

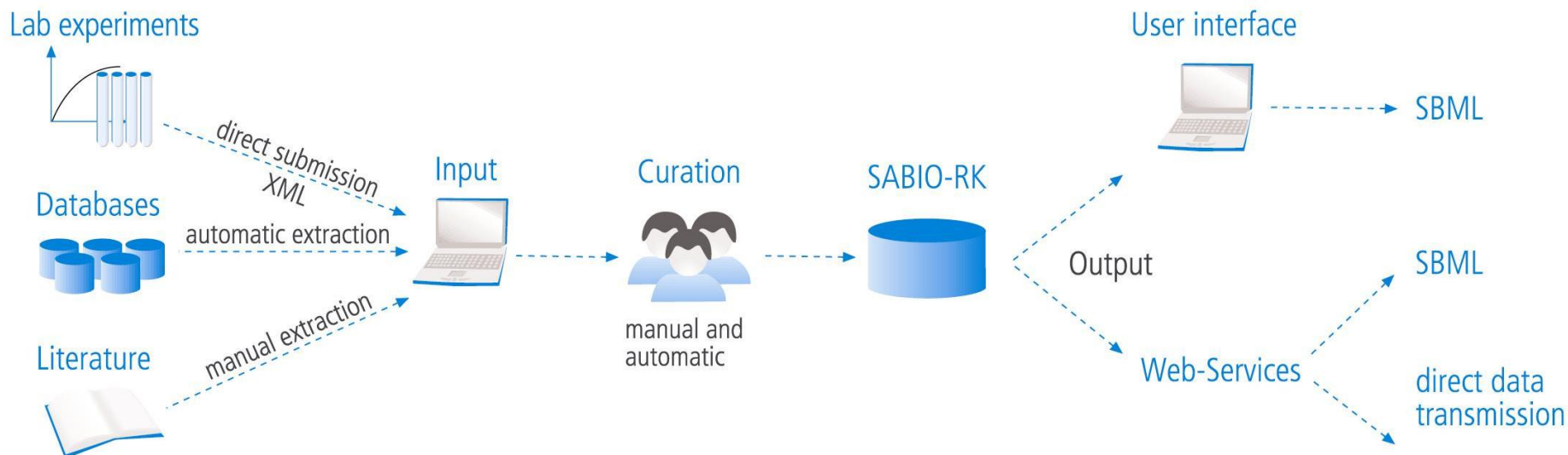
Upload of Kinetic Data into SABIO-RK via SBML

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HITS gGmbH, Germany

COMBINE 2014, Los Angeles, August 18-22

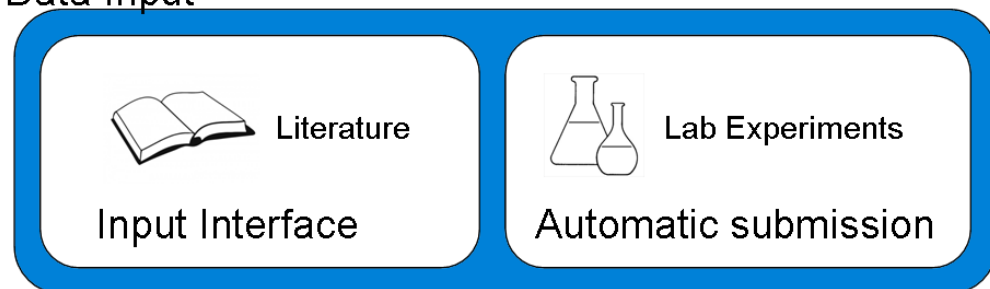
SABIO-RK

Database Population and Access

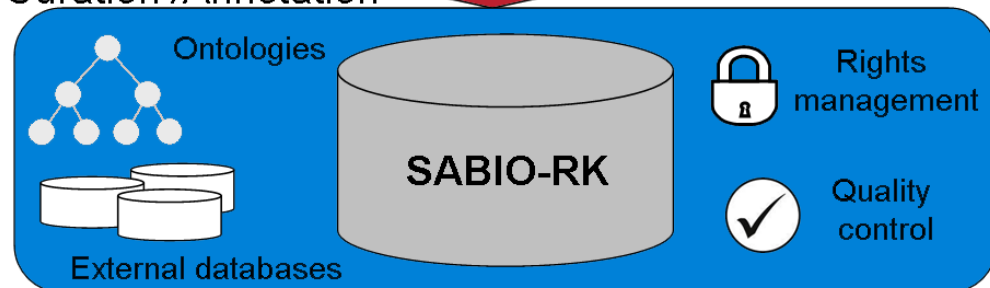


- Kinetic data from **literature** and directly from **experiments** merged with data describing biochemical reactions and pathways from **other resources**
- Data about **metabolic** and **signalling** reactions, as well as reaction mechanisms
- Data is unified, structured, normalized, interrelated and annotated
- Access through a web-based **user interface** and through **web-services (API)**
- **Proprietary levels** can be defined to restrict access to sensitive data
- **Data export** possible in spreadsheet and standard formats (SBML & BIOPAX)

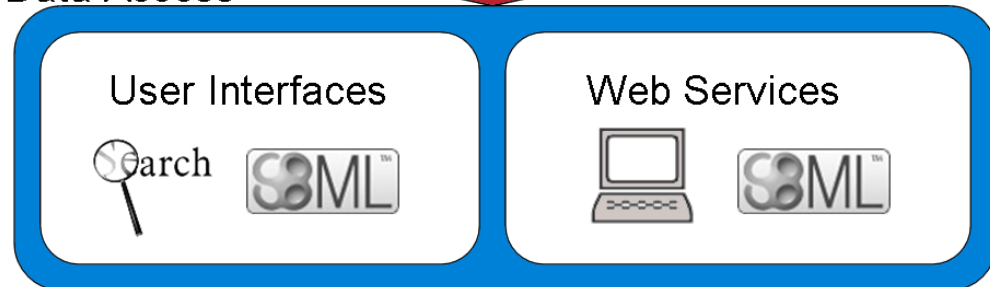
Data Input



Curation /Annotation



Data Access



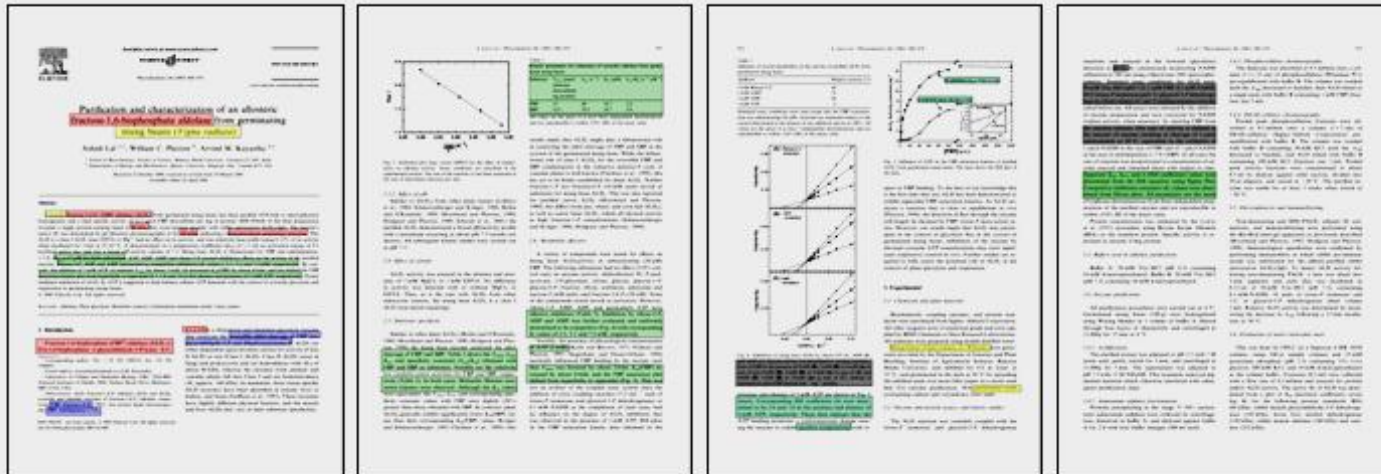
<http://sabiork.h-its.org>

Biochemical reaction kinetics

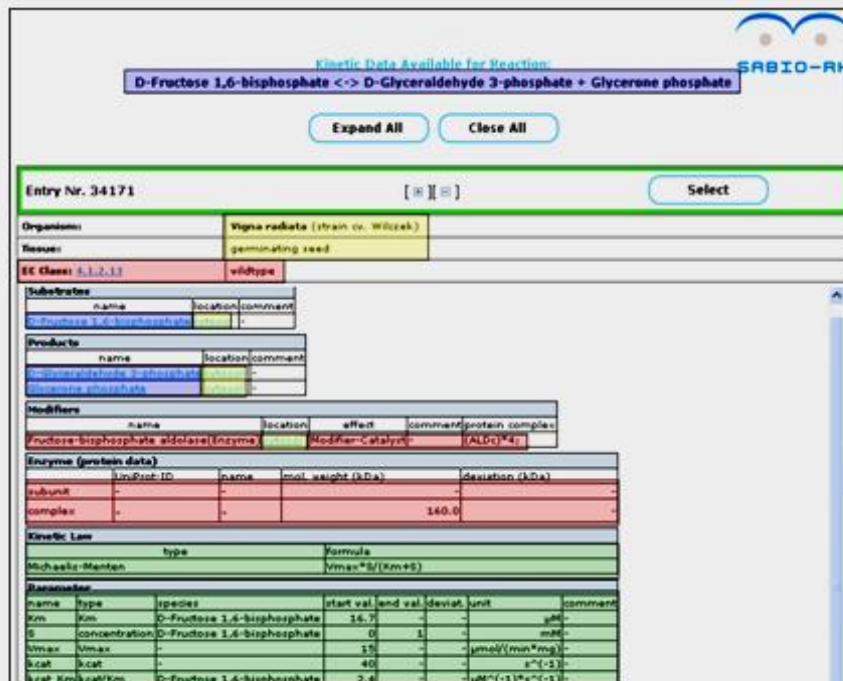
Data is

- Unified
- Structured
- Curated
- Normalized
- Interrelated
- Annotated

A



B



Kinetic Data Available for Reaction:
D-Fructose 1,6-bisphosphate <-> D-Glyceraldehyde 3-phosphate + Glycerone phosphate

Expand All Close All

Entry Nr. 34171 [] [] [] Select

Organism: **Vigna radiata (strain cv. Witzcek)**

Tissue: **germinating seed**

EC Class: **5.1.2.13** **vitType**

Substrates

name	location	comment
D-fructose 1,6-bisphosphate		

Products

name	location	comment
D-glyceraldehyde 3-phosphate		
glycerone phosphate		

Modifiers

name	location	effect	comment	protein complex
fructose-bisphosphate aldolase (Enzyme)		Modifier-Catalytic		ALDO14

