SBGN usage – paper review (work in progress)

Data provided by

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Paper review (2009-2012)

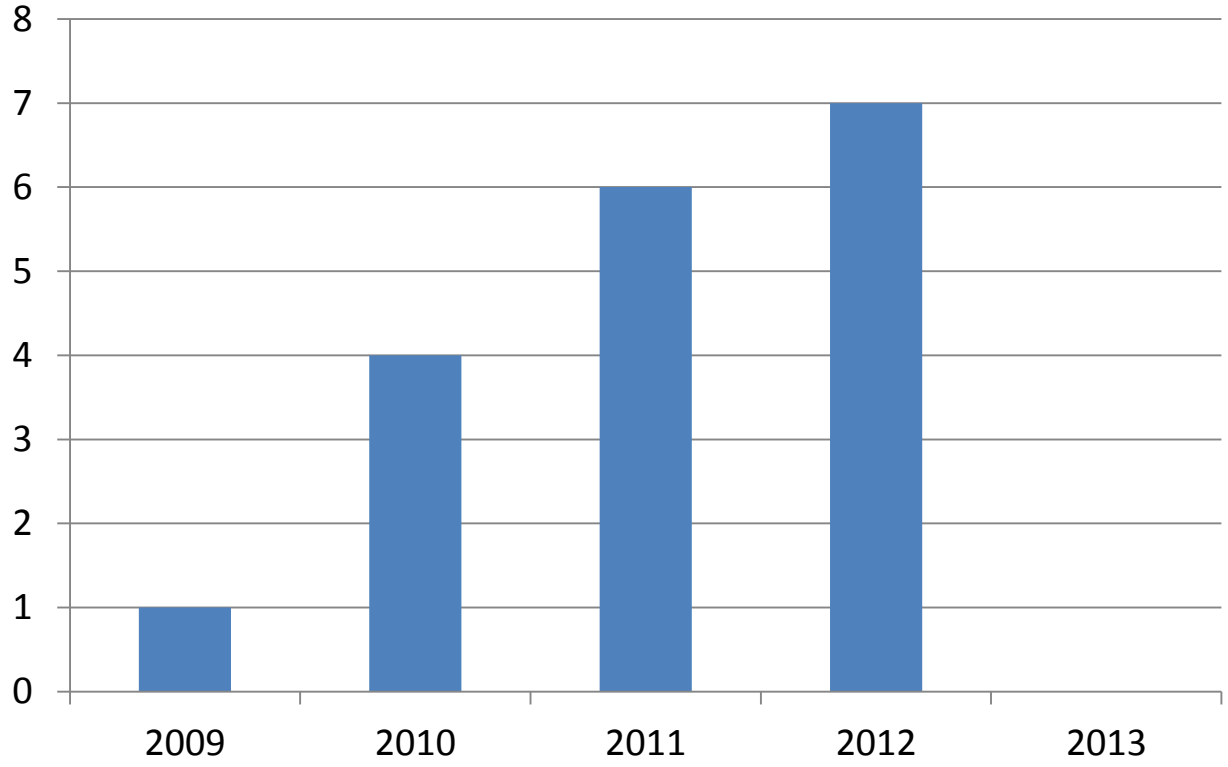
- citations for

  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)

