Gnomics

A Fully-Integrated Biological Interface for Python

DISCLAIMER: This documentation is not currently all inclusive of the various functionalities possible in *GNOMICS*. Any issues with the documentation should be submitted as issues on the respective GitHub page.

# Introduction

## Biomedical Informatics

AMIA, the American Medical Informatics Association, defines biomedical informatics (BMI) as the “interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving and decision making, motivated by efforts to improve human health.”

One of the most important pieces of this definition is *effective use*. [Michael Gurstein](https://en.wikipedia.org/wiki/Michael_Gurstein) characterized effective use as the “capacity and opportunity to successfully integrate [Information and Communications Technology] into the accomplishment of self or collaboratively identified goals.” One of the deepest divides in BMI is between clinical applications and strictly biological research. Even informatics is divided on the subject, considering clinical informatics and bioinformatics as separate disciplines.

A primary issue in this regard is the existence of different standards. Consider, for example, the FDA’s Adverse Event Reporting System (FAERS). FAERS records component drugs using RxCUIs and adverse events (AEs) as MedDRA terms. A bioinformaticist might more commonly utilize compound identifiers such as PubChem CIDs or ChEBI IDs instead of RxCUIs, or use Human Phenotype Ontology (HPO) IDs instead of MedDRA terms. Of course, translating from one ontology to another is somewhat laborious.

## UID Problem

The unique identifier (UID) problem is one rooted in the usage of primary keys for in database tables. Three basic keys of UIDs exist: serial numbers, random numbers, and choice codes. At times, just like there are many languages, there are many types of UIDs representing the same objects. Water has an RxCUI, a ChemSpider ID, a PubChem ID, etc., but they all *mean* the same thing. In many cases, “overarching” or meta- databases are constructed to link all of these sources together. A popular example of this would be the [UMLS Metathesaurus](https://www.nlm.nih.gov/research/umls/knowledge_sources/metathesaurus/). However, this introduces a problem, namely, that a new UID for this meta-database must be designed, adding a whole new identifier to worry about. This problem was represented well in the comic [XKCD #927](https://www.explainxkcd.com/wiki/index.php/927:_Standards):



The reason for the creation of competing identifiers and standards is multifaceted, ranging from “Not Invented Here” (NIH) ideologies[[1]](#footnote-1), economic or political motivations, or lack of reliable identifier mapping for usage in updates.

## APIs

An API is an *Application Programming Interface*. Essentially, it is code that allows two software programs to talk to one another—in the instance of *GNOMICS*, our Python code asks website code for specific information which is then returned to the Python code for further processing.

### REST and SOAP Services

TBA.

### Return Types: JSON, JSONP, and XML

TBA.

### API Security

Sometimes, massive usage of an API or unlicensed usage of an API can cause issues. Thus, many such services have some form of access control in order to keep these problems to a minimum. Some webservices utilize API security keys generated by a user or a combination of unique user identifiers (user names, passwords, emails, etc.). Many API services have a *request limit*, a number of requests allowed in a given unit of time.

#### ChemSpider

TBA.

#### EOL

TBA.

#### OMIM

TBA.

#### UMLS

TBA.

# Installation

## Windows

TBA.

### Installing Electron on Windows

*This section is incomplete*.

Getting Electron up and running on Windows platforms can sometimes be relatively difficult. The personal solution used in this case can be found [here](https://stackoverflow.com/questions/35293117/npm-install-that-requires-node-gyp-fails-on-windows) and is repeated below for clarity’s sake:

1. Download and install a version of Python 2.7.
2. Add the full path of the Python 2.7 install to the PATH variable.
3. Change directory in a Windows PowerShell (run as administrator) to wherever gnomics\_app is located.
4. Run the following command in a Windows PowerShell (run as administrator): npm config -g set msvs\_version 2015.
5. Run npm i to check for any possible errors.
6. Run npm install --runtime=electron --target=1.4.15 to install Electron.

## Linux

TBA.

## Mac OS

TBA.

# Usage

## Command-Line Interface (CLI)

TBA.

## Graphic User Interface (Electron)

TBA.

### Windows

First make sure no processes are current running on port 4242. To check this, open a command prompt and run the command netstat -a -o -n. This will list all protocols being run on various ports. If TCP 127.0.0.1:4242 does not appear in the list, we can continue the Electron launch procedure. However, if it does appear in the list, check the PID (last column of the netstat output) and run taskkill /F /PID $PID, where $PID is the aforementioned PID. For example, if the PID is 20284, run taskkill /F /PID 20284.

