

SBGN bricks

COMBINE 2012

17-08-2012

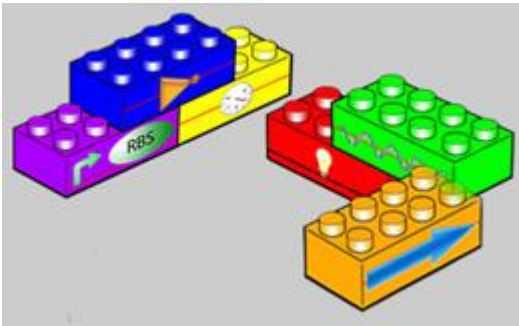
Junker A., Sorokin A., Czauderna T., Schreiber F. and Mazein A.

Wiring diagrams in biology: towards the standardized
representation of biological information

Trends in Biotechnology (2012), accepted (yesterday)

The brick concept

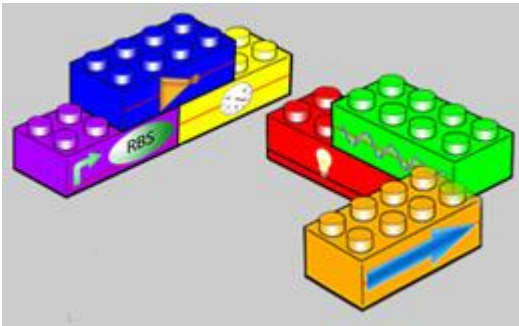
Synthetic biology



BioBrick standard biological parts are DNA sequences of defined structure and function, that are designed for assembly into new biological systems > engineering

The brick concept

Synthetic biology

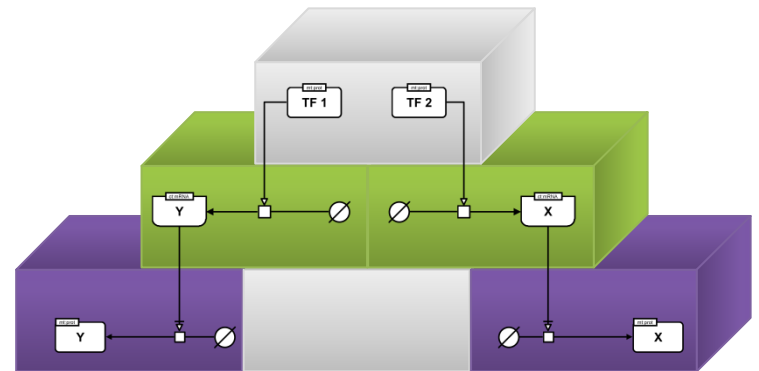
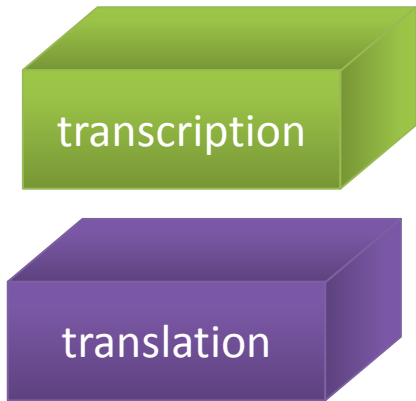
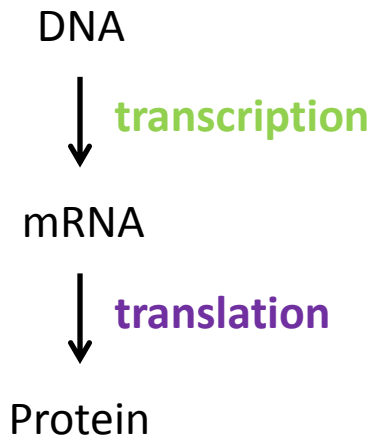


BioBrick standard biological parts are DNA sequences of defined structure and function, that are designed for assembly into new biological systems > engineering

