



SBML Team facilities & software

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On behalf of the SBML Team

ONLINE VALIDATOR

http://sbml.org/Facilities/Validator

The screenshot shows the 'Online SBML Validator' web page. At the top, the SBML.org logo and the text 'The Systems Biology Markup Language' are displayed. A navigation menu includes links for News, Documents, Downloads, Forums, Facilities, Community, Events, and About. A search bar is also present. The main content area features a welcome message for 'Frank Bergmann' and a section for retrieving validation results using a key. Below this, there are three tabs: 'Upload File', 'Submit URL', and 'Paste SBML'. The 'Upload File' tab is active, showing a 'Browse' button and a 'Clear Queue' button. To the right, there are 'Validate now' and 'Schedule for Validation' buttons. A section titled 'Validation options:' lists several checkboxes, all of which are checked. The page also includes a paragraph about the SBML Online Validator's capabilities and limitations, and a reference to the 'privacy notice'.

Online SBML Validator

http://sbml.org/Facilities/Validator/index.jsp

SBML.org The Systems Biology Markup Language

News Documents Downloads Forums Facilities Community Events About

Parent pages: SBML.org / Facilities / Online SBML Validator

Welcome back **Frank Bergmann**

This system can test the syntax and internal consistency of an SBML file. Passing this validator doesn't *guarantee* a file is 100% correct SBML, but it's the best automated assessment available.

You can retrieve the result of a previously-scheduled validation run by entering its key here:

(E.g., 7bf66904-7d67-49bb-9127-bee77a8f96ba)

Submit

Use the form below to upload your SBML content. You can also access this service via a **network API**. By using any part of this service or website, you agree to be bound by the terms of the **privacy notice**.

Upload File Submit URL Paste SBML

Browse Clear Queue Validate now Schedule for Validation

Select an SBML file located on your computer. The file can be uncompressed, or compressed using **zip**, **gzip** or **bzip2**.

Validation options:

- Check consistency of measurement units associated with quantities (**SBML L2V4 rules 105nn**)
- Check correctness and consistency of identifiers used for model entities (**SBML L2V4 rules 103nn**)
- Check syntax of MathML mathematical expressions (**SBML L2V4 rules 102nn**)
- Check validity of **SBO identifiers** (if any) used in the model (**SBML L2V4 rules 107nn**)
- Perform static analysis of whether the model is **overdetermined**
- Perform additional checks for recommended good **modeling practices**
- Perform all other general SBML consistency checks (**SBML L2V4 rules 2nnnn; highly recommended**)

The SBML Online Validator currently supports all specifications of SBML through **Level 3 Version 1 Core** (Release 1). Limitations: (1) SBML `<annotation>` element content is only checked for proper XML syntax; the *content* of annotations is *not* validated; consequently, a model may have errors in its annotations yet still pass this validator. (2) The maximum file size allowed is 32 megabytes (compressed or uncompressed).

Please refer to the **privacy notice** for information about how we use and store your model and other information.

*This facility is the work of Frank T. Bergmann, Michael Hucka, Benjamin J. Bornstein, and Akiya Jouraku. It is an interface to the validation engine built into **libSBML 5.1.0-b0**, written by Sarah M. Keating, Frank T. Bergmann, Akiya Jouraku, Benjamin J. Bornstein and Michael Hucka. This version of the validator uses the XML parser library "libxml".*

Options for Direct or Scheduled Validation

Direct Validation

- Intended for (smallish) models, or inexpensive validation runs (i.e., not for unit validation on models with thousands of reactions)
- 60 second timeout
- Yields results directly

Scheduled Validation

- Intended for all cases where validation is expected to take longer
- After scheduling you will receive a validation identifier that you can use later to retrieve the results
- Results will be kept for 24 hours

Customizable Error List

Customize Output

You can customize the way your results are displayed:

Traditional

Grouped By Category

Grouped By Severity

Grouped By Error

You can also choose to display / hide the SBML output:

Display on Error

Display Always

Always Hide

Or choose how detailed the error messages should be (for non-traditional display only):

Detailed

Short messages

Apply

Error Categories

Units consistency

Category of errors that can occur while validating the units of measurement on quantities in a model.

