

SBML Level 3 Package: Flux Balance Constraints version 3

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Abstract

Constraint-based modeling is a well-established modeling methodology used to analyze and study biological networks at both the medium-scale and genome-scale. Due to their large size and complexity, such steady-state flux models are typically analyzed using constraint-based optimization techniques, such as Flux Balance Analysis (FBA).

The Flux Balance Constraints (FBC) Package extends SBML Level 3 to provide a standardized format for encoding, exchanging, and annotating constraint-based models. It includes support for modeling concepts such as objective functions, flux bounds, and annotation of model components that facilitate reaction balancing. Version two extended the original release by adding official support for encoding gene-protein associations and their associated elements. Version three

extends version two by adding additional constraints, improves the syntax for storing chemical formulas, and adds a key-value pair for storing additional information in the context of constraint-based modeling.

In addition to providing the elements necessary to uniquely encode existing constraint-based models, the FBC package provides an open platform that facilitates the continued, cross-community development of an interoperable constraint-based model encoding format.