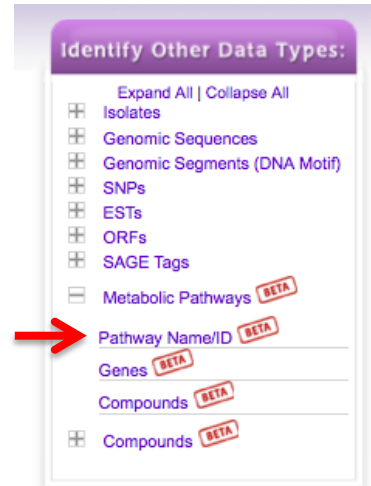


Exploring Metabolic Pathways and Compounds

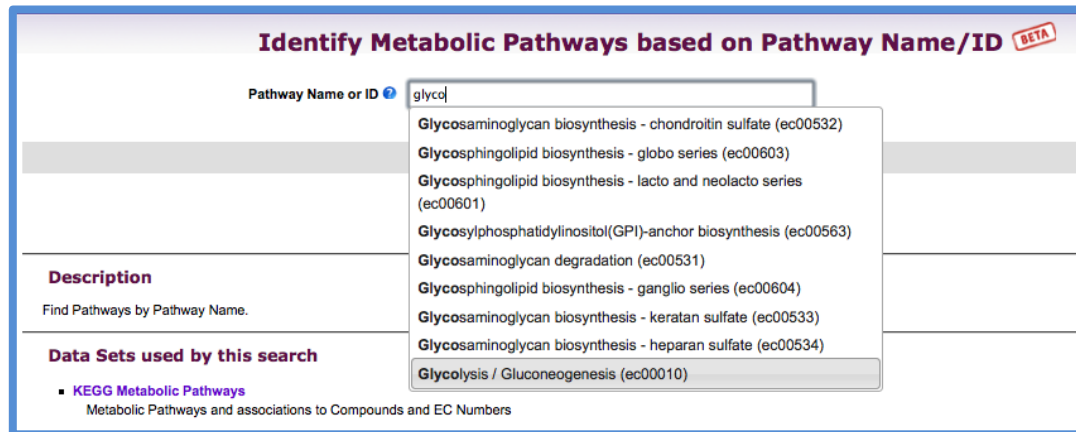
Exercise 5

1. Find the metabolic pathway for glycolysis.
For this exercise use <http://fungidb.org>

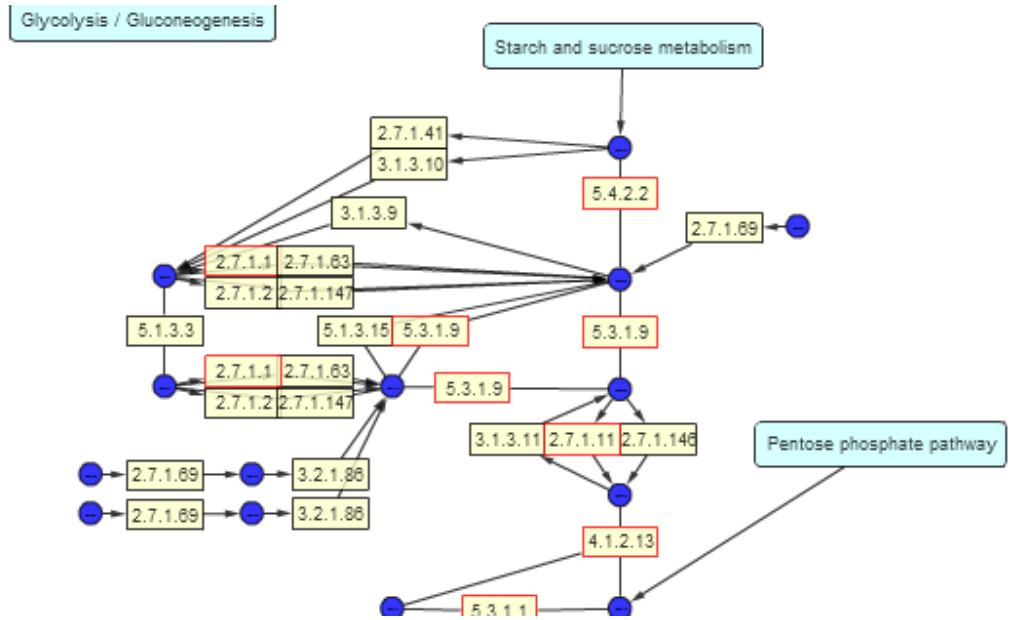
- Metabolic pathway and compound searches are available under the “Identify Other Data Types” heading on the home page. To find metabolic pathways by name, click on the “Pathway/Name/ID” option under the heading “Metabolic Pathways”.



