SBGN usage – paper review (work in progress)

Data provided by

Astrid Junker

(IPK Gatersleben, Germany)



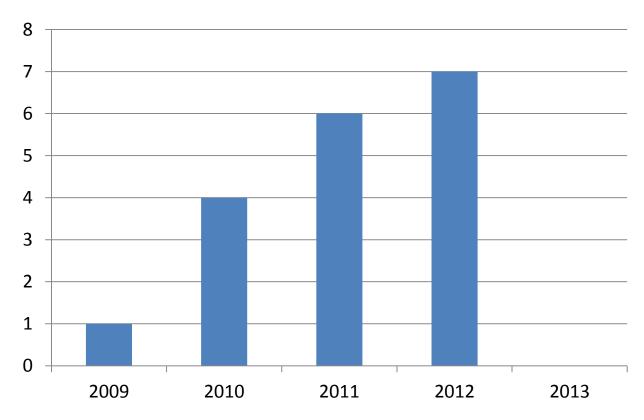


- citations for
 - Le Novère et al. (2009) The Systems Biology Graphical Notation *Nature Biotechnology*
 - PubMed > 90 citations (this week: 99)
 - Google Scholar > 240 citations (this week: 277)





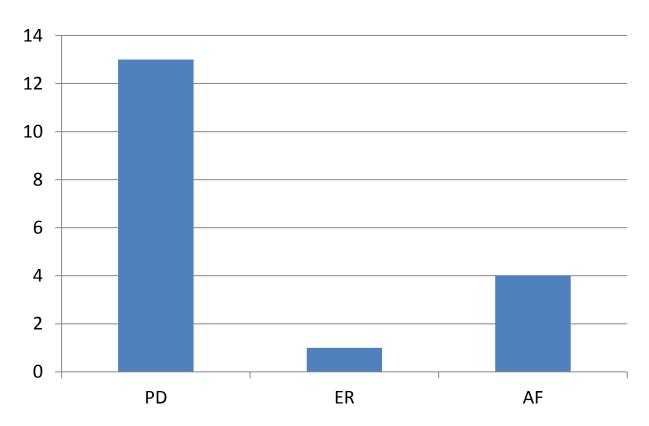
 18 biological papers citing and using SBGN (no reviews, no tools, etc.)







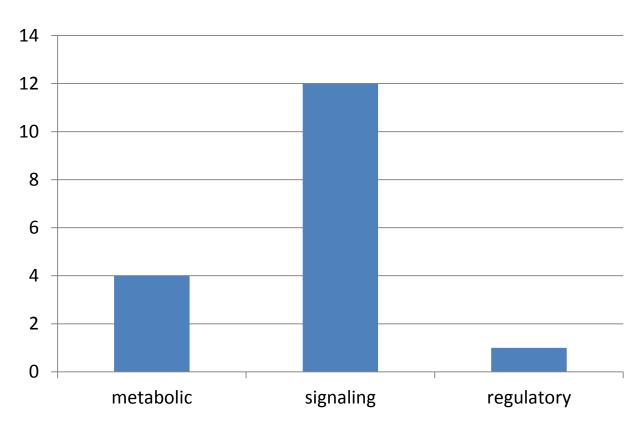
biologists mostly use PD







What kind of biological networks are drawn in SBGN?







Paper review (2009-2012) – usage of PD glyphs

		Caron	Cavalieri	Geenen	Mc Auley	Mosca	Lai	Poltz	Reyes- Palomares	Schaber	Smallbone	Telesco	Telikicherla	Thingnes	Würstle
		2010	2010	2012	2012			2009	2012	2011	2011	2011	2011	2012	2010
EPNs	unspecified entity														
	simple chemical			х	х	х		х	x*		Х	х	х	Х	х
	macromolecule	Х	х	Х	Х	х	Х	Х				х	Х	х	х
	nucleic acid feature		х				х*	х*							
	multimer		х									х			
	complex	х	Х				Х	Х				х	х	Х	х
	source and sink		Х	х	х		Х	х		х*				Х	х
	perturbing agent							х*							
auxiliary units	unit of information		Х	х								х			
	state variable	х	х				Х	Х				х	Х	Х	
	clone marker										Х				
process nodes	process	х	Х	х	Х	х	Х	Х	Х		Х	х	х	Х	х
	omitted process														
	uncertain process														
	association		х				х*	х*	х*			х	х*	х*	х*
	dissociation					х									х*
	phenotype						Х	Х							
arcs	consumption	Х	х	х	Х		Х		Х		Х	х	х	Х	х
	production	х	Х	х	х		х		Х		Х	х	х	Х	х
	modulation										Х		Х		
	stimulation			х				х*	х*						
	catalysis	х		х	Х		Х					х	х	Х	х
	inhibition		х					х					x		
	necessary stimulation		х										х		
	logic arc		х												
	equivalence arc														
logical operators	and		Х												
	or		Х												
	not														
others	submap														
	tag														
	compartment	Х	Х	х*	х			Х	Х		Х	х*	Х		

