

# SABIO-RK Documentation

(May 2016)

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## Search

The **Search** field offers free text search. The complete word (no fragments) inserted in this field will be searched in the entire database's content, including comments.

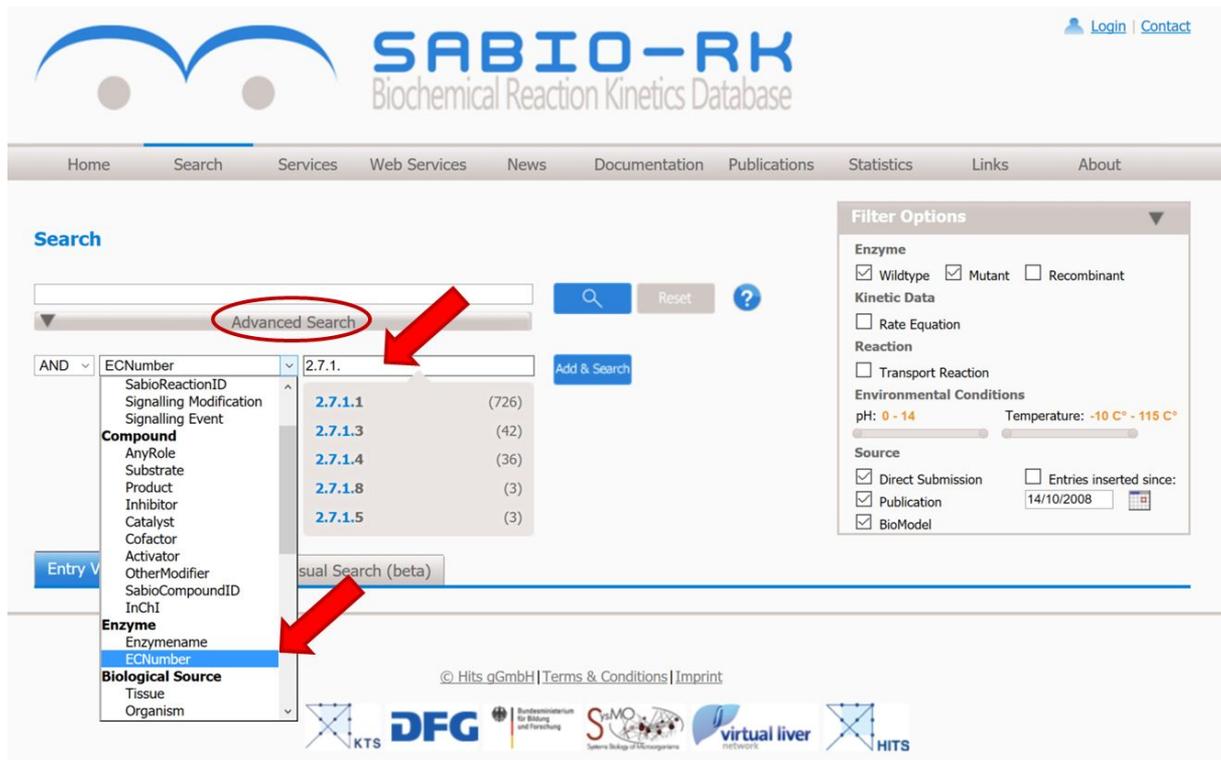
The auto completion function makes suggestions and indicates how many results (entries) are in the database for the distinct search terms. Queries can be modified by using the following syntax in the **Search** field:

Search	Result
rattus liver	entries containing both terms <i>rattus</i> and <i>liver</i>
rattus AND liver	
(rattus OR liver)	entries containing either the term <i>rattus</i> or <i>liver</i>
(rattus OR human) AND liver	entries containing the term <i>liver</i> and either <i>rattus</i> or <i>human</i>

Search	Result
"homo sapiens"	entries containing both terms <i>homo</i> and <i>sapiens</i> in the exact order
ratt* *kinase	wildcard search for more than one character  entries containing terms starting with <i>ratt</i> (e.g. <i>Rattus norvegicus</i> ) or ending with <i>kinase</i> (e.g. <i>Hexokinase</i> )
"mammalia (NCBI)" NOT "homo sapiens"  "liver (BTO)"	entries for all organisms of class <i>mammalia</i> (based on NCBI taxonomy) but not for <i>homo sapiens</i>  entries for tissue <i>liver</i> including all tissue sub-parts and cell lines (based on BRENDA Tissue Ontology)
Substrate:ATP	entries with reactions containing substrate <i>ATP</i>  similar queries for specific attributes can be defined by using all other database attributes (see <b>Advanced Search</b> )
Substrate:ATP AND Substrate:Pyruvate Substrate:(ATP AND Pyruvate)	entries with reactions containing both <i>ATP</i> and <i>Pyruvate</i> as substrates
Year:[1990 TO 2012]	entries with publication years between <i>1990</i> and <i>2012</i>  (see also <b>Advanced Search</b> )

More specific queries can additionally be defined by the **Advanced Search**.

# Advanced Search



To restrict search terms to specific attributes also the **Advanced Search** can be used. First an attribute from the list has to be selected. Then while typing terms a selection list with suggestions will appear containing the number of database entries related to them. Select a term from the list and click the **Add & Search** button to start the search. Wildcard search is not possible for the advanced search, the exact search term is needed.

