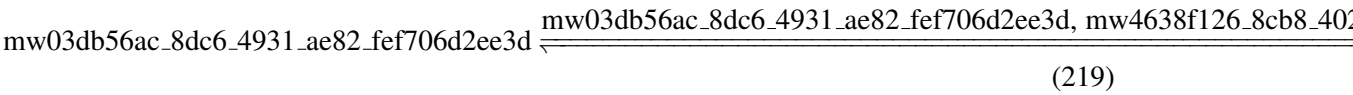
(218)

10.35 Reaction mw8e8b65a8_6830_4091_9a40_19645e8fe554

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mw8e8b65a8_6830_4091_9a40_19645e8fe554

Reaction equation



Reactant

Table 90: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | sR_IL6 | |

Modifiers

Table 91: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | sR_IL6 | |
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |

Product

Table 92: Properties of each product.

| Id | Name | SBO |
|--|--------|-----|
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{35} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\ & \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}] \\ & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\ & \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] \end{aligned}$$

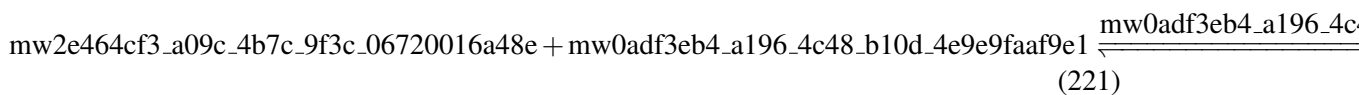
(220)

10.36 Reaction mwa812f08f_1035_42bd_82d2_72d691308f88

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name mwa812f08f_1035_42bd_82d2_72d691308f88

Reaction equation



Reactants

Table 93: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw2e464cf3_a09c_4b7c_9f3c_06720016a48e | sR | |
| mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1 | IL6 | |

Modifiers

Table 94: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1 | IL6 | |
| mw2e464cf3_a09c_4b7c_9f3c_06720016a48e | sR | |
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |

Product

Table 95: Properties of each product.

| Id | Name | SBO |
|--|--------|-----|
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{36} = & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \\ & \cdot \text{function_30}(\text{kRLOff}, \text{kRLOn}, [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}], \\ & [\text{mw2e464cf3_a09c_4b7c_9f3c_06720016a48e}], \\ & [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \end{aligned} \quad (222)$$

$$\begin{aligned} &\text{function_30}(\text{kRLOff}, \text{kRLOn}, [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}], \\ &[\text{mw2e464cf3_a09c_4b7c_9f3c_06720016a48e}], \\ &[\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\ &\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRLOn} \cdot [\text{mw2e464cf3_a09c_4b7c_9f3c_06720016a48e}] \cdot [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}] - \text{kRLO}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \tag{223}$$

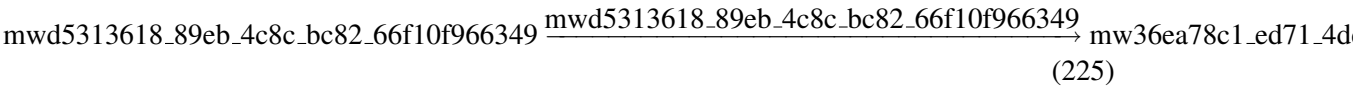
$$\begin{aligned} &\text{function_30}(\text{kRLOff}, \text{kRLOn}, [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}], \\ &[\text{mw2e464cf3_a09c_4b7c_9f3c_06720016a48e}], \\ &[\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\ &\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ &= \frac{\text{kRLOn} \cdot [\text{mw2e464cf3_a09c_4b7c_9f3c_06720016a48e}] \cdot [\text{mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1}] - \text{kRLO}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \tag{224}$$

10.37 Reaction [mwab0012ac_e5f2_4904_9893_820fd210402e](#)

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

Name mwab0012ac_e5f2_4904_9893_820fd210402e

Reaction equation



Reactant

| Table 96: Properties of each reactant. | | |
|--|------|-----|
| Id | Name | SBO |
| mwd5313618_89eb_4c8c_bc82_66f10f966349 | CRP | |

Modifier

| Table 97: Properties of each modifier. | | |
|--|------|-----|
| Id | Name | SBO |
| mwd5313618_89eb_4c8c_bc82_66f10f966349 | CRP | |

Product

Table 98: Properties of each product.

| Id | Name | SBO |
|--|------------------|-----|
| mw36ea78c1_ed71_4def_96d3_857a442d7195 | CRPExtracellular | |

Kinetic Law

Derived unit contains undeclared units

$$v_{37} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_31}(\text{mw862f1480_c60c_4863_a565_b2c1c77e238e}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), [\text{mwd5313618_89eb_4c8c_bc82_66f10f966349}]) \quad (226)$$

$$\begin{aligned} & \text{function_31}(\text{mw862f1480_c60c_4863_a565_b2c1c77e238e}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), [\text{mwd5313618_89eb_4c8c_bc82_66f10f966349}]) \\ &= \frac{\text{mw862f1480_c60c_4863_a565_b2c1c77e238e} \cdot [\text{mwd5313618_89eb_4c8c_bc82_66f10f966349}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (227)$$

$$\begin{aligned} & \text{function_31}(\text{mw862f1480_c60c_4863_a565_b2c1c77e238e}, \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), [\text{mwd5313618_89eb_4c8c_bc82_66f10f966349}]) \\ &= \frac{\text{mw862f1480_c60c_4863_a565_b2c1c77e238e} \cdot [\text{mwd5313618_89eb_4c8c_bc82_66f10f966349}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (228)$$

10.38 Reaction mwcdc24bd4_d9e4_47fe_8300_d222d853111c

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mwcdc24bd4_d9e4_47fe_8300_d222d853111c

Reaction equation

$$\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1} \rightleftharpoons \text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}, \text{mw36ea78c1_ed71_4def_96d3_857a442d7195} \quad (229)$$

Reactant

Table 99: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |

Modifiers

Table 100: Properties of each modifier.

| Id | Name | SBO |
|--|------------------|-----|
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |
| mw36ea78c1_ed71_4def_96d3_857a442d7195 | CRPExtracellular | |

Product

Table 101: Properties of each product.

| Id | Name | SBO |
|--|------------------|-----|
| mw36ea78c1_ed71_4def_96d3_857a442d7195 | CRPExtracellular | |

Kinetic Law

Derived unit contains undeclared units

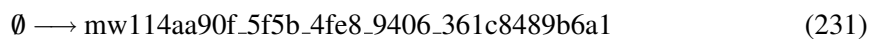
$$\begin{aligned}
 v_{38} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\
 & \cdot [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}] \\
 & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\
 & \cdot [\text{mw36ea78c1_ed71_4def_96d3_857a442d7195}]
 \end{aligned}
 \tag{230}$$

10.39 Reaction mwff2ebcf1_dcf1_47b9_9cac_7306fc6f7f76

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

Name mwff2ebcf1_dcf1_47b9_9cac_7306fc6f7f76

Reaction equation



Product

Table 102: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |

Kinetic Law

Derived unit contains undeclared units

$$v_{39} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_32}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \text{mw65c85954_5ca0_4df2_9e22_ff2aa3fbe3f1}) \quad (232)$$

$$\begin{aligned} & \text{function_32}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \text{mw65c85954_5ca0_4df2_9e22_ff2aa3fbe3f1}) \\ &= \frac{\text{mw65c85954_5ca0_4df2_9e22_ff2aa3fbe3f1}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (233)$$

$$\begin{aligned} & \text{function_32}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \text{mw65c85954_5ca0_4df2_9e22_ff2aa3fbe3f1}) \\ &= \frac{\text{mw65c85954_5ca0_4df2_9e22_ff2aa3fbe3f1}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (234)$$

10.40 Reaction mw1c5a5ff7_5130_490f_a740_6a744ccf8a94

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mw1c5a5ff7_5130_490f_a740_6a744ccf8a94

Reaction equation

$$\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99} \rightleftharpoons \frac{\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}, \text{mwd65b5b39_dc1b_4e}}{\quad} \quad (235)$$

Reactant

Table 103: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |

Modifiers

Table 104: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |
| mwd65b5b39_dc1b_4e77_a999_67277a880e5e | sgp130 | |

Product

Table 105: Properties of each product.

| Id | Name | SBO |
|--|--------|-----|
| mwd65b5b39_dc1b_4e77_a999_67277a880e5e | sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{40} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\ & \cdot [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}] \\ & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\ & \cdot [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}] \end{aligned} \quad (236)$$

10.41 Reaction [mw7b56053c_7256_4703_a8c3_4fd46b2c23d0](#)

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name [mw7b56053c_7256_4703_a8c3_4fd46b2c23d0](#)

Reaction equation

$$\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99} \xrightleftharpoons[\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}]{\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99, mw147d30ec_478e_408d_8197_408c_ad47_1daec8104cd8}} \text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e} \quad (237)$$

Reactant

Table 106: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |

Modifiers

Table 107: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |
| mw147d30ec_478e_4090_b496_128a131d29eb | sgp130 | |

Product

Table 108: Properties of each product.

| Id | Name | SBO |
|--|--------|-----|
| mw147d30ec_478e_4090_b496_128a131d29eb | sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{41} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\ & \cdot [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}] \\ & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\ & \cdot [\text{mw147d30ec_478e_4090_b496_128a131d29eb}] \end{aligned} \tag{238}$$