Once the port is cleared, open two command prompts or bash shells and change directories in both to gnomics\_app. Once there, run python ./gnomics/api.py in one prompt and ../gnomics\_app/node\_modules/electron/dist/electron.exe ../gnomics\_app in the other prompt.

## Graphic User Interface (Executable)

TBA.

# Outline

*This section is incomplete.*

*Gnomics* is meant to be setup in a (relatively) intuitive manner, with objects named after what they represent in real-life. Not only this, but with a Swiss army knife approach, it is hoped that if a component fails, another component will take its place dynamically.

Unfortunately, some data we try to find isn’t exactly easily accessible. In addition, certain databases or APIs being accessed might require particular security parameters or the entire API might be dropped suddenly. In these events, it is hoped that a dynamic user base will help keep the software up-to-date. If you encounter a bug or a database issue, at the very least, please please *please* note it on the GitHub.

The basic outline of the project currently includes the following folders/file hierarchy:

* data
* docs
* objects
  + assay\_files
  + clinical\_trial\_files
  + compound\_files
  + disease\_files
  + drug\_files
  + gene\_files
  + interaction\_objects
    - compound\_disease.py
    - compound\_gene.py
    - compound\_reference.py
    - disease\_gene.py
    - disease\_reference.py
    - gene\_reference.py
  + mutation\_files
  + pathway\_files
  + procedure\_files
  + protein\_files
  + reference\_files
  + taxon\_files
  + compound.py
  + disease.py
  + enzyme.py
  + gene.py
  + identifier.py
  + mutation.py
  + pathway.py
  + procedure.py
  + protein.py
  + reference.py
  + report.py
  + taxon.py
  + user.py

# Coverage

*This section is incomplete*.

*Gnomics* covers a variety of databases and identifiers, of which are listed here, along with various APIs, source code, and other materials. For ease of reference, sources are listed alphabetically, with subsources and identifiers listed with them.

## AEO

Files: /objects/anatomical\_structure\_files/aeo.py [Main]

Homepage:

Identifiers: AEO ID

Mappings: N/A

Packages: N/A

Requirements: N/A

## ATC/DDD Index

Files: /objects/drug\_files/atc.py [Main]

Homepage: <https://www.whocc.no/atc_ddd_index/>

Identifiers: ATC Code

Mappings: N/A

Packages: N/A

Requirements: N/A

## Beilstein Database

Files: /objects/compound\_files/beilstein.py [Main]

Homepage:

Identifiers: Beilstein Registry Number

Mappings: N/A

Packages: N/A

Requirements: N/A

## BioCyc Database Collection

Files:

Homepage:

Identifiers:

Mappings: N/A

Packages: N/A

Requirements: N/A

## CARO

Files: /objects/anatomical\_structure\_files/caro.py [Main]

Homepage:

Identifiers: CARO ID

Mappings: N/A

Packages: N/A

Requirements: N/A

## CAS

Files: /objects/compound\_files/cas.py [Main]

Homepage: <https://www.cas.org/>

Identifiers: CAS Registry Number

Mappings: CAS Registry Number 🡪 MeSH Term

CAS Registry Number 🡪 MeSH UID

Packages: N/A

Requirements: N/A

## Catalogue of Life

Files: /objects/taxon\_files/col.py [Main]

Homepage: <http://www.catalogueoflife.org/>

Identifiers: COL ID

Mappings:

Packages: N/A

Requirements:

## ChEBI

Files: /objects/compound\_files/chebi.py [Main]

Homepage: <https://www.ebi.ac.uk/chebi/>

Identifiers: ChEBI ID

Mappings: ChEBI ID 🡪 Beilstein Registry Number

ChEBI ID 🡪 CAS Registry Number

ChEBI ID 🡪 DrugBank ID

ChEBI ID 🡪 DrugCentral ID

ChEBI ID 🡪 InChI

ChEBI ID 🡪 INN

ChEBI ID 🡪 KEGG COMPOUND ID

ChEBI ID 🡪 KEGG DRUG ID

ChEBI ID 🡪 Patent Number

ChEBI ID 🡪 PDBeChem Code

ChEBI ID 🡪 SM LINCS ID

ChEBI ID 🡪 SMILES

Packages: N/A

Requirements: N/A

## ChEMBL

Files: /objects/compound\_files/chembl.py [Main]