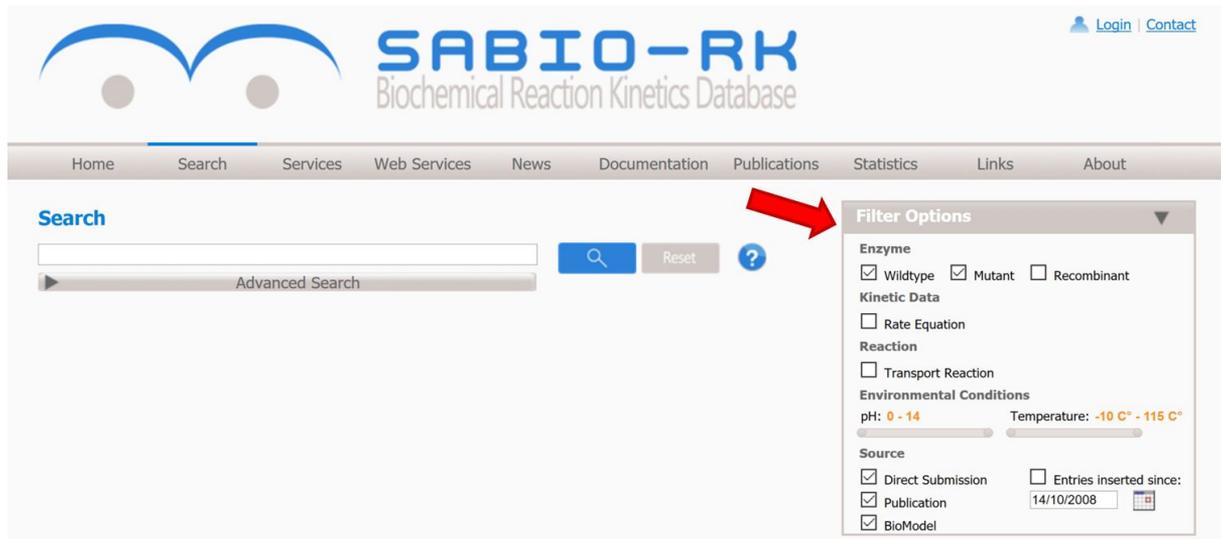
Searches with different terms for the same attribute is possible using the OR boolean operator.

For the specific attributes *Tissue* and *Organism* an ontology-based search can be defined by selecting terms with additional information (*BTO*) or (*NCBI*). By selecting BTO terms the search will include all subclasses of this term based on the BRENDA Tissue Ontology (<http://bioportal.bioontology.org/ontologies/1005>). By selecting NCBI terms the search will include all subclasses of this term based on the NCBI Organism Taxonomy (<http://www.ncbi.nlm.nih.gov/taxonomy>).

Time periods of publications in attribute *Year* can be defined:

>1990	entries with publication years from 1990 until today
<1990	entries with publication years up to 1990

# Filter Options



Queries can be specified additionally by setting different filters using the **Filter Options** box.

There are filters for the enzyme/protein. By default all entries containing Wildtype or Mutant proteins are displayed. By disabling one of these criteria only wildtype or only mutant data will be displayed. Selecting Recombinant will restrict the search output to entries resulting from experiments conducted with recombinant proteins.

Selecting the Rate Equation filter will display only data entries with a kinetic rate equation. Accordingly, selecting the Transport Reaction filter will restrict the search result to transport reactions.

Environmental conditions (pH value, Temperature) can be specified by moving the slider buttons to select a range.

Additionally the source of the data (Direct Submission, Publication, or BioModel (Model upload via SBML)) and the time of data insertion can be used to restrict the search.

## Search Result

### Entry View

The search result is represented by default in the **Entry View**, which is a table containing overview information of the database entries sorted by Sabio EntryID. The content of the table columns can be re-sorted by clicking on the column headers.

The number of entries per page can be varied.

Entry View   Reaction View   Visual Search (beta)										
Total number of kinetic law entries found: 1496 <input type="checkbox"/> expand all displayed entries										
Previous 1 .. 9 10 11 12 13 14 15 16 17 18 .. 60 Next										
display 25 entries per page										
Kinetic data	Reaction	Enzyme			Tissue	Organism	Parameter (besides concentration)	Environment		Add to export cart? <input type="checkbox"/>
		ECNumber	Protein	Variant				°C	pH	
	NAD+ + D-Glyceraldehyde 3-phosphate + Phosphate = NADH + H+ + 3-Phospho-D-glyceroyl phosphate	1.2.1.12	<a href="#">P04406</a>	wildtype	<a href="#">lung</a>	Homo sapiens	Hill coefficient S_half			<input type="checkbox"/>
	NAD+ + D-Glyceraldehyde 3-phosphate + Phosphate = NADH + H+ + 3-Phospho-D-glyceroyl phosphate	1.2.1.12	<a href="#">P04406</a>	wildtype	<a href="#">lung</a>	Homo sapiens	Hill coefficient S_half			<input type="checkbox"/>
	D-Glyceraldehyde 3-phosphate + Phosphate + NAD+ = H+ + NADH + Glycerate 1,3-bisphosphate	1.2.1.12	<a href="#">P04406</a>	wildtype	<a href="#">erythrocyte</a>	Homo sapiens	Kd Km Vmax	23.0	8.6	<input type="checkbox"/>
	ATP + 3-Phospho-D-glycerate = ADP + 3-Phospho-D-glyceroyl phosphate	2.7.2.3	<a href="#">P00558</a>	mutant	<a href="#">muscle</a>	Homo sapiens	Km Vmax	30.0	7.6	<input type="checkbox"/>
	ATP + 3-Phospho-D-glycerate = ADP + 3-Phospho-D-glyceroyl phosphate	2.7.2.3	<a href="#">P00558</a>	mutant	<a href="#">muscle</a>	Homo sapiens	Km Vmax	30.0	7.6	<input type="checkbox"/>
	ATP + 3-Phospho-D-glycerate = ADP + 3-Phospho-D-glyceroyl phosphate	2.7.2.3	<a href="#">P00558</a>	wildtype	<a href="#">muscle</a>	Homo sapiens	Km Vmax	30.0	7.6	<input type="checkbox"/>
	ATP + 3-Phospho-D-glycerate = ADP + 3-Phospho-D-glyceroyl phosphate	2.7.2.3	<a href="#">P00558</a>	wildtype	<a href="#">muscle</a>	Homo sapiens	Km Vmax	30.0	7.6	<input type="checkbox"/>
	ATP + D-Fructose 6-phosphate = ADP + D-Fructose 1,6-bisphosphate	2.7.1.11	<a href="#">P47857</a> <a href="#">P12382</a>	wildtype	<a href="#">liver</a>	Mus musculus	IC50 Vmax	30.0	7.45	<input type="checkbox"/>

Detailed information is given in the single database entries which can be displayed by clicking on the blue triangle to open an entry. Alternatively all entries can be opened at once by selecting “expand all displayed entries”.

