Welcome to EasyModel

This tutorial will teach you how to create and simulate your first model using EasyModel.

In each slide you will find general annotations, indicating how you can use the interface to create your model.

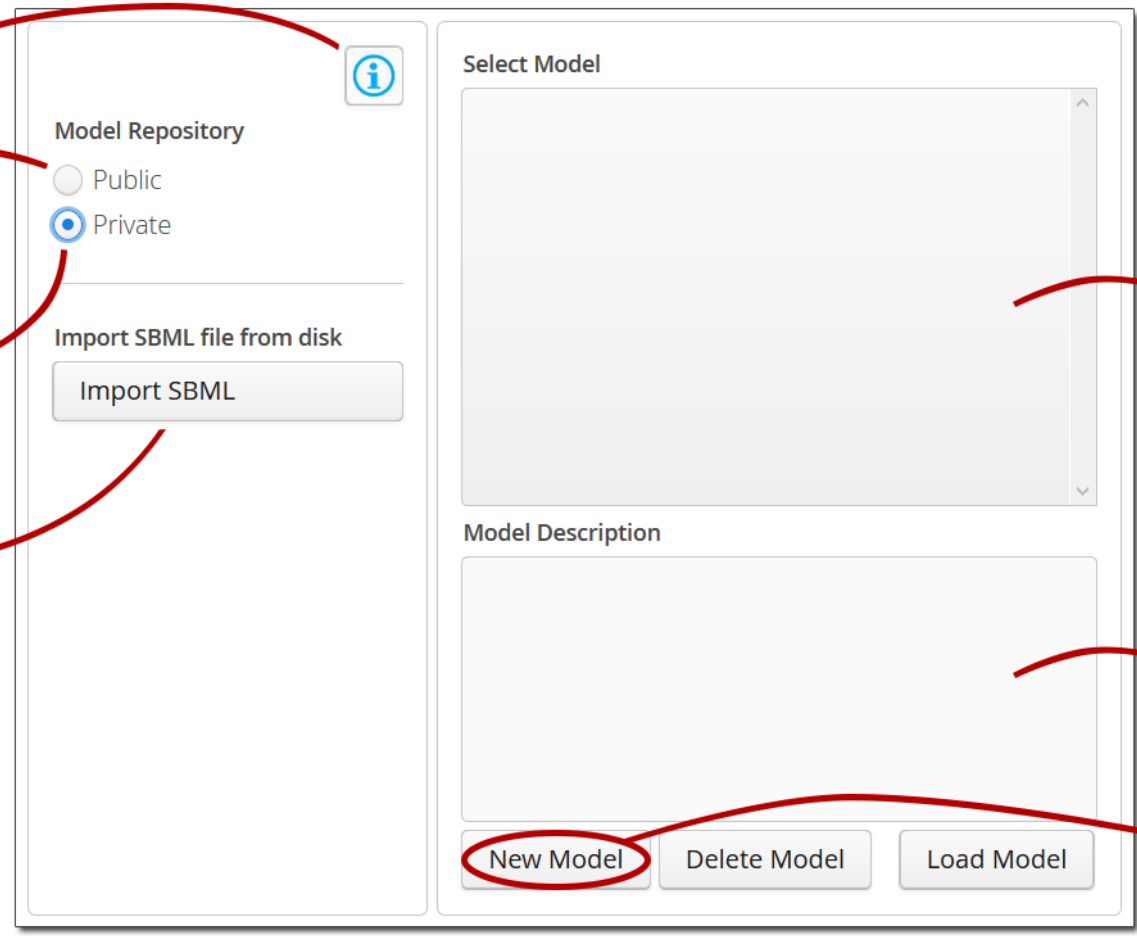
To start the tutorial press next (or press skip to use EasyModel).

Information buttons can be found accross the application.

Public models. Models can be modified as changes won't be saved.

Create and modify your personal models. Changes will be saved every time the model is validated.

