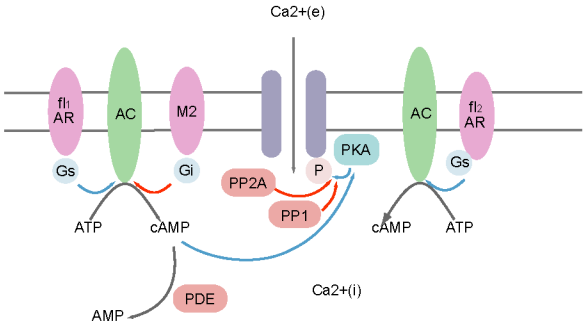
Levels of Modelling



Conceptual: Representation of the model through diagrams, natural language, or concepts from ontologies.

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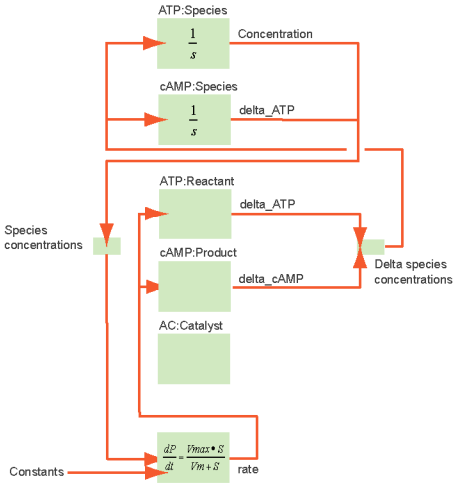
$$\frac{dP}{dt} = \frac{V_{max} \times S}{V_m + S} \qquad \frac{dP}{dt} = \frac{V_{max} \times \frac{S}{K_m} - V_{max\_} \times \frac{P}{K_{m\_}}}{1 + \frac{S}{K_m} + \frac{P}{K_{m\_}}}$$

Mass Action

$$\frac{dP_q}{dt} = (m_q) \times (k) \times \prod_{r=1}^{i} [S_r]^{n_r} \qquad \frac{dP_q}{dt} = (m_q) \times (k) \times \prod_{r=1}^{i} [S_r]^{n_r} - (m_q) \times (k\_) \times \prod_{u=1}^{j} [P_u]^{m_u}$$

Mathematical: Representation of the conceptual model using mathematical equations.



Instances: Representation of mathematical equations as instances of CellML components connected together.

Implementation: Simulation of model in simulation software, an iterative process of system identification.