Entry View										
Reaction View		Visual Search (beta)								
Total number of kinetic law entries found: <b>1496</b> <input type="checkbox"/> expand all displayed entries										
Previous 1 .. 9 10 11 12 13 <b>14</b> 15 16 17 18 .. 60 Next							display 25 entries per page			
Kinetic data	Reaction	Enzyme			Tissue	Organism	Parameter (besides concentration)	Environment		Add to export cart? <input type="checkbox"/>
		ECNumber	Protein	Variant				°C	pH	
	NAD+ + D-Glyceraldehyde 3-phosphate + Phosphate = NADH + H+ + 3-Phospho-D-glyceroyl phosphate	1.2.1.12	P04406	wildtype	lung	Homo sapiens	Hill coefficient S_half			<input type="checkbox"/>
<b>Entry ID: 27000</b>										
<b>General information</b>										
Organism	<a href="#">Homo sapiens</a>									
Tissue	<a href="#">lung</a>									
EC Class	<a href="#">1.2.1.12</a>									
SABIO reaction id	7844									
Variant	wildtype									
Experiment Type	in vitro									
Pathways	<a href="#">Carbon fixation in photosynthetic organisms</a> <a href="#">Glycolysis classical</a> <a href="#">Glycolysis/Gluconeogenesis</a>									
Event Description										
<b>Substrates</b>										
<b>name</b>	<b>location</b>	<b>comment</b>								
<a href="#">D-Glyceraldehyde 3-phosphate</a>	-	-								
<a href="#">Phosphate</a>	-	-								
<a href="#">NAD+</a>	-	-								
<b>Products</b>										
<b>name</b>	<b>location</b>	<b>comment</b>								
<a href="#">NADH</a>	-	-								
<a href="#">H+</a>	-	-								
<a href="#">3-Phospho-D-glyceroyl phosphate</a>	-	-								
<b>Modifiers</b>										
<b>name</b>	<b>location</b>	<b>effect</b>	<b>comment</b>	<b>protein complex</b>						
glyceraldehyde-3-phosphate dehydrogenase (phosphorylating)(Enzyme)	-	Modifier-Catalyst	-	(P04406 ) <sup>4</sup> ;						
<b>Enzyme (protein data)</b>										
	<b>UniProtKB_AC</b>	<b>name</b>	<b>mol. weight (kDa)</b>	<b>deviation (kDa)</b>						
subunit	P04406	-	-	-						
complex	-	-	-	-						
<b>Kinetic Law</b>										
<b>type</b>	<b>formula</b>			<b>annotation</b>						
Hill Cooperativity	$(V_{max} * S^n) / (S_{half}^n + S^n)$			<a href="#">SBO:0000192</a>						
<b>Parameter</b>										
<b>name</b>	<b>type</b>	<b>species</b>	<b>start val.</b>	<b>end val.</b>	<b>deviat.</b>	<b>unit</b>	<b>comment</b>			
S	<a href="#">concentration</a>	NAD+	-	-	-	-	-			
n	<a href="#">Hill coefficient</a>	NAD+	1.5	-	-	-	-			
S_half	<a href="#">S_half</a>	NAD+	0.26	-	-	mM	-			
Vmax	<a href="#">Vmax</a>	-	-	-	-	-	-			
<b>Experimental conditions</b>										
	<b>start value</b>	<b>end value</b>				<b>unit</b>				
buffer	50 mM Triethanolamine, 5 mM EDTA, 10 mM MgCl2									
comment	buffer composition is taken from PubMedID: 14188477									
<b>General comment</b>										
WI38VA13A cells, SV-40 transformed										
<b>Reference</b>										
<b>title</b>	<b>author</b>	<b>year</b>	<b>journal</b>	<b>volume</b>	<b>pages</b>	<b>PubMed</b>				
A comparative study of some of the enzymes involved in glucose metabolism of human diploid and SV40-transformed human diploid cells	Dunaway GA Jr, Smith EC	1971	Cancer Res	31	1418-21	<a href="#">4328735</a>				

SABIO-RK offers details about the Reaction, Organism, Enzyme, Pathway and Compound of an entry which are shown in additional pop-up windows after clicking on the appropriate term.

These Details are partially interlinked, and contain additionally links to external databases, e.g., clicking on the Reaction (in the Entry View or in the Reaction View) opens the Reaction Details containing the SABIO ReactionID, Stoichiometric Equation, Substrates, Products, Enzymes known to catalyse this reaction, Pathways and links to external databases.

