Gene Ontology Guidelines

URL

Gene Ontology: http://www.ebi.ac.uk/QuickGO/

Description

The Gene Ontology (GO) project provides a controlled vocabulary to describe gene and gene product attributes in any organism.

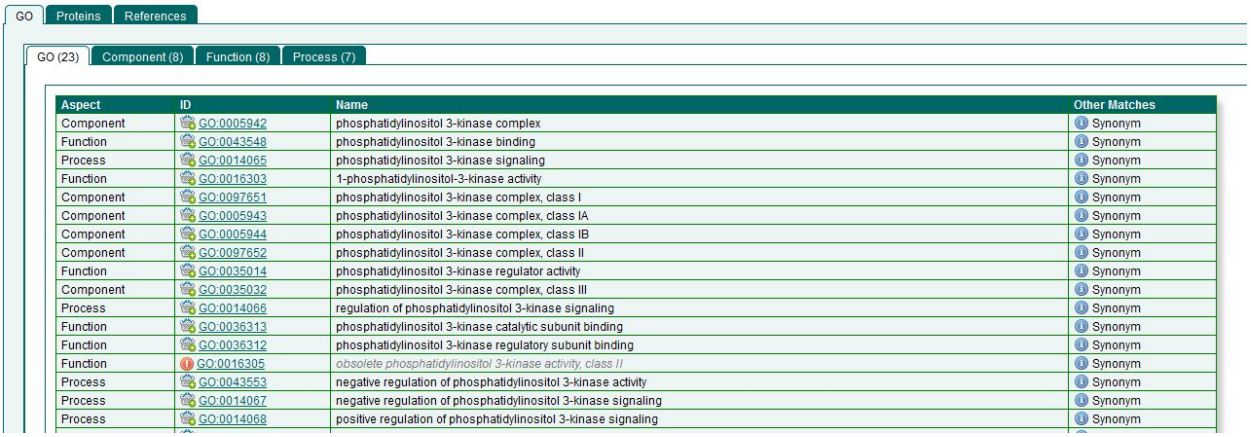
Important Note

GO is used to gather terms pertaining to proteins and reactions. You may use a term in GO to describe a reaction if the reaction is general. If the reaction is specific, please use KEGG or Reactome.

Guidelines (protein)

There are many ways to search for Proteins and Biological Processes using the search bar at the center-left portion of the screen. You have the option of searching by: keyword, name of process, PubMed ID (PID) of paper that references the term, name of reaction, or proteins involved with the process. For this example, we will be using the PI3K enzyme.

When you type 'PI3K' in the search bar, you should see the following screen.