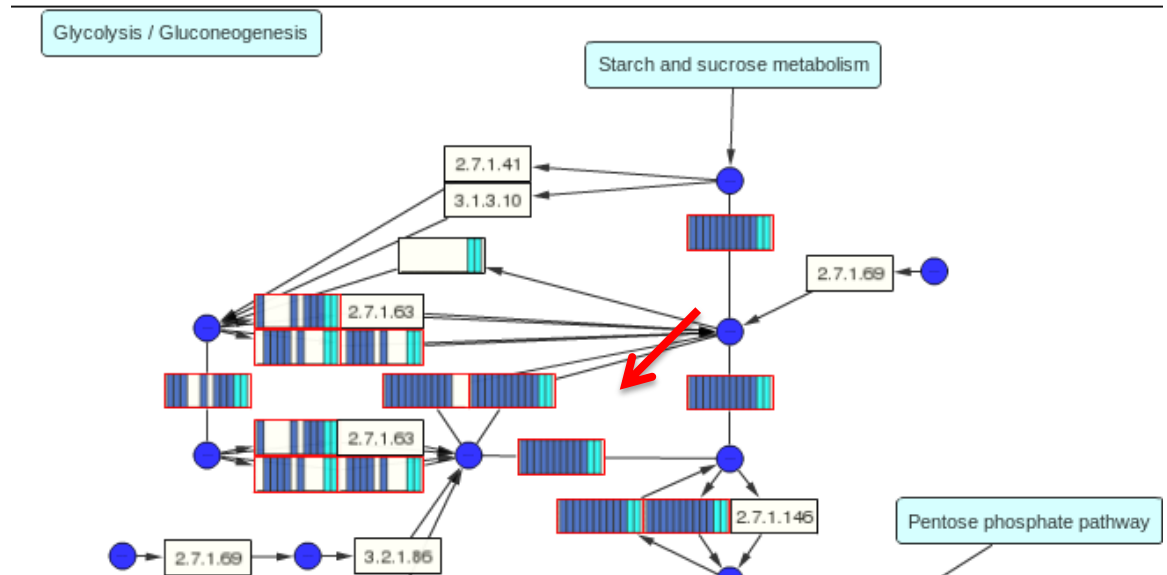
- This search provides type-ahead options.



- Once you find glycolysis, the result page will display a graphical KEGG representation of the pathway. Examine the pathway – What do the rectangles with numbers like 2.7.1.41 represent? What do the circles represent?



- Turn on 'Paint Genera', 'Albujo, Apha.... What do the colors mean? Note that you can mouse over and click on the various elements in the pathway to reveal popups with additional information, and you can zoom in and out.



- Find the rectangle representing 6-phosphofructokinase. (hint: its EC number is 2.7.1.11).
- Do you believe that this enzyme is only present in yeast? What are some other possibilities? How can you determine if this enzyme has orthologs in any oomycete species?
- Click on enzyme name/EC number taking you to a FungiDB strategy. You get 3 genes but this is not necessarily all the orthologs identified by OrthoMCL. How can you find orthologs of this gene in other oomycetes?