Paper review (2009-2012) – usage of PD glyphs

			-						Poyes						
		Caron	Cavaliari	Cooper	Mc Auley	Massa	Lai	Dol+-	Reyes-	Schahar	Cmallhono	Tologgo	Telikicherla	Thingnes	Mürstle
		Caron 2010	2010	2012	2012	2012	2012	2009	2012	2011	2011	2011	2011	2012	2010
EPNs	unspecified entity	2010	2010	2012	2012	2012	2012	2009	2012	2011	2011	2011	2011	2012	2010
EPINS	simple chemical			Х	х	х		х	x*		Х	х	х	х	х
	macromolecule	х	V		X	X	, , ,	X	Χ		X	X			X
	nucleic acid feature	_ ^	X X	Х	X	_ X	x x*	x*				X	Х	Х	_ ^
	multimer		X									Х			
	complex	х	X				х	х				X	х	х	х
	source and sink	^	X	х	х		X	x		x*		^	^	X	x
	perturbing agent		^	^	^			x*		_^				^	
auxiliary units	unit of information		х	х								Х			
daxiidi y diiits	state variable	Х	X				х	х				X	х	х	
	clone marker	, A						_^_			х	^	Α	Α	
process nodes	process	Х	х	х	х	Х	х	х	х		X	х	х	х	х
process measure	omitted process														
	uncertain process														
	association		х				х*	х*	x*			х	x*	x*	x*
	dissociation					х									x*
	phenotype						х	х							
arcs	consumption	х	Х	х	х		х		х		Х	х	Х	Х	х
	production	х	х	х	х		х		х		Х	х	х	Х	х
	modulation										Х		х		
	stimulation			х				х*	x*						
	catalysis	х		х	х		Х					х	Х	х	х
	inhibition		х					Х					Х		
	necessary stimulation		х										Х		
	logic arc		х												
	equivalence arc														
logical operators	and		х												
	or		х												
	not														
<u>others</u>	submap														
	tag														
	compartment	х	Х	x*	х			х	х		Х	х*	Х		

Paper review (2009-2012) – usage of PD glyphs

		Caron 2010	Cavalieri 2010	Geenen 2012	Mc Auley 2012			Poltz 2009	Reyes- Palomares 2012	Schaber 2011	Smallbone 2011	Telesco 2011	Telikicherla 2011	Thingnes	Würstle 2010
EPNs	unspecified entity	2010	2010	2012	2012	2012	2012	2009	2012	2011	2011	2011	2011	2012	2010
LITINS	simple chemical			х	х	Х		х	x*		Х	х	х	х	x
	macromolecule	Х	х	X	X	X	х	X	^		^	X	X	X	X
	nucleic acid feature	^	X	^	^	^	x*	x*				_^	^	^	_^
	multimer		X				^	^				Х			
	complex	Х	X				х	х				x	х	х	х
	source and sink		X	х	х		х	X		x*				X	x
	perturbing agent							x*							
auxiliary units	unit of information		х	х								х			
	state variable	Х	х				х	х				х	Х	х	
	clone marker										Х				
process nodes	process	х	х	х	х	х	х	х	Х		Х	х	Х	х	х
·	omitted process														
	uncertain process														
	association		х				х*	х*	x*			х	х*	х*	х*
	dissociation					х									х*
	phenotype						х	Х							
arcs	consumption	х	х	х	х		Х		Х		Х	х	х	х	х
	production	х	х	х	х		Х		Х		Х	х	х	х	х
	modulation										Х		х		
	stimulation			х				х*	x*						
	catalysis	х		Х	Х		Х					х	Х	Х	Х
	inhibition		Х					Х					х		
	necessary stimulation		Х										Х		
	logic arc		х												
	equivalence arc														
logical operators	and		х												
	or		х												
	not														
others	submap														
	tag														
	compartment	х	х	х*	х			х	Х		Х	х*	х		

Paper review (2009-2012) – usage of ER glyphs

		Rogers	Stefan
		2011	2012
interactors	entity		Х
	outcome		Х
auxiliary units	unit of information		Х
	state variable		Х
	existence		
	location		
statements	assignment		Х
	interaction		Х
	phenotype		
logical operators	and		
	or		
	not		
	delay	х*	
influences	modulation		
	stimulation		
	necessary stimulation		Х
	absolute stimulation		Х
	inhibition		Х
	absolute inhibition		Х
	logic arc		
reference	annotation		





Paper review (2009-2012) – usage of ER glyphs

		Rogers	Stefan
		2011	2012
interactors	entity		Х
	outcome		Х
auxiliary units	unit of information		Х
	state variable		Х
	existence		
	location		
statements	assignment		Х
	interaction		Х
	phenotype		
logical operators	and		
	or		
	not		
	delay	x*	
influences	modulation		
	stimulation		
	necessary stimulation		Х
	absolute stimulation		Х
	inhibition		Х
	absolute inhibition		Х
	logic arc		
reference	annotation		





Paper review (2009-2012) – usage of AF glyphs

		Caron	Rogers	Schaber
		2010	2011	2011
activity nodes	biological activity	Х	Х	х*
	perturbation			х*
	phenotype		Х	
auxiliary units	unit of information			
modulating arcs	positive influence	Х	Х	х
	negative influence	Х	Х	Х
	unknown influence			Х
	necessary stimulation		Х	
	logic arc		Х	
	equivalence arc			
logical operators	and		Х	
	or			
	not			
others	submap			
	tags			
	compartment		Х	





Paper review (2009-2012) – usage of AF glyphs

		Caron	Rogers	Schaber
		2010	2011	2011
activity nodes	biological activity	х	Х	х*
	perturbation			х*
	phenotype		Х	
auxiliary units	unit of information			
modulating arcs	positive influence	х	Х	Х
	negative influence	Х	Х	Х
	unknown influence			Х
	necessary stimulation		Х	
	logic arc		Х	
	equivalence arc			
logical operators	and		Х	
	or			
	not			
others	submap			
	tags			
	compartment		Х	





Summary

- biologists mostly use PD
- most SBGN maps drawn show signaling networks
- for PD maps some glyphs are not used at all (yet?)
- glyphs from one language are also used on maps in another language