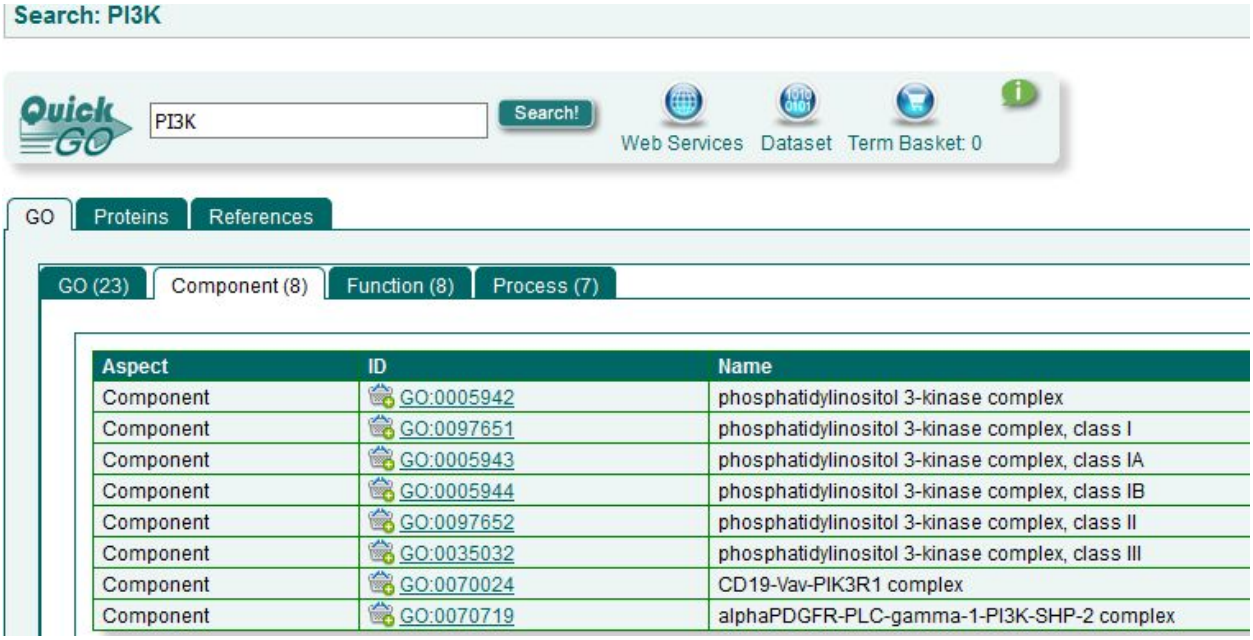
GO | Proteins | References

GO (23) | Component (8) | Function (8) | Process (7)

Aspect	ID	Name	Other Matches
Component	GO:0005942	phosphatidylinositol 3-kinase complex	Synonym
Function	GO:0043548	phosphatidylinositol 3-kinase binding	Synonym
Process	GO:0014065	phosphatidylinositol 3-kinase signaling	Synonym
Function	GO:0016303	1-phosphatidylinositol-3-kinase activity	Synonym
Component	GO:0097651	phosphatidylinositol 3-kinase complex, class I	Synonym
Component	GO:0005943	phosphatidylinositol 3-kinase complex, class IA	Synonym
Component	GO:0005944	phosphatidylinositol 3-kinase complex, class IB	Synonym
Component	GO:0097652	phosphatidylinositol 3-kinase complex, class II	Synonym
Function	GO:0035014	phosphatidylinositol 3-kinase regulator activity	Synonym
Component	GO:0035032	phosphatidylinositol 3-kinase complex, class III	Synonym
Process	GO:0014066	regulation of phosphatidylinositol 3-kinase signaling	Synonym
Function	GO:0036313	phosphatidylinositol 3-kinase catalytic subunit binding	Synonym
Function	GO:0036312	phosphatidylinositol 3-kinase regulatory subunit binding	Synonym
Function	GO:0016305	*obsolete phosphatidylinositol 3-kinase activity, class II*	Synonym
Process	GO:0043553	negative regulation of phosphatidylinositol 3-kinase activity	Synonym
Process	GO:0014067	negative regulation of phosphatidylinositol 3-kinase signaling	Synonym
Process	GO:0014068	positive regulation of phosphatidylinositol 3-kinase signaling	Synonym

Since you are looking for a species, then the GO "Component" tab would probably contain the protein that we are looking for.

Upon clicking on the "Component" tab, you will see this list of results.



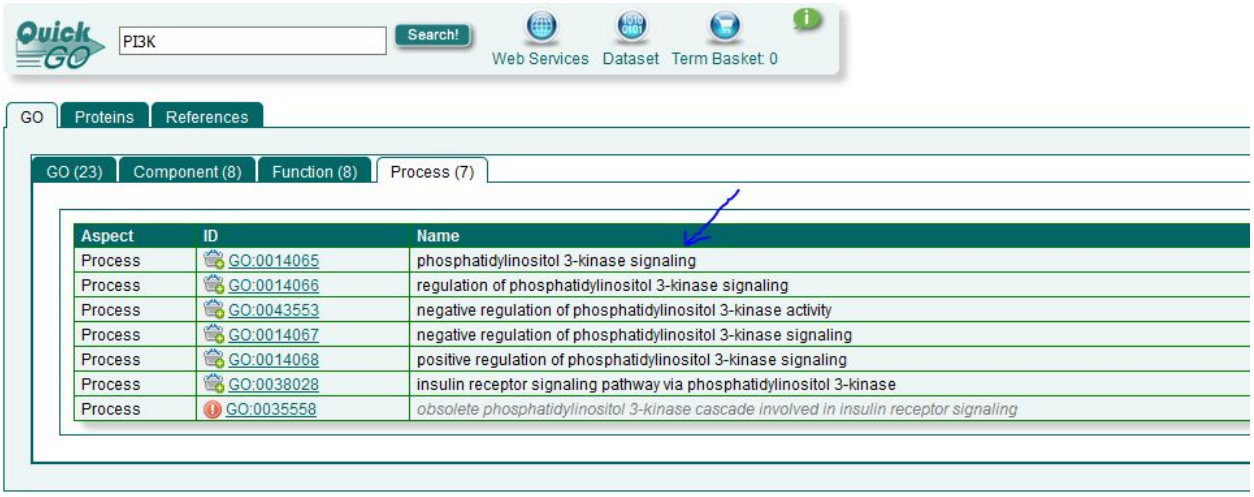
The first result seems the most promising, and if you click on the ID you will see under the definition that this term is used to describe the protein complex "... containing subunits of any phosphatidylinositol 3-kinase (PI3K) enzyme." (GO, 2016).