Enzyme (protein data)

subunit	UniProt ID	name	mol. weight (kDa)	deviation (kDa)
complex			140.0	

Kinetic Law

type	formula
Michaelis-Menten	$V_{max} \cdot S / (K_m + S)$

Parameters

name	type	species	start val.	end val.	deviat.	unit	comment
Km	concentration	D-fructose 1,6-bisphosphate	14.7	-	-	gM	
S	concentration	D-fructose 1,6-bisphosphate	0	1	-	gM	
Vmax	Vmax		17	-	-	gmo/(min*gM)	
Kcat	Kcat		40	-	-	s ⁻¹ (s ⁻¹)	
Kcat Km/(K _m + Km)		D-fructose 1,6-bisphosphate	2.4	-	-	gM/(min*gM)	

Added Value:

- Clean
- Standardized
- Coherent
- Interlinked

→ High quality data

- Protein- bzw. Enzymdaten
- Reaktionen und chemische Verbindungen
- kinetische Daten
- experimentelle Bedingungen
- biologische Quelle (Organismus, Gewebe, Zelltyp)



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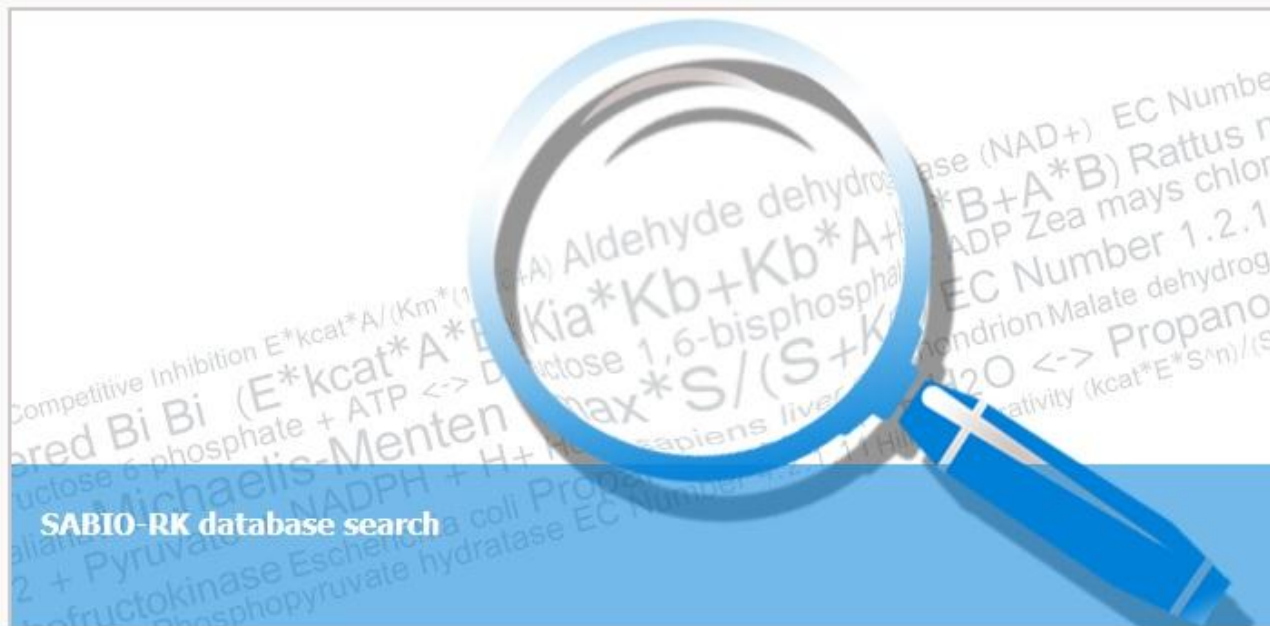
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Welcome!

SABIO-RK is a curated database that contains information about biochemical reactions, their kinetic rate equations with parameters and experimental conditions.



News

[COMBINE & ERASysAPP Tutorial](#)

18-06-2014

SABIO-RK at the tutorial "Modelling and Simulation of Biological Models" on Sunday, September 14th, 2014 at the ICSB in Melbourne [more>>](#)

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16-06-2014

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Search

Organism:"mammalia (NCBI)" AND Tissue:"liver (BTO)" NOT
UniprotID:P00637 AND Substrate:"D-Fructose 1,6-bisphosphate"

[Reset](#)

Advanced Search

AND d-fructo [Add & Search](#)

[d-fructose, 6-\(dihydrogen phosphate\)](#) (0)
[d-fructose 6-phosphoric acid](#)(0)
[d-fructose 2,6-bisphosphate](#) (0)
[d-fructose 6-phosphate](#) (0)
[d-fructose](#) (0)

[Entry View](#)[Reaction View](#)

Filter Options

Enzyme

☒ Wildtype ☒ Mutant ☐ Recombinant

Kinetic Data

☒ Rate Equation

Environmental Conditions

pH: 0 - 14

Temperature: -10 C° - 115 C°

Source

☒ Direct Submission

☐ Entries inserted since:

☒ Journal



15/10/2008





Total number of kinetic law entries found: 40

1 2 3 Next

display 15 entries per page

Kinetic data	Reaction	Enzyme			Tissue	Organism	Parameter (besides concentration)	Environment		Add to export cart?
		ECNumber	Protein	Variant				°C	pH	
	D-Fructose 1,6-bisphosphate + H ₂ O = D-Fructose 6-phosphate + Orthophosphate	3.1.3.11	Q9N0J6	wildtype	liver	<i>Oryctolagus cuniculus</i>	Kd Km Vmax	25.0	9.5	<input type="checkbox"/>
	H ₂ O + D-Fructose 1,6-bisphosphate =	3.1.3.11	Q3SZB7	wildtype	liver	<i>Bos taurus</i>	Km Vmax	28.0	6.5	<input type="checkbox"/>

	D-Fructose 1,6-bisphosphate = Glycerone phosphate + D-Glyceraldehyde 3-phosphate	4.1.2.13	P05062 ↗	wildtype aldolase B	liver ↗	Homo sapiens	Vmax Km	22.0	7.6	
--	--	----------	--------------------------	------------------------	-------------------------	-----------------	------------	------	-----	--

Entry ID: 2175

General information

Organism	Homo sapiens
Tissue	liver ↗
EC Class	4.1.2.13
SABIO reaction id	1338
Variant	wildtype aldolase B
Recombinant	expressed in Escherichia coli BL21(DE3)

Substrates

name	location	comment
D-Fructose 1,6-bisphosphate	-	-

Products

name	location	comment
Glycerone phosphate	-	-
D-Glyceraldehyde 3-phosphate	-	-

Modifiers

name	location	effect	comment	protein complex
fructose-bisphosphate aldolase(Enzyme)	-	Modifier-Catalyst	-	(P05062 ↗)*4;

Enzyme (protein data)

	UniProt-ID	name	mol. weight (kDa)	deviation (kDa)
subunit	P05062	-	-	-
complex	-	-	-	-

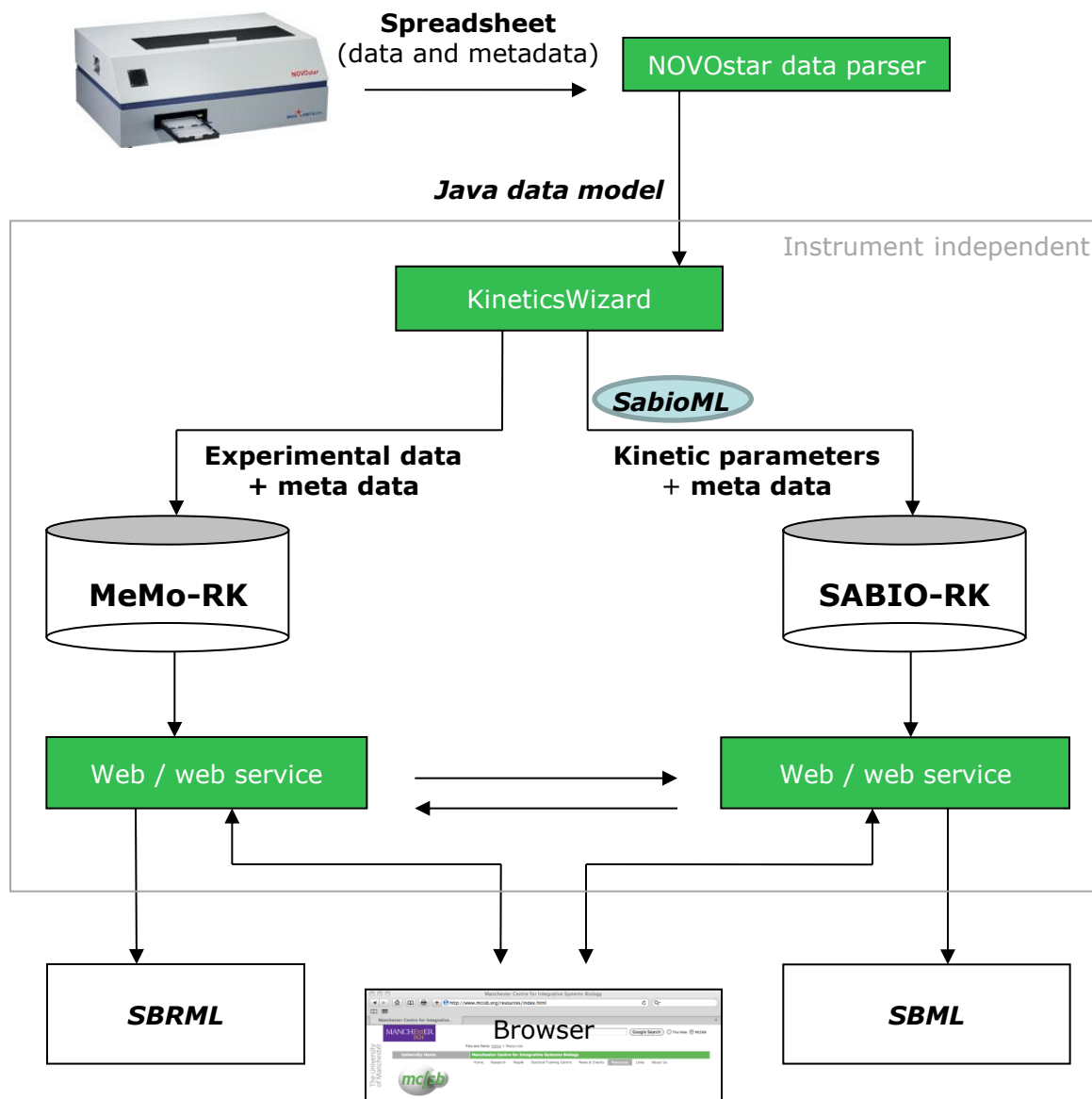
Kinetic Law

type	formula
Michaelis-Menten	$V_{max} * S / (K_m + S)$

Parameter

name	type	species	start val.	end val.	deviat.	unit	comment
S	concentration	D-Fructose 1,6-bisphosphate	-	-	-	-	-
Km	Km	D-Fructose 1,6-bisphosphate	4.0	-	0.6	μM	-