## Reaction Details

<b>Reaction ID</b>	7844			
<b>Stoichiometric Equation</b>	D-Glyceraldehyde 3-phosphate + Phosphate + NAD+ <-> NADH + H+ + 3-Phospho-D-glyceroyl phosphate			
<b>Substrates</b>	<a href="#">NAD+</a> <a href="#">D-Glyceraldehyde 3-phosphate</a> <a href="#">Phosphate</a>			
<b>Products</b>	<a href="#">NADH</a> <a href="#">H+</a> <a href="#">3-Phospho-D-glyceroyl phosphate</a>			
<b>Enzymes known to catalyse this reaction (curated information)</b>	<b>EC Number</b>	<b>In Organism</b>	<b>UniProtKB Link</b>	<b>PubMedID</b>
	<a href="#">1.2.1.12</a>	Entamoeba histolytica	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">15794763</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Geobacillus stearothermophilus	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">10799476</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Homo sapiens	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">1395515</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Homo sapiens	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">4328735</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Jaculus orientalis	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">8547342</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Lactococcus lactis subsp. cremoris	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">11369999</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Lactococcus lactis subsp. cremoris	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">2824452</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Lactococcus lactis subsp. lactis	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">10937934</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Lactococcus lactis subsp. lactis	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">11395443</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Lactococcus lactis subsp. lactis	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">9286977</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Mus musculus	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">10336623</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Mus musculus	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">14114860</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Mus musculus	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">18721135</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Oncorhynchus mykiss	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">6509907</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Oryctolagus cuniculus	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">4353270</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Plasmodium falciparum	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">25693925</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Rattus norvegicus	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">5009289</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Saccharomyces cerevisiae	<a href="#">UniProtKB</a> <input type="checkbox"/>	- <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Saccharomyces cerevisiae	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">1149170</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Saccharomyces cerevisiae	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">4353270</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Spinacia oleracea	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">202324</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Streptococcus mutans	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">33184</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Streptomyces arenae	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">6822480</a> <input type="checkbox"/>
	<a href="#">1.2.1.12</a>	Zymomonas mobilis	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">3026343</a> <input type="checkbox"/>
	<a href="#">1.2.1.13</a>	Spinacia oleracea	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">12705826</a> <input type="checkbox"/>
	<a href="#">1.2.1.13</a>	Spinacia oleracea	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">8554310</a> <input type="checkbox"/>
	<a href="#">1.2.1.59</a>	Bacillus subtilis	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">10799476</a> <input type="checkbox"/>
	<a href="#">1.2.1.59</a>	Methanothermus fervidus	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">3569291</a> <input type="checkbox"/>
	<a href="#">1.2.1.59</a>	Synechocystis sp.	<a href="#">UniProtKB</a> <input type="checkbox"/>	<a href="#">9226260</a> <input type="checkbox"/>
<b>Pathways</b>	<a href="#">Glycolysis classical</a> <a href="#">Carbon fixation in photosynthetic organisms</a> <a href="#">Glycolysis/Gluconeogenesis</a>			
<b>External Links</b>				
<b>KEGG-COMPOUND-ID</b>	<a href="#">R01061</a> <input type="checkbox"/>			

## Reaction View

In addition to the **Entry View** table there is the **Reaction View** table which groups the entries based on the biochemical reaction.

In the Entry and in the Reaction View data can be exported in spreadsheet, SBML or BioPAX format. Entries can be selected either by clicking the checkbox at the end of each entry row in the overview table or by clicking the checkbox in the last column header to select all displayed entries per page (see also **Data Export**).

Entry View **Reaction View** Visual Search (beta)

There are 1496 entries in 23 reaction(s) matching your query  expand all displayed reaction entries

display 15 reactions per page

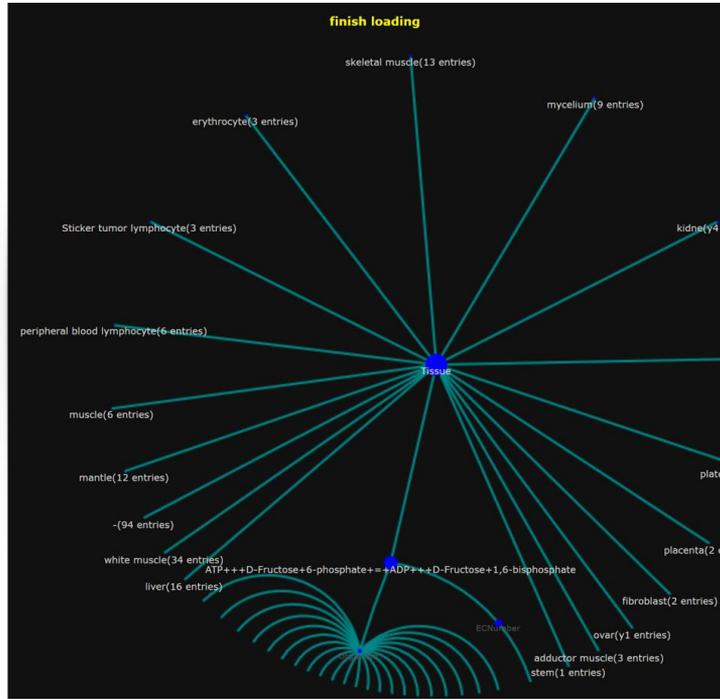
Kinetic data	[Sabio ID]: Reaction	Kegg ID	Visualization (Please allow pop-up windows in your browser)	Number of Entries	Add to export cart? <input type="checkbox"/>
	[1]: alpha-D-Glucose 6-phosphate = beta-D-Fructose 6-phosphate	<a href="#">R02740</a>	<a href="#">Click here to view visualization</a>	3	<input type="checkbox"/>
	[10]: ATP + alpha-D-Glucose = ADP + alpha-D-Glucose 6-phosphate	<a href="#">R01786</a>	<a href="#">Click here to view visualization</a>	4	<input type="checkbox"/>
	[1113]: ATP + D-Fructose 6-phosphate = ADP + D-Fructose 1,6-bisphosphate	<a href="#">R00756</a>	<a href="#">Click here to view visualization</a>	225	<input type="checkbox"/>
	[1123]: D-Glucose 6-phosphate = D-Fructose 6-phosphate	<a href="#">R00771</a>	<a href="#">Click here to view visualization</a>	187	<input type="checkbox"/>
	[1338]: D-Fructose 1,6-bisphosphate = D-Glyceraldehyde 3-phosphate + Glycerone phosphate	<a href="#">R01068</a>	<a href="#">Click here to view visualization</a>	51	<input type="checkbox"/>
	[22]: UTP + D-Fructose 6-phosphate = UDP + D-Fructose 1,6-bisphosphate	<a href="#">R00769</a>	<a href="#">Click here to view visualization</a>	24	<input type="checkbox"/>
	[23]: CTP + D-Fructose 6-phosphate = CDP + D-Fructose 1,6-bisphosphate	<a href="#">R00767</a>	<a href="#">Click here to view visualization</a>	24	<input type="checkbox"/>
	[24]: ITP + D-Fructose 6-phosphate = IDP + D-Fructose 1,6-bisphosphate	<a href="#">R00770</a>	<a href="#">Click here to view visualization</a>	22	<input type="checkbox"/>
	[274]: D-Fructose 1-phosphate = Glycerone phosphate + D-Glyceraldehyde	<a href="#">R02568</a>	<a href="#">Click here to view visualization</a>	22	<input type="checkbox"/>
	[4]: D-Glyceraldehyde 3-phosphate = Glycerone phosphate	<a href="#">R01015</a>	<a href="#">Click here to view visualization</a>	22	<input type="checkbox"/>
	[5]: D-Glyceraldehyde 3-phosphate + Phosphate + NAD+ = H+ + NADH + Glycerate 1,3-bisphosphate	-	<a href="#">Click here to view visualization</a>	74	<input type="checkbox"/>
	[53]: UTP + Pyruvate = Phosphoenolpyruvate + UDP	<a href="#">R00659</a>	<a href="#">Click here to view visualization</a>	3	<input type="checkbox"/>
	[54]: Pyruvate + GTP = GDP + Phosphoenolpyruvate	<a href="#">R00430</a>	<a href="#">Click here to view visualization</a>	2	<input type="checkbox"/>
	[55]: CTP + Pyruvate = CDP + Phosphoenolpyruvate	<a href="#">R00572</a>	<a href="#">Click here to view visualization</a>	1	<input type="checkbox"/>
	[56]: ITP + Pyruvate = IDP + Phosphoenolpyruvate	<a href="#">R00724</a>	<a href="#">Click here to view visualization</a>	2	<input type="checkbox"/>