Homepage: <https://www.ebi.ac.uk/chembl/>

Identifiers: ChEMBL ID

Mappings: ChEMBL ID 🡪 ATC Code

ChEMBL ID 🡪 BAN

ChEMBL ID 🡪 Canonical SMILES

ChEMBL ID 🡪 FDA Approved Drug Name

ChEMBL ID 🡪 INN

ChEMBL ID 🡪 JAN

ChEMBL ID 🡪 USAN

ChEMBL ID 🡪 USP

ChEMBL ID 🡪 Wikipedia Accession

Packages: N/A

Requirements: N/A

## ChemSpider

Files: /objects/compound\_files/cs.py [Main]

Homepage: <http://www.chemspider.com/>

Identifiers: ChemSpider ID

Mappings: ChemSpider ID 🡪 InChI

ChemSpider ID 🡪 Molecular Formula

ChemSpider ID 🡪 PubChem CID

ChemSpider ID 🡪 PubChem CID 🡪 CAS Registry Number

ChemSpider ID 🡪 SMILES

InChI 🡪 ChemSpider ID

Packages: ChemSpiPy (<http://chemspipy.readthedocs.io>)

Requirements: API security token

## DGIdb

Files:

Homepage: <http://dgidb.genome.wustl.edu/>

Identifiers: DGIdb Gene Interaction ID

Mappings:

Packages: N/A

Requirements:

## Disease Ontology

Files: /objects/disease\_files/do.py [Main]

Homepage: <http://disease-ontology.org/>

Identifiers: DO Term

DOID

Mappings: DOID 🡪 DO Term

DOID 🡪 HGNC Approved Symbol

DOID 🡪 MIM Number

DOID 🡪 NCBI Gene ID

DOID 🡪 ORDO ID

DOID 🡪 SNOMED-CT ID

DOID 🡪 UMLS ID

Packages: N/A

Requirements:

## DrugBank

Files: /objects/drug\_files/drugbank.py [Main]

Homepage: <https://www.drugbank.ca/>

Identifiers: DrugBank ID

Mappings:

Packages: N/A

Requirements: API security token

## DrugCentral

Files: /objects/drug\_files/drugcentral.py [Main]

Homepage: <http://drugcentral.org/>

Identifiers: DrugCentral ID

Mappings:

Packages: N/A

Requirements:

## Drugs@FDA

Files: /objects/drug\_files/fda.py [Main]

Homepage: <https://www.fda.gov/drugs/informationondrugs/ucm135821.htm>

Identifiers: FDA Approved Drug Name

NDA

Mappings:

Packages: N/A

Requirements:

## EOL

Files: /objects/taxon\_files/eol.py [Main]

Homepage: <http://eol.org/>

Identifiers: EOL ID

Mappings: EOL ID 🡪 COL ID

Index Fungorum ID 🡪 EOL ID

ITIS TSN 🡪 EOL ID

NCBI Taxonomy ID 🡪 EOL ID

Paleobiology Database ID 🡪 EOL ID

Packages: N/A

Requirements:

## FMA

Files: /objects/anatomical\_structure\_files/fma.py [Main]

Homepage:

Identifiers: FMA ID

Mappings: N/A

Packages: N/A

Requirements: N/A

## Gene Ontology

Files: /objects/auxiliary\_files/go.py [Main]

Homepage: <http://www.geneontology.org/>

Identifiers: GO Accession

GO Term

Mappings:

Packages: N/A

Requirements:

## ICD

Files: /objects/disease\_files/icd.py [Main]

Homepage:

Identifiers: ICD-10-CM Code

ICD-9-CM Code

Mappings:

Packages: N/A

Requirements:

## KEGG

Files: /objects/auxiliary\_files/kegg.py [Main]

/objects/compound\_files/kegg.py [Main]

/objects/disease\_files/kegg.py [Main]

Homepage: <http://www.genome.jp/kegg/>

Identifiers: KEGG COMPOUND ID

KEGG DISEASE ID

KEGG DRUG ID

KEGG GENE ID

KEGG ORGANISM ID

KEGG ORTHOLOGY ID

KEGG PATHWAY ID (EC)

KEGG PATHWAY ID (KO)

KEGG PATHWAY ID (MAP)

KEGG PATHWAY ID (Reaction)