10.42 Reaction mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c

Reaction equation

$$\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e} + \text{mw7becb5fe_8da8_4285_a821_0d77ad811b62} \xrightleftharpoons{\text{mw6335d5d7_c7b0}} \tag{239}$$

Reactants

Table 109: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mwd65b5b39_dc1b_4e77_a999_67277a880e5e | sgp130 | |
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |

Modifiers

Table 110: Properties of each modifier.

| Id | Name | SBO |
|--|---------------|-----|
| mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3 | sR_IL6_sgp130 | |
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |
| mwd65b5b39_dc1b_4e77_a999_67277a880e5e | sgp130 | |

Product

Table 111: Properties of each product.

| Id | Name | SBO |
|--|---------------|-----|
| mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3 | sR_IL6_sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{42} = & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \\
 & \cdot \text{function_33}(\text{kgp130Off}, \text{kgp130On}, [\text{mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3}], \\
 & \quad [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \\
 & \quad [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}], \\
 & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\
 & \quad (240)
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_33}(\text{kgp130Off}, \text{kgp130On}, [\text{mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3}], \quad (241) \\
 & \quad [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \\
 & \quad [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}], \\
 & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\
 = & \frac{\text{kgp130On} \cdot [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] - \text{kgp130Off} \cdot [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})}
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_33}(\text{kgp130Off}, \text{kgp130On}, [\text{mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3}], \quad (242) \\
 & \quad [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \\
 & \quad [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}], \\
 & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\
 = & \frac{\text{kgp130On} \cdot [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] - \text{kgp130Off} \cdot [\text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})}
 \end{aligned}$$

10.43 Reaction [mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6](#)

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name [mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6](#)

Reaction equation

[mw4638f126_8cb8_4021_ab41_6ae195743ba0](#) + [mw147d30ec_478e_4090_b496_128a131d29eb](#) $\xrightleftharpoons[\text{(243)}]{\text{mw147d30ec_478e_4090_b496_128a131d29eb}}$

Reactants

Table 112: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |
| mw147d30ec_478e_4090_b496_128a131d29eb | sgp130 | |

Modifiers

Table 113: Properties of each modifier.

| Id | Name | SBO |
|--|---------------|-----|
| mw147d30ec_478e_4090_b496_128a131d29eb | sgp130 | |
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |
| mwab41493c_6349_45f1_a226_3030cfed0e06 | sR_IL6_sgp130 | |

Product

Table 114: Properties of each product.

| Id | Name | SBO |
|--|---------------|-----|
| mwab41493c_6349_45f1_a226_3030cfed0e06 | sR_IL6_sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{43} = & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \\
 & \cdot \text{function_34}(\text{kgp130Off}, \text{kgp130On}, [\text{mw147d30ec_478e_4090_b496_128a131d29eb}], \\
 & \quad [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwab41493c_6349_45f1_a226_3030cfed0e06}]) \\
 & \quad (244)
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_34}(\text{kgp130Off}, \text{kgp130On}, [\text{mw147d30ec_478e_4090_b496_128a131d29eb}], \quad (245) \\
 & \quad [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwab41493c_6349_45f1_a226_3030cfed0e06}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] \cdot [\text{mw147d30ec_478e_4090_b496_128a131d29eb}] - \text{I}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})}
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_34}(\text{kgp130Off}, \text{kgp130On}, [\text{mw147d30ec_478e_4090_b496_128a131d29eb}], \quad (246) \\
 & \quad [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\
 & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\
 & \quad [\text{mwab41493c_6349_45f1_a226_3030cfed0e06}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] \cdot [\text{mw147d30ec_478e_4090_b496_128a131d29eb}] - \text{I}}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})}
 \end{aligned}$$

10.44 Reaction [mw01babcdf_0f03_46b0_81b1_201cc846e361](#)

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name [mw01babcdf_0f03_46b0_81b1_201cc846e361](#)

Reaction equation

$$\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e} \xrightleftharpoons{\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e}, \text{mw6335d5d7_c7b0_4b}} \quad (247)$$

Reactant

Table 115: Properties of each reactant.

| Id | Name | SBO |
|--|-------------------------------|-----|
| mw810ff751_fa4e_4143_bd50_169b3e325e1e | sR_IL6_sgp130 | |

Modifiers

Table 116: Properties of each modifier.

| Id | Name | SBO |
|--|---------------|-----|
| mw810ff751_fa4e_4143_bd50_169b3e325e1e | sR_IL6_sgp130 | |
| mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3 | sR_IL6_sgp130 | |

Product

Table 117: Properties of each product.

| Id | Name | SBO |
|--|---------------|-----|
| mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3 | sR_IL6_sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{44} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\
 & \cdot [\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e}] \\
 & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\
 & \cdot [\text{mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3}]
 \end{aligned} \tag{248}$$

10.45 Reaction mwae5dbb44_7de5_46ab_8c20_ac4f8956b0f0

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mwae5dbb44_7de5_46ab_8c20_ac4f8956b0f0

Reaction equation

$$\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e} \xrightleftharpoons{\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e, mwab41493c_6349_451}} \tag{249}$$

Reactant

Table 118: Properties of each reactant.

| Id | Name | SBO |
|--|---------------|-----|
| mw810ff751_fa4e_4143_bd50_169b3e325e1e | sR_IL6_sgp130 | |

Modifiers

Table 119: Properties of each modifier.

| Id | Name | SBO |
|--|---------------|-----|
| mw810ff751_fa4e_4143_bd50_169b3e325e1e | sR_IL6_sgp130 | |
| mwab41493c_6349_45f1_a226_3030cfed0e06 | sR_IL6_sgp130 | |

Product

Table 120: Properties of each product.

| Id | Name | SBO |
|--|---------------|-----|
| mwab41493c_6349_45f1_a226_3030cfed0e06 | sR_IL6_sgp130 | |

Kinetic Law

Derived unit contains undeclared units

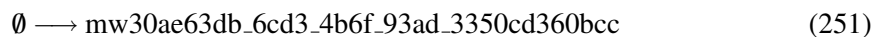
$$\begin{aligned} v_{45} = & \text{mwc67e1333_079a_4bea_9b4f_0a1b15ddd7bb} \\ & \cdot [\text{mw810ff751_fa4e_4143_bd50_169b3e325e1e}] \\ & - \text{mwce10678d_8197_408c_ad47_1daec8104cd8} \\ & \cdot [\text{mwab41493c_6349_45f1_a226_3030cfed0e06}] \end{aligned} \quad (250)$$

10.46 Reaction [mw432fde6e_59ab_47f0_9fb1_086433a602e3](#)

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

Name [mw432fde6e_59ab_47f0_9fb1_086433a602e3](#)

Reaction equation



Product

Table 121: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |

Kinetic Law

Derived unit contains undeclared units

$$v_{46} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_35}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \text{mwc4c58db7_5535_4590_aaa5_bbc8ed53cdab}) \quad (252)$$

$$\begin{aligned} & \text{function_35}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \quad \text{mwc4c58db7_5535_4590_aaa5_bbc8ed53cdab}) \\ &= \frac{\text{mwc4c58db7_5535_4590_aaa5_bbc8ed53cdab}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (253)$$

$$\begin{aligned} & \text{function_35}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \quad \text{mwc4c58db7_5535_4590_aaa5_bbc8ed53cdab}) \\ &= \frac{\text{mwc4c58db7_5535_4590_aaa5_bbc8ed53cdab}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (254)$$

10.47 Reaction [mw41c27823_d7ee_4554_9eac_3d5beec8e854](#)

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

Name mw41c27823_d7ee_4554_9eac_3d5beec8e854

Reaction equation

$$\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc} \xrightarrow{\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}} \emptyset \quad (255)$$

Reactant

Table 122: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |

Modifier

Table 123: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |

Kinetic Law

Derived unit contains undeclared units

$$v_{47} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_36}([\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}], \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \text{mw88a75379_f9a1_4acc_baeb_94c32bb736a5}) \quad (256)$$

$$\begin{aligned} & \text{function_36}([\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}], \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \text{mw88a75379_f9a1_4acc_baeb_94c32bb736a5}) \\ & = \frac{\text{mw88a75379_f9a1_4acc_baeb_94c32bb736a5} \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (257)$$

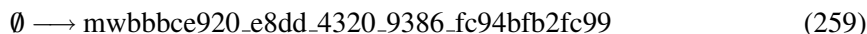
$$\begin{aligned} & \text{function_36}([\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}], \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \text{mw88a75379_f9a1_4acc_baeb_94c32bb736a5}) \\ & = \frac{\text{mw88a75379_f9a1_4acc_baeb_94c32bb736a5} \cdot [\text{mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (258)$$

10.48 Reaction mw50c6744c_e883_4612_8663_e38750cbad1b

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

Name mw50c6744c_e883_4612_8663_e38750cbad1b

Reaction equation



Product

Table 124: Properties of each product.

| Id | Name | SBO |
|--|--------|-----|
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{48} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_37}(\text{mw1f41474c_c399_4a60_a53a_9926dd092e8d}, \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \quad (260)$$

$$\begin{aligned} & \text{function_37}(\text{mw1f41474c_c399_4a60_a53a_9926dd092e8d}, \\ & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \\ &= \frac{\text{mw1f41474c_c399_4a60_a53a_9926dd092e8d}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (261)$$