1 2 Next display 15 entries per page

To get a quick impression about a certain reaction and to understand the connections between reaction, enzymes, organisms, and tissues a visualization is available.

Reaction Related Information Visualization (ECNumber, Organism, Tissue)

you can click on "ECNumber", "Organism", "Tissue" nodes respectively to see all possible ecumbers, organisms and tissues for each reaction



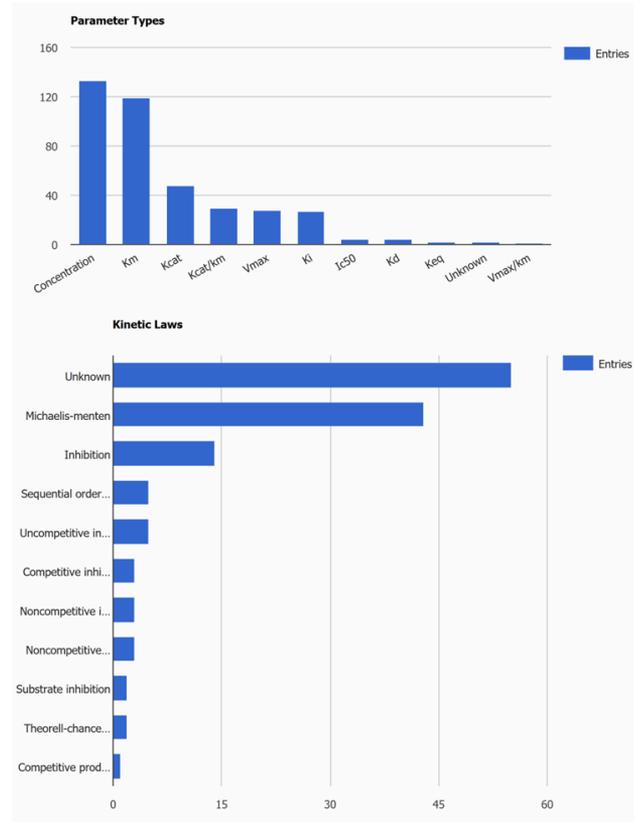
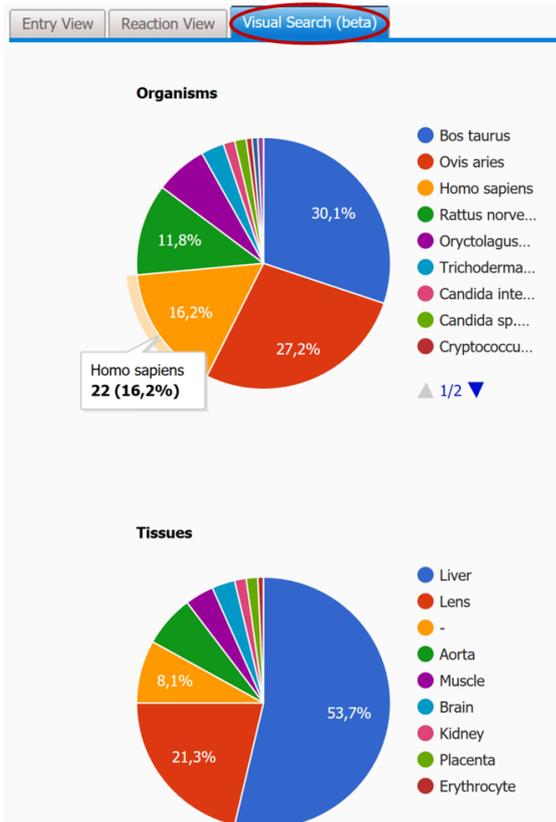
Tissue