Substrates							
name		location		comment			
D-Fructose 1,6-bisphosphate		-		-			
Products							
name		location		comment			
Glycerone phosphate		-		-			
D-Glyceraldehyde 3-phosphate		-		-			
Modifiers							
name		location	effect	comment	protein complex		
fructose-bisphosphate aldolase(Enzyme)		-	Modifier-Catalyst	-	(P05062 ↗)*4;		
Enzyme (protein data)							
	UniProt-ID	name	mol. weight (kDa)		deviation (kDa)		
subunit	P05062	-	-		-		
complex	-	-	-		-		
Kinetic Law							
type			formula				
Michaelis-Menten			$V_{max} \cdot S / (K_m + S)$				
Parameter							
name	type	species	start val.	end val.	deviat.	unit	comment
S	concentration	D-Fructose 1,6-bisphosphate	-	-	-	-	-
Km	Km	D-Fructose 1,6-bisphosphate	4.0	-	0.6	μM	-
Vmax	Vmax	-	4.787	-	-	μmol/(min*mg)	-
Experimental conditions							
	start value		end value		unit		
temperature	22.0		-		°C		
pH	7.6		-		-		
buffer	50 mM Tris-acetate, 0.15 mM NADH, 10 mM EDTA, 100 mg/ml bovine serum albumin, 2 mg/ml alpha-glycerophosphate dehydrogenase/triose phosphate isomerase						
comment	-						
Reference							
title		author	year	journal	volume	pages	PubMed
Expression, purification, and characterization of natural mutants of human aldolase B. Role of quaternary structure in catalysis.		Rellos P, Sygusch J, Cox TM.	2000	J Biol Chem	275	1145-51	10625657 ↗





Enzyme kinetics informatics: from instrument to browser

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Kania², Sylvestre Kengne², Olga Krebs²,
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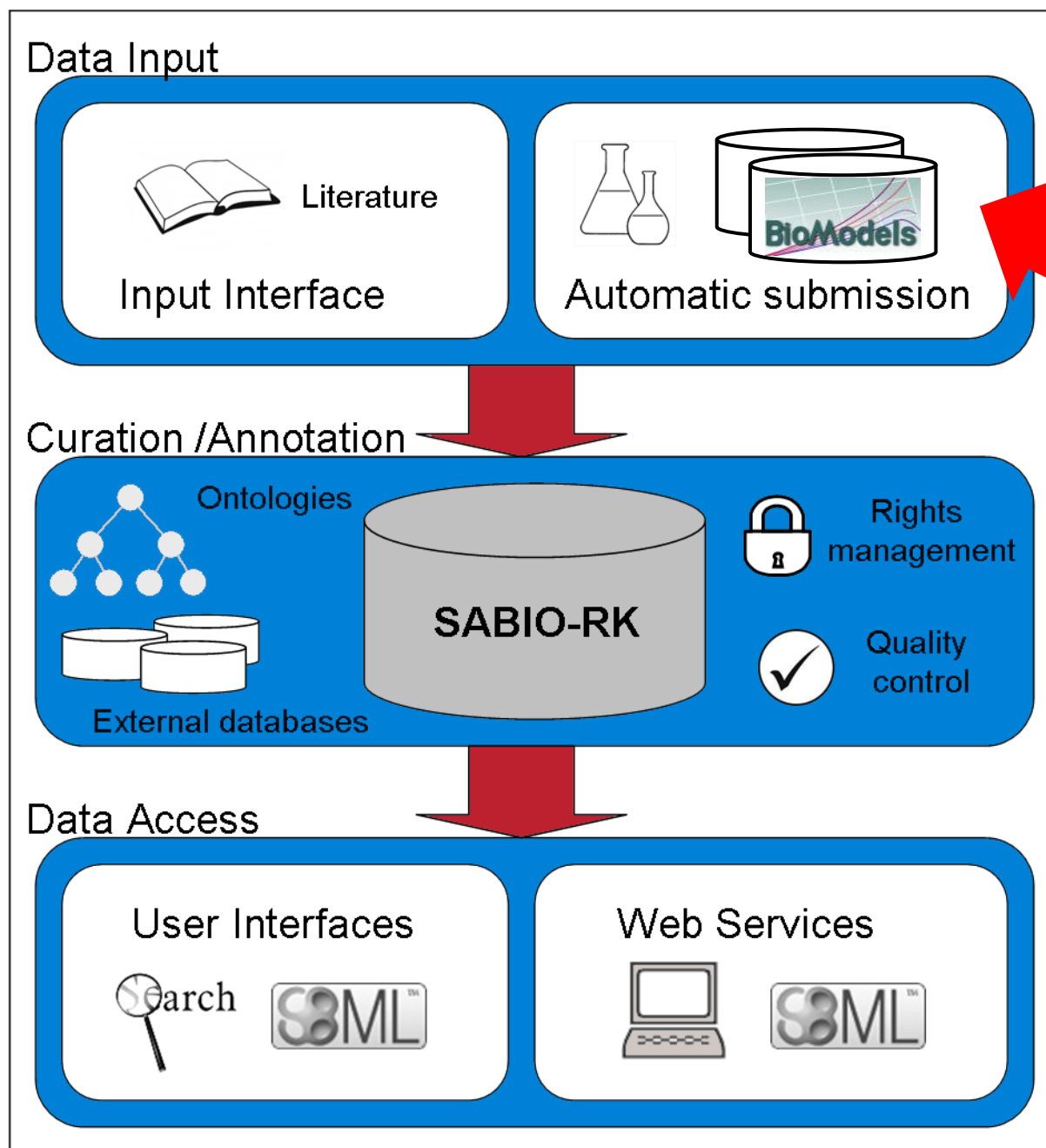
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These authors contributed equally to this work





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BIOMD0000000023 - Rohwer2001_Sucrose

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Model

Overview

Math

Physical entities

Parameters

Curation

Reference Publication

Publication ID: [11513743](#)

Rohwer JM, Botha FC.
 Analysis of sucrose accumulation in the sugar cane culm on the basis of in vitro kinetic data.
 Biochem. J. 2001 Sep; 358(Pt 2): 437-445
 Department of Biochemistry, University of Stellenbosch, Private Bag X1, 7602 Matieland, South Africa. jr@maties.sun.ac.za [\[more\]](#)

Model

Original Model: [BIOMD0000000023.xml.orig](#)

set #1 bqbiol:is [KEGG Pathway map00500](#)

Submitter: [Nicolas Le Novère](#)

bqbiol:isVersionOf [Gene Ontology sucrose biosynthetic process](#)

Submission ID: MODEL6618063111

set #2 bqbiol:occursIn [Taxonomy Saccharum officinarum](#)

Submission Date: 13 Sep 2005 13:28:04 UTC

Last Modification Date: 20 May 2012 12:43:33 UTC

Creation Date: 03 May 2005 13:08:30 UTC

Encoders: [Jacky L. Snoep](#)

Notes

[SBML](#) Level 2 code generated for the JWS Online project by Jacky Snoep using [PySCeS](#).

Run this model online at <http://jii.biochem.sun.ac.za>.

To cite JWS Online please refer to: Olivier, B.G. and Snoep, J.L. (2004) [Web-based modelling using JWS Online](#), Bioinformatics, 20:2143-2144.

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SABIO-RK

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File Type:

SBML: ☒

FREI: ☐

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Publication entries

Publication ID 4864 (11 entries)

Reference

ID	Title	Authors	Journal	Volume	Pages	Year	PubMed	Type	Identifier	Organization	Responsible Person	Contact Email	Contact Phone	Base Url
4864	Analysis of sucrose accumulation in the sugar cane culm on the basis of in vitro kinetic data.	Rohwer JM, Botha FC.	Biochem J	358(Pt 2)	437-45.	2001	11513743	BioModel	MODEL6618063111	Stellenbosh University,	Snoep,Jacky L;	jls@sun.ac.za	null	http://www.ebi.ac.uk/biomodels-main/

General

ID	Organism	Org ID	Strain	Experiment Type	Pathway	Path ID	Mechanism	Tissue	Tiss ID	Comment	Select	Edit
63457	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63458	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63459	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63460	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63461	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63462	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63463	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63464	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63465	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63466	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit
63467	Saccharum officinarum	1541	strain	in silico	Starch and Sucrose metabolism	26	unknown	culm	1476	Bio Model Import	<input type="checkbox"/>	edit

Reaction

ID	Reaction	Reaction ID	Transport	Select	Edit
63457	D-Fructose=D-Fructose	13415	true	<input type="checkbox"/>	edit
63458	D-Glucose=D-Glucose	7002	true	<input type="checkbox"/>	edit
63459	ATP + D-Glucose = D-Glucose 6-phosphate + ADP	793		<input type="checkbox"/>	edit
63460	D-Fructose + ATP = D-Fructose 6-phosphate + ADP	1116		<input type="checkbox"/>	edit
63461	D-Fructose + ATP = D-Fructose 6-phosphate + ADP	1116		<input type="checkbox"/>	edit
63462	D-Fructose 6-phosphate + UDP-D-glucose = UDP + Sucrose 6-phosphate	8678		<input type="checkbox"/>	edit
63463	Sucrose 6-phosphate + H2O = Sucrose + Phosphate	1150		<input type="checkbox"/>	edit
63464	UDP-D-glucose + D-Fructose = Sucrose + UDP	8404		<input type="checkbox"/>	edit
63465	Sucrose + H2O = D-Fructose + D-Glucose	1146		<input type="checkbox"/>	edit
63466	D-Fructose 6-phosphate + ATP = D-Fructose 1,6-bisphosphate + ADP	1113		<input type="checkbox"/>	edit
63467	Sucrose=Sucrose	13123	true	<input type="checkbox"/>	edit