Mappings: KEGG COMPOUND ID 🡪 ChEBI ID

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 Beilstein Registry Number

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 CAS Registry Number

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 DrugBank ID

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 DrugCentral ID

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 InChI

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 KEGG DRUG ID

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 SM LINCS ID

KEGG COMPOUND ID 🡪 ChEBI ID 🡪 SMILES

KEGG COMPOUND ID 🡪 ChEMBL ID

KEGG COMPOUND ID 🡪 PubChem SID

KEGG COMPOUND ID 🡪 PubChem SID 🡪 PubChem CID

KEGG DISEASE ID 🡪 ICD-10-CM

KEGG DISEASE ID 🡪 MeSH UID

KEGG DISEASE ID 🡪 MIM Number

KEGG GENE ID 🡪

KEGG ORTHOLOGY ID 🡪 GO Accession

KEGG ORTHOLOGY ID 🡪 KEGG COMPOUND ID

KEGG ORTHOLOGY ID 🡪 KEGG DRUG ID

KEGG ORTHOLOGY ID 🡪 KEGG GENE ID

KEGG ORTHOLOGY ID 🡪 KEGG PATHWAY ID (KO)

KEGG PATHWAY ID (KO) 🡪 BSID

KEGG PATHWAY ID (KO) 🡪 GO Accession

KEGG PATHWAY ID (KO) 🡪 KEGG COMPOUND ID

KEGG PATHWAY ID (KO) 🡪 KEGG DISEASE ID

KEGG PATHWAY ID (KO) 🡪 KEGG ORTHOLOGY ID

KEGG PATHWAY ID (MAP) 🡪 GO Accession

KEGG PATHWAY ID (MAP) 🡪 KEGG DISEASE ID

KEGG PATHWAY ID (MAP) 🡪 KEGG PATHWAY ID (KO)

Packages:

Requirements: N/A

## LINCS Data Portal

Files: /objects/compound\_files/lincs.py [Main]

Homepage: <http://lincsportal.ccs.miami.edu/dcic-portal/>

Identifiers: SM LINCS ID

Mappings:

Packages: N/A

Requirements:

## MeSH

Files: /objects/compound\_files/mesh.py [Main]

Homepage: <https://meshb.nlm.nih.gov/>

Identifiers: MeSH Term

MeSH UID

Mappings: MeSH UID 🡪 MeSH Term

Packages: N/A

Requirements:

## MMDB

Files: /objects/compound\_files/mmdb.py [Main]

Homepage: <https://www.ncbi.nlm.nih.gov/structure>

Identifiers: MMDB ID

Mappings:

Packages: N/A

Requirements:

## NCBI BioSystems Database

Files: /objects/auxiliary\_files/biosystems.py [Main]

Homepage: <https://www.ncbi.nlm.nih.gov/biosystems/>

Identifiers: BSID

Mappings:

Packages: N/A

Requirements:

## Noble

Files: /objects/reference\_files/noble.py [Main]

Homepage: <http://noble-tools.dbmi.pitt.edu/>

Identifiers:

Mappings:

Packages: NOBLE Coder

Requirements:

## OMIM

Files: /objects/disease\_files/omim.py [Main]

Homepage: <https://omim.org/>

Identifiers: MIM Number

Mappings: MIM Number 🡪 DOID

MIM Number 🡪 HGNC Approved Symbol

MIM Number 🡪 ICD-10-CM

MIM Number 🡪 ICD-9-CM

MIM Number 🡪 NCBI Gene ID

MIM Number 🡪 SNOMED-CT ID

MIM Number 🡪 UMLS ID

Packages: N/A

Requirements: API security token

## PDB

Files: /objects/protein\_files/pdb.py [Main]

Homepage: <https://www.rcsb.org/pdb/home/home.do>

Identifiers: PDB ID

Mappings:

Packages: N/A

Requirements:

## PDBeChem

Files: /objects/compound\_files/pdbechem.py [Main]

Homepage: <http://www.ebi.ac.uk/pdbe-srv/pdbechem/>

Identifiers: PDBeChem Code

Mappings:

Packages: N/A

Requirements:

## PIR

Files: /objects/protein\_files/pir.py [Main]

Homepage: <http://pir.georgetown.edu/>

Identifiers: PIR ID

Mappings:

Packages: N/A

Requirements:

## PubChem

Files: /objects/assay\_files/pubchem.py [Main]

/objects/compound\_files/pubchem.py [Main]