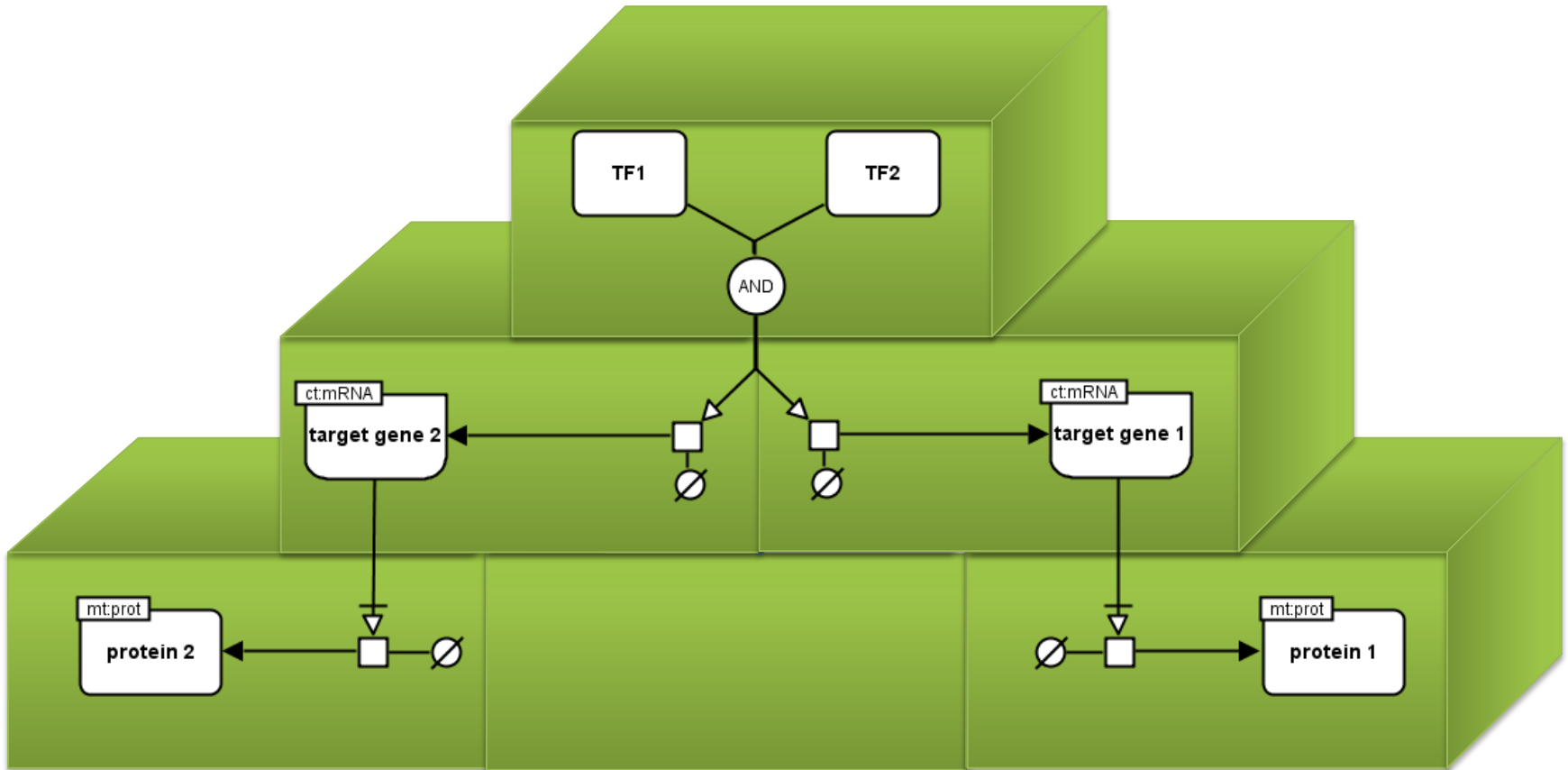
Systems Biology Graphical Notation (SBGN)

SBGN bricks are building blocks representing basic biological patterns which can be assembled into larger SBGN maps.