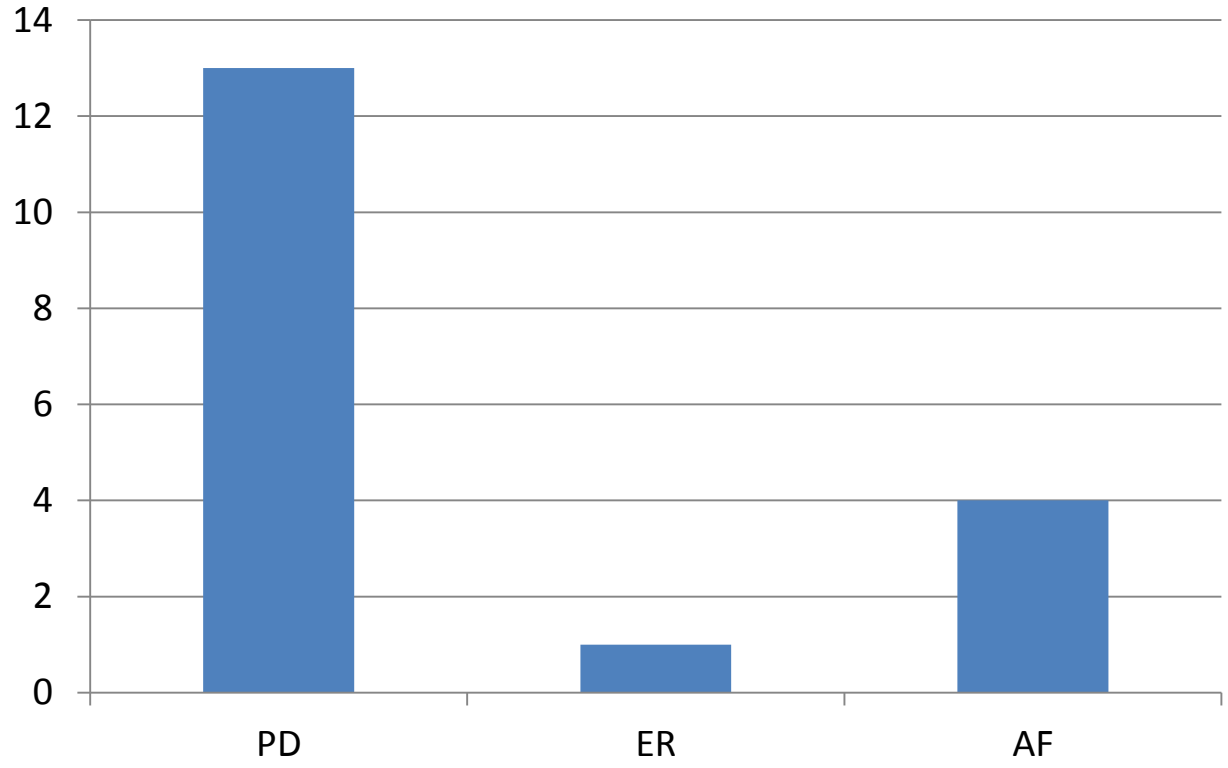
Paper review (2009-2012)

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



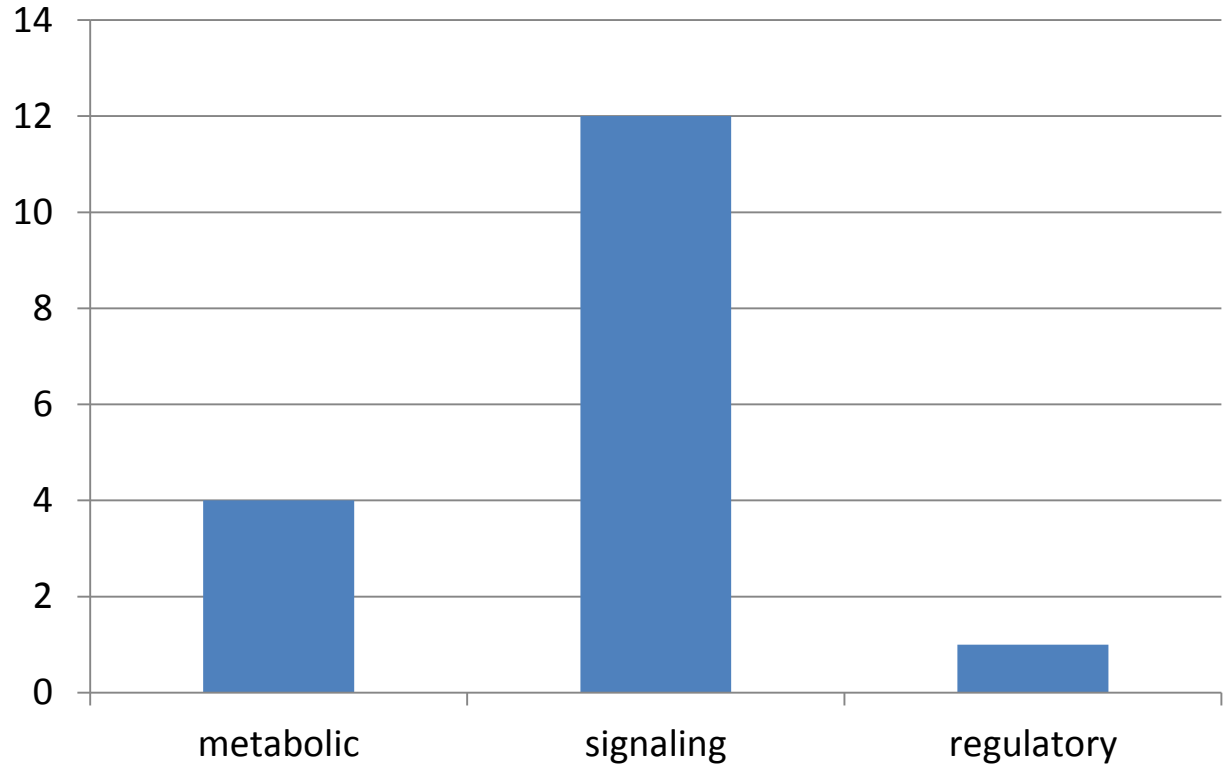
Paper review (2009-2012)