Homepage: <https://pubchem.ncbi.nlm.nih.gov/>

Identifiers: PubChem AID

PubChem CID

PubChem SID

Mappings: PubChem CID 🡪 Canonical SMILES

PubChem CID 🡪 CAS Registry Number

PubChem CID 🡪 DGIdb Gene Interaction ID 🡪

HGNC Approved Gene Symbol

PubChem CID 🡪 InChI

PubChem CID 🡪 Isomeric SMILES

PubChem CID 🡪 IUPAC Name

PubChem CID 🡪 MIM Number

PubChem CID 🡪 MMDB ID

PubChem CID 🡪 Molecular Formula

PubChem CID 🡪 Patent Number

PubChem CID 🡪 PubChem AID

Packages: PubChemPy (<https://pubchempy.readthedocs.io>)

Requirements: N/A

## PubMed

Files: /objects/reference\_files/pubmed.py [Main]

Homepage: <https://www.ncbi.nlm.nih.gov/pubmed/>

Identifiers: PMID

Mappings:

Packages: N/A

Requirements:

## PubTator

Files: /objects/reference\_files/pubtator.py [Main]

Homepage: <https://www.ncbi.nlm.nih.gov/CBBresearch/Lu/Demo/PubTator/>

Identifiers:

Mappings: PMID 🡪 ChEBI ID[[2]](#footnote-2)

PMID 🡪 MeSH UID[[3]](#footnote-3)

PMID 🡪 NCBI Gene ID

PMID 🡪 NCBI Taxonomy ID

PMID 🡪 RS Number

Packages:

Requirements:

## RefSeq

Files: /objects/protein\_files/refseq.py [Main]

Homepage: <https://www.ncbi.nlm.nih.gov/refseq/>

Identifiers: RefSeq Nucleotide ID

RefSeq Protein Accession

Mappings:

Packages: N/A

Requirements:

## RxNorm

Files: /objects/drug\_files/rxcui.py [Main]

Homepage:

Identifiers: RxCUI

Mappings: AMPID 🡪 RxCUI

ANDA 🡪 RxCUI

ATC Code 🡪 RxCUI

CVX 🡪 RxCUI

DrugBank ID 🡪 RxCUI

GCN 🡪 RxCUI

GFC 🡪 RxCUI

GPI 🡪 RxCUI

GPPC 🡪 RxCUI

HIC Sequence Number 🡪 RxCUI

MMSL Code 🡪 RxCUI

NDA 🡪 RxCUI

NDC 🡪 RxCUI

NUI 🡪 RxCUI

SNOMED-CT ID 🡪 RxCUI

SPL Set ID 🡪 RxCUI

UMLS CUI 🡪 RxCUI

UNII 🡪 RxCUI

VUID 🡪 RxCUI

Packages: N/A

Requirements:

## SNOMED

Files: /objects/disease\_files/snomed.py [Main]

Homepage: <http://www.snomed.org/>

Identifiers: SNOMED-CT ID

Mappings:

Packages: N/A

Requirements:

## UniProt

Files: /objects/protein\_files/uniprot.py [Main]

Homepage: <http://www.uniprot.org/>

Identifiers: UniParc

UniProtKB AC/ID

UniProtKB Accession

UniProtKB ID

UniRef50

UniRef90

UniRef100

Mappings: UniProtKB Accession 🡪 DisProt ID

UniProtKB Accession 🡪 MINT ID

UniProtKB Accession 🡪 PDB ID

UniProtKB Accession 🡪 PIR ID

UniProtKB Accession 🡪 RefSeq Protein Accession

UniProtKB Accession 🡪 STRING ID

UniProtKB ID 🡪 DisProt ID

UniProtKB ID 🡪 MINT ID

UniProtKB ID 🡪 PDB ID

UniProtKB ID 🡪 PIR ID

UniProtKB ID 🡪 RefSeq Protein Accession

UniProtKB ID 🡪 STRING ID

Packages: N/A

Requirements:

## UBERON

Files: /objects/anatomical\_structure\_files/uberon.py [Main]

Homepage:

Identifiers: UBERON ID

Mappings: N/A

Packages: N/A

Requirements: N/A

## Wikidata

Files: /objects/compound\_files/wiki.py [Main]

/objects/taxon\_files/wiki.py [Main]