You may use this record to describe the protein by using the qualifier bqbiol: isVersionOf . This is because the record represents the parent component of the enzyme.

If you can't find the protein directly, you could also try other databases. But it doesn't have to be perfect. Remember, some *correct* annotation is better than none at all as long as it is not misleading.

Guidelines (reaction)

Keeping with example above, let's say that the PI3K enzyme is involved in a signaling process. This is very general, and could be described by a GO Process. If you click on the "Process" tab, you will see a list of biological processes associated with PI3K.



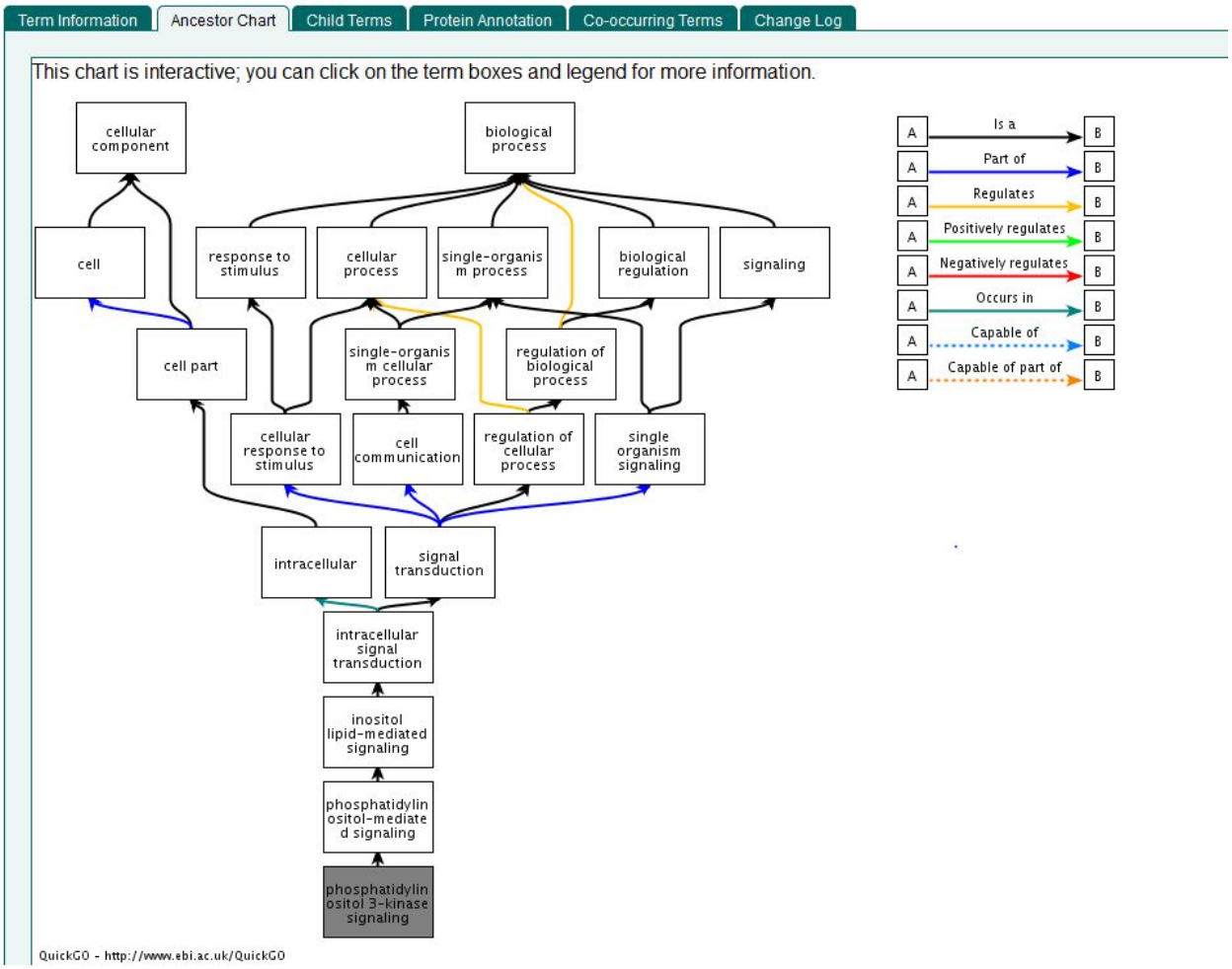
The first link should be “phosphatidylinositol 3-kinase signaling”. This could be used to annotate the PI3K signaling process that is described in the paper by using the qualifier and term “bqbiol: is GO:0014065”.