PATTERN **BRICK** **NETWORK**

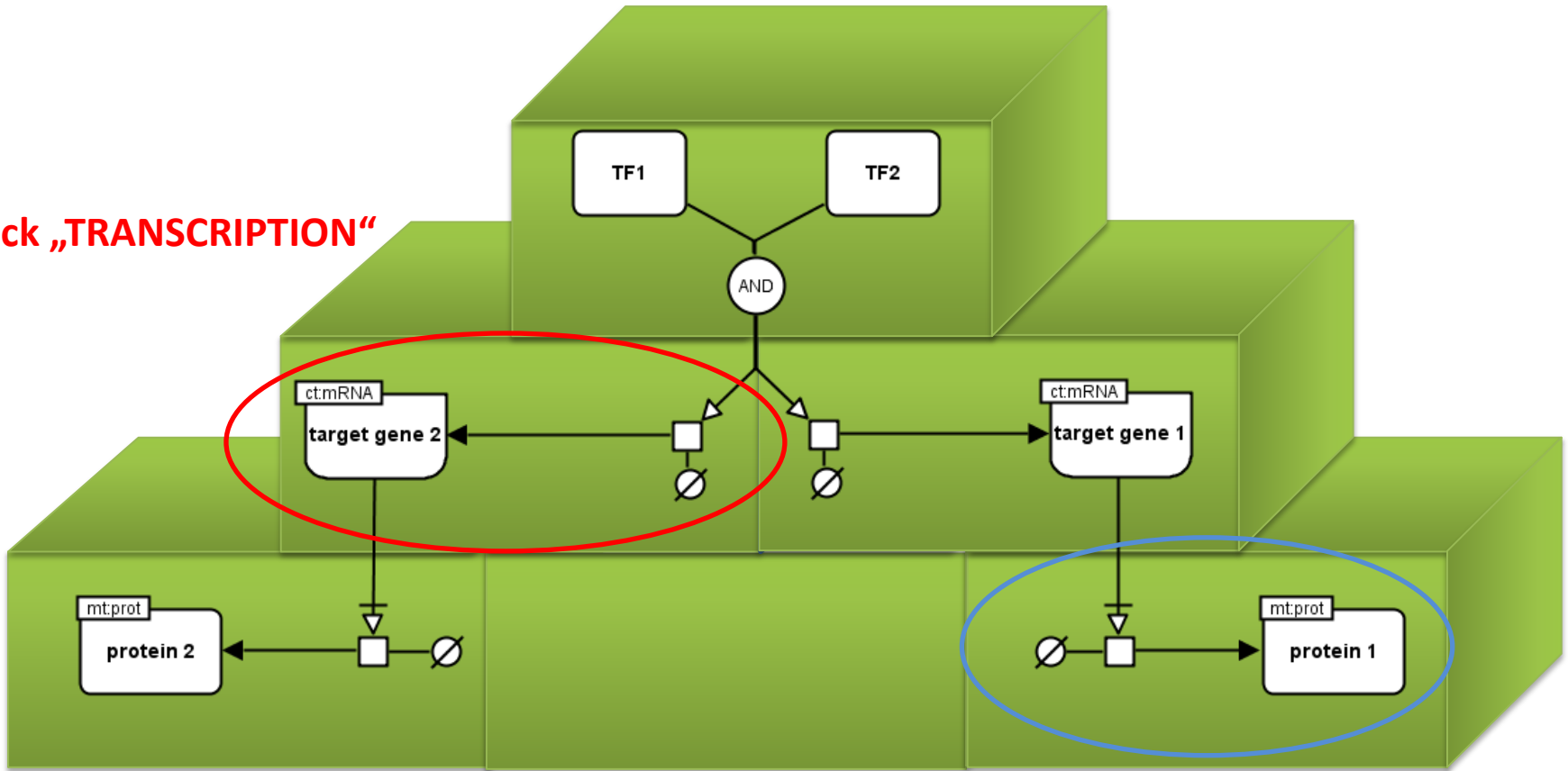


Regulatory networks



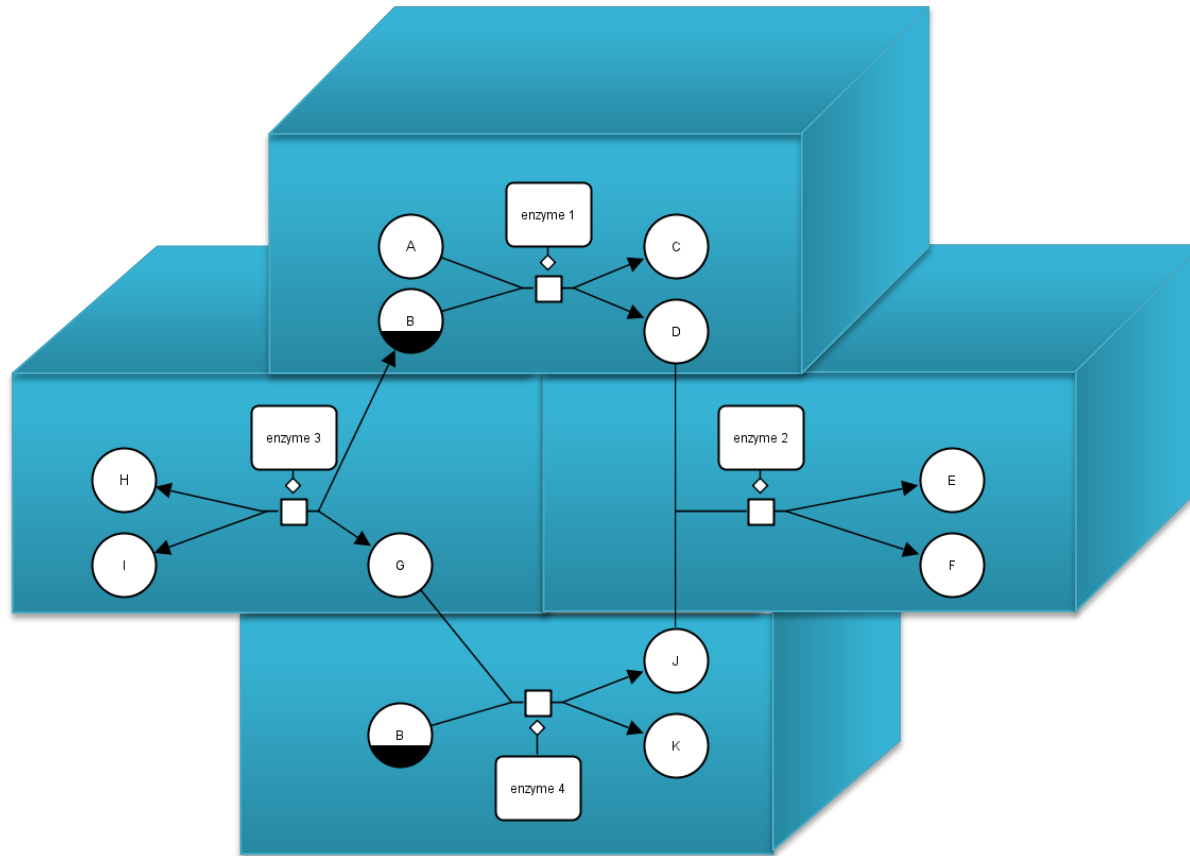
Regulatory networks