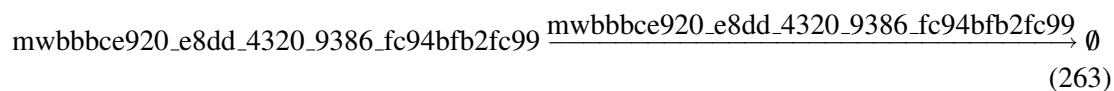
$$\begin{aligned} & \text{function_37}(\text{mw1f41474c_c399_4a60_a53a_9926dd092e8d}, \\ & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})) \\ &= \frac{\text{mw1f41474c_c399_4a60_a53a_9926dd092e8d}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (262)$$

10.49 Reaction [mw6a99eb5_ea4c_4733_98dd_1daf5ec6b0db](#)

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

Name [mw6a99eb5_ea4c_4733_98dd_1daf5ec6b0db](#)

Reaction equation



Reactant

Table 125: Properties of each reactant.

| Id | Name | SBO |
|--|------------------------|-----|
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |

Modifier

Table 126: Properties of each modifier.

| Id | Name | SBO |
|--|--------|-----|
| mwbbbce920_e8dd_4320_9386_fc94bfb2fc99 | sgp130 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{49} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_38}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}], \text{mwbc5a310_9b67_405e_89ec_43d25e8cc93d}) \quad (264)$$

$$\begin{aligned} & \text{function_38}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}], \text{mwbc5a310_9b67_405e_89ec_43d25e8cc93d}) \\ &= \frac{\text{mwbc5a310_9b67_405e_89ec_43d25e8cc93d} \cdot [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (265)$$

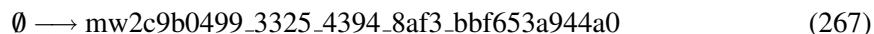
$$\begin{aligned} & \text{function_38}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}], \text{mwbc5a310_9b67_405e_89ec_43d25e8cc93d}) \\ &= \frac{\text{mwbc5a310_9b67_405e_89ec_43d25e8cc93d} \cdot [\text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (266)$$

10.50 Reaction mw1ce0c484_681f_4d85_8ffe_392d0c100cfa

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

Name mw1ce0c484_681f_4d85_8ffe_392d0c100cfa

Reaction equation



Product

Table 127: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw2c9b0499_3325_4394_8af3_bbf653a944a0 | IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{50} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_39}(\text{mwa8d72918_f6c2_4d81_bf3b_fc2b464d5e69}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \quad (268)$$

$$\begin{aligned} & \text{function_39}(\text{mwa8d72918_f6c2_4d81_bf3b_fc2b464d5e69}, \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{mwa8d72918_f6c2_4d81_bf3b_fc2b464d5e69}}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (269)$$

$$\begin{aligned} & \text{function_39}(\text{mwa8d72918_f6c2_4d81_bf3b_fc2b464d5e69}, \\ & \quad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{mwa8d72918_f6c2_4d81_bf3b_fc2b464d5e69}}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (270)$$

10.51 Reaction [mwf913ea0b_785a_4701_ac91_b18ab5dd5a89](#)

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

Name [mwf913ea0b_785a_4701_ac91_b18ab5dd5a89](#)

Reaction equation

$$\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0} \xrightarrow{\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}} \emptyset \quad (271)$$

Reactant

Table 128: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw2c9b0499_3325_4394_8af3_bbf653a944a0 | IL6 | |

Modifier

Table 129: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mw2c9b0499_3325_4394_8af3_bbf653a944a0 | IL6 | |

Kinetic Law

Derived unit contains undeclared units

$$v_{51} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_40}(\text{mw06241335_b5f2_47ed_bdcc_ef77b68a2b98}, [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}], \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \quad (272)$$

$$\begin{aligned} & \text{function_40}(\text{mw06241335_b5f2_47ed_bdcc_ef77b68a2b98}, [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ & = \frac{\text{mw06241335_b5f2_47ed_bdcc_ef77b68a2b98} \cdot [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (273)$$

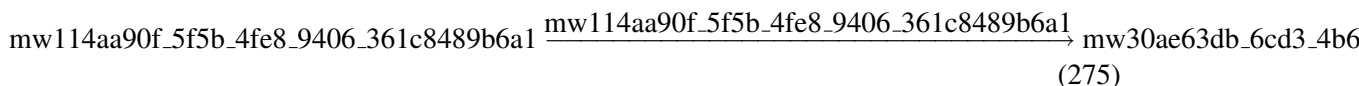
$$\begin{aligned} & \text{function_40}(\text{mw06241335_b5f2_47ed_bdcc_ef77b68a2b98}, [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ & = \frac{\text{mw06241335_b5f2_47ed_bdcc_ef77b68a2b98} \cdot [\text{mw2c9b0499_3325_4394_8af3_bbf653a944a0}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (274)$$

10.52 Reaction mw71d90b81_8211_4039_8807_12a7fe03206c

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

Name mw71d90b81_8211_4039_8807_12a7fe03206c

Reaction equation



Reactant

Table 130: Properties of each reactant.

| Id | Name | SBO |
|--|------|-----|
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |

Modifier

Table 131: Properties of each modifier.

| Id | Name | SBO |
|--|------|-----|
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |

Products

Table 132: Properties of each product.

| Id | Name | SBO |
|--|------|-----|
| mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc | sR | |
| mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 | CRP | |

Kinetic Law

Derived unit contains undeclared units

$$v_{52} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_41}([\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}], \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \text{mw5832a2dc_ee18_44df_aa59_ccb21cb74df2}) \quad (276)$$

$$\begin{aligned} & \text{function_41}([\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}], \quad (277) \\ & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \text{mw5832a2dc_ee18_44df_aa59_ccb21cb74df2}) \\ & = \frac{\text{mw5832a2dc_ee18_44df_aa59_ccb21cb74df2} \cdot [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned}$$

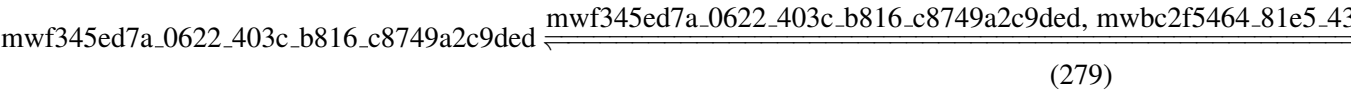
$$\begin{aligned} & \text{function_41}([\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}], \quad (278) \\ & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\ & \text{mw5832a2dc_ee18_44df_aa59_ccb21cb74df2}) \\ & = \frac{\text{mw5832a2dc_ee18_44df_aa59_ccb21cb74df2} \cdot [\text{mw114aa90f_5f5b_4fe8_9406_361c8489b6a1}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned}$$

10.53 Reaction mwdf4ba845_7271_4ada_b43f_fdac83df3b5c

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mwdf4ba845_7271_4ada_b43f_fdac83df3b5c

Reaction equation



Reactant

Table 133: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |

Modifiers

Table 134: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |
| mwbc2f5464_81e5_43fd_8b39_f5a2756af72f | sgpFc | |

Product

Table 135: Properties of each product.

| Id | Name | SBO |
|--|-------|-----|
| mwbc2f5464_81e5_43fd_8b39_f5a2756af72f | sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{53} = & \text{mwf67caf9d_2f4b_4986_abf2_e6090bbb72ce} \\ & \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \\ & - \text{mw4aea26f6_8860_414c_97f5_40d325196f2e} \\ & \cdot [\text{mwbc2f5464_81e5_43fd_8b39_f5a2756af72f}] \end{aligned}$$

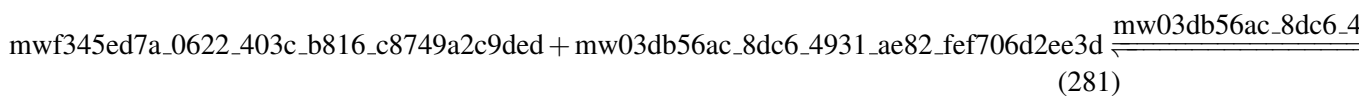
(280)

10.54 Reaction [mwc32a28fa_525c_44af_8d2c_e728c21eb90a](#)

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name [mwc32a28fa_525c_44af_8d2c_e728c21eb90a](#)

Reaction equation



Reactants

Table 136: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |
| mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | sR_IL6 | |

Modifiers

Table 137: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mw03db56ac_8dc6_4931_ae82_fef706d2ee3d | sR_IL6 | |
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |

Product

Table 138: Properties of each product.

| Id | Name | SBO |
|--|--------------|-----|
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned}
 v_{54} = & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \\
 & \cdot \text{function_42}(\text{kgp130Off}, \text{kgp130On}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \\
 & \qquad \qquad \qquad \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & \qquad \qquad \qquad [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}], \\
 & \qquad \qquad \qquad [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]) \\
 & \qquad \qquad \qquad (282)
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_42}(\text{kgp130Off}, \text{kgp130On}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \qquad (283) \\
 & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}], \\
 & [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}] - \text{kg}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})}
 \end{aligned}$$

$$\begin{aligned}
 & \text{function_42}(\text{kgp130Off}, \text{kgp130On}, [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}], \qquad (284) \\
 & \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \\
 & [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}], \\
 & [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]) \\
 = & \frac{\text{kgp130On} \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \cdot [\text{mw03db56ac_8dc6_4931_ae82_fef706d2ee3d}] - \text{kg}}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})}
 \end{aligned}$$