EC Number
3 Genes
Step 1

Add Step

3 Genes from Step 1
Strategy: EC Number

Click on a number in this table to limit/filter your results

All Results	Ortholog Groups	Agaricomycetes		Blastocladiomycetes	Chytridiomycetes		E.Ajello Genes:	
		A.Coprinopsis	A.Phanerochaete	B.Allomyces	C.Batrachochytrium	C.Spizellomyces	capsulatus	Ge
		cinerea okayama7#130	chrysosporium RP-78	macrogyrus ATCC 38327	dendrobatidis JEL423	punctatus DAOM BR117	G186AR	ce
3	1	0	0	0	0	0	0	0

- Orthologs can be identified by add an “ortholog transform” step to the search strategy. (hint: click on add step, then select ortholog transform from the popup window. In this case allow all the organism).

EC Number
3 Genes
Step 1

Orthologs
20 Genes
Step 2

Add Step

20 Genes from Step 2
Strategy: EC Number

Click on a number in this table to limit/filter your results

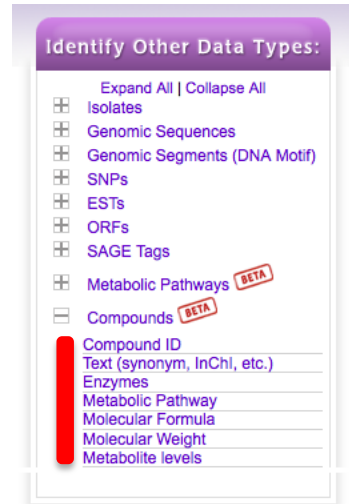
All Results	Ortholog Groups	Agaricomycetes		Blastocladiomycetes	Chytridiomycetes		E.Ajello Ge	
		A.Coprinopsis	A.Phanerochaete	B.Allomyces	C.Batrachochytrium	C.Spizellomyces	capsulatu	Ge
		cinerea okayama7#130	chrysosporium RP-78	macrogyrus ATCC 38327	dendrobatidis JEL423	punctatus DAOM BR117	G186AR	
20	1	0	0	0	0	0	0	0

- What do your results show? Is 6-phosphofructokinase unique to *P. falciparum*?

- Compound records can be accessed by running a specific compound search available under “Identify Other Data Types” heading on the home page. Compound records can also be accessed from the mouse over popups in a metabolic pathway.

- Find Phosphoenolpyruvate (PEP) and visit its record page.

- o PEP can be identified using a specific compound search. For example, compounds may be identified by ID, text search, metabolic pathway, Molecular formula, molecular weight and metabolite levels.



- o Choose one of these options to identify PEP. For example, you can type phosphoenolpyruvate in the compound text search:

- Examine the PEP record page. Note that sections (ie. Metabolic Pathway

Synonyms: 138-08-9, Phosphoenolpyruvic acid, Phosphoenolpyruvate, PEP
Molecular Weight: 168.041962
Molecular Formula: C₃H₅O₆P

2D Structure

Compound Properties [Show](#) [\[Data Sets\]](#)
Substance Properties [Show](#) [\[Data Sets\]](#)
Metabolic Pathway Reactions [Show](#) [\[Data Sets\]](#)
Related Compounds none [\[Data Sets\]](#)
Mass Profiles for Compounds 1005 [Hide](#) [\[Data Sets\]](#)

Mass Profile - 1005

Description
 In this experiment infected RBCs, isolated parasites, and uninfected RBCs were incubated for 4 hours in RPMI containing U-¹³C glutamine at pH 6.4, 7.4, and 8.4. Extracts were analyzed by mass spectrometry. The effect of pH on steady-state metabolite levels and glutamine metabolism was measured.

x-axis: pH
y-axis: Metabolite levels in infected red blood cells, saproin-purified parasites, and uninfected cells

Reactions) may be expanded by clicking on the “show” link.