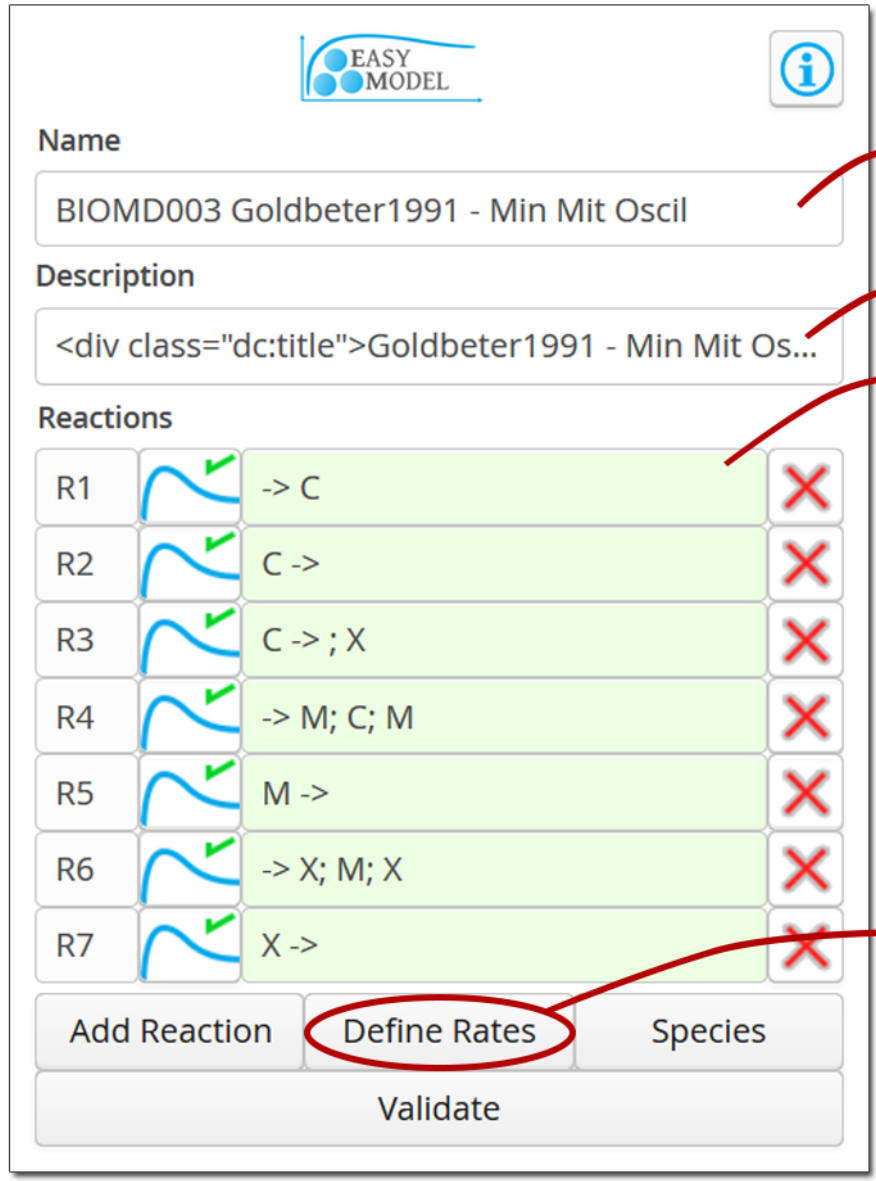
A local SBML model file may be imported to EasyModel.



List of models (empty)

Selected model description

Press 'New' to create a new model



Start by naming your model.

Description is optional, but recommended.

Define reactions using Substrates, Products and Modifiers.

How to write reactions:

$n_1*S_1 + n_2*S_2 + \ldots \rightarrow m_1*P_1 + m_2*P_2 + \ldots ; M_1; M_2; \ldots$

n_i, m_i: Stoichiometric coefficient.