10.55 Reaction mw14d351b9_623a_48e8_a21c_854411039120

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

Name mw14d351b9_623a_48e8_a21c_854411039120

Reaction equation

$$\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d} \xrightarrow{\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}} \emptyset \qquad (285)$$

Reactant

Table 139: Properties of each reactant.

| Id | Name | SBO |
|--|--------------|-----|
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |

Modifier

Table 140: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$v_{55} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_43}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}], \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \quad (286)$$

$$\begin{aligned} & \text{function_43}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}], \\ & \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \\ & = \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (287)$$

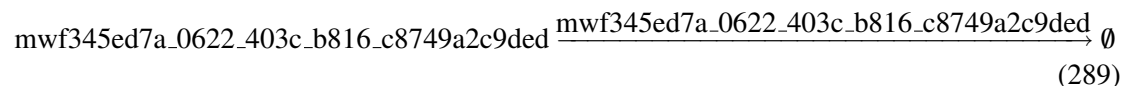
$$\begin{aligned} & \text{function_43}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}], \\ & \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \\ & = \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned} \quad (288)$$

10.56 Reaction mwba7f4605_8571_439b_b3ab_eb0b43808db8

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

Name mwba7f4605_8571_439b_b3ab_eb0b43808db8

Reaction equation



Reactant

Table 141: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |

Modifier

Table 142: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$v_{56} = \text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}) \cdot \text{function_44}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]) \quad (290)$$

$$\begin{aligned} &\text{function_44}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \quad (291) \\ &\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \\ &[\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]) \\ &= \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned}$$

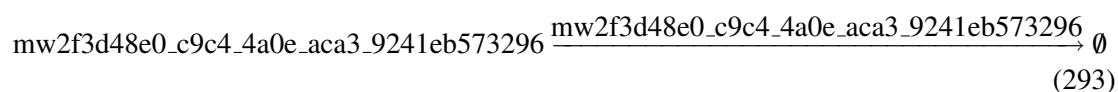
$$\begin{aligned} &\text{function_44}(\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e}), \quad (292) \\ &\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \\ &[\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]) \\ &= \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}]}{\text{vol}(\text{mw53ffe9e6_beef_45c4_90a5_a79197ed506e})} \end{aligned}$$

10.57 Reaction mw5be6711a_526a_4a58_80c6_d353dcabdf87

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

Name mw5be6711a_526a_4a58_80c6_d353dcabdf87

Reaction equation



Reactant

Table 143: Properties of each reactant.

| Id | Name | SBO |
|--|--------------|-----|
| mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296 | sR_IL6_sgpFc | |

Modifier

Table 144: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296 | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$v_{57} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_45}([\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}], \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \quad (294)$$

$$\begin{aligned} & \text{function_45}([\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}], \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (295)$$

$$\begin{aligned} & \text{function_45}([\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}], \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})) \\ &= \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (296)$$

10.58 Reaction mw1d3068d7_5679_41ee_9892_984e33012070

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name mw1d3068d7_5679_41ee_9892_984e33012070

Reaction equation

$$\text{mwf7796221_1fea_4274_a93e_c00adbf5778c} + \text{mw7becb5fe_8da8_4285_a821_0d77ad811b62} \xrightarrow{(297)} \text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}$$

Reactants

Table 145: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mwf7796221_1fea_4274_a93e_c00adbf5778c | sgpFc | |
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |

Modifiers

Table 146: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296 | sR_IL6_sgpFc | |
| mw7becb5fe_8da8_4285_a821_0d77ad811b62 | sR_IL6 | |
| mwf7796221_1fea_4274_a93e_c00adbf5778c | sgpFc | |

Product

Table 147: Properties of each product.

| Id | Name | SBO |
|--|--------------|-----|
| mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296 | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{58} = & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \\ & \cdot \text{function_46}(\text{kgp130Off}, \text{kgp130On}, [\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}], \\ & \qquad \qquad \qquad [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \\ & \qquad \qquad \qquad \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \\ & \qquad \qquad \qquad [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]) \end{aligned}$$

(298)

$$\begin{aligned} & \text{function_46}(\text{kgp130Off}, \text{kgp130On}, [\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}], \\ & [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \\ & [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]) \\ & = \frac{\text{kgp130On} \cdot [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] - \text{kgp130Off} \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (299)$$

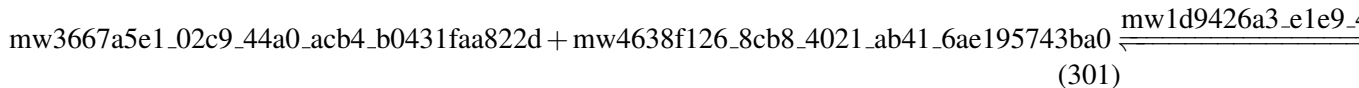
$$\begin{aligned} & \text{function_46}(\text{kgp130Off}, \text{kgp130On}, [\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}], \\ & [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}], \\ & \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), \\ & [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]) \\ & = \frac{\text{kgp130On} \cdot [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}] \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}] - \text{kgp130Off} \cdot [\text{mw7becb5fe_8da8_4285_a821_0d77ad811b62}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (300)$$

10.59 Reaction [mwb341c690_7147_46a1_8577_201598de3bf1](#)

This is a reversible reaction of two reactants forming one product influenced by three modifiers.

Name [mwb341c690_7147_46a1_8577_201598de3bf1](#)

Reaction equation



Reactants

Table 148: Properties of each reactant.

| Id | Name | SBO |
|--|--------|-----|
| mw3667a5e1_02c9_44a0_acb4_b0431faa822d | sgpFc | |
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |

Modifiers

Table 149: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mw1d9426a3_e1e9_49e0_ad77_eb6833be398a | sR_IL6_sgpFc | |
| mw3667a5e1_02c9_44a0_acb4_b0431faa822d | sgpFc | |
| mw4638f126_8cb8_4021_ab41_6ae195743ba0 | sR_IL6 | |

Product

Table 150: Properties of each product.

| Id | Name | SBO |
|--|--------------|-----|
| mw1d9426a3_e1e9_49e0_ad77_eb6833be398a | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{59} = & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \\ & \cdot \text{function_47}(\text{kgp130Off}, \text{kgp130On}, [\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}], \\ & \quad [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}], \\ & \quad [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\ & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \end{aligned} \quad (302)$$

$$\begin{aligned} & \text{function_47}(\text{kgp130Off}, \text{kgp130On}, [\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}], \quad (303) \\ & \quad [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}], \\ & \quad [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\ & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ = & \frac{\text{kgp130On} \cdot [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}] \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] - k}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned}$$

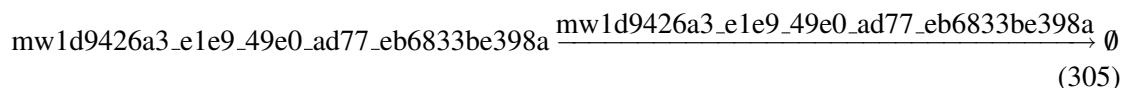
$$\begin{aligned} & \text{function_47}(\text{kgp130Off}, \text{kgp130On}, [\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}], \quad (304) \\ & \quad [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}], \\ & \quad [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}], \\ & \quad \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})) \\ = & \frac{\text{kgp130On} \cdot [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}] \cdot [\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0}] - k}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned}$$

10.60 Reaction mw5d9fcd0c_ca08_4444_b509_2ea4777e0025

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

Name mw5d9fcd0c_ca08_4444_b509_2ea4777e0025

Reaction equation



Reactant

Table 151: Properties of each reactant.

| Id | Name | SBO |
|--|--------------|-----|
| mw1d9426a3_e1e9_49e0_ad77_eb6833be398a | sR_IL6_sgpFc | |

Modifier

Table 152: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mw1d9426a3_e1e9_49e0_ad77_eb6833be398a | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$v_{60} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_48}([\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \quad (306)$$

$$\begin{aligned} & \text{function_48}([\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \\ & = \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (307)$$

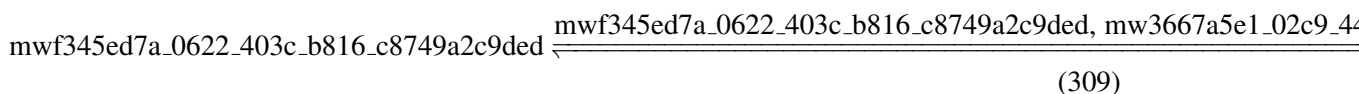
$$\begin{aligned} & \text{function_48}([\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}], \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \\ & = \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned} \quad (308)$$

10.61 Reaction mw131e3c9d_e77d_48c0_bdbb_77b2c10aaf3d

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mw131e3c9d_e77d_48c0_bdbb_77b2c10aaf3d