Where to Get More Information

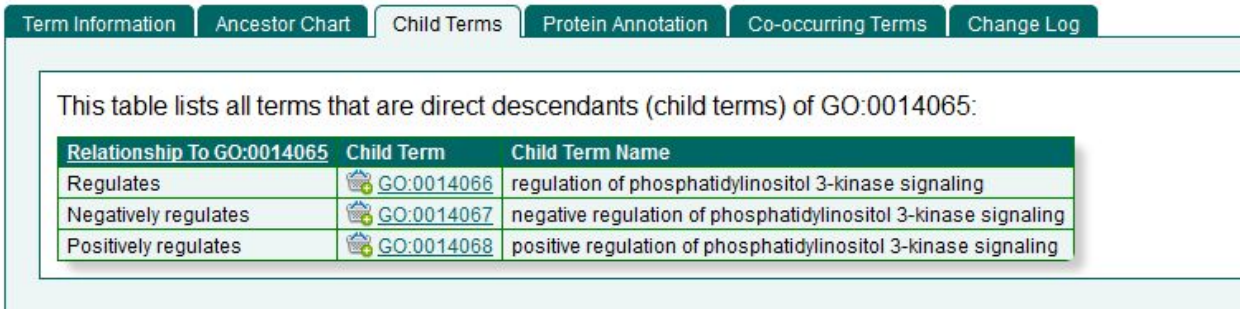
If you need more relational information on a term, you may want to explore the ‘Ancestor Chart’, ‘Child Terms’ and “Co-occurring Terms’ tabs.

Ancestor Chart

If you click on the ‘GO: 0014065’ link, you will be taken to that process’ record which is equipped with a series of tabs. The ‘Ancestor Chart’ tabs contains the parent processes of phosphatidoylinositol 3-kinase signaling along with the semantic relationship between each process.