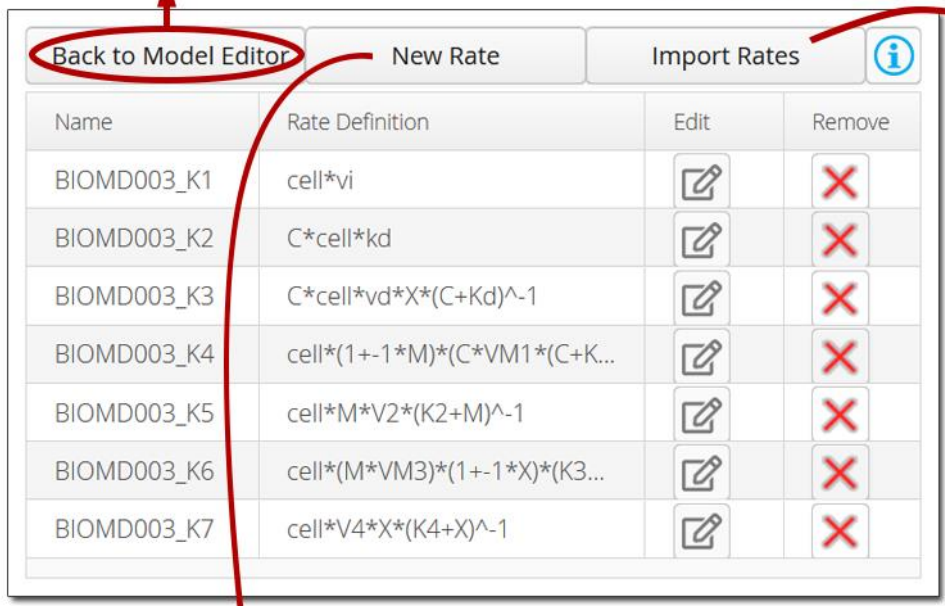
S_i, P_i: Substrates and Products.

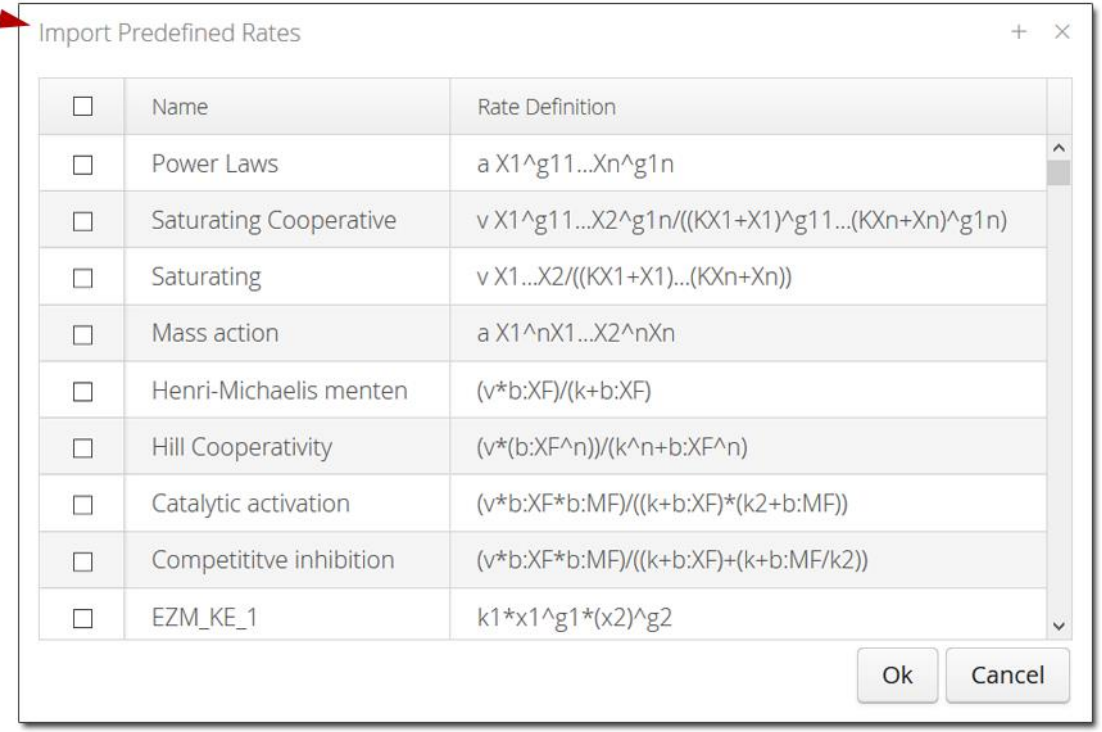
M_i: Modifiers that can activate or inhibit the reaction rate.