Kinetic law

ID	Type	Type ID	Kinetic law	Reversible	Select	Edit
63457	Michaelis-Menten with product inhibition	0	$\text{vol} \cdot \text{Vmax1} \cdot \text{Frux} / (\text{Km1} \cdot \text{Frux} \cdot (1 + \text{Fru} / \text{Ki1Fru}) + \text{Frux})$	reversible	<input type="checkbox"/>	edit
63458	Michaelis-Menten with product inhibition	0	$\text{vol} \cdot \text{Vmax2} \cdot \text{Glcex} / (\text{Km2} \cdot \text{Glcex} \cdot (1 + \text{Glc} / \text{Ki2Glc}) + \text{Glcex})$	reversible	<input type="checkbox"/>	edit
63459	irreversible random Bi	0	$\text{vol} \cdot \text{Vmax3} \cdot \text{Glc} / \text{Km3Glc} \cdot \text{ATP} / \text{Km3ATP} \cdot ((1 + \text{ATP} / \text{Km3ATP}) \cdot (1 + \text{Glc} / \text{Km3Glc} + \text{Fru} / \text{Km4Fru} + 0.113 \cdot \text{HexP} / \text{Ki3G6P} + 0.0575 \cdot \text{HexP} / \text{Ki4F6P}))$	reversible	<input type="checkbox"/>	edit
63460	irreversible random Bi	0	$\text{vol} \cdot \text{Vmax4} \cdot \text{Fru} / \text{Km4Fru} \cdot \text{ATP} / \text{Km4ATP} \cdot ((1 + \text{ATP} / \text{Km4ATP}) \cdot (1 + \text{Glc} / \text{Km3Glc} + \text{Fru} / \text{Km4Fru} + 0.113 \cdot \text{HexP} / \text{Ki3G6P} + 0.0575 \cdot \text{HexP} / \text{Ki4F6P}))$	reversible	<input type="checkbox"/>	edit
63461	irreversible random Bi	0	$\text{vol} \cdot \text{Vmax5} \cdot (1 + \text{Fru} / \text{Ki5Fru}) \cdot \text{Fru} / \text{Km5Fru} \cdot \text{ATP} / \text{Km5ATP} \cdot ((1 + \text{Fru} / \text{Km5Fru} + \text{ATP} / \text{Km5ATP} + \text{Fru} \cdot \text{ATP} / (\text{Km5Fru} \cdot \text{Km5ATP}) + \text{ADP} / \text{Ki5ADP}))$	reversible	<input type="checkbox"/>	edit
63462	reversible ordered Bi	0	$\text{vol} \cdot \text{Vmax6} \cdot ((0.0575 \cdot \text{HexP} \cdot 0.8231 \cdot \text{HexP} \cdot \text{Suc6P} \cdot \text{UDP} / \text{Keq6}) / (0.0575 \cdot \text{HexP} \cdot 0.8231 \cdot \text{HexP} \cdot (1 + \text{Suc6P} / \text{Ki6Suc6P}) + \text{Km6F6P} \cdot (1 + \text{phos} / \text{Ki6Pi})) \cdot (0.8231 \cdot \text{HexP} + \text{Ki6UDPGlc} + \text{Km6UDPGlc} \cdot 0.0575 \cdot \text{HexP} + \text{Vmax6} \cdot ((\text{Vmax6} \cdot \text{r} \cdot \text{Keq6}) \cdot (\text{Km6UDPGlc} \cdot \text{Suc6P} \cdot (1 + 0.8231 \cdot \text{HexP} / \text{Ki6UDPGlc}) + \text{UDP} \cdot (\text{Km6Suc6P} \cdot (1 + \text{Km6UDPGlc} \cdot 0.0575 \cdot \text{HexP} / (\text{Ki6UDPGlc} \cdot \text{Km6F6P} \cdot (1 + \text{phos} / \text{Ki6Pi}))) + \text{Suc6P} \cdot (1 + 0.0575 \cdot \text{HexP} / \text{Ki6F6P}))))))$	reversible	<input type="checkbox"/>	edit
63463	Michaelis-Menten	23	$\text{vol} \cdot \text{Vmax7} \cdot \text{Suc6P} / (\text{Km7Suc6P} + \text{Suc6P})$	reversible	<input type="checkbox"/>	edit
63464	reversible ordered Bi	0	$\text{vol} \cdot ((\text{Vmax8} \cdot \text{f} \cdot (\text{Suc} \cdot \text{UDP} \cdot \text{Fru} \cdot 0.8231 \cdot \text{HexP} / \text{Keq8}) / (\text{Suc} \cdot \text{UDP} \cdot (1 + \text{Fru} / \text{Ki8Fru}) + \text{Km8Suc} \cdot (\text{UDP} + \text{Ki8UDP}) + \text{Km8UDP} \cdot \text{Suc} + \text{Vmax8} \cdot \text{f} \cdot (\text{Vmax8} \cdot \text{r} \cdot \text{Keq8}) \cdot (\text{Km8UDPGlc} \cdot \text{Fru} \cdot (1 + \text{UDP} / \text{Ki8UDP}) + 0.8231 \cdot \text{HexP} \cdot (\text{Km8Fru} \cdot (1 + \text{Km8UDP} \cdot \text{Suc} / (\text{Ki8UDP} \cdot \text{Km8Suc})) + \text{Fru} \cdot (1 + \text{Suc} / \text{Ki8Suc}))))))$	reversible	<input type="checkbox"/>	edit
63465	Michaelis-Menten with product inhibition	0	$\text{vol} \cdot \text{Vmax9} \cdot (1 + \text{Glc} / \text{Ki9Glc}) \cdot \text{Suc} / (\text{Km9Suc} \cdot (1 + \text{Fru} / \text{Ki9Fru}) + \text{Suc})$	reversible	<input type="checkbox"/>	edit
63466	Michaelis-Menten	23	$\text{vol} \cdot \text{Vmax10} \cdot 0.0575 \cdot \text{HexP} / (\text{Km10F6P} + 0.0575 \cdot \text{HexP})$	reversible	<input type="checkbox"/>	edit
63467	Michaelis-Menten	23	$\text{vol} \cdot \text{Vmax11} \cdot \text{Suc} / (\text{Km11Suc} + \text{Suc})$	reversible	<input type="checkbox"/>	edit

Variables

ID	Name	Term	Not replaced	Comment	Edit
----	------	------	--------------	---------	------

Parameter

ID	Name	Role	Type	Compound	Start	End	Deviation	Unit	Comment	Select	Edit
63457	vol	Constant	volume		1			l		<input type="checkbox"/>	edit
63457	Vmax1	Constant	Vmax		0.286			mM/min		<input type="checkbox"/>	edit
63457	Frux	Variable	concentration	D-Fructose	5.0			mM		<input type="checkbox"/>	edit
63457	Km1Frux	Constant	Km	D-Fructose	0.2			mM		<input type="checkbox"/>	edit
63457	Fru	Variable	concentration	D-Fructose	1.0			mM		<input type="checkbox"/>	edit
63457	Ki1Fru	Constant	Km	D-Fructose	1.0			mM	competitive	<input type="checkbox"/>	edit
63458	vol	Constant	volume		1			l		<input type="checkbox"/>	edit
63458	Vmax2	Constant	Vmax		0.286			mM/min		<input type="checkbox"/>	edit
63458	Glcex	Variable	concentration	D-Glucose	5.0			mM		<input type="checkbox"/>	edit
63458	Km2Glcex	Constant	Km	D-Glucose	0.2			mM		<input type="checkbox"/>	edit
63458	Glc	Variable	concentration	D-Glucose	1.0			mM		<input type="checkbox"/>	edit
63458	Ki2Glc	Constant	Km	D-Glucose	1.0			mM	competitive	<input type="checkbox"/>	edit
63459	vol	Constant	volume		1			l		<input type="checkbox"/>	edit
63459	Vmax3	Constant	Vmax		0.197			mM/min		<input type="checkbox"/>	edit
63459	Glc	Variable	concentration	D-Glucose	1.0			mM		<input type="checkbox"/>	edit
63459	Km3Glc	Constant	Km	D-Glucose	0.07			mM		<input type="checkbox"/>	edit
63459	ATP	Variable	concentration	ATP	1.0			mM		<input type="checkbox"/>	edit

Edit entry

Publication ID: 4864 Entry ID: 63463

Pathway		Starch and Sucrose metabolism		26					
Reaction		Sucrose 6-phosphate + H2O = Sucrose + Phosphate		1150					
				Transport: <input type="checkbox"/> Reverse reaction					
Compounds									
Stoech.	Name	Name Abbr./Synonym Name	Role	Cell. location	Loc. ID	Complex Protein		Comment	Comp. ID
						Protein Identifier	Protein Name		
1	Enzyme		Modifier-Catalyst ▾	cytoplasm	54				0
1	Sucrose 6-phosphate		Substrate ▾	cytoplasm	54				1373
1	Sucrose		Product ▾	cytoplasm	54			-	1294
1	Phosphate		Product ▾	cytoplasm	54			-	36
1	H2O		Substrate ▾	cytoplasm	54				40

Substrate

Product

Modifier-unknown

Modifier-Activator

Modifier-Inhibitor

Modifier-Catalyst

Modifier-Cofactor

add species row

add 5 species rows

Enter

search compounds

Enter compound(s):

search reactions

Choose location:

Please Select

search locations

Choose pathway:

Please Select

clear reaction fields

Signalling event (reaction_based)		
Event Description: <input type="text"/>		
Event type(s)		
Event type ID	Event type description	Event type annotation (GO)

Kinetic law										
Type	Michaelis-Menten							23		
Formula	vol*Vmax7*Suc6P/(Km7Suc6P+Suc6P)							reversible ▼		
Variables										
Name	Term	Do not replace variable in formula						Comment		
		<input type="checkbox"/>								
Parameter										
Name	Role	Type	Species	Value start	Value end	Deviation	Unit	Unit ID	Unit def.	Comment
vol	Constant ▼	volume ▼		1				64	- ▼	
Vmax7	Constant ▼	Vmax ▼		0.5			mM/min	11	- ▼	
Suc6P	Variable ▼	concentration ▼	Sucrose 6-phosphate ▼	1.0			mM	29	- ▼	
Km7Suc6P	Constant ▼	Km ▼	Sucrose 6-phosphate ▼	0.1			mM	29	- ▼	
	unknown ▼	area bimolecular rate constant concentration EC50 enz. activity forward bimolecular rate constant forward rate constant forward unimolecular rate constant half-life Hill coefficient Hill constant IC50 kcat kcat/Km kcat/S_half Kd Keq Ki kinact Km						null	- ▼	
Choose kinetic law type: Please Select ▼										
<input type="button" value="add variable row"/>										
<input type="button" value="add parameter row"/> <input type="button" value="add 10 parameter rows"/>										
<input type="button" value="clear kinetic law fields"/>										
Enzyme description										
Complex information (UniProtID(s))			Q4FCW1							
Complex information (names)			(enter complex information separated by semicolon)							
EC number			3.1.3.24							
Protein			wildtype <input type="checkbox"/> Recombinant <input type="checkbox"/> Expressed in <input type="text"/>							
Stoech.	Name	UniProt ID	Mol. weight (kDa)		Deviation (kDa)					
	native complex	Q4FCW1								
1										
<input type="button" value="add row"/> <input type="button" value="add 5 rows"/>										
<input type="button" value="clear enzyme description fields"/>										

Experimental conditions				
pH		Temperature (°C)		Buffer
Start	End	Start	End	Composition