Reaction equation



Reactant

Table 153: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |

Modifiers

Table 154: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |
| mw3667a5e1_02c9_44a0_acb4_b0431faa822d | sgpFc | |

Product

Table 155: Properties of each product.

| Id | Name | SBO |
|--|-------|-----|
| mw3667a5e1_02c9_44a0_acb4_b0431faa822d | sgpFc | |

Kinetic Law

Derived unit contains undeclared units

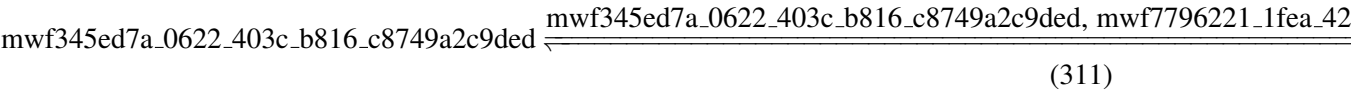
$$\begin{aligned} v_{61} = & \text{mw640ca705_e089_4c64_a5f4_9562317e8c76} \\ & \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \\ & - \text{mw43ccad8c_cabf_4eaf_90d5_e06ae43be2cb} \\ & \cdot [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}] \end{aligned} \tag{310}$$

10.62 Reaction mw14940d1f_6a1f_47cb_8170_801ba645f4c1

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name mw14940d1f_6a1f_47cb_8170_801ba645f4c1

Reaction equation



Reactant

Table 156: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |

Modifiers

Table 157: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mwf345ed7a_0622_403c_b816_c8749a2c9ded | sgpFc | |
| mwf7796221_1fea_4274_a93e_c00adbf5778c | sgpFc | |

Product

Table 158: Properties of each product.

| Id | Name | SBO |
|--|-------|-----|
| mwf7796221_1fea_4274_a93e_c00adbf5778c | sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{62} = & \text{mw9f83bdd3_3aa1_47ff_abd6_54e5ce60704a} \\ & \cdot [\text{mwf345ed7a_0622_403c_b816_c8749a2c9ded}] \\ & - \text{mwa071fdbe_d498_4620_a7a4_940aa31c8161} \\ & \cdot [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}] \end{aligned} \tag{312}$$

10.63 Reaction [mw b62106e7_e959_4a1d_9a00_b36d4e19a48f](#)

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name [mw b62106e7_e959_4a1d_9a00_b36d4e19a48f](#)

Reaction equation

$$\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d} \rightleftharpoons \frac{\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d, mw1d9426a3_e1e9_4}}{\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}} \tag{313}$$

Reactant

Table 159: Properties of each reactant.

| Id | Name | SBO |
|--|--------------|-----|
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |

Modifiers

Table 160: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |
| mw1d9426a3_e1e9_49e0_ad77_eb6833be398a | sR_IL6_sgpFc | |

Product

Table 161: Properties of each product.

| Id | Name | SBO |
|--|--------------|-----|
| mw1d9426a3_e1e9_49e0_ad77_eb6833be398a | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$\begin{aligned} v_{63} = & \text{mw640ca705_e089_4c64_a5f4_9562317e8c76} \\ & \cdot [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}] \\ & - \text{mw43ccad8c_cabf_4eaf_90d5_e06ae43be2cb} \\ & \cdot [\text{mw1d9426a3_e1e9_49e0_ad77_eb6833be398a}] \end{aligned} \tag{314}$$

10.64 Reaction [mwad648b6c_45ca_4f41_9747_06db1f6060fc](#)

This is a reversible reaction of one reactant forming one product influenced by two modifiers.

Name [mwad648b6c_45ca_4f41_9747_06db1f6060fc](#)

Reaction equation

$$\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d} \rightleftharpoons \text{mwad648b6c_45ca_4f41_9747_06db1f6060fc} \tag{315}$$

Reactant

Table 162: Properties of each reactant.

| Id | Name | SBO |
|--|--------------|-----|
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |

Modifiers

Table 163: Properties of each modifier.

| Id | Name | SBO |
|--|--------------|-----|
| mwa2d8dd1c_bb9a_4552_8738_e24671651c1d | sR_IL6_sgpFc | |
| mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296 | sR_IL6_sgpFc | |

Product

Table 164: Properties of each product.

| Id | Name | SBO |
|--|--------------|-----|
| mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296 | sR_IL6_sgpFc | |

Kinetic Law

Derived unit contains undeclared units

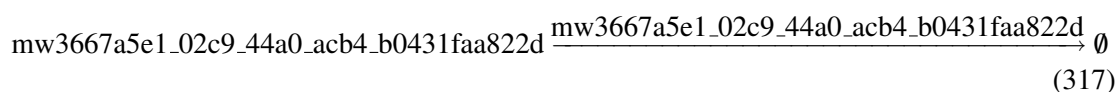
$$\begin{aligned} v_{64} = & \text{mw9f83bdd3_3aa1_47ff_abd6_54e5ce60704a} \\ & \cdot [\text{mwa2d8dd1c_bb9a_4552_8738_e24671651c1d}] \\ & - \text{mwa071fdbe_d498_4620_a7a4_940aa31c8161} \\ & \cdot [\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296}] \end{aligned} \quad (316)$$

10.65 Reaction [mw2ae288ab_7d03_4a84_a024_c711ad2b77e6](#)

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

Name [mw2ae288ab_7d03_4a84_a024_c711ad2b77e6](#)

Reaction equation



Reactant

Table 165: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mw3667a5e1_02c9_44a0_acb4_b0431faa822d | sgpFc | |

Modifier

Table 166: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mw3667a5e1_02c9_44a0_acb4_b0431faa822d | sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$v_{65} = \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}) \cdot \text{function_49}([\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}], \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \quad (318)$$

$$\begin{aligned} & \text{function_49}([\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}], \quad (319) \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \\ & = \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned}$$

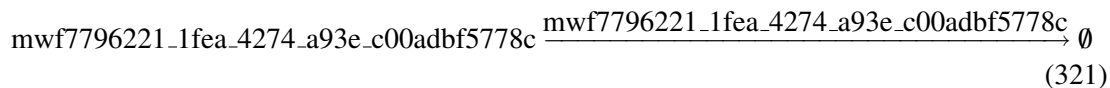
$$\begin{aligned} & \text{function_49}([\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}], \quad (320) \\ & \text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e}), \\ & \text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}) \\ & = \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mw3667a5e1_02c9_44a0_acb4_b0431faa822d}]}{\text{vol}(\text{mw88ca8d9a_f5cf_41bf_9d9d_fc48f6e1a19e})} \end{aligned}$$

10.66 Reaction mw9629d028_fcc0_4886_9e4d_36eecd b0381d

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

Name mw9629d028_fcc0_4886_9e4d_36eecd b0381d

Reaction equation



Reactant

Table 167: Properties of each reactant.

| Id | Name | SBO |
|--|-------|-----|
| mwf7796221_1fea_4274_a93e_c00adbf5778c | sgpFc | |

Modifier

Table 168: Properties of each modifier.

| Id | Name | SBO |
|--|-------|-----|
| mwf7796221_1fea_4274_a93e_c00adbf5778c | sgpFc | |

Kinetic Law

Derived unit contains undeclared units

$$v_{66} = \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}) \cdot \text{function_50}(\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]) \quad (322)$$

$$\begin{aligned} & \text{function_50}(\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]) \\ &= \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (323)$$

$$\begin{aligned} & \text{function_50}(\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30}, \text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5}), [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]) \\ &= \frac{\text{mwbd1d5bc3_d4b9_4aec_9b86_6f776da20a30} \cdot [\text{mwf7796221_1fea_4274_a93e_c00adbf5778c}]}{\text{vol}(\text{mwe9501423_9fb4_494b_b5b6_288f3fcb17b5})} \end{aligned} \quad (324)$$

11 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.

11.1 Species [mwf626e95e_543f_41e4_aad4_c6bf60ab345b](#)

Name IL6

Initial amount $4.35628896551166 \cdot 10^{-4}$ nmol

This species takes part in nine reactions (as a reactant in [reaction_1](#), [reaction_4](#), [mw61d2af92-6da5_41ce_b90e_aa6f430e6ba1](#), [mw1046000b_e1e8_4f6f_82a1_532d2aa793bb](#) and as a product in [reaction_3](#) and as a modifier in [reaction_1](#), [reaction_4](#), [mw61d2af92_6da5_41ce-b90e_aa6f430e6ba1](#), [mw1046000b_e1e8_4f6f_82a1_532d2aa793bb](#)).

$$\frac{d}{dt} \text{mwf626e95e_543f_41e4_aad4_c6bf60ab345b} = v_3 - v_1 - v_4 - v_{30} - v_{34} \quad (325)$$

11.2 Species [mwbbbce920_e8dd_4320_9386_fc94bfb2fc99](#)

Name sgp130

Initial amount 3.9 nmol

This species takes part in nine reactions (as a reactant in [reaction_2](#), [mw1c5a5ff7_5130-490f_a740_6a744ccf8a94](#), [mw7b56053c_7256_4703_a8c3_4fd46b2c23d0](#), [mw6a99eb5_ea4c-4733_98dd_1daf5ec6b0db](#) and as a product in [mw50c6744c_e883_4612_8663_e38750cbad1b](#) and as a modifier in [reaction_2](#), [mw1c5a5ff7_5130_490f_a740_6a744ccf8a94](#), [mw7b56053c-7256_4703_a8c3_4fd46b2c23d0](#), [mw6a99eb5_ea4c_4733_98dd_1daf5ec6b0db](#)).

