The Systems Biology Markup Language (SBML): Language Specification for Level 3 Version 1

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Summary

Many software tools provide facilities for depicting reaction network diagrams in a visual form. Two aspects of such a visual diagram can be distinguished: the layout (i.e.: the positioning and connections) of the elements in the diagram, and the graphical form of the elements (for example, the glyphs used for symbols, the properties of the lines connecting them, and so on). For software tools that also read and write models in SBML (Systems Biology Markup Language) format, a common need is to store the network diagram together with the SBML representation of the model. This in turn raises the question of how to encode the layout and the rendering of these diagrams. The *SBML Level 3 Version 1 Core* specification does not provide a mechanism for explicitly encoding diagrams, but it does provide a mechanism for SBML *packages* to extend the Core specification and add additional syntactical constructs. The *Layout* package for SBML Level 3 adds the necessary features to SBML so that diagram layouts can be encoded in SBML files, and a companion package called SBML *Rendering* specifies how the graphical rendering of elements can be encoded.

The SBML Layout package is based on the principle that reaction network diagrams should be described as representations of entities such as species and reactions (with direct links to the underlying SBML elements), and not as arbitrary drawings or graphs; for this reason, existing languages for the description of vector drawings (such as SVG) or general graphs (such as GraphML) cannot be used.