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Enzyme

☒ Wildtype ☒ Mutant ☐ Recombinant

Kinetic Data

☐ Rate Equation

Reaction

☐ Transport Reaction

Environmental Conditions

pH: 0 - 14

Temperature: -10 C° - 115 C°

Source

☐ Direct Submission☐ Publication☒ BioModel☐ Entries inserted since:[Entry View](#)[Reaction View](#)[Visual Search \(beta\)](#)

Total number of kinetic law entries found: 11

display 15 entries per page

Kinetic data	Reaction	Enzyme			Tissue	Organism	Parameter (besides concentration)	Environment		Add to export cart?
		ECNumber	Protein	Variant				°C	pH	
▶	D-Fructose = D-Fructose	-		wildtype	stem ↗	Saccharum officinarum	Km Vmax Volume			<input type="checkbox"/>
▶	D-Glucose = D-Glucose	-		wildtype	stem ↗	Saccharum officinarum	Km Vmax Volume			<input type="checkbox"/>

▶	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	2.4.1.14		wildtype	stem ↗	Saccharum officinarum	Keq Ki Km Vmax Volume			<input type="checkbox"/>
▼	H2O + Sucrose 6-phosphate = Sucrose + Phosphate	3.1.3.24	Q4FCW1 ↗	wildtype	stem ↗	Saccharum officinarum	Km Vmax Volume			<input type="checkbox"/>


click to collapse

Entry ID: 49364

General information				
Organism	Saccharum officinarum			
Tissue	stem ↗			
EC Class	3.1.3.24			
SABIO reaction id	1150			
Variant	wildtype			
Experiment Type	in silico			
Pathways	Starch and Sucrose metabolism			
Event Description	-			
Substrates				
name	location		comment	
H2O	cytoplasm ↗		-	
Sucrose 6-phosphate	cytoplasm ↗		-	
Products				
name	location		comment	
Sucrose	cytoplasm ↗		-	
Phosphate	cytoplasm ↗		-	
Modifiers				
name	location	effect	comment	protein complex
sucrose-phosphate phosphatase(Enzyme)	cytoplasm ↗	Modifier-Catalyst	-	Q4FCW1 ↗;


Modifiers							
name	location	effect	comment	protein complex			
sucrose-phosphate phosphatase(Enzyme)	cytoplasm ↗	Modifier-Catalyst	-	Q4FCW1 ↗;			
Enzyme (protein data)							
	UniProtKB_AC	name	mol. weight (kDa)	deviation (kDa)			
subunit	-	-	-	-			
complex	-	-	-	-			
Kinetic Law							
type	formula			annotation			
Michaelis-Menten	vol*Vmax7*Suc6P/(Km7Suc6P+Suc6P)			SBO:0000029 ↗			
Parameter							
name	type	species	start val.	end val.	deviat.	unit	comment
Suc6P	concentration ↗	Sucrose 6-phosphate	1.0	-	-	mM	-
Km7Suc6P	Km ↗	Sucrose 6-phosphate	0.1	-	-	mM	-
Vmax7	Vmax ↗	-	0.5	-	-	mM/min	-
vol	volume ↗	-	1.0	-	-	l	-
General comment							
Bio Model Import							
Reference							
title		author	year	data identifier			
Analysis of sucrose accumulation in the sugar cane culm on the basis of in vitro kinetic data.		Rohwer JM, Botha FC.	2001	MODEL6618063111 ↗			

	UDP-D-glucose + D-Fructose = UDP + Sucrose	2.4.1.13	Q9LKR0	wildtype	stem	Saccharum officinarum	Keq Ki Km Vmax Volume	<input type="checkbox"/>
--	--	----------	------------------------	----------	----------------------	-----------------------	-----------------------------------	--------------------------



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Selected kinetics data

Entry ID	Selected Reaction	Organism	Tissue	Kinetic law type	View details	Remove entry (Select all: <input type="checkbox"/>)
49364	H ₂ O + Sucrose 6-phosphate <-> Phosphate + Sucrose	Saccharum officinarum	stem	Michaelis-Menten	view	<input type="checkbox"/>
49363	UDP-D-glucose + D-Fructose 6-phosphate <-> UDP + Sucrose 6-phosphate	Saccharum officinarum	stem	reversible ordered Bi	view	<input type="checkbox"/>
12527	H ₂ O + Sucrose 6-phosphate <-> alpha-D-Glucose 6-phosphate + beta-D-Fructose	Lactococcus lactis subsp. lactis	-	Michaelis-Menten	view	<input type="checkbox"/>
18577	alpha-D-Glucose 1-phosphate <-> alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. cremoris	-	Michaelis-Menten	view	<input type="checkbox"/>
3460	D-Glucose 1-phosphate <-> alpha-D-Glucose 6-phosphate	Rattus norvegicus	heart	Michaelis-Menten	view	<input type="checkbox"/>

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Regiochemistry	+	EntryID	-
KineticMechanism	+	Reaction	-
Other Modifier	+	Organism	-
Pathway	+	Rate Equation	-
Product	+	Parameter	-
PubMedID	+		
Publication	+		
SabioReactionID	+		
Substrate	+		

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Export tsv

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SABIO-RK public user interface

Preview of the first 5 entries

SABIO Excel Export Preview							
	A	B	C	D	E	F	G
1	EntryID	Reaction	Organism	Rate Equation	parameter.type	parameter.asso...	parameter.sta
2	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	Km	Sucrose 6-phos...	1.0E-4
3	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	concentration	D-Fructose 6-p...	0.001
4	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	Keq		10.0
5	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	Ki	Sucrose 6-phos...	7.0E-5
6	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	Km	UDP	3.0E-4
7	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	Km	UDP-D-glucose	0.0018
8	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	concentration	UDP	2.0E-4
9	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	Ki	Phosphate	0.003
10	49363	UDP-D-glucose ...	Saccharum offic...	vol*Vmax6f*(0.0...	Km	D-Fructose 6-p...	6.0E-4

Data Export: Spreadsheets

#	A	B	C	D	E	F	G	H	I	J	K	
1	EntryID	Reaction	Organism	Rate Equation	parameter.type	parameter.associatedSpeci	parameter.start	parameter.end	parameter.start	parameter.end	parameter.unit	Publication
2	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su Km)$		Sucrose 6-phosphate	1.0E-4	-	M		Rohwer JM, B	
3	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su volume)$			1.0	-	I		Rohwer JM, B	
4	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su Km)$		D-Fructose 6-phosphate	6.0E-4	-	M		Rohwer JM, B	
5	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su K_{eq})$			10.0	-	-		Rohwer JM, B	
6	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su V_{max})$			3.33333333E-6	-	M*s*(-1)		Rohwer JM, B	
7	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su K_i)$		Phosphate	0.003	-	M		Rohwer JM, B	
8	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su Km)$		UDP	3.0E-4	-	M		Rohwer JM, B	
9	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su Km)$		UDP-D-glucose	0.0018	-	M		Rohwer JM, B	
10	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su concentration)$		Phosphate	0.0051	-	M		Rohwer JM, B	
11	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su V_{max})$			6.31666667E-6	-	M*s*(-1)		Rohwer JM, B	
12	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su K_i)$		D-Fructose 6-phosphate	4.0E-4	-	M		Rohwer JM, B	
13	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su concentration)$		UDP	2.0E-4	-	M		Rohwer JM, B	
14	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su concentration)$		Sucrose 6-phosphate	0.001	-	M		Rohwer JM, B	
15	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su K_i)$		UDP-D-glucose	0.0014	-	M		Rohwer JM, B	
16	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su K_i)$		Sucrose 6-phosphate	7.0E-5	-	M		Rohwer JM, B	
17	49363	UDP-D-glucose + D-Fructose 6-phosphate = UDP + Sucrose 6-phosphate	Saccharum officinarum	$vol \cdot V_{max}6P^0(0.0575 \cdot HexP^0.8231 \cdot HexP-Su concentration)$		D-Fructose 6-phosphate	0.001	-	M		Rohwer JM, B	
18	49364	H2O + Sucrose 6-phosphate = Sucrose + Phosphate	Saccharum officinarum	$vol \cdot V_{max}7^*Suc6P/(Km7Suc6P+Suc6P)$	volume		1.0	-	I		Rohwer JM, B	
19	49364	H2O + Sucrose 6-phosphate = Sucrose + Phosphate	Saccharum officinarum	$vol \cdot V_{max}7^*Suc6P/(Km7Suc6P+Suc6P)$	Vmax		8.33333333E-6	-	M*s*(-1)		Rohwer JM, B	
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21	49364	H2O + Sucrose 6-phosphate = Sucrose + Phosphate	Saccharum officinarum	$vol \cdot V_{max}7^*Suc6P/(Km7Suc6P+Suc6P)$	Km	Sucrose 6-phosphate	1.0E-4	-	M		Rohwer JM, B	
22	3460	D-Glucose 1-phosphate = alpha-D-Glucose 6-phosphate	Rattus norvegicus	$V^*S/(Km+S)$	concentration	D-Glucose 1-phosphate	-	-	-	-	-	Kashiwaya Y,
23	3460	D-Glucose 1-phosphate = alpha-D-Glucose 6-phosphate	Rattus norvegicus	$V^*S/(Km+S)$	Km	D-Glucose 1-phosphate	4.5E-5	-	M		Kashiwaya Y,	
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25	12527	H2O + Sucrose 6-phosphate = beta-D-Fructose + alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. lactis	$V_{max}^*S/(Km+S)$	Km	Sucrose 6-phosphate	1.0E-4	1.1E-4	-	M		Thompson J,
26	12527	H2O + Sucrose 6-phosphate = beta-D-Fructose + alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. lactis	$V_{max}^*S/(Km+S)$	Vmax		1.55E-4	1.71666667E-4	-	mol*s*(-1)*g*(-1)		Thompson J,
27	12527	H2O + Sucrose 6-phosphate = beta-D-Fructose + alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. lactis	$V_{max}^*S/(Km+S)$	concentration	Sucrose 6-phosphate	0.0	0.002	-	M		Thompson J,
28	18577	alpha-D-Glucose 1-phosphate = alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. cremoris	$V_{max}^*S/(Km+S)$	concentration	Enzyme	0.0067	-	-	mg/ml		Neves AR, Po
29	18577	alpha-D-Glucose 1-phosphate = alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. cremoris	$V_{max}^*S/(Km+S)$	Vmax		0.0010883551	-	3.00006E-5	katal*g*(-1)		Neves AR, Po
30	18577	alpha-D-Glucose 1-phosphate = alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. cremoris	$V_{max}^*S/(Km+S)$	Km	alpha-D-Glucose 1-phosphate	7.14E-5	-	2.8E-6	M		Neves AR, Po
31	18577	alpha-D-Glucose 1-phosphate = alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. cremoris	$V_{max}^*S/(Km+S)$	concentration	Mg2+	0.005	-	-	M		Neves AR, Po



