

iBioSim 1.2: A Tool for the Analysis and Design of Genetic Circuits

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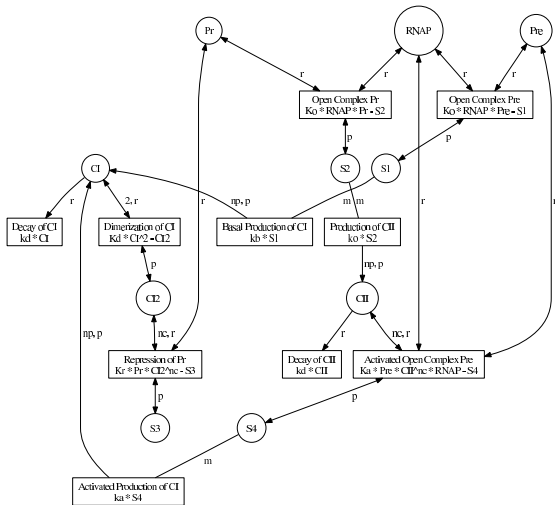
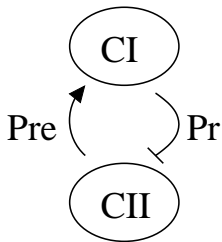
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iBioSim 1.2: The Intelligent Biological Simulator

- Project management support.
- SBML Editor - creates models using the *Systems Biology Markup Language* (SBML).
- GCM Editor - creates *Genetic Circuit Models* (GCM).
- reb2sac - abstraction-based ODE, Monte Carlo, and Markov analysis.
- TSD Graph Editor - visualizes TSD files.
- Probability Graph Editor - visualizes probability data.
- GeneNet - learns GCMs from time series data (TSD).

GCM versus SBML Representation



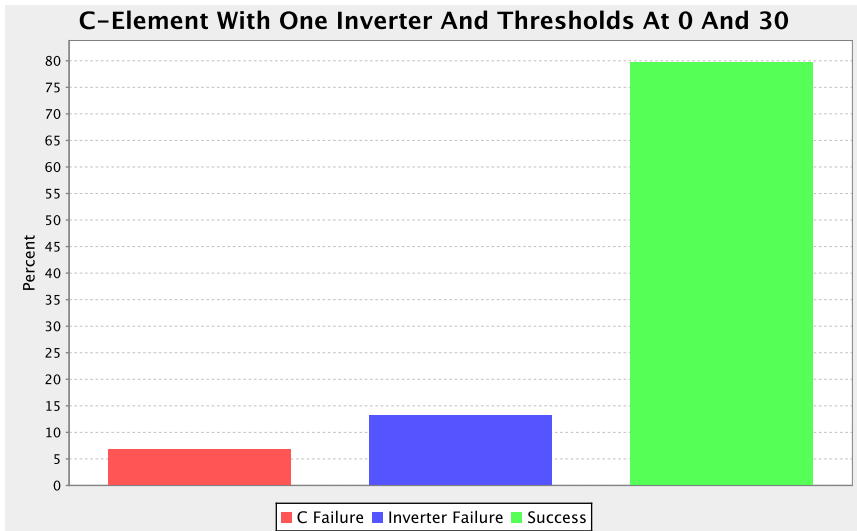
Updates from iBioSim 1.0

- Cosmetic changes (added toolbar, menu items, etc.).
- Added more preferences.
- Added support to select SBML elements to use in analysis.

GCM Updates from iBioSim 1.0

- Added a parameter editor for GCMs in the analysis view.
- Added hierarchical support for GCMs.
- Added ability to specify conditions of interest.
- Added a method to generate logical models directly from GCMs facilitating the application of Markovian analysis.

Markovian Analysis



Madsen and Myers, poster at ICSB 2009.

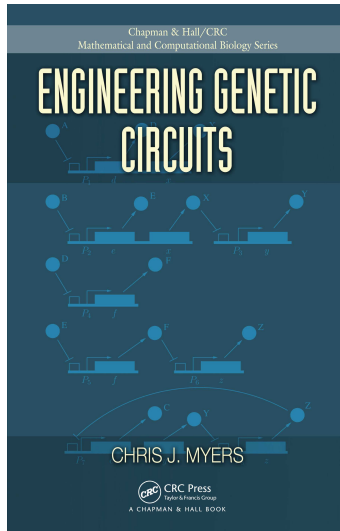
Testing of iBioSim

- SBML Test Suite
 - Passes all tests excluding those with algebraic rules or “fast” reactions.
 - Cases 408, 428, 684, and 849 have some mismatches due to event timing.
- BioModels Test Suite
 - Simulates all models except 13 which is too slow.
 - Results appear to be in agreement with most other simulators.
- Discrete Stochastic Models Test Suite
 - Models 002-05, 002-06, and 002-07 have a boundary condition reactant with 0 molecules. Should this reaction be able to occur?
 - Other than these examples, results agree except for some mismatches on standard deviation for 001-03 and some mean differences on 003-04.

More Information

- Versions available for Windows, Linux, and MacOS.
- Available for free download from:
<http://www.async.ece.utah.edu/iBioSim>
- Publications and course materials available from our website:
<http://www.async.ece.utah.edu>

Engineering Genetic Circuits



Acknowledgments



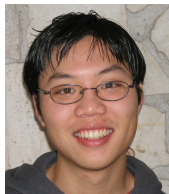
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