Brick „TRANSCRIPTION“



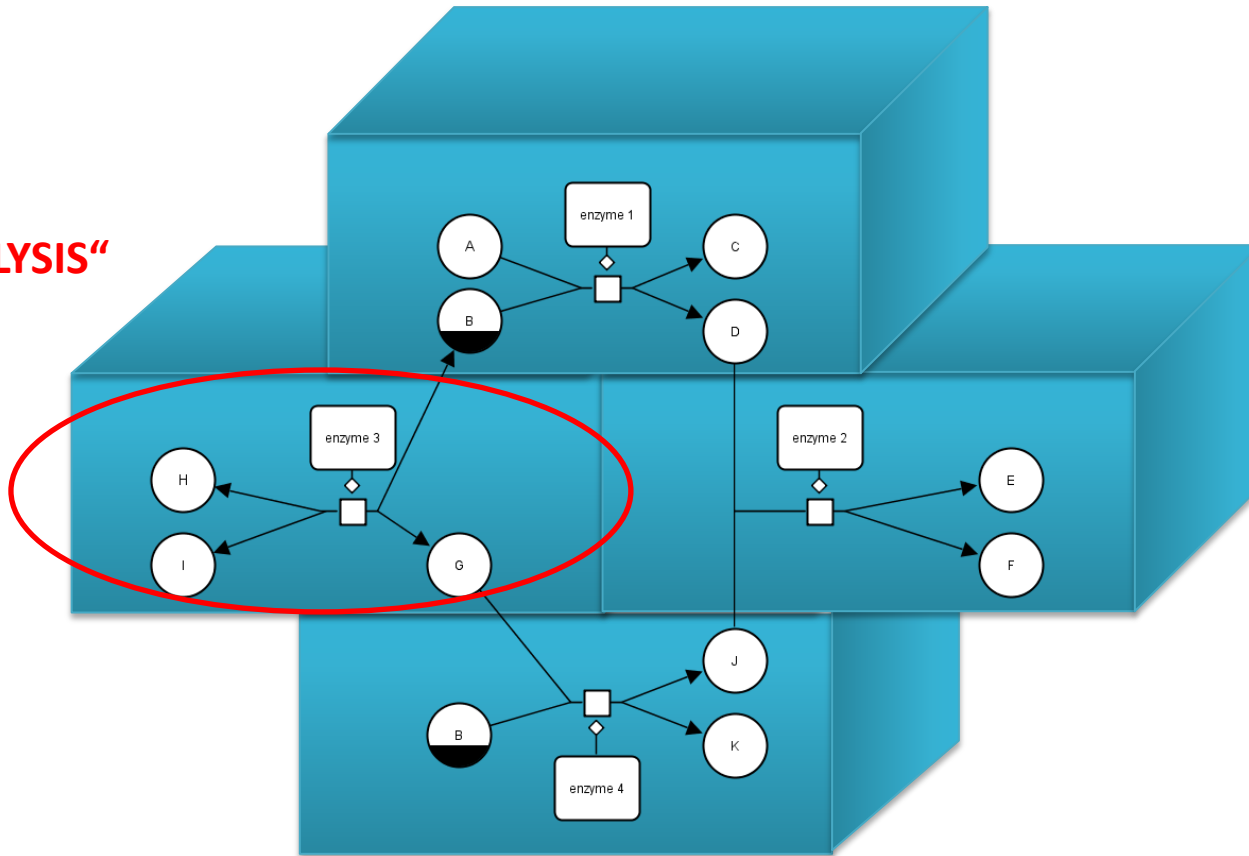
Brick „TRANSLATION“

Metabolic networks



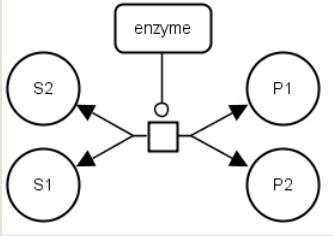
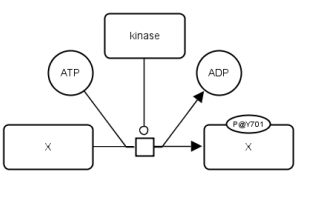
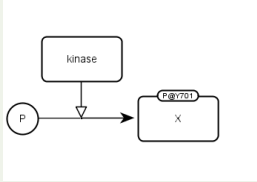
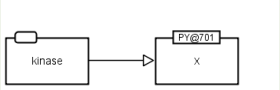
Metabolic networks

