



# In the Know About GO: A Newly Redesigned Website for the Gene Ontology



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The Gene Ontology resource (GO; <http://geneontology.org>) is a major bioinformatics initiative to provide a comprehensive, computational representation of our evolving knowledge of the biological functions of genes and gene products in all organisms. GO has been cited in over 148,000 published papers. In order to coordinate the efforts of the GO Consortium with thousands of users worldwide, it is necessary to keep the website current and concise. We have recently restructured the GO website in order to simplify the user interface, clarify citation and standardization practices for the various GO data products, and to make educational documentation a prominent aspect of the website. Here we present the newly overhauled GO site, which has been specifically targeted toward two groups of users: (1) novice users and (2) researchers who need a specific GO annotation or ontology file. Novice users will find training documentation and introductory material to ensure proper use and understanding of GO data products, including annotation and ontology file formats. More experienced users are still able to download GO files, but now through a more intuitive interface. Current GO release dates are prominently featured on the website and emphasis has been placed on the citation policy of GO, allowing for greater reproducibility in GO enrichment analyses and other uses of GO. Additionally, updated training documentation and guidelines are available to encourage and enable outside groups to contribute or suggest modifications to annotations and the ontology. Overall, the redesigned website is expected to enhance involvement of the research community with GO, and is a welcome improvement to an already well-known and heavily used resource. This work is funded by the US National Institutes of Health: National Human Genome Research Institute (NHGRI) U41HG001315 and U41HG002273.

## About GO

### UDP-galactosyltransferase activity

#### Term Information

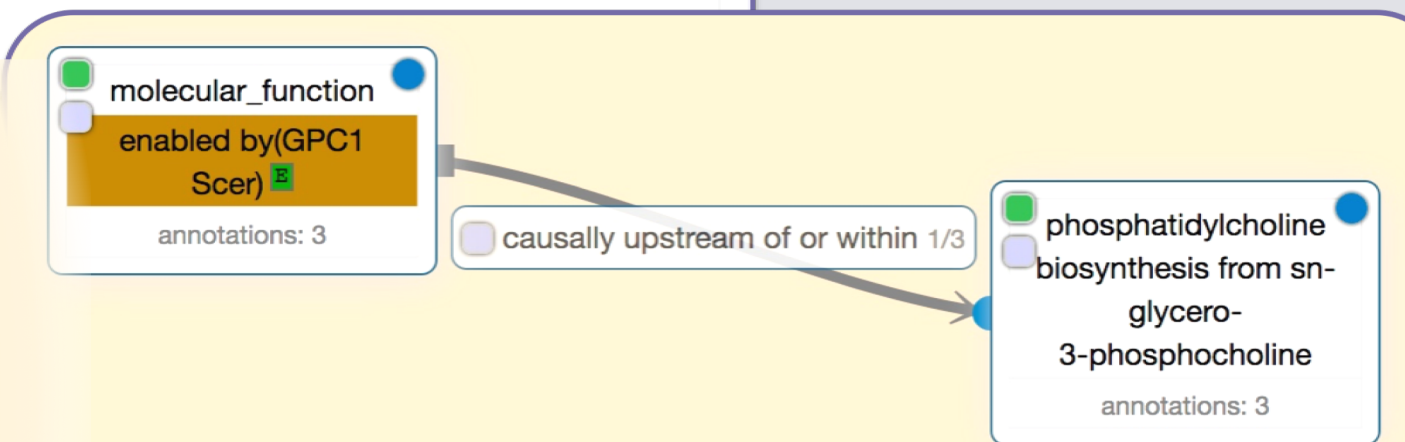
Accession: GO:0035250  
Name: UDP-galactosyltransferase activity  
Ontology: molecular\_function  
Synonyms: None  
Alternate IDs: None  
Definition: Catalysis of the transfer of a galactose group from UDP-galactose to an acceptor, resulting in UDP and a galactosylated acceptor.  
Comment: None  
History: See term history for GO:0035250 at QuickGO  
Subset: None  
Related: [Link](#) to all genes and gene products annotated to UDP-galactosyltransferase activity.  
[Link](#) to all direct and indirect annotations to UDP-galactosyltransferase activity.

#### GO Terms

- Controlled vocabulary
  - Computer-readable ID number
  - Human-readable name & definition
  - Structured relationships between terms

#### GO Annotations

- Statements tying a GO Term to a gene product
  - Different types of evidence (e.g. direct assay, high throughput genetic interaction, or sequence alignment)
  - Relationships and additional information when possible



## Quick Enrichment Analysis

### GO Enrichment Analysis ?

Powered by PANTHER

ACHE  
AMOT  
CDK5R1  
CDK6  
CELSR1  
CNTFR

#### PANTHER Enrichment Analysis (EA)

- Perform EA directly from homepage
- Over 130 genomes in dropdown
  - Another 770+ genomes available from Reference Proteome project

biological process

Homo sapiens

Examples

Launch >

Gene set example: genes up-regulated by activation of hedgehog signaling (source: msigdb)

## Accessing the GO Resource

**THE GENE ONTOLOGY RESOURCE**

The mission of the GO Consortium is to develop a comprehensive, computational model of biological systems, ranging from the molecular to the organism level, across the multiplicity of species in the tree of life.

The Gene Ontology (GO) knowledgebase is the world's largest source of information on the functions of genes. This knowledge is both human-readable and machine-readable, and is a foundation for computational analysis of large-scale molecular biology and genetics experiments in biomedical research.

Search GO term or Gene Product in AmiGO ...

Any ● Ontology ● Gene Product

**GO Enrichment Analysis**  
Powered by PANTHER

**Citation Information:**

- Current release date at-a-glance
- Unique DOI for each release:  
DOI: 10.5281/zenodo.2598351
- Statistics: GO terms, annotations, gene products, species

**Quick Access**

- Ontology, Annotations, and Guides for GO Tools

[Browse Ontology](#) [Download Ontology](#) [Browse Annotations](#) [Download Annotations](#) [Browse Tool Guides](#)

## Download the ontology

### Ontology files

- Released monthly and available in OBO 1.4, OWL, and JSON formats
- Also includes GO sub-ontologies
- SVN access is available

### Ontology

- Official releases monthly; daily "snapshot" versions available

- OBO, OWL, JSON formats

- Available via PURL

go-basic.obo

This is the basic version of the GO, filtered such that the graph is guaranteed to be acyclic and annotations can be propagated up the graph. The relations included are is a, part of, regulates, negatively regulates and positively regulates. This version excludes relationships that cross the 3 GO hierarchies. This version should be used with most GO enrichment tools.

### Filtered Annotation File Downloads for 2019-03-18 release

Show: All entries

Search:

Species/Database	Entity type	Annotations	File
Arabidopsis thaliana	The Arabidopsis Information Resource		
Aspergillus nidulans	Aspergillus Genome Database (AGD)		
Bos taurus	EBI Gene Ontology Annotation Database		(zip)
Bos taurus	EBI Gene Ontology Annotation Database		(ip)
Bos taurus	EBI Gene Ontology Annotation Database		
Bos taurus	EBI Gene Ontology Annotation Database		
Bos taurus	EBI Gene Ontology Annotation Database		

#### Annotations

- Official releases monthly; daily "snapshot" versions available
- Taxon-specific and multi-organism files
- GAF, GPI, GPAD files available