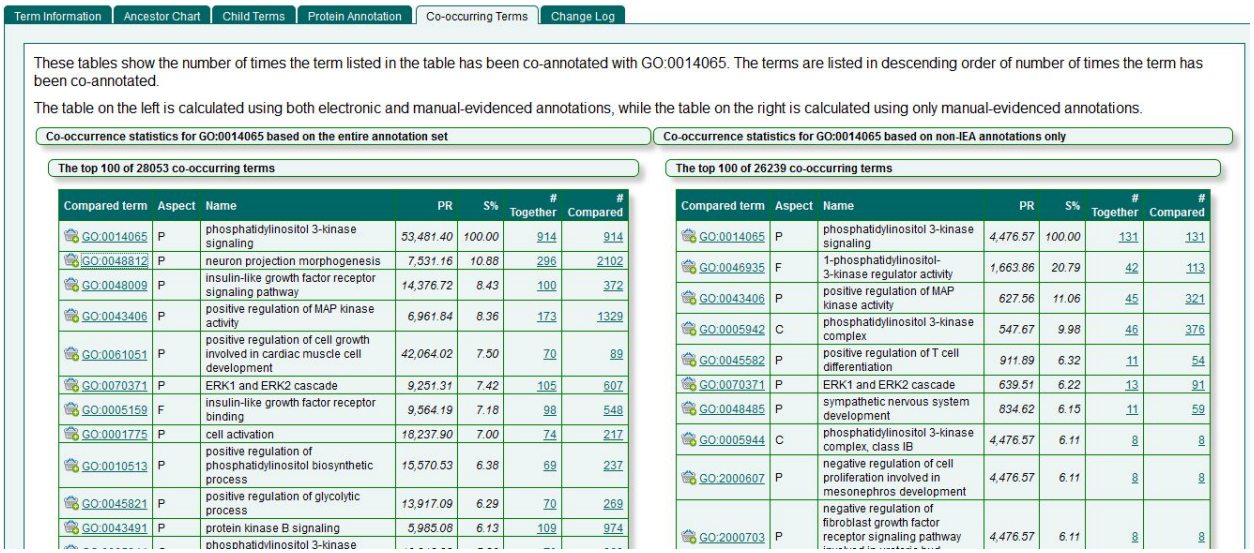
Child Terms



This tab lists all of the processes that are descendants of this term. You could use the statement GO: 0014066 bqbiol: isPartOf GO: 0014065 .

Co-occurring Terms

The terms listed in this tab are terms that have been annotated with this process and are separated into two columns.



Term Information | Ancestor Chart | Child Terms | Protein Annotation | Co-occurring Terms | Change Log

These tables show the number of times the term listed in the table has been co-annotated with GO:0014065. The terms are listed in descending order of number of times the term has been co-annotated.

The table on the left is calculated using both electronic and manual-evidenced annotations, while the table on the right is calculated using only manual-evidenced annotations.

Co-occurrence statistics for GO:0014065 based on the entire annotation set

The top 100 of 28053 co-occurring terms

Compared term	Aspect	Name	PR	S%	# Together	# Compared
GO:0014065	P	phosphatidylinositol 3-kinase signaling	53,481.40	100.00	914	914
GO:0048812	P	neuron projection morphogenesis	7,531.16	10.88	296	2102
GO:0048009	P	insulin-like growth factor receptor signaling pathway	14,376.72	8.43	100	372
GO:0043406	P	positive regulation of MAP kinase activity	6,961.84	8.36	173	1329
GO:0061051	P	positive regulation of cell growth involved in cardiac muscle cell development	42,064.02	7.50	70	89
GO:0070371	P	ERK1 and ERK2 cascade	9,251.31	7.42	105	607
GO:0005159	F	insulin-like growth factor receptor binding	9,564.19	7.18	98	548
GO:0001775	P	cell activation	18,237.90	7.00	74	217
GO:0010513	P	positive regulation of phosphatidylinositol biosynthetic process	15,570.53	6.38	69	237
GO:0045821	P	positive regulation of glycolytic process	13,917.09	6.29	70	269
GO:0043491	P	protein kinase B signaling	5,985.08	6.13	109	974
[illegible]	[illegible]	phosphatidylinositol 3-kinase	[illegible]	[illegible]	[illegible]	[illegible]

Co-occurrence statistics for GO:0014065 based on non-IEA annotations only

The top 100 of 26239 co-occurring terms

Compared term	Aspect	Name	PR	S%	# Together	# Compared
GO:0014065	P	phosphatidylinositol 3-kinase signaling	4,476.57	100.00	131	131
GO:0046935	F	1-phosphatidylinositol-3-kinase regulator activity	1,663.86	20.79	42	113
GO:0043406	P	positive regulation of MAP kinase activity	627.56	11.06	45	321
GO:0005942	C	phosphatidylinositol 3-kinase complex	547.67	9.98	46	376
GO:0045582	P	positive regulation of T cell differentiation	911.89	6.32	11	54
GO:0070371	P	ERK1 and ERK2 cascade	639.51	6.22	13	91
GO:0048485	P	sympathetic nervous system development	834.62	6.15	11	59
GO:0005944	C	phosphatidylinositol 3-kinase complex, class IB	4,476.57	6.11	8	8
GO:2000607	P	negative regulation of cell proliferation involved in mesonephros development	4,476.57	6.11	8	8
GO:2000703	P	negative regulation of fibroblast growth factor receptor signaling pathway	4,476.57	6.11	8	8

The column on the left represents annotations that have occurred using electronic and manual annotations, meaning that these terms were both automatically and physically/manually used to tag BioModels. The column on the right represents annotations that have occurred physically/manually. The S% column indicates how many times they have been annotated together, and indicates how likely those processes happen in the same BioModel. It's also important to note that the chart goes in descending order, with the more relevant terms at the top.