ErrorId	Meaning	L1V1	L1V2	L2V1	L2V2	L2V3	L2V4	L3V1
10501	Units of arguments to function call do not match function's definition	Warning	Warning	Warning	Error	Error	Warning	Warning
10503	Inconsistent <kineticLaw> units	N/A	N/A	N/A	N/A	N/A	N/A	Warning
10511	Mismatched units in assignment rule for compartment	Error	Error	Error	Error	Error	Warning	Warning
10512	Mismatched units in assignment rule for species	Error	Error	Error	Error	Error	Warning	Warning
10513	Mismatched units in assignment rule for parameter	Error	Error	Error	Error	Error	Warning	Warning
10514	Mismatched units in assignment rule for stoichiometry	N/A	N/A	N/A	N/A	N/A	N/A	Warning
10521	Mismatched units in initial assignment to compartment	N/A	N/A	N/A	Error	Error	Warning	Warning
10522	Mismatched units in initial assignment to species	N/A	N/A	N/A	Error	Error	Warning	Warning
10523	Mismatched units in initial assignment to parameter	N/A	N/A	N/A	Error	Error	Warning	Warning
10524	Mismatched units in initial assignment to stoichiometry	N/A	N/A	N/A	N/A	N/A	N/A	Warning
10531	Mismatched units in rate rule for compartment	Error	Error	Error	Error	Error	Warning	Warning
10532	Mismatched units in rate rule for species	Error	Error	Error	Error	Error	Warning	Warning
10533	Mismatched units in rate rule for parameter	Error	Error	Error	Error	Error	Warning	Warning
10534	Mismatched units in rate rule for	N/A	N/A	N/A	N/A	N/A	N/A	Warning

REST API

- Invoke the validator by POST ing a file to it, or passing in a URL (with an API Key)

```
curl -F file=@filename.xml  
-F output=text  
-F offcheck=u,p,s  
http://sbml.org/validator/
```

REST API

- Invoke the validator by POST ing a file to it, or passing in a URL (with an API Key)

```
curl -F url=<URL>  
      -F apikey=<KEY>  
      -F output=text  
      -F offcheck=u,p,s  
      http://sbml.org/validator/
```


REST API

- Invoke the validator by POSTing a file to it or

```
$ curl -F url=http://sbml.org/validator/api/sample-02.xml -F  
File: sample-02.xml
```

Options:

```
Units consistency checking: off  
Identifier consistency checking: on  
MathML consistency checking: on  
SBO consistency checking: on  
Overdetermined model checking: on  
Modeling practices checking: on  
Overall SBML consistency checking: on
```

```
Results: The web request could not be authenticated.
```

<http://sbml.org/validator/>

REST API

User information

Name: Frank Bergmann

Email Address: fbergman@caltech.edu

API Key: 1f234c22-7162-43e3-8715-3a10686dc33c

[Get new key](#)

Software (optional): SBML Validator

[Log out](#)

[Change Password](#)



[Return to the SBML Validator front page.](#)

Web Service

```
String convertSBML(String sbmlModel,  
                  int targetLevel, int targetVersion)  
String convertSBMLtoHTML(String content)  
String expandFunctionDefinitions(String sbmlModel)  
String expandInitialAssignments(String sbmlModel)  
String getLibSBMLVersion()  
String validateSBML(String sbmlModel, boolean withUnits,  
                   boolean withIdentifiers, boolean withMathML,  
                   boolean withSBO, boolean withOverdetermined,  
                   boolean withModelingPractices, boolean withGeneral)  
String validateSBMLBuffer(byte[] sbmlContent, String type,  
                          boolean withUnits, boolean withIdentifiers, boolean withMathML,  
                          boolean withSBO, boolean withOverdetermined, boolean  
                          withModelingPractices, boolean withGeneral)  
String validateSBMLBufferWithoutUnitChecks(byte[] sbmlContent,  
                                           String type)  
String validateSBMLWithoutUnitChecks(String sbmlModel)
```

SOFTWARE INDEX

SBML Software Tools Survey

Parent pages: [SBML.org](#) / [SBML Software Guide](#)

SBML Software Details Questionnaire

General information about your software

1 / 6

Please fill out this form to tell us about your SBML-compatible software. We will use this information to update the **SBML Software Guide**. We may also use the information to write **papers about SBML software**.