$$\frac{d}{dt} \text{mwbbbce920_e8dd_4320_9386_fc94bfb2fc99} = v_{48} - v_2 - v_{40} - v_{41} - v_{49} \quad (326)$$

11.3 Species [mw810ff751_fa4e_4143_bd50_169b3e325e1e](#)

Name sR_IL6_sgp130

Initial amount 0.0874060669217432 nmol

This species takes part in six reactions (as a reactant in [mw01babcdf_0f03_46b0_81b1_201cc846e361](#), [mwae5dbb44_7de5_46ab_8c20_ac4f8956b0f0](#) and as a product in [reaction_2](#) and as a modifier in [reaction_2](#), [mw01babcdf_0f03_46b0_81b1_201cc846e361](#), [mwae5dbb44_7de5_46ab_8c20_ac4f8956b0f0](#)).

$$\frac{d}{dt}mw810ff751_fa4e_4143_bd50_169b3e325e1e = v_2 - v_{44} - v_{45} \quad (327)$$

11.4 Species [mw114aa90f_5f5b_4fe8_9406_361c8489b6a1](#)

Name CRP

Notes

Initial amount 221.06367608557 nmol

This species takes part in eight reactions (as a reactant in [reaction_5](#), [mwcdc24bd4_d9e4_47fe_8300_d222d853111c](#), [mw71d90b81_8211_4039_8807_12a7fe03206c](#) and as a product in [mwff2ebcf1_dcf1_47b9_9cac_7306fc6f7f76](#), [mw71d90b81_8211_4039_8807_12a7fe03206c](#) and as a modifier in [reaction_5](#), [mwcdc24bd4_d9e4_47fe_8300_d222d853111c](#), [mw71d90b81_8211_4039_8807_12a7fe03206c](#)).

$$\frac{d}{dt}mw114aa90f_5f5b_4fe8_9406_361c8489b6a1 = v_{39} + v_{52} - v_5 - v_{38} - v_{52} \quad (328)$$

11.5 Species [mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc](#)

Name sR

Notes

Initial amount 4.25350679194445 nmol

This species takes part in ten reactions (as a reactant in [reaction_1](#), [mwfb35eca9_7afc_4ba8_a46c_738cab57eb9f](#), [mw12a9fa7e_a273_4c1e_b970_ed33f3a9a705](#), [mw41c27823_d7ee_4554_9eac_3d5beec8e854](#) and as a product in [mw432fde6e_59ab_47f0_9fb1_086433a602e3](#), [mw71d90b81_8211_4039_8807_12a7fe03206c](#) and as a modifier in [reaction_1](#), [mwfb35eca9_7afc_4ba8_a46c_738cab57eb9f](#), [mw12a9fa7e_a273_4c1e_b970_ed33f3a9a705](#), [mw41c27823_d7ee_4554_9eac_3d5beec8e854](#)).

$$\frac{d}{dt}mw30ae63db_6cd3_4b6f_93ad_3350cd360bcc = v_{46} + v_{52} - v_1 - v_{29} - v_{33} - v_{47} \quad (329)$$

11.6 Species [mw03db56ac_8dc6_4931_ae82_fef706d2ee3d](#)

Name sR_IL6

Initial amount 0.00109424263781451 nmol

This species takes part in ten reactions (as a reactant in [reaction_2](#), [mwbe8567ce_3349_4442-_8b12_53cd9bc168e7](#), [mw8e8b65a8_6830_4091_9a40_19645e8fe554](#), [mwc32a28fa_525c_44af-_8d2c_e728c21eb90a](#) and as a product in [reaction_1](#) and as a modifier in [reaction_1](#), [reaction_2](#), [mwbe8567ce_3349_4442_8b12_53cd9bc168e7](#), [mw8e8b65a8_6830_4091_9a40-_19645e8fe554](#), [mwc32a28fa_525c_44af_8d2c_e728c21eb90a](#)).

$$\frac{d}{dt}mw03db56ac_8dc6_4931_ae82_fef706d2ee3d = v_1 - v_2 - v_{32} - v_{35} - v_{54} \quad (330)$$

11.7 Species [mwf345ed7a_0622_403c_b816_c8749a2c9ded](#)

Name sgpFc

Initial amount $-1.22575436720674 \cdot 10^{-26}$ nmol

Involved in events [event_1](#), [event_2](#), [event_3](#), [event_4](#), [event_5](#), [event_6](#), [event_7](#), [event_8](#), [event_9](#), [event_10](#), [event_11](#), [event_12](#), [event_13](#)

This species takes part in ten reactions (as a reactant in [mwdf4ba845_7271_4ada_b43f_fdac83df3b5c](#), [mwc32a28fa_525c_44af_8d2c_e728c21eb90a](#), [mwba7f4605_8571_439b_b3ab_eb0b43808db8](#), [mw131e3c9d_e77d_48c0_bdbb_77b2c10aaf3d](#), [mw14940d1f_6a1f_47cb_8170_801ba645f4c1](#) and as a modifier in [mwdf4ba845_7271_4ada_b43f_fdac83df3b5c](#), [mwc32a28fa_525c_44af-_8d2c_e728c21eb90a](#), [mwba7f4605_8571_439b_b3ab_eb0b43808db8](#), [mw131e3c9d_e77d_48c0-_bdbb_77b2c10aaf3d](#), [mw14940d1f_6a1f_47cb_8170_801ba645f4c1](#)).

$$\frac{d}{dt}mwf345ed7a_0622_403c_b816_c8749a2c9ded = -v_{53} - v_{54} - v_{56} - v_{61} - v_{62} \quad (331)$$

Furthermore, 13 events influence this species' rate of change.

11.8 Species [mwa2d8dd1c_bb9a_4552_8738_e24671651c1d](#)

Name sR_IL6_sgpFc

Initial amount $-2.29473714389906 \cdot 10^{-28}$ nmol

This species takes part in eight reactions (as a reactant in [mw14d351b9_623a_48e8_a21c-_854411039120](#), [mwb62106e7_e959_4a1d_9a00_b36d4e19a48f](#), [mwad648b6c_45ca_4f41_9747-_06db1f6060fc](#) and as a product in [mwc32a28fa_525c_44af_8d2c_e728c21eb90a](#) and as a modifier in [mwc32a28fa_525c_44af_8d2c_e728c21eb90a](#), [mw14d351b9_623a_48e8_a21c-_854411039120](#), [mwb62106e7_e959_4a1d_9a00_b36d4e19a48f](#), [mwad648b6c_45ca_4f41_9747-_06db1f6060fc](#)).

$$\frac{d}{dt}mwa2d8dd1c_bb9a_4552_8738_e24671651c1d = v_{54} - v_{55} - v_{63} - v_{64} \quad (332)$$

11.9 Species [mw80848184_e2dd_47ce_86d7_7a21479342bd](#)

Name gp130

Initial amount 0.388958921403941 nmol

This species takes part in seven reactions (as a reactant in [reaction_6](#), [reaction_8](#), [mw4a00a3a4-_778f_4952_8100_2dc3cc2b7046](#) and as a product in [mw391f3b8e_5649_4851_b2e2_782cb3e015b6](#) and as a modifier in [reaction_6](#), [reaction_8](#), [mw4a00a3a4_778f_4952_8100_2dc3cc2b7046](#)).

$$\frac{d}{dt}\text{mw80848184_e2dd_47ce_86d7_7a21479342bd} = v_{25} - v_6 - v_8 - v_{26} \quad (333)$$

11.10 Species [mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a](#)

Name R_IL6_gp130

Initial amount $6.59935877686372 \cdot 10^{-5}$ nmol

This species takes part in nine reactions (as a reactant in [reaction_16](#), [reaction_12](#) and as a product in [reaction_6](#), [reaction_8](#), [mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4](#) and as a modifier in [reaction_6](#), [reaction_8](#), [reaction_16](#), [reaction_12](#)).

$$\frac{d}{dt}\text{mwd2d9d93a_3bd1_4f17_bac1_baba9ef2d55a} = v_6 + v_8 + v_{23} - v_9 - v_{14} \quad (334)$$

11.11 Species [mw4638f126_8cb8_4021_ab41_6ae195743ba0](#)

Name sR_IL6

Initial amount $9.76164943878913 \cdot 10^{-4}$ nmol

This species takes part in ten reactions (as a reactant in [reaction_6](#), [mwd77df15b_fed7-_41a8_a3d6_b0f6c590c5f6](#), [mwb341c690_7147_46a1_8577_201598de3bf1](#) and as a product in [mw8e8b65a8_6830_4091_9a40_19645e8fe554](#), [mwa812f08f_1035_42bd_82d2_72d691308f88](#) and as a modifier in [reaction_6](#), [mw8e8b65a8_6830_4091_9a40_19645e8fe554](#), [mwa812f08f-_1035_42bd_82d2_72d691308f88](#), [mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6](#), [mwb341c690-_7147_46a1_8577_201598de3bf1](#)).

$$\frac{d}{dt}\text{mw4638f126_8cb8_4021_ab41_6ae195743ba0} = v_{35} + v_{36} - v_6 - v_{43} - v_{59} \quad (335)$$

11.12 Species [mw10315fa3_6f13_4618_bda8_a8694bd3c374](#)

Name R

Notes nM4500 copies per cell on rat hepatocytes. Assuming same volume as HepG2 (2.8pL) gives 0.27 nM concentration.