Connections:

- ATP+++D-Fructose+6-phosphate+=ADP+++D-Fructose+1,6-bisphosphate (relation: one of Tissues)
- liver(16 entries) (relation: one of Tissues)
- white muscle(34 entries) (relation: one of Tissues)
- -(94 entries) (relation: one of Tissues)
- mantle(12 entries) (relation: one of Tissues)
- muscle(6 entries) (relation: one of Tissues)
- peripheral blood lymphocyte(6 entries) (relation: one of Tissues)
- Sticker tumor lymphocyte(3 entries) (relation: one of Tissues)
- erythrocyte(3 entries) (relation: one of Tissues)
- skeletal muscle(13 entries) (relation: one of Tissues)
- mycelium(9 entries) (relation: one of Tissues)
- kidney(4 entries) (relation: one of Tissues)
- polymorphonuclear leukocyte(8 entries) (relation: one of Tissues)
- platelet(8 entries) (relation: one of Tissues)
- placenta(2 entries) (relation: one of Tissues)
- fibroblast(2 entries) (relation: one of Tissues)
- ovary(1 entries) (relation: one of Tissues)
- adductor muscle(3 entries) (relation: one of Tissues)
- stem(1 entries) (relation: one of Tissues)

## Visual Search

Finally **Visual Search** gives an visual overview of the Search Result together with the opportunity to confine the search, e.g. to an organism, a tissue or a special kind of kinetic parameter or kinetic rate law.



# Data Export

To export data in SBML, BioPAX, or spreadsheet format entries can be selected either in the **Entry View** or **Reaction View** by clicking the checkbox at the end of each entry row in the overview table or by clicking the checkbox in the last column header to select all displayed entries per page.

The screenshot shows the SABIO-RK Biochemical Reaction Kinetics Database interface. At the top right, there is a 'Login | Contact' link and a 'Entries to Export: 3' indicator with a red arrow pointing to it. The navigation bar includes Home, Search, Services, Web Services, News, Documentation, Publications, Statistics, Links, and About. The search bar contains 'glycolysis classical' and has a search button and a reset button. The 'Filter Options' panel on the right includes sections for Enzyme (Wildtype, Mutant, Recombinant), Kinetic Data (Rate Equation), Reaction (Transport Reaction), Environmental Conditions (pH: 0 - 14, Temperature: -10 C° - 115 C°), and Source (Direct Submission, Publication, BioModel, Entries inserted since: 14/10/2008). Below the search bar, there are tabs for 'Entry View', 'Reaction View', and 'Visual Search (beta)'. The main content area shows 'Total number of kinetic law entries found: 1496' and a pagination control. A table of search results is displayed with columns for Kinetic data, Reaction, Enzyme (ECNumber, Protein, Variant), Tissue, Organism, Parameter (besides concentration), Environment (°C, pH), and Add to export cart? (checkbox). A red arrow points to the 'Add to export cart?' checkbox in the second row of the table.

Kinetic data	Reaction	Enzyme			Tissue	Organism	Parameter (besides concentration)	Environment		Add to export cart?
		ECNumber	Protein	Variant				°C	pH	
	NAD+ + D-Glyceraldehyde 3-phosphate + Phosphate = NADH + H+ + 3-Phospho-D-glyceroyl phosphate	1.2.1.12	P04406	wildtype	lung	Homo sapiens	Hill coefficient S_half			<input type="checkbox"/>
	NAD+ + D-Glyceraldehyde 3-phosphate + Phosphate = NADH + H+ + 3-Phospho-D-glyceroyl phosphate	1.2.1.12	P04406	wildtype	lung	Homo sapiens	Hill coefficient S_half			<input checked="" type="checkbox"/>
	D-Glyceraldehyde 3-phosphate + Phosphate + NAD+ = H+ + NADH + Glycerate 1,3-bisphosphate	1.2.1.12	P04406	wildtype	erythrocyte	Homo sapiens	Kd Km Vmax	23.0	8.6	<input checked="" type="checkbox"/>
	ATP + 3-Phospho-D-glycerate = ADP + 3-Phospho-D-glyceroyl phosphate	2.7.2.3	P00558	mutant	muscle	Homo sapiens	Km Vmax	30.0	7.6	<input checked="" type="checkbox"/>

Selected entries are stored in the **Export Cart** (“Entries to Export”) and the total number of selected entries is given. By clicking on “Entries to Export” a table gives an overview about selected entries for export in SBML, BioPAX or spreadsheet format. Single entries can be removed afterwards from the export table by checking them and clicking on the remove button.

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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"/> )
27001	D-Glyceraldehyde 3-phosphate + Phosphate + NAD+ <-> NADH + H+ + 3-Phospho-D-glyceroyl phosphate	Homo sapiens	lung	Hill Cooperativity	<a href="#">view</a>	<input type="checkbox"/>
2723	D-Glyceraldehyde 3-phosphate + Phosphate + NAD+ <-> Glycerate 1,3-bisphosphate + NADH + H+	Homo sapiens	erythrocyte	Michaelis-Menten	<a href="#">view</a>	<input checked="" type="checkbox"/>
27402	ATP + 3-Phospho-D-glycerate <-> ADP + 3-Phospho-D-glyceroyl phosphate	Homo sapiens	muscle	Michaelis-Menten	<a href="#">view</a>	<input type="checkbox"/>

remove selected Reactions

Back to Results Write spreadsheet Write SBML Write BioPAX beta

There are three different exports methods: Write spreadsheet, SBML, and BioPAX

**Write spreadsheet** allows to export the data in a table format (xls or tsv).

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Save Excelsheet

Select Columns to Export

Add all 8 items selected Remove all

Activator	+	EntryID	-
CellularLocation	+	Reaction	-
Cofactor	+	ECNumber	-
Enzyme Variant	+	UniProtKB_AC	-
Enzymename	+	Tissue	-
Inhibitor	+	Organism	-
KeggReactionID	+	Temperature	-
KineticMechanism	+	pH	-
Other Modifier	+		

