

# SBFC

## The Systems Biology Format Converter Framework

<http://sbfc.sourceforge.net/>

# Introduction

What is SBFC?

# Context

- Computational Modeling in Biology
  - Community with different goals
    - Descriptive models
    - Mathematical models
  - Different Formats
    - SBML, BioPAX, CellML, ...
    - Octave, R, Matlab, Mathematica, ...
    - SBGN, GPML,...

# Context

- Problem of interoperability
- Need for conversion between formats

# Problem

- Lots of different formats
- Existing conversion tools by different groups
- Separate programs in different programming languages
- Often integrated in existing tools – not easy to reuse

# Goal

- Generic Framework in Java
  - potentially translate any format into another
  - add new converters easily
  - easy to use locally (command line tool)
  - easy to integrate into existing applications

# Goal

- Web Application
  - model upload (file, URL, copy/paste)
  - Prototype using EBI resources
- Web Service
  - use converters from within applications

# SBFC API

- Interfaces:

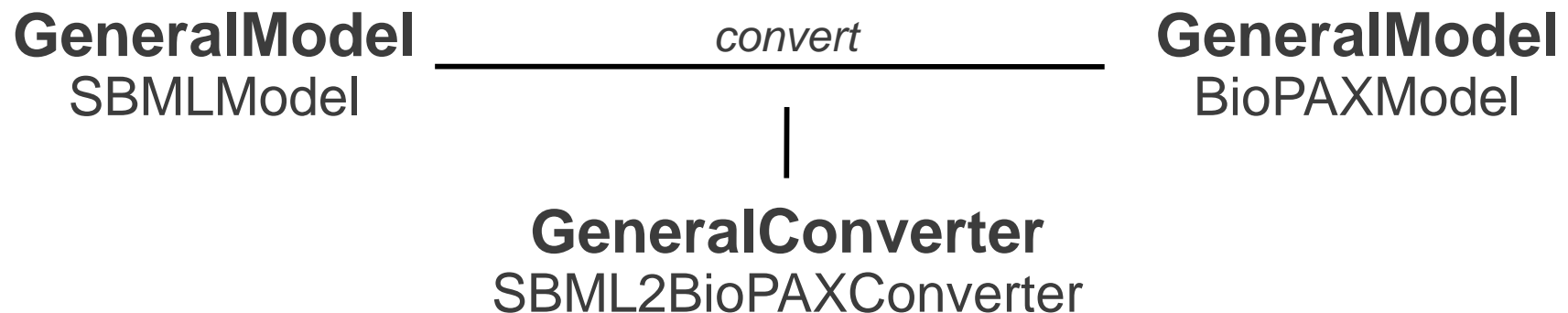
GeneralModel **and** GeneralConverter



# SBFC API

- Interfaces:

GeneralModel and GeneralConverter



# SBFC API

- `GeneralModel`
  - read and write methods (from file or from string)
  - method to get the file extension
- `GeneralConverter`
  - input model and output model
  - convert method
  - method to set converter specific options

# Development

- Developing a prototype with OSGi
- Modular and generic framework
- "Easy" to add new converters
- Code reuse
- Easy integration of converters (or the complete framework) in existing tools

# Web Application

- Accessible from internet browser:  
<http://www.ebi.ac.uk/compneur-srv/converters/converters>
- Models from files, URL or copy/paste
- Running on a server at the EBI
- Conversion jobs are running on a cluster

# <http://sbml.org/Downloads>

sbml.org/Downloads



Google

Parent pages: [SBML.org](#)

## Downloads

### *Software by the SBML Team and the BioModels.net Team*

The SBML Project helps develop a variety of software packages for working with SBML. (Many more third-party packages also support SBML—visit the [SBML Software Guide](#) to find out more about them!)



#### LibSBML

A free, open-source [API](#) library for working with SBML content. It supports many programming languages and operating systems.



#### JSBML

A free, open-source, pure-Java library for working with SBML. It emulates libSBML's API, with more Java idioms and without native object code.



#### SBMLToolbox

A free, open-source package for working with SBML in [MATLAB](#). It provides functions for reading, writing, manipulating, and simulating SBML models.



#### SBML Converters

The [BioModels Database](#) team provides several converters between SBML and other formats.



#### SBMLEditor

A portable (written in Java), low-level, tree-structured editor for SBML. It supports annotations and validation.