Initial amount 0.438235811135574 nmol

This species takes part in five reactions (as a reactant in [reaction_7](#), [reaction_15](#) and as a product in [reaction_14](#) and as a modifier in [reaction_7](#), [reaction_15](#)).

$$\frac{d}{dt}mw10315fa3_6f13_4618_bda8_a8694bd3c374 = v_{16} - v_7 - v_{12} \quad (336)$$

11.13 Species [mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1](#)

Name IL6

Initial amount $7.2566581144648 \cdot 10^{-4}$ nmol

This species takes part in six reactions (as a reactant in [reaction_7](#), [mwa812f08f_1035_42bd_82d2_72d691308f88](#) and as a product in [mw1046000b_e1e8_4f6f_82a1_532d2aa793bb](#) and as a modifier in [reaction_7](#), [mw1046000b_e1e8_4f6f_82a1_532d2aa793bb](#), [mwa812f08f_1035_42bd_82d2_72d691308f88](#)).

$$\frac{d}{dt}mw0adf3eb4_a196_4c48_b10d_4e9e9faaf9e1 = v_{34} - v_7 - v_{36} \quad (337)$$

11.14 Species [mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83](#)

Name R_IL6

Initial amount $1.60036523605187 \cdot 10^{-5}$ nmol

This species takes part in six reactions (as a reactant in [reaction_8](#), [reaction_11](#) and as a product in [reaction_7](#) and as a modifier in [reaction_7](#), [reaction_8](#), [reaction_11](#)).

$$\frac{d}{dt}mw7d86cc23_a1af_44c3_bdb9_71e9b1bb2a83 = v_7 - v_8 - v_{13} \quad (338)$$

11.15 Species [mw0eb6c959_d408_45a0_a450_928b8c5876bb](#)

Name Ractive

Initial amount 0.765416493681823 nmol

This species takes part in eight reactions (as a reactant in [reaction_9](#), [reaction_13](#), [mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4](#) and as a product in [reaction_16](#), [reaction_9](#) and as a modifier in [reaction_9](#), [reaction_13](#), [mwb675e13a_26c0_4b18_a8c3_0f5a62090ba4](#)).

$$\frac{d}{dt}mw0eb6c959_d408_45a0_a450_928b8c5876bb = v_9 + v_{10} - v_{10} - v_{15} - v_{23} \quad (339)$$

11.16 Species [mw42054cd7_17af_46da_970c_7f99151906ad](#)

Name STAT3

Initial amount 0.777537339578334 nmol

This species takes part in three reactions (as a reactant in [reaction_9](#) and as a product in [reaction_10](#) and as a modifier in [reaction_9](#)).

$$\frac{d}{dt}mw42054cd7_17af_46da_970c_7f99151906ad = v_{11} - v_{10} \quad (340)$$

11.17 Species [mw39c2e431_fdc3_4964_be29_6ca856620b1b](#)

Name pSTAT3

Initial amount 9.22246266042167 nmol

This species takes part in three reactions (as a reactant in [reaction_10](#) and as a product in [reaction_9](#) and as a modifier in [reaction_10](#)).

$$\frac{d}{dt}mw39c2e431_fdc3_4964_be29_6ca856620b1b = v_{10} - v_{11} \quad (341)$$

11.18 Species [mwd5313618_89eb_4c8c_bc82_66f10f966349](#)

Name CRP

Initial amount 158.325846781611 nmol

Involved in rule [mwd5313618_89eb_4c8c_bc82_66f10f966349](#)

This species takes part in two reactions (as a reactant in [mwab0012ac_e5f2_4904_9893_820fd210402e](#) and as a modifier in [mwab0012ac_e5f2_4904_9893_820fd210402e](#)). Not these but one rule determines the species' quantity because this species is on the boundary of the reaction system.

11.19 Species [mw2e464cf3_a09c_4b7c_9f3c_06720016a48e](#)

Name sR

Initial amount 6.08704712819468 nmol

This species takes part in four reactions (as a reactant in [mwa812f08f_1035_42bd_82d2_72d691308f88](#) and as a product in [mw12a9fa7e_a273_4c1e_b970_ed33f3a9a705](#) and as a modifier in [mw12a9fa7e_a273_4c1e_b970_ed33f3a9a705](#), [mwa812f08f_1035_42bd_82d2_72d691308f88](#)).

$$\frac{d}{dt}mw2e464cf3_a09c_4b7c_9f3c_06720016a48e = v_{33} - v_{36} \quad (342)$$

11.20 Species [mw36ea78c1_ed71_4def_96d3_857a442d7195](#)

Name CRPExtracellular

Initial amount 409.775322370541 nmol

This species takes part in three reactions (as a product in [mwab0012ac_e5f2_4904_9893_820fd210402e](#), [mwcdc24bd4_d9e4_47fe_8300_d222d853111c](#) and as a modifier in [mwcdc24bd4_d9e4_47fe_8300_d222d853111c](#)).

$$\frac{d}{dt}mw36ea78c1_ed71_4def_96d3_857a442d7195 = v_{37} + v_{38} \quad (343)$$

11.21 Species [mw147d30ec_478e_4090_b496_128a131d29eb](#)

Name sgp130

Initial amount 5.5896988923534 nmol

This species takes part in four reactions (as a reactant in [mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6](#) and as a product in [mw7b56053c_7256_4703_a8c3_4fd46b2c23d0](#) and as a modifier in [mw7b56053c_7256_4703_a8c3_4fd46b2c23d0](#), [mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6](#)).

$$\frac{d}{dt}mw147d30ec_478e_4090_b496_128a131d29eb = v_{41} - v_{43} \quad (344)$$

11.22 Species [mwab41493c_6349_45f1_a226_3030cfed0e06](#)

Name sR_IL6_sgp130

Initial amount 0.116343661809953 nmol

This species takes part in four reactions (as a product in [mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6](#), [mwae5dbb44_7de5_46ab_8c20_ac4f8956b0f0](#) and as a modifier in [mwd77df15b_fed7_41a8_a3d6_b0f6c590c5f6](#), [mwae5dbb44_7de5_46ab_8c20_ac4f8956b0f0](#)).

$$\frac{d}{dt}mwab41493c_6349_45f1_a226_3030cfed0e06 = v_{43} + v_{45} \quad (345)$$

11.23 Species [mw1d9426a3_e1e9_49e0_ad77_eb6833be398a](#)

Name sR_IL6_sgpFc

Initial amount $-1.68120955431364 \cdot 10^{-27}$ nmol

This species takes part in six reactions (as a reactant in [mw5d9fcd0c_ca08_4444_b509_2ea4777e0025](#) and as a product in [mwb341c690_7147_46a1_8577_201598de3bf1](#), [mwb62106e7_e959_4a1d_9a00_b36d4e19a48f](#) and as a modifier in [mwb341c690_7147_46a1_8577_201598de3bf1](#), [mw5d9fcd0c_ca08_4444_b509_2ea4777e0025](#), [mwb62106e7_e959_4a1d_9a00_b36d4e19a48f](#)).

$$\frac{d}{dt}mw1d9426a3_e1e9_49e0_ad77_eb6833be398a = v_{59} + v_{63} - v_{60} \quad (346)$$

11.24 Species [mw3667a5e1_02c9_44a0_acb4_b0431faa822d](#)

Name sgpFc

Initial amount $-6.97919693038973 \cdot 10^{-26}$ nmol

This species takes part in six reactions (as a reactant in [mw341c690_7147_46a1_8577_201598de3bf1](#), [mw2ae288ab_7d03_4a84_a024_c711ad2b77e6](#) and as a product in [mw131e3c9d_e77d_48c0-_bdbb_77b2c10aaf3d](#) and as a modifier in [mw341c690_7147_46a1_8577_201598de3bf1](#), [mw131e3c9d_e77d_48c0-_bdbb_77b2c10aaf3d](#), [mw2ae288ab_7d03_4a84_a024_c711ad2b77e6](#)).

$$\frac{d}{dt}mw3667a5e1_02c9_44a0_acb4_b0431faa822d = v_{61} - v_{59} - v_{65} \quad (347)$$

11.25 Species [mw7becb5fe_8da8_4285_a821_0d77ad811b62](#)

Name sR_IL6

Initial amount 0.00130682388893128 nmol

This species takes part in ten reactions (as a reactant in [reaction_41](#), [mw8be158f1_ea81-_45bf_80d4_6e31cd83fe6c](#), [mw1d3068d7_5679_41ee_9892_984e33012070](#) and as a product in [mw4c099d5c_200f_474e_8ec1_59e9223a8afd](#), [mwbe8567ce_3349_4442_8b12_53cd9bc168e7](#) and as a modifier in [reaction_41](#), [mw4c099d5c_200f_474e_8ec1_59e9223a8afd](#), [mwbe8567ce-_3349_4442_8b12_53cd9bc168e7](#), [mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c](#), [mw1d3068d7-_5679_41ee_9892_984e33012070](#)).