Selected kinetics data

Entry ID	Selected Reaction	Organism	Tissue	Kinetic law type	View details	Remove entry (Select all: <input type="checkbox"/>)
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49363	UDP-D-glucose + D-Fructose 6-phosphate <-> UDP + Sucrose 6-phosphate	Saccharum officinarum	stem	reversible ordered Bi	view	<input type="checkbox"/>
12527	H ₂ O + Sucrose 6-phosphate <-> alpha-D-Glucose 6-phosphate + beta-D-Fructose	Lactococcus lactis subsp. lactis	-	Michaelis-Menten	view	<input type="checkbox"/>
18577	alpha-D-Glucose 1-phosphate <-> alpha-D-Glucose 6-phosphate	Lactococcus lactis subsp. cremoris	-	Michaelis-Menten	view	<input type="checkbox"/>
3460	D-Glucose 1-phosphate <-> alpha-D-Glucose 6-phosphate	Rattus norvegicus	heart	Michaelis-Menten	view	<input type="checkbox"/>

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SABIO-RK - database for biochemical reaction kinetics. Wittig U, Kania R, Golebiewski M, Rey M, Shi L, Jong L, Alga E, Weidemann A, Sauer-Danzwith H, Mir S, Krebs O, Bittkowski M, Wetsch E, Rojas I, Mueller W. Nucleic Acids Res. 2012;40(Database issue)790-6

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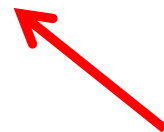
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Kinetic Rate Equations


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Parameter Units

Reactants
(+ Annotations)

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  </rdf:Bag>
</bqbiol:is>
</rdf:Description>
</rdf:RDF>
</annotation>
<listOfReactants>
  <speciesReference constant="true" species="SPC_1450_Cell" sboTerm="SBO:0000015" stoichiometry="1"/>
</listOfReactants>
<listOfProducts>
  <speciesReference constant="true" species="SPC_24_Cell" sboTerm="SBO:0000011" stoichiometry="1"/>
</listOfProducts>
<listOfModifiers>
  <modifierSpeciesReference species="ENZ_140996_Cell" sboTerm="SBO:0000460"/>
</listOfModifiers>
<kineticLaw metaid="META_KL_3460" sboTerm="SBO:0000029">
  <annotation sbrk="http://sabiork.h-its.org" bqbiol="http://biomodels.net/biology-qualifiers/" rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"/>
</sbrk:sabiork xmlns:sbrk="http://sabiork.h-its.org">
<sbrk:kineticLawID>3460</sbrk:kineticLawID>
<sbrk:experimentalConditions>
<sbrk:temperature>
<sbrk:startValueTemperature>38.0</sbrk:startValueTemperature>
<sbrk:temperatureUnit>°C</sbrk:temperatureUnit>
</sbrk:temperature>
<sbrk:pH>
<sbrk:startValuepH>7.2</sbrk:startValuepH>
</sbrk:pH>
<sbrk:buffer> 10 mM K2HPO4/KH2PO4, 20 mM imidazole-HCl, 150 mM KCl, 5 mM MgCl2</sbrk:buffer>
</sbrk:experimentalConditions>
</sbrk:sabiork>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:bqbiol="http://biomodels.net/biology-qualifiers/"
xmlns:bqmodel="http://biomodels.net/model-qualifiers/">
  <rdf:Description rdf:about="#META_KL_3460">
    <bqbiol:isDescribedBy>
      <rdf:Bag>
        <rdf:li rdf:resource="http://identifiers.org/kegg.reaction/R00959"/>
      </rdf:Bag>
    </bqbiol:isDescribedBy>
  </rdf:Description>
</rdf:RDF>

```

Reactions
(+ Annotations)

SABIO-RK
Annotations

Experimental Conditions
(SABIO-RK namespace)

```

</listOfModifiers>
<kineticLaw metaid="META_KL_3460" sboTerm="SBO:0000029">
  <annotation sbrk="http://sabiork.h-its.org" bqbiol="http://biomodels.net/biology-qualifiers/" rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#/">
<sbrk:sabiork xmlns:sbrk="http://sabiork.h-its.org">
<sbrk:kineticLawID>3460</sbrk:kineticLawID>
<sbrk:experimentalConditions>
<sbrk:temperature>
<sbrk:startValueTemperature>38.0</sbrk:startValueTemperature>
<sbrk:temperatureUnit>°C</sbrk:temperatureUnit>
</sbrk:temperature>
<sbrk:pH>
<sbrk:startValuepH>7.2</sbrk:startValuepH>
</sbrk:pH>
<sbrk:buffer> 10 mM K2HPO4/KH2PO4, 20 mM imidazole-HCl, 150 mM KCl, 5 mM MgCl2</sbrk:buffer>
</sbrk:experimentalConditions>
</sbrk:sabiork>
  <rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:bqbiol="http://biomodels.net/biology-qualifiers/"
xmlns:bqmodel="http://biomodels.net/model-qualifiers/">
    <rdf:Description rdf:about="#META_KL_3460">
      <bqbiol:isDescribedBy>
        <rdf:Bag>
          <rdf:li rdf:resource="http://identifiers.org/pubmed/7929251"/>
        </rdf:Bag>
      </bqbiol:isDescribedBy>
      <bqbiol:isDescribedBy>
        <rdf:Bag>
          <rdf:li rdf:resource="http://identifiers.org/sabiork.kineticrecord/3460"/>
        </rdf:Bag>
      </bqbiol:isDescribedBy>
    </rdf:Description>
  </rdf:RDF>
</annotation>
<math xmlns="http://www.w3.org/1998/Math/MathML">
  <apply>
    <ci> KL_3460 </ci>
    <ci> Km_SPC_1450_Cell </ci>
    <ci> SPC_1450_Cell </ci>
    <ci> V </ci>
  </apply>
</math>
  <listOfLocalParameters>
    <localParameter id="Km_SPC_1450_Cell" name="Km_DGlucose_1phosphate" value="4.5E-5" sboTerm="SBO:0000027" units="M"/>
    <localParameter id="V" name="V" value="0.00193333333" sboTerm="SBO:0000186"/>
  </listOfLocalParameters>
</kineticLaw>

```

Primary data source

SABIO-RK entry ID

Kinetic Parameters
(+ SBO Annotations)

- Currently up to **SBML Level 3 Version 1**
- **Reaction Kinetics Warehouse:**

Reactions, kinetic equations and parameters (with corresponding units) from different database entries can be exported in one SBML file
- Data annotated (RDF) with **identifiers.org** or **MIRIAM** URIs:
 - Annotations to reaction, protein and chemical compound databases
 - Annotations of reactions to organism and tissue databases
 - Annotations to SABIO-RK Ids (reaction and kinetic data entry) for tracking
 - Annotations to primary data source: Publications (PubMed Ids)
 - Content fully annotated to Systems Biology Ontology (SBO)
- Export with **experimental conditions** (SABIO-RK specific namespace)
- Optional **normalization of kinetic parameters** to SI base units
- Export also as human readable PDF (only SBML level 2) → **SBML2LaTeX**



Save Model

Enter name of model:

Export parameters normalized to SI base units ☐

Choose the annotation schema *:

SBML level 2, version 4 ▾

SBML level 3, version 1

SBML level 2, version 4

SBML level 2, version 3

SBML level 2, version 2

Save Model on Disk as SBML

Save Model on Disk as PDF

Bioinformatics. 2009 June 1; 25(11): 1455–1456.
Published online 2009 March 23. doi: [10.1093/bioinformatics/btp170](https://doi.org/10.1093/bioinformatics/btp170).

PMCID: PMC2682517

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SBML2L^AT_EX: Conversion of SBML files into human-readable reports

Andreas Dräger,^{1*} Hannes Planatscher,¹ Dieudonné Motsou Wouamba,¹
Adrian Schröder,¹ Michael Hucka,² Lukas Endler,³ Martin Golebiewski,⁴
Wolfgang Müller,⁴ and Andreas Zell¹



* For details please refer to <http://identifiers.org/> or http://co.mbine.org/standards/miriam_uris.

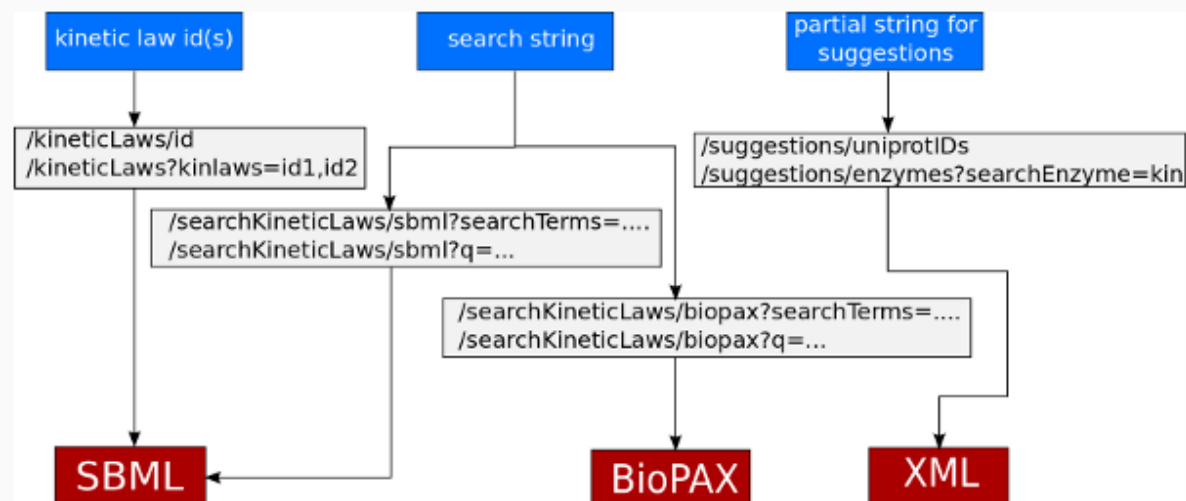
- **Reaction Kinetics Warehouse:**
Reactions, kinetic equations and parameters (with corresponding units) from different database entries can be exported in one BioPAX file
- Data is annotated according to **MIRIAM**
- **SBPAX3** (Systems Biology Pathway Exchange) is used to represent the reaction kinetics data and experimental conditions (<http://www.sbpax.org>)
- Parameter units are described via the **UOME** (Units of Measurement Expressions) extension to BioPax (<http://www.sbpax.org/uome/>)
- BioPAX export is available in both web search interface and web services (<http://sabio.h-its.org/sabioRestWebServices/searchKineticLaws/biopax> endpoint)