Define the rates for each reaction.

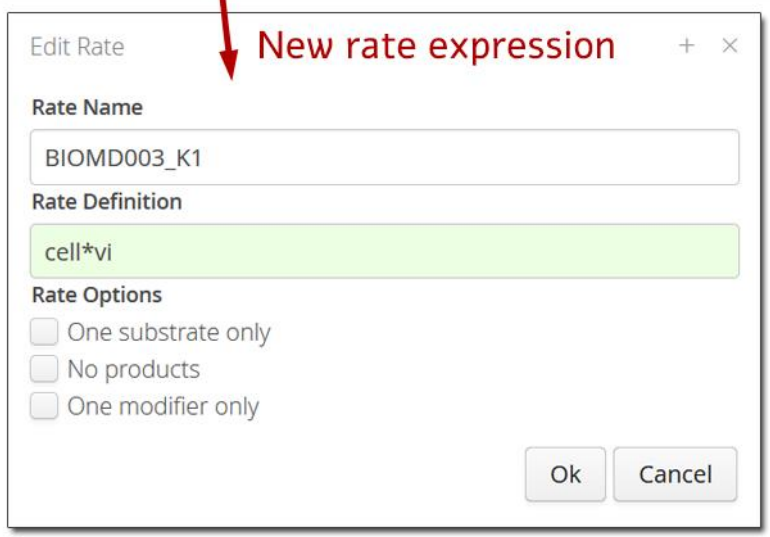
When you're done press this

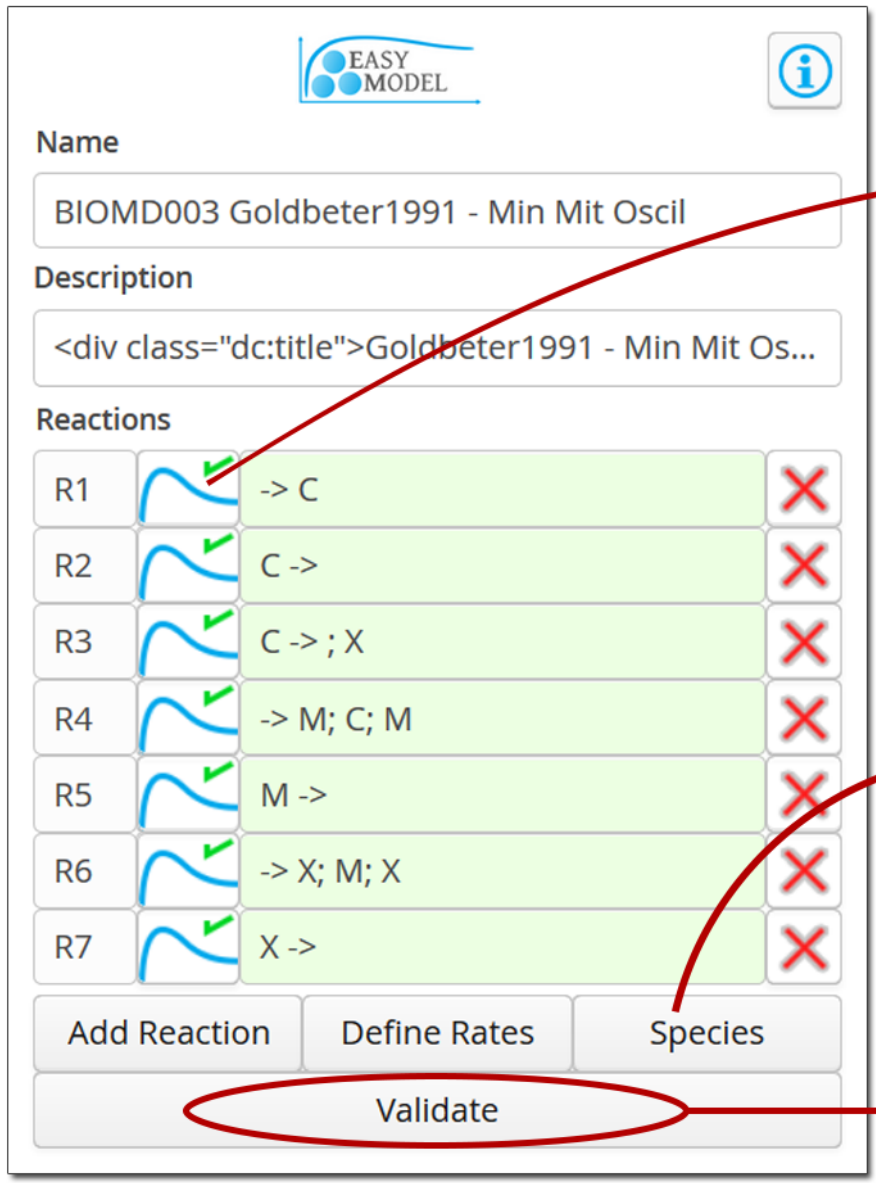
Import predefined rate expressions

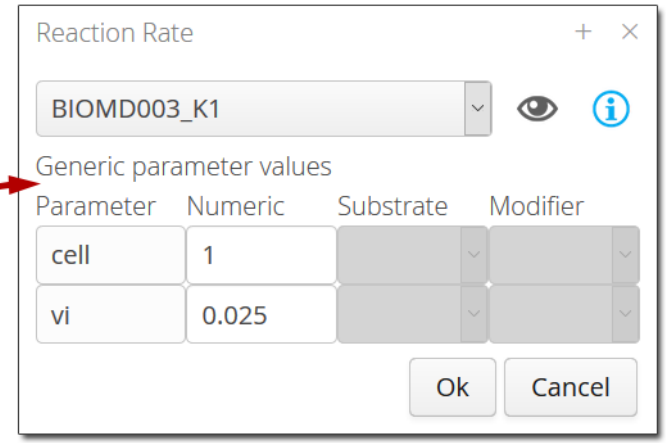




New rate expression