Export Distinct Rows Only

Export xls Export tsv Reset

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Preview of the first 3 entries

	A	B	C	D	E	F	G
1	Reaction	ECNumber	Enzymename	UniProtKB_AC	Tissue	Organism	Temperature
2	NAD+ + D-Glycer...	1.2.1.12	glyceraldehyde-3...	P04406	lung	Homo sapiens	-
3	ATP + 3-Phospho...	2.7.2.3	phosphoglycerate..	P00558	muscle	Homo sapiens	30.0
4	D-Glyceraldehyd...	1.2.1.12	glyceraldehyde-3...	P04406	erythrocyte	Homo sapiens	23.0

The user can choose which entry information should be exported by selecting the columns to be exported.

As a default choice 8 items are selected (right column) which can easily be removed by clicking on the minus. To include additional columns in the export table the appropriate items on the left side should be included by clicking on the plus.

The order of the columns can easily be changed by shifting them up and down.

After finishing the selection and the order of the favoured columns, which are previewed for the first 3 entries, the Export xls or Export tsv button should be pressed to execute the export.

**Write SBML** allows to export the selected entries as a model in the Systems Biology Markup Language (SBML)-format or as pdf. Different SBML versions and annotation schema could be selected and a user-defined name could be given to the SBML file.

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Save Model

Enter name of model: SABIOmdl\_001

Export parameters normalized to SI base units:

Choose the annotation schema \*: identifier.org

Save Model on Disk as SBML

Save Model on Disk as PDF

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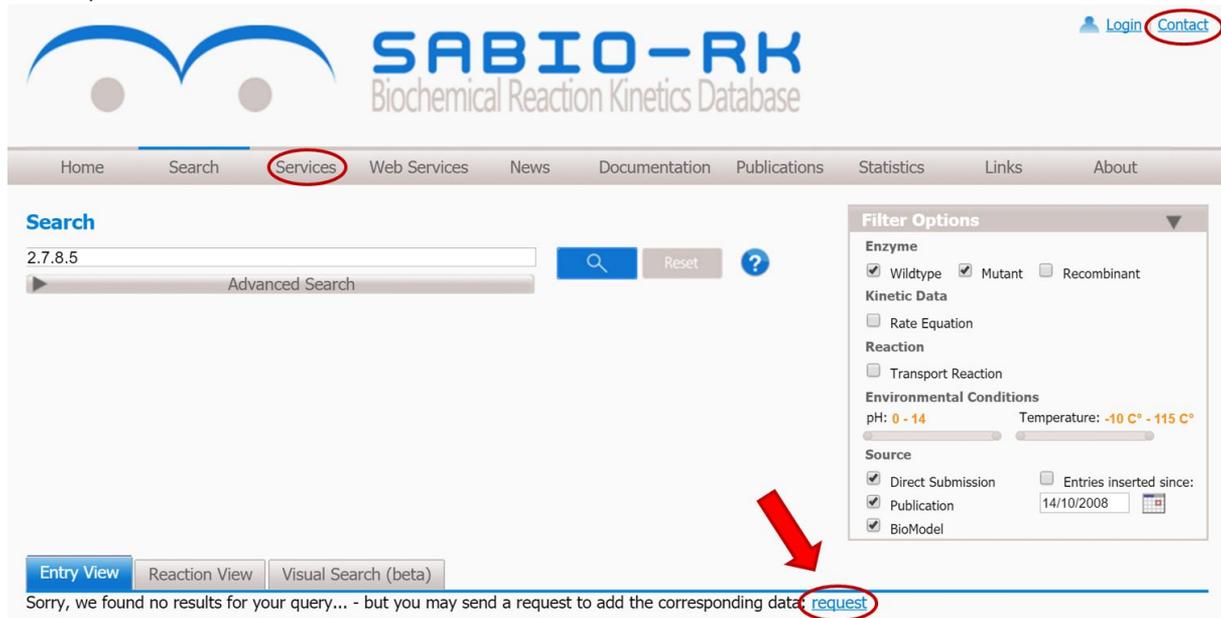
SBML

SBML LATEX

\* For details please refer to <http://identifiers.org/> or [http://co.mbine.org/standards/miriam\\_uris](http://co.mbine.org/standards/miriam_uris) .