```
<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:bp3="http://www.biopax.org/release/biopax-level3.owl#"
  xmlns:sbx3="http://vcell.org/sbpax3#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:uome-core="http://www.sbpax.org/uome/core.owl#"
  xmlns:owl="http://www.w3.org/2002/07/owl#"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:sabio="http://sabio.h-its.org/biopax#"
  xmlns:uome-list="http://www.sbpax.org/uome/list.owl#">
  <owl:Ontology rdf:about="http://sabio.h-its.org/biopax">
    <owl:imports rdf:resource="http://vcell.org/sbpax3"/>
    <owl:imports rdf:resource="http://www.biopax.org/release/biopax-level3.owl"/>
    <owl:imports rdf:resource="http://www.sbpax.org/uome/core.owl"/>
    <owl:imports rdf:resource="http://www.sbpax.org/uome/list.owl"/>
  </owl:Ontology>
  <bp3:UnificationXref rdf:about="http://sabio.h-its.org/biopax#Brenda_Tissue_Ontology:BT0:0000424">
    <bp3:db rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Brenda Tissue Ontology</bp3:db>
    <bp3:id rdf:datatype="http://www.w3.org/2001/XMLSchema#string">BT0:0000424</bp3:id>
  </bp3:UnificationXref>
  <bp3:SmallMolecule>
    <bp3:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">D-Glucose</bp3:name>
  </bp3:SmallMolecule>
  <sbx3:SBMeasurable rdf:about="http://sabio.h-its.org/biopax#temperature714">
    <sbx3:SBVocabulary rdf:resource="http://sabio.h-its.org/biopax#SBO:0000147"/>
    <sbx3:hasNumber rdf:datatype="http://www.w3.org/2001/XMLSchema#double">37.0</sbx3:hasNumber>
    <sbx3:hasUnit rdf:resource="http://www.sbpax.org/uome/list.owl#DegreeCelsius"/>
    <sbx3:sbTerm rdf:resource="http://sabio.h-its.org/biopax#SBO:0000147"/>
  </sbx3:SBMeasurable>
  <bp3:TissueVocabulary rdf:about="http://sabio.h-its.org/biopax#tissue_erythrocyte">
    <bp3:term rdf:datatype="http://www.w3.org/2001/XMLSchema#string">erythrocyte</bp3:term>
    <bp3:xref rdf:resource="http://sabio.h-its.org/biopax#Brenda_Tissue_Ontology:BT0:0000424"/>
  </bp3:TissueVocabulary>
  <uome-core:UnitOfMeasurement rdf:nodeID="node16t8bg47mx420">