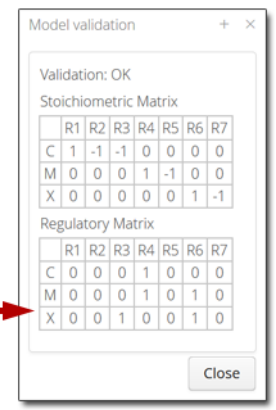




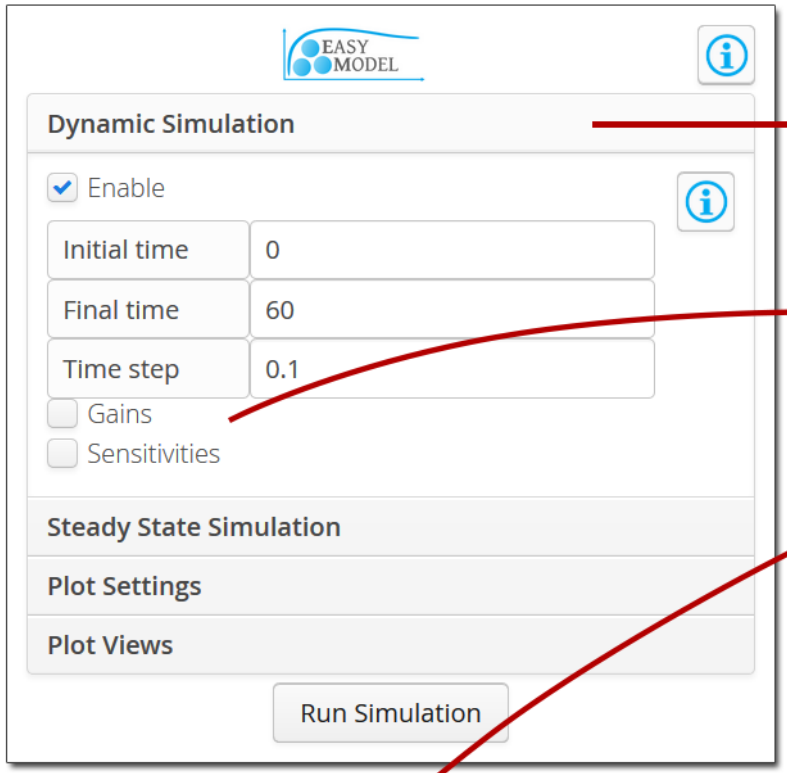
For every reaction in the model select a kinetic rate and set a value for each parameter. Each parameter must have either a numeric value, a reference to a substrate, or a reference to a modifier.