$$\frac{d}{dt}mw7becb5fe_8da8_4285_a821_0d77ad811b62 = v_{31} + v_{32} - v_{17} - v_{42} - v_{58} \quad (348)$$

11.26 Species [mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca](#)

Name gp130

Initial amount 0.374962692933961 nmol

This species takes part in five reactions (as a reactant in [reaction_41](#), [mw6f470e13_f0e4-_4294_83d8_59dd5670d10c](#) and as a product in [mw6db30657_4e56_4c3a_8575_9c67393dde4f](#) and as a modifier in [reaction_41](#), [mw6f470e13_f0e4_4294_83d8_59dd5670d10c](#)).

$$\frac{d}{dt}mw8c9107e6_f51d_442d_b2dc_2bfdbb8482ca = v_{27} - v_{17} - v_{28} \quad (349)$$

11.27 Species [mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9](#)

Name R_IL6_gp130

Initial amount $8.44890497633548 \cdot 10^{-5}$ nmol

This species takes part in seven reactions (as a reactant in [reaction_46](#), [reaction_44](#) and as a product in [reaction_41](#), [mw64df7c9e_35da_4c7f_be56_c5dabfb060b6](#) and as a modifier in [reaction_41](#), [reaction_46](#), [reaction_44](#)).

$$\frac{d}{dt} \text{mw824bc3d4_1ac3_4912_9b51_8f14ff1c96b9} = v_{17} + v_{24} - v_{18} - v_{21} \quad (350)$$

11.28 Species [mw6cce2109_0e32_4dd9_98ec_41173e8ef07d](#)

Name Ractive

Initial amount 0.980272509547246 nmol

This species takes part in eight reactions (as a reactant in [reaction_42](#), [reaction_45](#), [mw64df7c9e_35da_4c7f_be56_c5dabfb060b6](#) and as a product in [reaction_46](#), [reaction_42](#) and as a modifier in [reaction_42](#), [reaction_45](#), [mw64df7c9e_35da_4c7f_be56_c5dabfb060b6](#)).

$$\frac{d}{dt} \text{mw6cce2109_0e32_4dd9_98ec_41173e8ef07d} = v_{18} + v_{19} - v_{19} - v_{22} - v_{24} \quad (351)$$

11.29 Species [mw2b255f94_8018_4b99_bde8_918eeac45446](#)

Name STAT3

Initial amount 0.610636013508212 nmol

This species takes part in three reactions (as a reactant in [reaction_42](#) and as a product in [reaction_43](#) and as a modifier in [reaction_42](#)).

$$\frac{d}{dt} \text{mw2b255f94_8018_4b99_bde8_918eeac45446} = v_{20} - v_{19} \quad (352)$$

11.30 Species [mw48867e93_f170_44e8_ac7a_185b23e1bf3b](#)

Name pSTAT3

Initial amount 9.38936398649179 nmol

This species takes part in three reactions (as a reactant in [reaction_43](#) and as a product in [reaction_42](#) and as a modifier in [reaction_43](#)).

$$\frac{d}{dt} \text{mw48867e93_f170_44e8_ac7a_185b23e1bf3b} = v_{19} - v_{20} \quad (353)$$

11.31 Species [mw0083d743_836f_4238_a17f_4602193d5bc0](#)

Name geneProduct

Initial amount 159.80359735889 nmol

Involved in rule [mw0083d743_836f_4238_a17f_4602193d5bc0](#)

One rule determines the species' quantity.

11.32 Species [mwd31f52cc_04e7_40e0_885f_c7b2d9e62215](#)

Name sR

Initial amount 6.06410682471754 nmol

This species takes part in four reactions (as a reactant in [mw4c099d5c_200f_474e_8ec1_59e9223a8afd](#) and as a product in [mwfb35eca9_7afc_4ba8_a46c_738cab57eb9f](#) and as a modifier in [mwfb35eca9_7afc_4ba8_a46c_738cab57eb9f](#), [mw4c099d5c_200f_474e_8ec1_59e9223a8afd](#)).

$$\frac{d}{dt} \text{mwd31f52cc_04e7_40e0_885f_c7b2d9e62215} = v_{29} - v_{31} \quad (354)$$

11.33 Species [mw2c9b0499_3325_4394_8af3_bbf653a944a0](#)

Name IL6

Initial amount 0.0093481986616084 nmol

This species takes part in seven reactions (as a reactant in [mw4c099d5c_200f_474e_8ec1_59e9223a8afd](#), [mwfb913ea0b_785a_4701_ac91_b18ab5dd5a89](#) and as a product in [mw61d2af92_6da5_41ce_b90e_aa6f430e6ba1](#), [mw1ce0c484_681f_4d85_8ffe_392d0c100cfa](#) and as a modifier in [mw61d2af92_6da5_41ce_b90e_aa6f430e6ba1](#), [mw4c099d5c_200f_474e_8ec1_59e9223a8afd](#), [mwfb913ea0b_785a_4701_ac91_b18ab5dd5a89](#)).

$$\frac{d}{dt} \text{mw2c9b0499_3325_4394_8af3_bbf653a944a0} = v_{30} + v_{50} - v_{31} - v_{51} \quad (355)$$

11.34 Species [mwd65b5b39_dc1b_4e77_a999_67277a880e5e](#)

Name sgp130

Initial amount 5.56973864471412 nmol

This species takes part in four reactions (as a reactant in [mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c](#) and as a product in [mw1c5a5ff7_5130_490f_a740_6a744ccf8a94](#) and as a modifier in [mw1c5a5ff7_5130_490f_a740_6a744ccf8a94](#), [mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c](#)).

$$\frac{d}{dt} \text{mwd65b5b39_dc1b_4e77_a999_67277a880e5e} = v_{40} - v_{42} \quad (356)$$

11.35 Species [mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3](#)

Name sR_IL6_sgp130

Initial amount 0.136303909449242 nmol

This species takes part in four reactions (as a product in [mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c](#), [mw01babcdf_0f03_46b0_81b1_201cc846e361](#) and as a modifier in [mw8be158f1_ea81_45bf_80d4_6e31cd83fe6c](#), [mw01babcdf_0f03_46b0_81b1_201cc846e361](#)).

$$\frac{d}{dt}\text{mw6335d5d7_c7b0_4bc0_b883_f7ee4915c2c3} = v_{42} + v_{44} \quad (357)$$

11.36 Species [mwf7796221_1fea_4274_a93e_c00adbf5778c](#)

Name sgpFc

Initial amount $-5.46278871281916 \cdot 10^{-28}$ nmol

This species takes part in six reactions (as a reactant in [mw1d3068d7_5679_41ee_9892_984e33012070](#), [mw9629d028_fcc0_4886_9e4d_36eecd0381d](#) and as a product in [mw14940d1f_6a1f_47cb_8170_801ba645f4c1](#) and as a modifier in [mw1d3068d7_5679_41ee_9892_984e33012070](#), [mw14940d1f_6a1f_47cb_8170_801ba645f4c1](#), [mw9629d028_fcc0_4886_9e4d_36eecd0381d](#)).

$$\frac{d}{dt}\text{mwf7796221_1fea_4274_a93e_c00adbf5778c} = v_{62} - v_{58} - v_{66} \quad (358)$$

11.37 Species [mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296](#)

Name sR_IL6_sgpFc

Initial amount $5.3253664019487 \cdot 10^{-28}$ nmol

This species takes part in six reactions (as a reactant in [mw5be6711a_526a_4a58_80c6_d353dcabdf87](#) and as a product in [mw1d3068d7_5679_41ee_9892_984e33012070](#), [mwad648b6c_45ca_4f41_9747_06db1f6060fc](#) and as a modifier in [mw5be6711a_526a_4a58_80c6_d353dcabdf87](#), [mw1d3068d7_5679_41ee_9892_984e33012070](#), [mwad648b6c_45ca_4f41_9747_06db1f6060fc](#)).

$$\frac{d}{dt}\text{mw2f3d48e0_c9c4_4a0e_aca3_9241eb573296} = v_{58} + v_{64} - v_{57} \quad (359)$$

11.38 Species [mwbc2f5464_81e5_43fd_8b39_f5a2756af72f](#)

Name sgpFc

Initial amount $-6.85083014757454 \cdot 10^{-27}$ nmol

This species takes part in two reactions (as a product in [mwdf4ba845_7271_4ada_b43f_fdac83df3b5c](#) and as a modifier in [mwdf4ba845_7271_4ada_b43f_fdac83df3b5c](#)).

$$\frac{d}{dt}\text{mwbc2f5464_81e5_43fd_8b39_f5a2756af72f} = v_{53} \quad (360)$$

11.39 Species `species_1`

Name CRP Suppression (%)

Initial concentration $0 \text{ nmol} \cdot \text{l}^{-1}$

Involved in rule `species_1`

One rule determines the species' quantity.

SBML2^ATeX was developed by Andreas Dräger^a, Hannes Planatscher^a, Dieudonné M Wouamba^a, Adrian Schröder^a, Michael Hucka^b, Lukas Endler^c, Martin Golebiewski^d and Andreas Zell^a. Please see <http://www.ra.cs.uni-tuebingen.de/software/SBML2LaTeX> for more information.

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