What is **your name**? (This is to verify the info you enter in this form; your name will not be put in the SBML Software Guide.)

What is **your email address**? (Again, this is to verify the information you enter; your name will not be put in the Guide.)

What is the public **contact address** for the software? Generally this is an email address (possibly the same as the one above, if you wish), although it can be an online help form instead.

What is the URL to the **home page of your software**?

Updated: Software Matrix

SBML Software Matrix

This matrix provides an at-a-glance summary of software known to us to provide some degree of support for reading, writing, or otherwise working with SBML. The columns' meanings are explained below. For a list of longer descriptions grouped into themes, please see our [SBML Software Summary](#) page. Please use the [survey form](#) to notify us about omissions, updates and suggestions.

	Recent contact	Capabilities					Frameworks						API	Dep.	Platforms				SBML			Availabil.		
		Creation	Simulation	Analysis	Database	Utility	ODE	DAE	PDE	Stochastic	Events	Logical	Other			Linux	Mac OS X	Windows	Web Browser	Import	Export	Open source	Academic use	Commercial use
ABC-SysBio				•			•			•					Python	•	•	•		•		•	•	•
acslXtreme		•																•		•		•	•	•
ALC		•					•	•		•			•					•		•		•	•	•
Antimony	•	•												C, C++		•	•	•	•		•		•	•
Arcadia	•						•	•	•	•	•	•	•								•		•	•
Asmparts		•					•									•				•	•	•	•	•
Athena	•	•	•	•	•	•	•			•	•	•	•	SBW, .NET				•		•	•	•	•	•
AutoSBW	•			•			•							SBW	SBW	•		•		•	•	•	•	•
AVIS													•							•		•	•	•
BALSA		•													Sigtran									
BASIS	•	•	•		•		•			•	•			Web Services					•	•	•	•	•	•
BetaWB	•	•	•	•						•	•					•	•	•			•		•	•
Bifurcation Discovery Tool	•			•			•								SBW	•	•	•		•	•	•	•	•
BiGG					•														•			•		•
BiNoM	•	•		•		•						•				•	•	•		•	•	•	•	•
BiNoM Cytoscape Plugin	•	•		•		•						•		Cytoscape		•	•	•		•	•	•	•	•
Big Sketch Pad		•												BigChem		•	•	•		•	•	•	•	•

This matrix was generated on 2011-07-19 (total number of tools: 230)

Updated: Software Summary

SBML Software Summary

This page lists software known to us to provide some degree of support for reading, writing, or otherwise working with SBML. For an at-a-glance matrix summarizing key features of these software packages, please see our [SBML Software Matrix](#) page. Please [use the survey form](#) to notify us about additions and suggestions.

Note that several of the ODE/DAE-based simulators also include some form of stochastic simulation capability, and vice-versa. Also most of the model simulation, development, and analysis tools listed elsewhere on this page include some form of visualization.

Analysis software

- **ABC-SysBio** [↗](#) — ABC-SysBio implements likelihood free parameter inference and model selection in dynamical systems. It is designed to work with both stochastic and deterministic models written in Systems Biology Markup Language (SBML). ABC-SysBio is a Python package that combines three algorithms: ABC rejection sampler, ABC SMC for parameter inference and ABC SMC for model selection.
- **AutoSBW** [↗](#) — A frontend around AUTO to simplify bifurcation analysis.
- **Bifurcation Discovery Tool** [↗](#) — The Bifurcation Discovery Tool uses a genetic algorithm to search for Hopf bifurcations, turning points, and bistable switches. The user can select parameters to be searched, admissible parameter ranges, and the nature of the bifurcation to be sought. The tool returns parameter values for the model for which the particular behavior is observed.