Define the initial values for the species.

Define the type of variable:
'Time dependent' or 'Constant'.

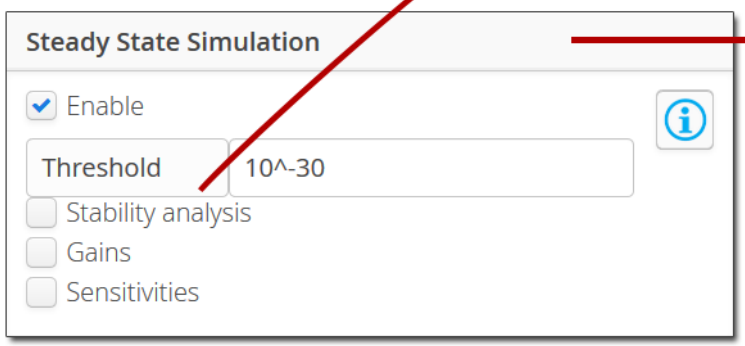


Press 'Validate' to check if model is appropiately defined and ready to be simulated. Model will be saved in your account if you are logged in (a message will be displayed).

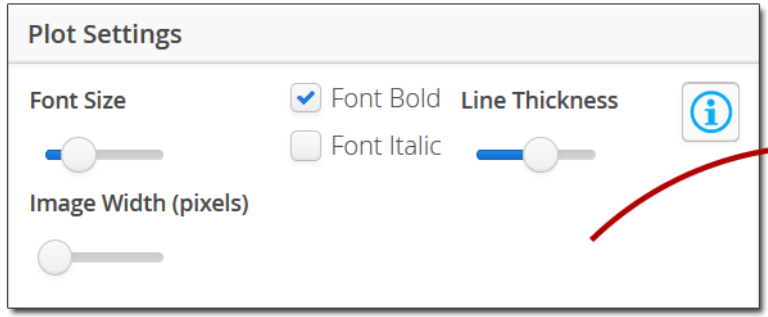


Dynamic simulation: time evolution of the species in the model.

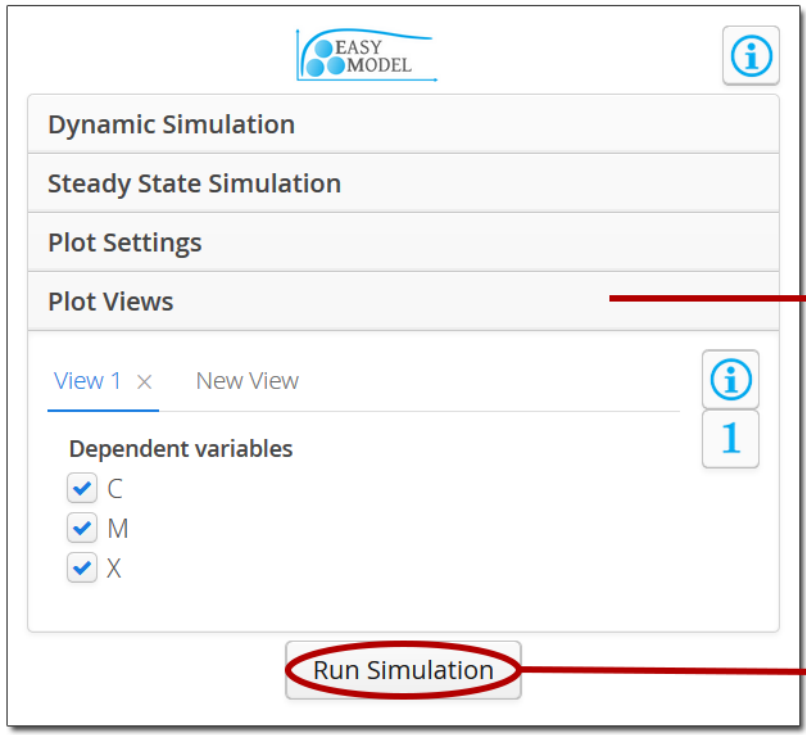
"Gains" option analyses how changes in the independent variables affect the values of the time-dependent variables.
"Sensitivities" option analyses how changes in the parameter values affect the values of the time-dependent variables.
"Stability analysis" calculates if the steady state (homeostasis) is stable (negative real parts for all eigenvalues) or not (non-negative real part for at least one eigenvalue)