#### SBML Test Suite

A conformance testing suite for assessing a simulator's support for SBML.

# The System Biology Format Converter

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- News
- Contact Us

Groups > Computational Systems Neurobiology Group > SBML Converters

We are developing a new converter framework that will allow us and contributors to add easily new converter. The framework is developed on sourceforge, see the [System Biology Format Converter project](#) pages.

It is currently supporting SBML to BioPax 2 and 3, SBML to XPP and SBML to Octave.

## [Online converters service](#)

We are testing a new online service that would allow you to convert your own models yourself, either via the [online converters](#) web page or via webservice.

It is using the System Biology Format Converter (SBFC) in the background so only the converters already integrated in the SBFC are available. It is in a beta stage and is only tested on the latest versions of firefox at the moment.

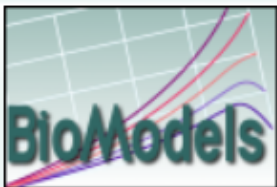
## SBML Converters

Here is a list of all the conversions to and from [SBML](#) that we are developing and maintaining.

## [SBML to Octave](#)

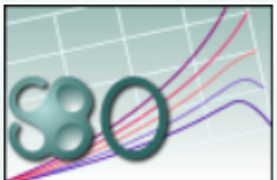
[GNU Octave](#) is a high-level language, primarily intended for numerical computations. It provides a convenient command line interface for solving linear and nonlinear problems numerically, and for performing other numerical experiments using a language that is mostly compatible with Matlab.

### BioModels Database



BioModels Database is a data resource providing quantitative models of biological processes...

### Systems Biology Ontology



If you detect any problems or issues, please send a mail to **biomodels-net-support at lists.sourceforge.net**

### Step 1 : Choose your input format

The input format you choose should match the model(s) you will submit, otherwise you will get an error. We strongly advise you validate your model(s) before the conversion

At the moment only SBML files can be selected as input.

Model format : SBML



### Step 2 : Choose your output format

The output format you choose will determine the converter to use, if the format you want doesn't appear here it means the converter is not implemented yet

Output format : Select the output format



### Step 3 : Enter your email address to get a URL to your results (optional)



### Step 3 : Enter your email address to get a URL to your results (optional)

If you choose to enter an email address, you will receive a link to your conversion results. This field is optional as you will be redirected to the result page after submitting your model(s) anyway

Email address :

### Step 4 : Choose the model(s) you want to convert

You have three different ways to submit model(s), you can upload your files on the server, give the URL to a model or copy/past it directly

#### Choose a method for submitting your model(s):

file upload : ☒

model from URL : ☐

copy/paste : ☐

Select files to upload and convert

Select Model(s)

Files To Upload

Name	Size	Progress
exercise4WithUnits.xml	2717	<div></div>

Convert !



## Conversion Results

**WARNING : you need to refresh the page, when your conversion jobs are finished, the result files will appear.**

You can get your conversion results during 72H at the URL: <http://www.ebi.ac.uk:80/compneur-srv/converters/results?sessionId=c529b51d28876e8d1f0e5ab155af17df>

Download all files

**Job : exercise4WithUnits\_8**

complete

Submitted Model



You can get your conversion results during 72H at the URL: <http://www.ebi.ac.uk:80/compneur-srv/converters/results?sessionId=c529b51d28876e8d1f0e5ab155af17df>

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### Job : exercise4WithUnits\_8

complete

Result file



Submitted Model



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Download all files

# Converters table

Input Format	Output Format	Status
SBML	Biopax	Stable. Some work needed for Biopax L3
SBML	Octave/Matlab	Stable
SBML	XPP	Stable
SBML Lx Vy	SBML Li Vj	Stable (libSBML conversion)
SBML	Dot	In dev
GPML	Biopax	Stable – reverse conversion also available
PathVisio converters		Stable – OSGi – conflict of paxtools version
MDL	SBML+spatial	In dev
SBML	APM	Stable
SBML	SBGN-ML	In dev – hope to get SBGN-ed lib soon
SBGN-ML	Interactive web	In dev (current implementation use processing)
Your converter !!!		

# Conclusion

- Collaborative Project
  - Framework to combine format converters
  - Open Source: <http://sbfc.sourceforge.net/>
- Provide your converters as SBFC converters (implement SBFC-API interfaces)

# Acknowledgements

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- Martijn Van Iersel