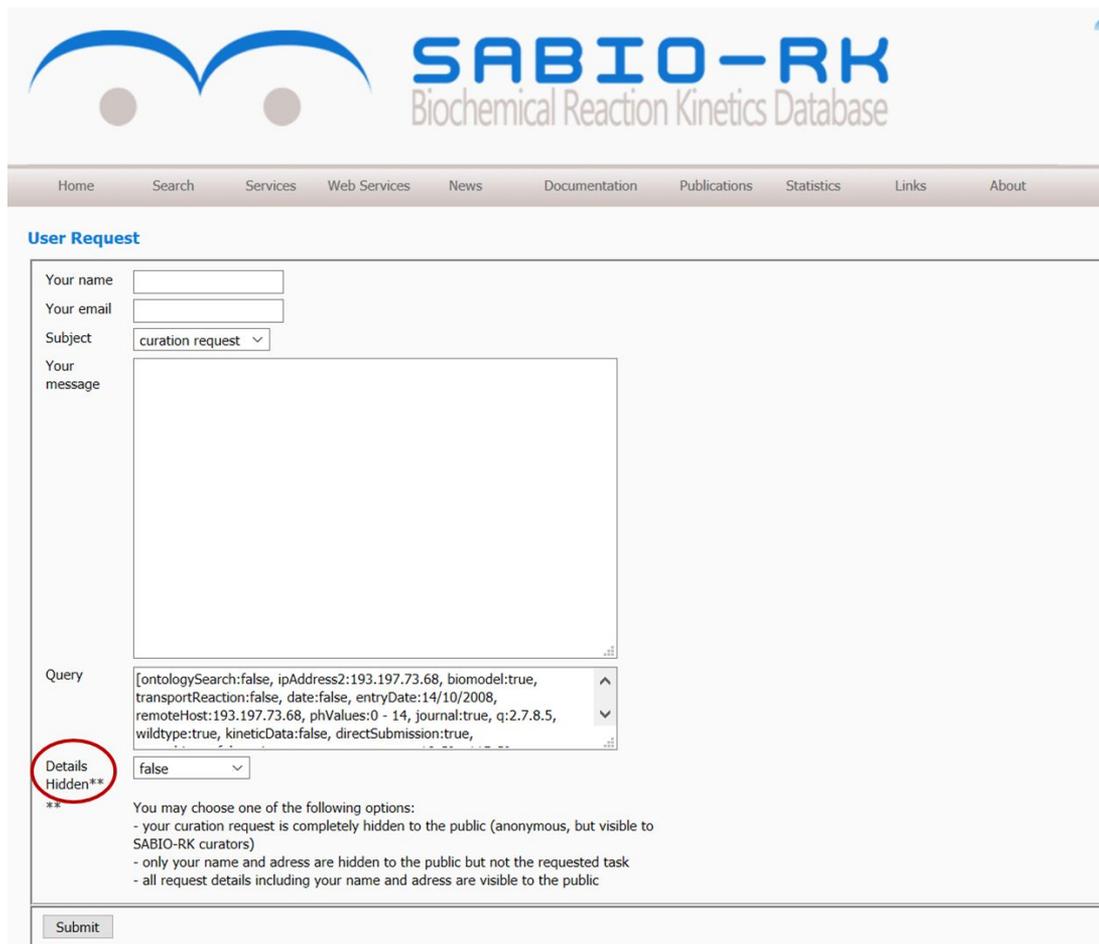
# No Search Result

If the **Search** did not give any results, a link to a pre-filled request form is given (see below).



The screenshot shows the SABIO-RK Biochemical Reaction Kinetics Database search interface. The search bar contains '2.7.8.5'. The search results area displays a message: 'Sorry, we found no results for your query... - but you may send a request to add the corresponding data [request](#)'. A red arrow points to the 'request' link. The 'Services' menu item is circled in red. The 'Filter Options' panel on the right shows various search filters such as Enzyme, Kinetic Data, Reaction, Environmental Conditions, and Source.

User feedback can also be given via the contact button or within Services as Request for SABIO-RK curation service. Any feedback is highly appreciated.



The screenshot shows the 'User Request' form in the SABIO-RK database. The form includes fields for 'Your name', 'Your email', and 'Subject' (set to 'curation request'). There is a large text area for 'Your message'. Below this is a 'Query' field containing a JSON string: `{\"ontologySearch\":false,\"ipAddress2\":193.197.73.68,\"biomodel\":true,\"transportReaction\":false,\"date\":false,\"entryDate\":14/10/2008,\"remoteHost\":193.197.73.68,\"phValues\":0-14,\"journal\":true,\"q\":2.7.8.5,\"wildtype\":true,\"kineticData\":false,\"directSubmission\":true,\"...\"}`. A 'Details Hidden\*\*' dropdown menu is set to 'false'. Below the form, there is explanatory text: 'You may choose one of the following options: - your curation request is completely hidden to the public (anonymous, but visible to SABIO-RK curators) - only your name and address are hidden to the public but not the requested task - all request details including your name and address are visible to the public'. A 'Submit' button is at the bottom.

The search term is already filled in, so that the user can request, e.g., for the addition of special publications, pathways or kinetic data for the search term.

This request is for free, will be edited by a SABIO curator and shown subsequently in the Public Curation List, if the user allowed it by choosing false in the Details Hidden section.



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### SABIO-RK Curation Service

To improve the SABIO-RK database content and to better match user requirements, we encourage you to send us curation requests. These requests can be either e.g. PubMed identifiers or a more general request for kinetic data associated e.g. with a particular biochemical pathway, organism or tissue. Currently, this service is still provided without any fee. In case of questions don't hesitate to send us an email. [Contact](#)

[Request for SABIO-RK curation service](#)

### Public Curation List

Topic	Priority	Status	Client Name	Client Address	Request Date	Completed Date	Publ.	Kin. Param.
PMID 2034664, 25218291, 23530019, 10413446, 9882543, 10480985, 8504762, 8561950, 2229474, 8954570, 12479589, 18092823, 1314948, 9642276, 598368, 10434065	low	pending	-	-	15-02-2016		16	
glycolysis in fungi	low	pending	-	-	13-11-2015		294	
PMID 8975785, 21616088, 24731827, 2034664, 25218291	low	public	-	-	03-10-2015	16-01-2016	1	3
PMID 2998459, 20728568, 10620362, 7582103, 15642802, 23474502, 11696084, 21854595, 23336999, 20955753, 7910416, 11437368, 20707407	low	public	-	-	22-09-2015	16-01-2016	6	165
Insert kinetic data from model: PubMed 25693925	high	public	-	-	03-08-2015	16-09-2015	1	81
Pathway: arachidonic acid metabolism Organism: mammalia	medium	pending	-	-	09-07-2015		2	5