Brick „CATALYSIS“



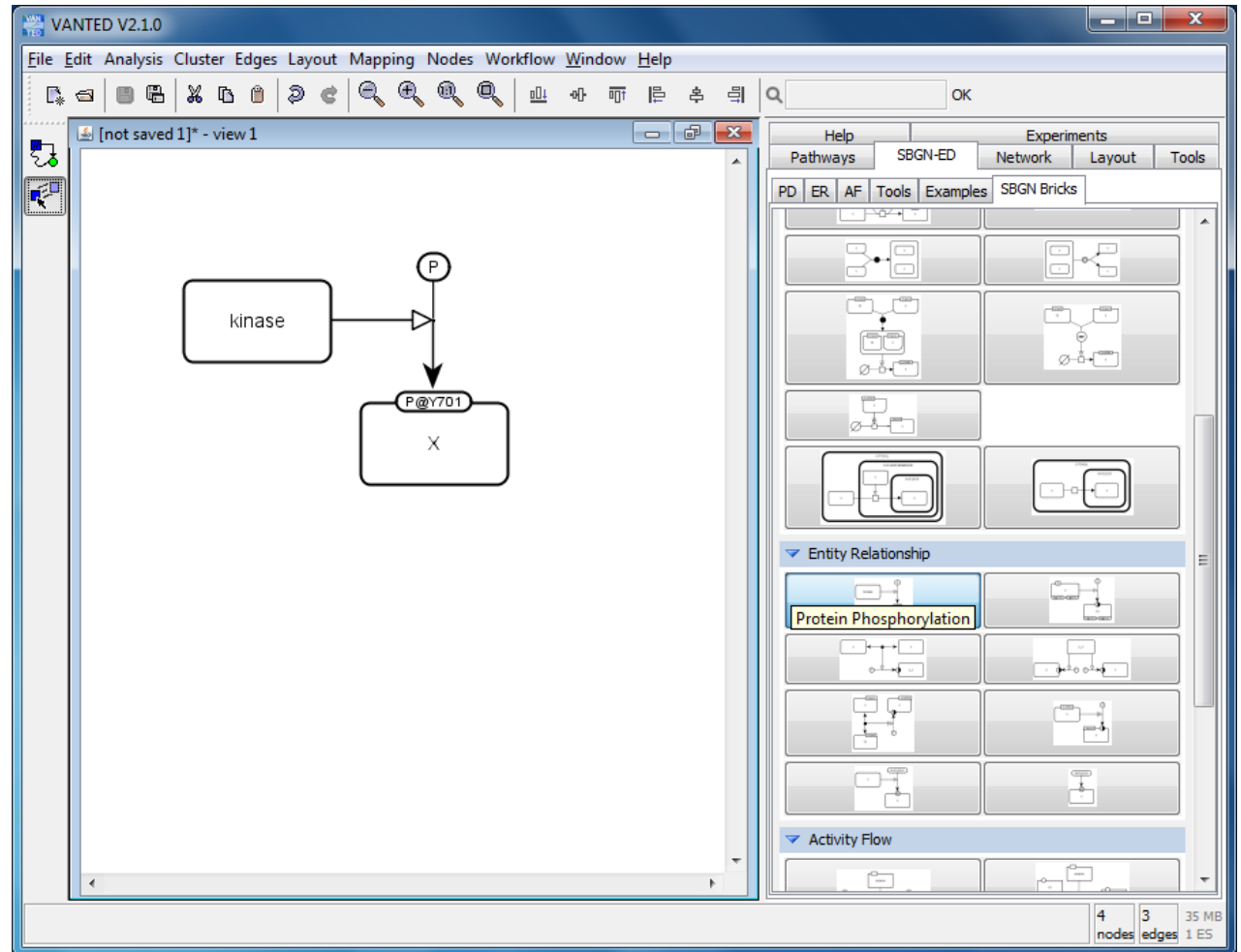
Availability of SBGN bricks

Sourceforge: <http://sbgnbricks.sourceforge.net>

	PD	ER	AF
catalysis		Not applicable	Not applicable
Protein phosphorylation			

Availability of SBGN bricks

SBGN-ED



Advantages of SBGN bricks

- representation of biological patterns in all three languages of SBGN
- applicability of the three languages for specific bricks
- reduced time for SBGN map drawing, but requires manual re-drawing
- faster understanding of SBGN

SBGN dictionary of bricks for download in SBGN-ML format <http://sbgnbricks.sourceforge.net>

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SBGN bricks dictionary

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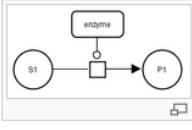
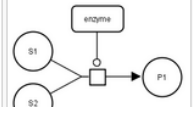
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Metabolic networks

Biological event	SBGN brick	Description
<p>CATALYSIS</p> <p>associated GO terms:</p> <p>GO:0008152 ↗</p> <p>GO:0044238 ↗</p> <p>GO:0003824 ↗</p>		
PD	 <p>Download SBGN-ML ↗</p>	<p>Irreversible reaction with 1 substrate and 1 product</p> <p>The enzyme catalyzes an irreversible (metabolic) process which consumes the substrate (S1) and produces the product (P1). The enzyme is a protein, therefore represented as a 'macromolecule'. Substrate and product of the biochemical reaction are represented by 'simple chemicals'. The consumption of S1 is represented by the consumption arc. The production arc represents the synthesis of P1.</p>
		<p>Irreversible reaction with 2 substrates and 1 product</p> <p>The enzyme catalyzes an irreversible (metabolic) process which consumes two substrates (S1 and S2) and produces the product (P1). The enzyme is a protein, therefore represented as a 'macromolecule'. Substrates and product of the biochemical reaction are represented by 'simple chemicals'. The consumption of S1 and S2 is represented by the</p>