Contents [\[hide\]](#)

- 1 Analysis software
- 2 Annotation software
- 3 Creation/development software
- 4 Data integration and management software
- 5 Framework or library
- 6 Repository or database
- 7 Scripting module
- 8 Simulation software
- 9 Utility software
- 10 Visualization software

New: Software Showcase

SBML Software Showcase

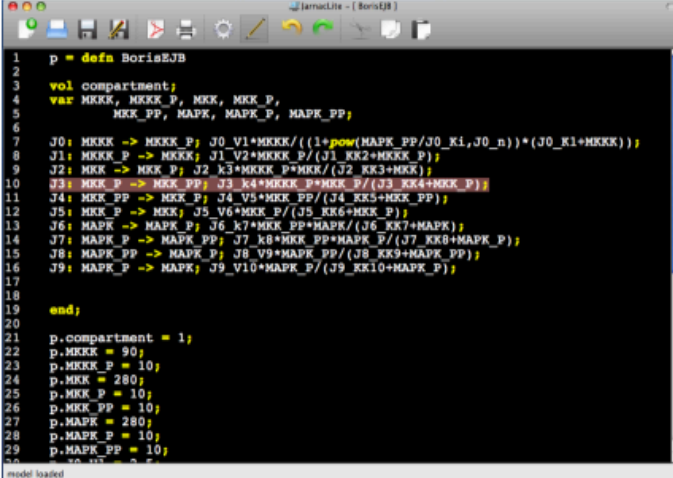
The following slideshow of SBML-compatible software systems contains the subset of packages for which we were provided screenshots by the software's authors. For a complete listing of SBML software, see the [SBML Software Matrix](#), and for a list of longer descriptions grouped into themes, please see our [SBML Software Summary](#) page.

[Play Slideshow](#)

[← Previous](#) [Next →](#)

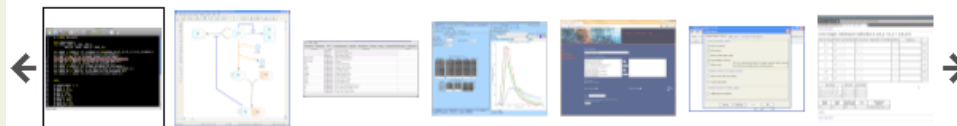
JarnacLite

JarnacLite allows to edit SBML through a simple script based format. It is integrated with SBW, so that a model created with JarnacLite can be quickly simulated and analyzed with a variety of tools. JarnacLite is available on all platforms, and as translator also online. It is released under the BSD license.



```
1 p = defn BorisEJB
2
3 vol compartment;
4 var MKKK, MKKK_P, MKK, MKK_P,
5     MKK_PP, MAPK, MAPK_P, MAPK_PP;
6
7 J0: MKKK -> MKKK_P; J0_V1*MKKK/((1+pow(MAPK_PP/J0_K1,J0_n))*(J0_K1+MKKK));
8 J1: MKKK_P -> MKKK; J1_V2*MKKK_P/(J1_KK2+MKKK_P);
9 J2: MKK -> MKK_P; J2_K3*MKK_P/MKK/(J2_KK3+MKK);
10 J3: MKK_P -> MKK_PP; J3_K4*MKK_P*MKK_P/(J3_KK4+MKK_P);
11 J4: MKK_PP -> MKK_P; J4_V5*MKK_PP/(J4_KK5+MKK_PP);
12 J5: MKK_P -> MKK; J5_V6*MKK_P/(J5_KK6+MKK_P);
13 J6: MAPK -> MAPK_P; J6_K7*MKK_PP*MAPK/(J6_KK7+MAPK);
14 J7: MAPK_P -> MAPK_PP; J7_K8*MKK_PP*MAPK_P/(J7_KK8+MAPK_P);
15 J8: MAPK_PP -> MAPK_P; J8_V9*MAPK_PP/(J8_KK9+MAPK_PP);
16 J9: MAPK_P -> MAPK; J9_V10*MAPK_P/(J9_KK10+MAPK_P);
17
18
19 end;
20
21 p.compartment = 1;
22 p.MKKK = 90;
23 p.MKKK_P = 10;
24 p.MKK = 280;
25 p.MKK_P = 10;
26 p.MKK_PP = 10;
27 p.MAPK = 280;
28 p.MAPK_P = 10;
29 p.MAPK_PP = 10;
30
31
```

Tool 29 of 71



In Development: Software Index

Demonstration

Software Matrix

<http://sysbioapps.dyndns.org>

Home Services Software About

Fullscreen

The SBML Software Matrix is from the SBML homepage provides a list of software packages known to work with SBML. In May of 2011 a new call was made for authors to submit their tools for inclusion. This survey is ongoing and you can still [submit your entry](#).

SBML Software Matrix

Sort: Category

Search...