Steady state simulation: calculates the steady states (non-trivial equilibriums) of the biological system. These steady states remain constant over the time.



Plot settings: contains several configuration parameters for the graphical plots that will be performed.

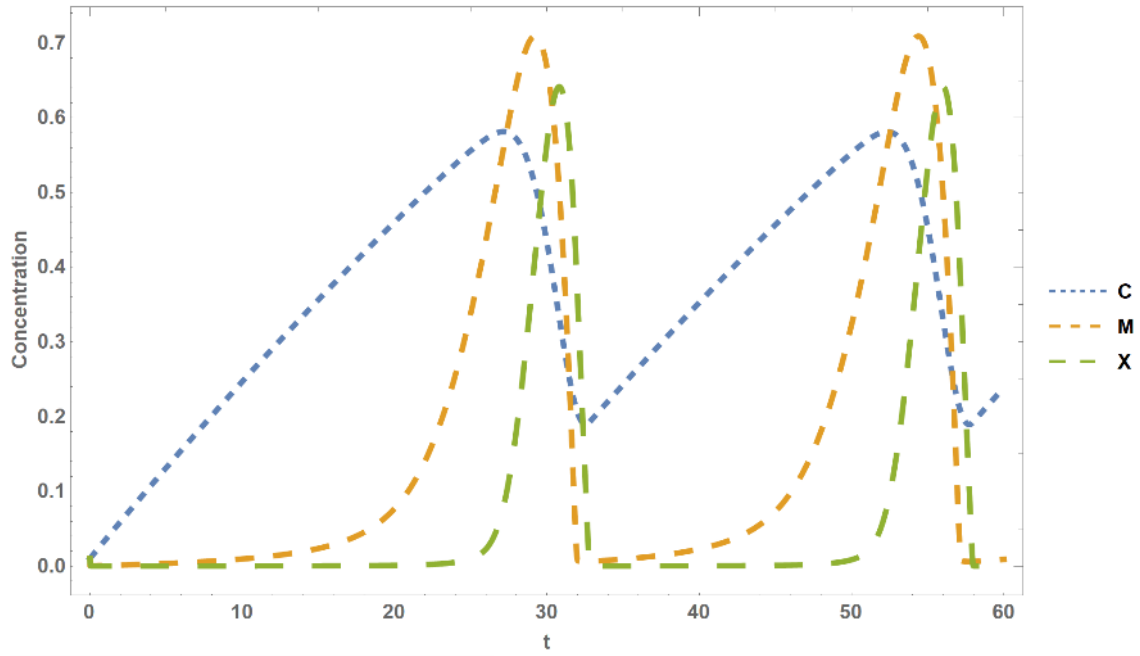


Plot views: you can select which time-dependent species are to be plotted in the simulation graphics. Furthermore, you can define several plot views, each of them with its own selected time-dependent species.

Press 'Run Simulation' to start your simulation

Results for BIOMD003 Goldbeter1991 - Min Mit Oscil

Dynamic Simulation



Download Dynamic Simulation Table

Generated Files

Mathematica Notebook | SBML

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The simulation results are displayed in the final step. Clicking the cancel button aborts the simulation.

Left-click images for high-resolution copies.

You can download:
- Images
- Results text files
- Mathematica Notebook of the whole simulation
- SBML file of your model

You have completed the tutorial!

Press next to start using EasyModel.