- biologists mostly use PD



Paper review (2009-2012)

- What kind of biological networks are drawn in SBGN?



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

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

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EPNs	unspecified entity														
	simple chemical			x	x	x		x	x*		x	x	x	x	x
	macromolecule	x	x	x	x	x	x	x				x	x	x	x
	nucleic acid feature		x				x*	x*							
	multimer		x									x			
	complex	x	x				x	x				x	x	x	x
	source and sink		x	x	x		x	x		x*				x	x
	perturbing agent							x*							
auxiliary units	unit of information		x	x								x			
	state variable	x	x				x	x				x	x	x	
	clone marker										x				
process nodes	process	x	x	x	x	x	x	x	x		x	x	x	x	x
	omitted process														
	uncertain process														
	association		x				x*	x*	x*			x	x*	x*	x*
	dissociation					x									x*
	phenotype						x	x							
arcs	consumption	x	x	x	x		x		x		x	x	x	x	x
	production	x	x	x	x		x		x		x	x	x	x	x
	modulation										x		x		
	stimulation			x				x*	x*						
	catalysis	x		x	x		x					x	x	x	x
	inhibition		x					x					x		
	necessary stimulation		x										x		
	logic arc		x												
	equivalence arc														
logical operators	and		x												
	or		x												
	not														
others	submap														
	tag														
	compartment	x	x	x*	x			x	x		x	x*	x		

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EPNs	unspecified entity														
	simple chemical			x	x	x		x	x*		x	x	x	x	x
	macromolecule	x	x	x	x	x	x	x				x	x	x	x
	nucleic acid feature		x				x*	x*							
	multimer		x									x			
	complex	x	x				x	x				x	x	x	x
	source and sink		x	x	x		x	x		x*				x	x
	perturbing agent							x*							
auxiliary units	unit of information		x	x								x			
	state variable	x	x				x	x				x	x	x	
	clone marker										x				
process nodes	process	x	x	x	x	x	x	x	x		x	x	x	x	x
	omitted process														
	uncertain process														
	association		x				x*	x*	x*			x	x*	x*	x*
	dissociation					x									x*
	phenotype						x	x							
arcs	consumption	x	x	x	x		x		x		x	x	x	x	x
	production	x	x	x	x		x		x		x	x	x	x	x
	modulation										x		x		
	stimulation			x				x*	x*						
	catalysis	x		x	x		x					x	x	x	x
	inhibition		x					x					x		
	necessary stimulation		x										x		
	logic arc		x												
	equivalence arc														
logical operators	and		x												
	or		x												
	not														
others	submap														
	tag														
	compartment	x	x	x*	x			x	x		x	x*	x		

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

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

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

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

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

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

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

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

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