Category

Sort: Quantity

- Simulation software 87
- Analysis software 58
- Creation/development 51
- Visualization software 40
- Utility software 37
- Data integration and n 33
- Repository or database 33
- Scripting module 32
- Framework or library 18
- Annotation software 11
- (no info) 1

Dependencies

Capabilities

Frameworks

API

SBML Import/Export

Supported Versions

SBML TOOLBOX 4.0.1

SBMLToolbox 4.0.1

Home / SBMLToolbox / 4.0.1

Name ↕

↑ Parent folder

README.txt

SBMLToolbox-4.0.1.zip

Totals: 2 Items

S B M L Toolbox 4.0.1

SBMLToolbox 4.0.1

- import and export removed to libSBML
- improved simulation
(passes 450 tests from SBML Test-suite)
- improved creation of SBML models
- removed GUI support
(fully octave compatible)
- improved documentation

SBMLToolbox 4.0.1

SBMLToolbox 4.0 API Manual

SBMLToolbox 4.0 API

This manual describes the application programming interface (API) of SBMLToolbox, an open-source (LGPL) MATLAB/Octave toolbox for writing and manipulating content in the Systems Biology Markup Language (SBML). This version of SBMLToolbox supports all releases of SBML up through **Level 3 Version 1 Core Release 1**. For more information about SBML, please visit <http://sbml.org> on the Internet.

All functions can be used in both the MATLAB and Octave environments.

Installation

- Installation

Functions

- Accessing the model
- Convenience functions
- Simulation functions
- Validation functions

MATLAB_SBML Structure Functions

- General functions
- Fieldname functions
- AlgebraicRule
- AssignmentRule
- Compartment
- CompartmentType
- CompartmentVolumeRule
- Constraint
- Delay
- Event
- EventAssignment
- FunctionDefinition
- InitialAssignment
- KineticLaw
- LocalParameter
- Model
- ModifierSpeciesReference
- Parameter

SBMLToolbox 4.0 API Manual

ACCESSMODEL

The AccessModel folder contains a number of functions that derive information from the MATLAB_SBML structures.

Function are:

array = *DetermineSpeciesRoleInReaction*(*SBMLSpecies*, *SBMLReaction*)

Takes

1. SBMLSpecies, an SBML species structure
2. SBMLReaction, an SBML reaction structure

Returns

1. an array with five elements [*isProduct*, *isReactant*, *isModifier*, *positionInProductList*, *positionInReactantList*] indicating whether the species is a product, reactant or modifier and re position in the list of products/reactants

or

1. array = 0 if the species is NOT part of the reaction

EXAMPLE:

```

y = DetermineSpeciesRoleInReaction(s, r)
= 0           if s is not in r
= [1, 0, 0, 2, 0] if s is product number 2 in rb
= [0, 1, 0, 0, 1] if s is reactant number 1 in r
= [0, 0, 1, 0, 0] if s is a modifier in r
= [1, 1, 0, 1, 2] if s is product number 1 and reactant number 2
    
```

[names, values] = *GetAllParameters*(*SBMLModel*)

Takes

1. SBMLModel, an SBML Model structure

Returns

1. an array of strings representing the identifiers of all parameters (both global and embedded) within
2. an array of the values of each parameter

NOTE: the value returned will be (in order)

- determined from assignmentRules/initialAssignments where appropriate
- the attribute 'value' for the given parameter
- NaN, if the value is not specified in any way within the model

SBMLToolbox 4.0 API Manual

Model

typecode = SBML_MODEL

SBML Level 1

Version 1		Version 2	
Fieldname	Type	Fieldname	Type
typecode	as above	typecode	as above
notes	string	notes	string
annotation	string	annotation	string
SBML_level	double	SBML_level	double
SBML_version	double	SBML_version	double
name	string	name	string
unitDefinition	array of structures	unitDefinition	array of structures
compartment	array of structures	compartment	array of structures
species	array of structures	species	array of structures
parameter	array of structures	parameter	array of structures
rule	array of structures	rule	array of structures
reaction	array of structures	reaction	array of structures

SBML Level 2

Version 1		Version 2	
Fieldname	Type	Fieldname	Type
typecode	as above	typecode	as above
metaid	string	metaid	string
notes	string	notes	string
annotation	string	annotation	string

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