    <uome-core:unitSymbol rdf:datatype="http://www.w3.org/2001/XMLSchema#string">M</uome-core:unitSymbol>
  </uome-core:UnitOfMeasurement>
</rdf:RDF>
```



RESTful Web Services Introduction


RESTful Web Services are implemented offering data access via HTTP requests following a Representational State Transfer (REST) approach. Data can be accessed using simple http GET requests to either retrieve a complete SBML model, or a BioPAX/SBPAX3 representation of the requested entries, or pieces of information in a tailored format (in plain text or XML). Entries can be requested directly by using the database entry ID or can be searched for using the same format query built in user interface advanced search.



RESTFUL

- Introduction
- Manual - including request examples
- Search Keyword Vocabulary

SOAP

- Manual
- Sample Client Code
- WSDL 

Example requests:

Entries may be requested directly if the database entry ID is known

<http://sabio.h-its.org/sabioRestWebServices/kineticLaws/20147>

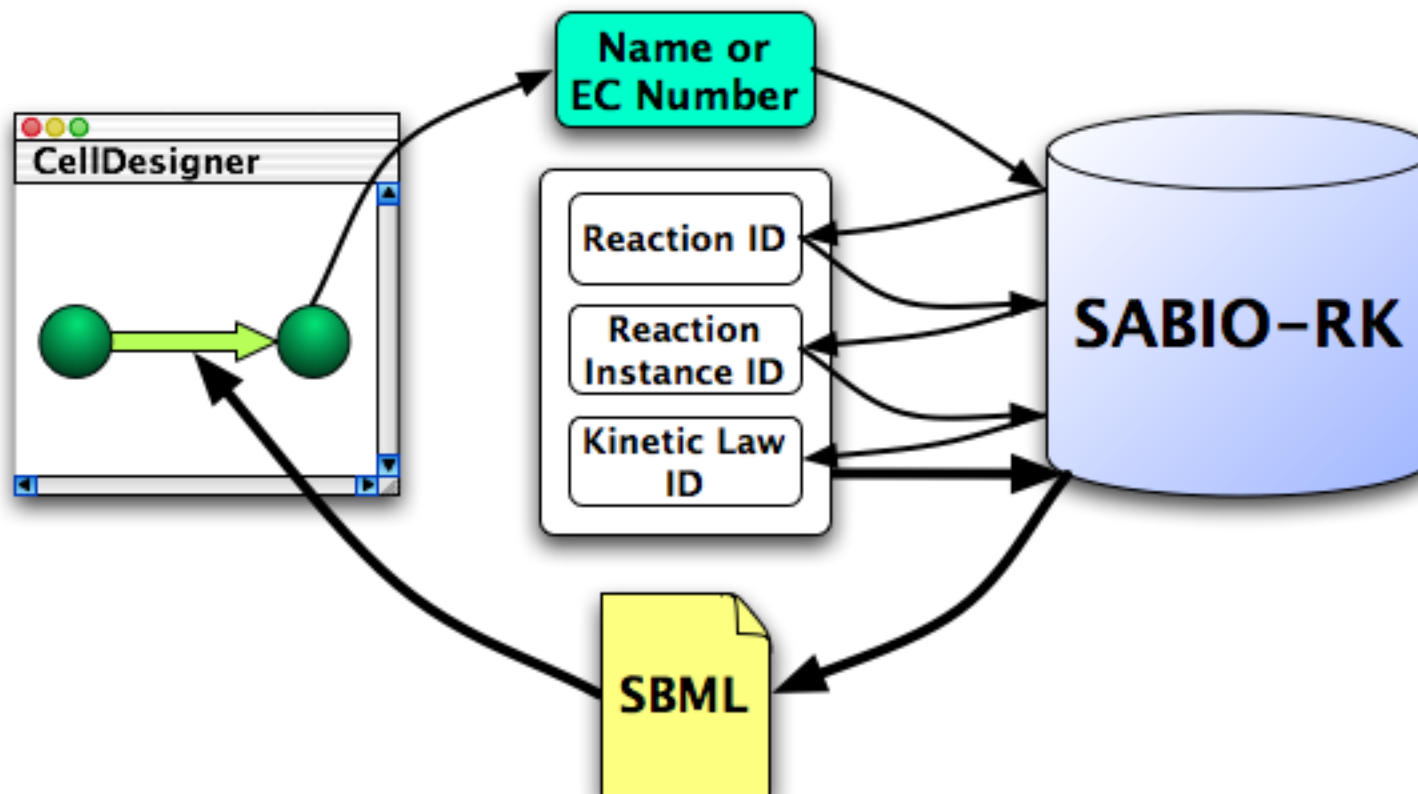
Entries may be searched for using the same search options available in the browser search interface

<http://sabio.h-its.org/sabioRestWebServices/searchKineticLaws/sbml?searchTerms=ORGANISM=Homo sapiens;TISSUE=liver>

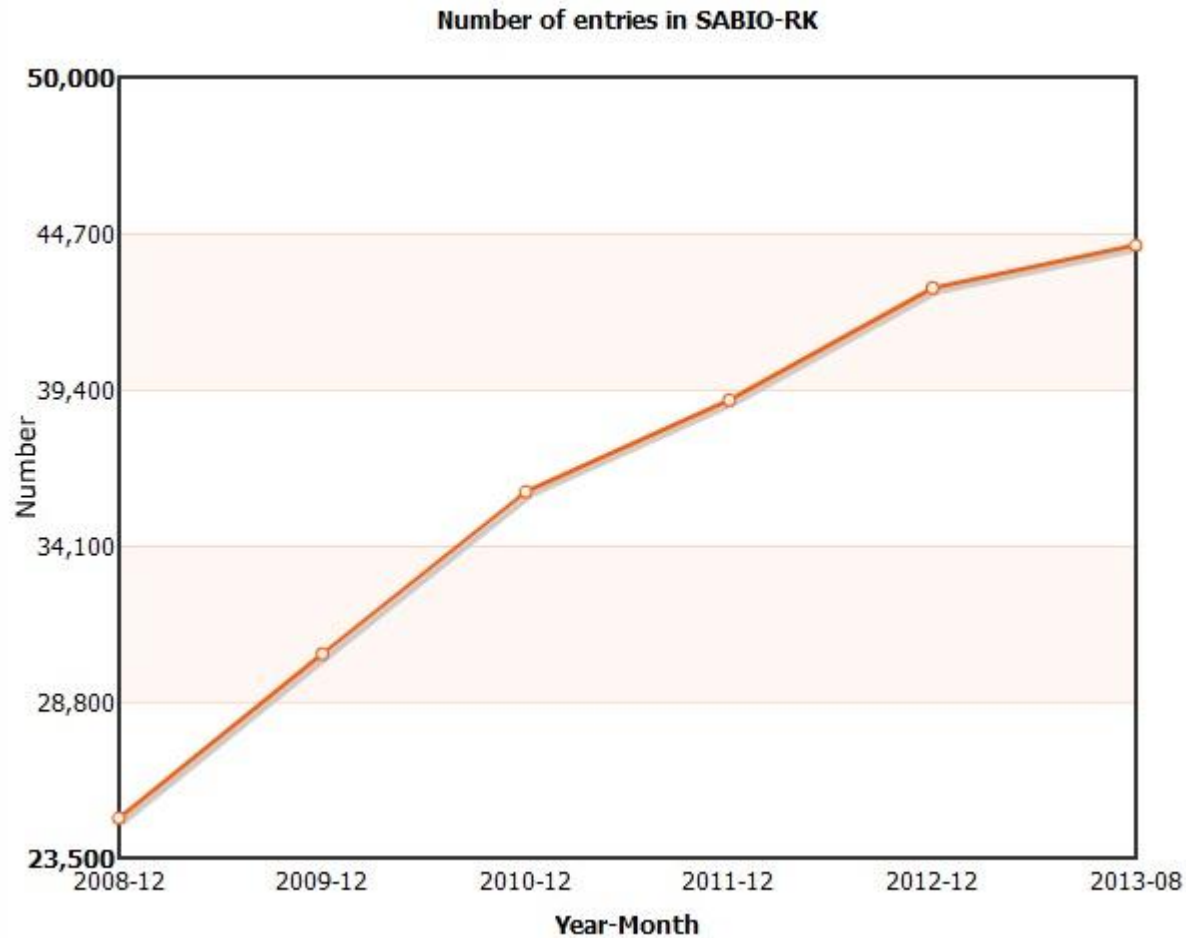
Suggestions for search terms can be done

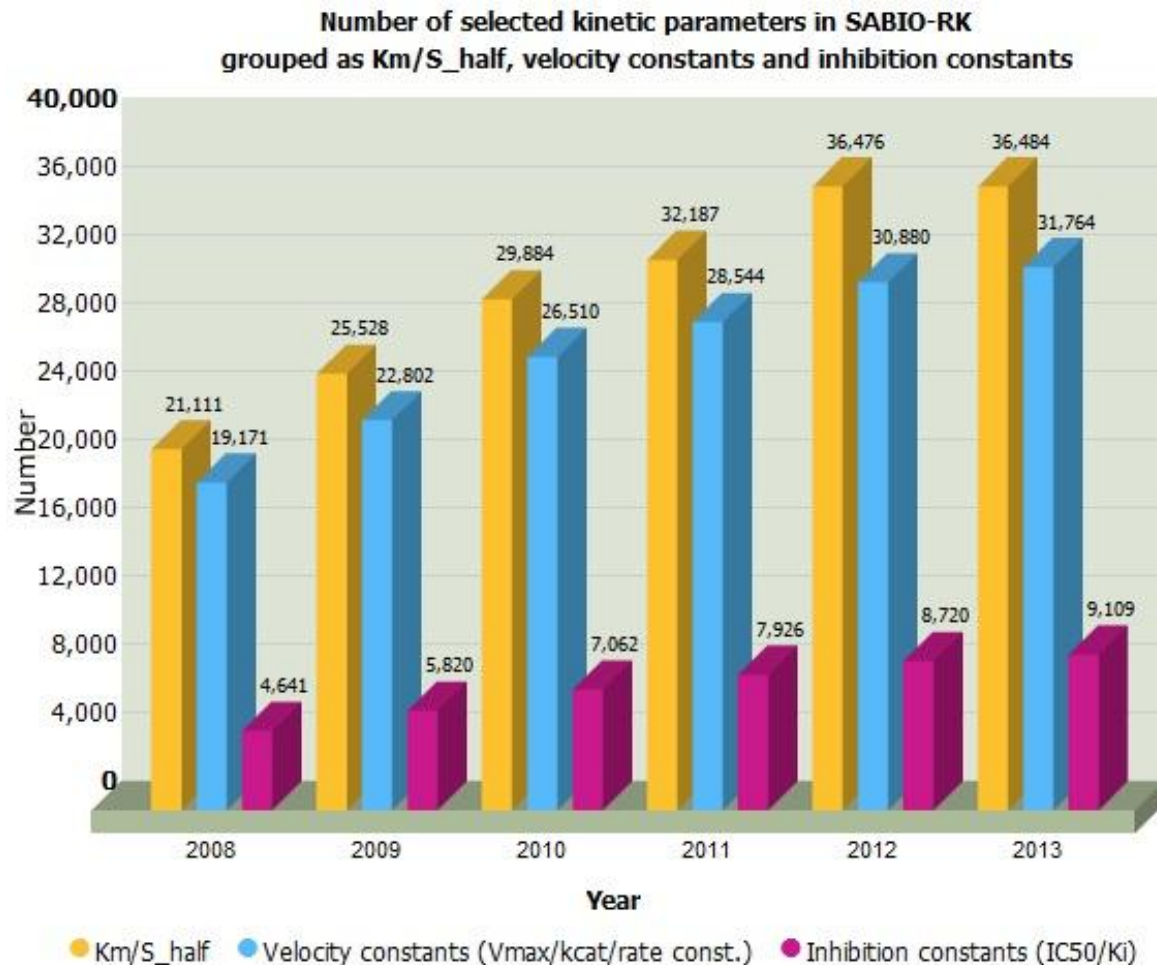
<http://sabio.h-its.org/sabioRestWebServices/suggestions/compounds?searchCompounds=glycoch>

SABIO-RK API Access Integration into Modeling Tools

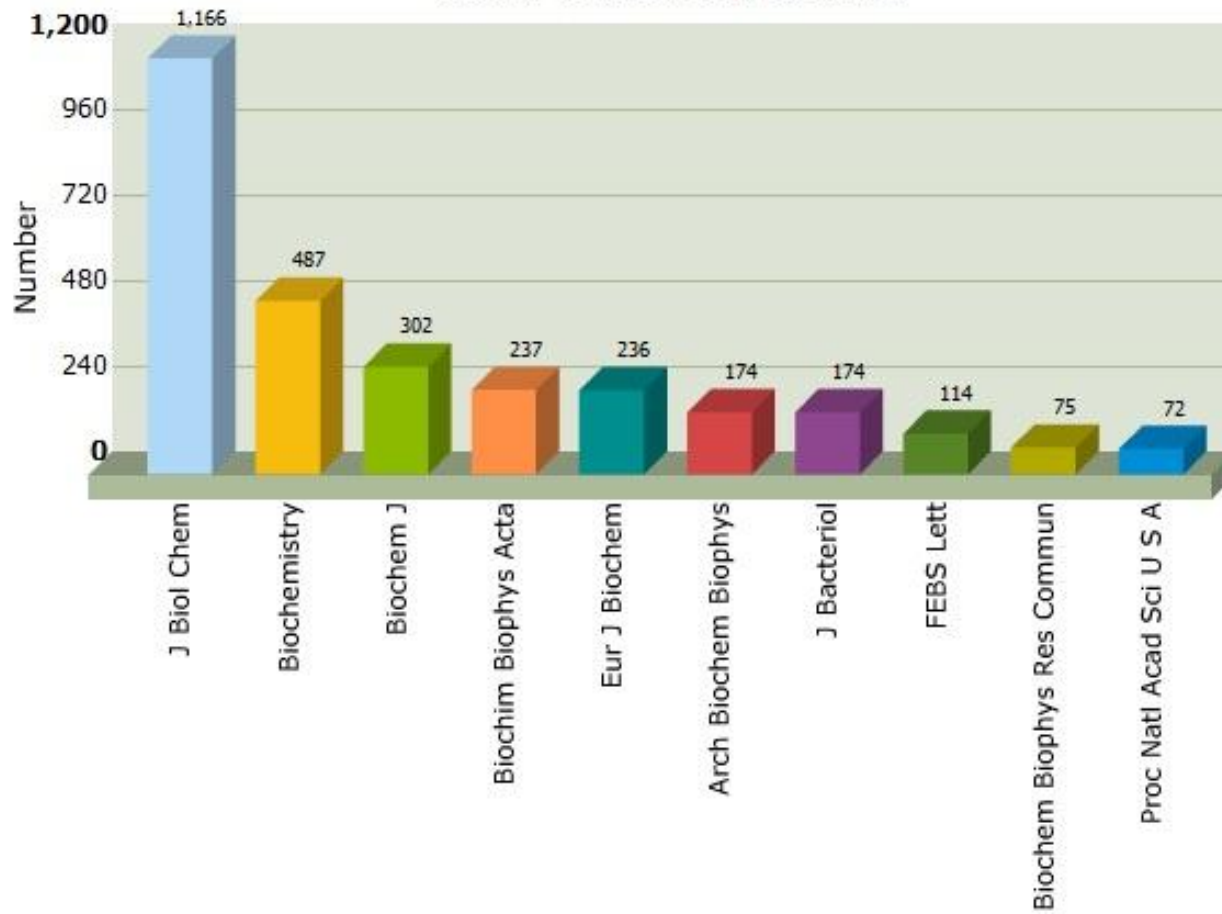


<http://www.celldesigner.org>

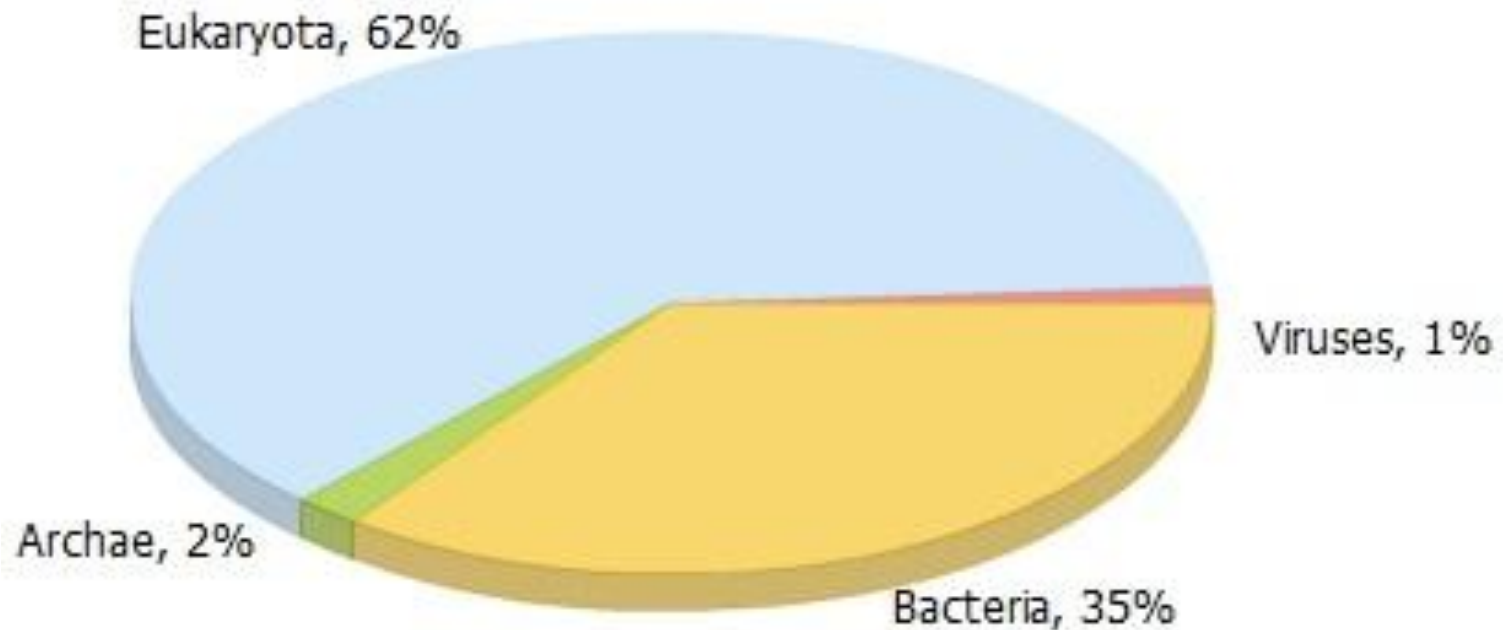




Top Ten Journals in SABIO-RK
Number of publications per journal



Taxonomic distribution of organisms in SABIO-RK





<http://sabio.h-its.org>



<http://sabiork.h-its.org>

Wittig U, Kania R, Golebiewski M, Rey M, Shi L, Jong L, Algaa E, Weidemann A, Sauer-Danzwith H, Mir S, Krebs O, Bittkowski M, Wetsch E, Rojas I, Müller W

Nucleic Acids Research (2012) 40 (D1): D790-D796 (doi: 10.1093/nar/gkr1046)