Homepage: <https://www.wikidata.org/>

Identifiers: Wikidata Accession

Mappings: Wikidata Accession 🡪 AAT ID

Wikidata Accession 🡪 ATC Code

Wikidata Accession 🡪 Canonical SMILES

Wikidata Accession 🡪 CAS Registry Number

Wikidata Accession 🡪 ChEBI ID

Wikidata Accession 🡪 ChEMBL ID

Wikidata Accession 🡪 ChemSpider ID

Wikidata Accession 🡪 DrugBank ID

Wikidata Accession 🡪 EOL ID

Wikidata Accession 🡪 Fossilworks ID

Wikidata Accession 🡪 Freebase ID

Wikidata Accession 🡪 InChI

Wikidata Accession 🡪 InChI Key

Wikidata Accession 🡪 INN

Wikidata Accession 🡪 Isomeric SMILES

Wikidata Accession 🡪 ITIS TSN

Wikidata Accession 🡪 KEGG COMPOUND ID

Wikidata Accession 🡪 KEGG DRUG ID

Wikidata Accession 🡪 MeSH UID

Wikidata Accession 🡪 MSW ID

Wikidata Accession 🡪 NCBI Taxonomy ID

Wikidata Accession 🡪 PDB Ligand ID

Wikidata Accession 🡪 PubChem CID

Wikidata Accession 🡪 RxCUI

Wikidata Accession 🡪 UMLS CUI

Wikidata Accession 🡪 UNII

Packages: N/A

Requirements:

## Wikipedia

Files: /objects/compound\_files/wiki.py [Main]

Homepage: <https://wikipedia.org/>

Identifiers: Albanian Wikipedia Article

Arabic Wikipedia Article

Aramaic Wikipedia Article

Azerbaijani Wikipedia Article

Bangla Wikipedia Article

Bashkir Wikipedia Article

Basque Wikipedia Article

Bosnian Wikipedia Article

Breton Wikipedia Article

Bulgarian Wikipedia Article

Catalan Wikipedia Article

Central Kurdish Wikipedia Article

Chinese Wikipedia Article

Classical Chinese Wikipedia Article

Croatian Wikipedia Article

Czech Wikipedia Article

Danish Wikipedia Article

Divehi Wikipedia Article

Dutch Wikipedia Article

English Wikipedia Article

Esperanto Wikipedia Article

Estonian Wikipedia Article

Finnish Wikipedia Article

French Wikipedia Article

Galician Wikipedia Article

Georgian Wikipedia Article

German Wikipedia Article

Greek Wikipedia Article

Hebrew Wikipedia Article

Hungarian Wikipedia Article

Ido Wikipedia Article

Indonesian Wikipedia Article

Irish Wikipedia Article

Italian Wikipedia Article

Japanese Wikipedia Article

Kazakh Wikipedia Article

Korean Wikipedia Article

Latin Wikipedia Article

Latvian Wikipedia Article

Lithuanian Wikipedia Article

Macedonian Wikipedia Article

Newari Wikipedia Article

Norwegian Wikipedia Article

Persian Wikipedia Article

Polish Wikipedia Article

Portuguese Wikipedia Article

Romanian Wikipedia Article

Russian Wikipedia Article

Scots Wikipedia Article

Serbo-Croatian Wikipedia Article

Simple English Wikipedia Article

Slovenian Wikipedia Article

Spanish Wikipedia Article

Swedish Wikipedia Article

Tamil Wikipedia Article

Telugu Wikipedia Article

Thai Wikipedia Article

Turkish Wikipedia Article

Ukrainian Wikipedia Article

Urdu Wikipedia Article

Walloon Wikipedia Article

Western Mari Wikipedia Article

Xhosa Wikipedia Article

Mappings: English Wikipedia Article 🡪 Wikidata Accession

Packages: N/A

Requirements:

# Alphabetical List of Identifiers

*This section is incomplete*.

What follows is an alphabetical list of identifiers recognized and parsed within the *Gnomics* system (this, however, does not mean that every function will work with every identifier).

## 0-9

## Aa

**AAT ID**, *Art and Architecture Thesaurus IDentifier*.

**ADW Taxon ID**, *Animal Diversity Web Taxon IDentifier*.

**AEO ID**, *Anatomical Entity Ontology IDentifier*.

**AOD ID**, *Alcohol and Other Drug IDentifier*.

**ATC Code**, *Anatomical Therapeutic Chemical Code*.

## Bb

**BAN**, *British Accepted Name*.

**BAO ID**, *BioAssay Ontology IDentifier*.

**Beilstein Registry Number**.

**BNCF Thesaurus ID**, *Biblioteca Nazionale Centrale di Firenze (National Central Library of Florence) Thesaurus IDentifier*.

**BnF ID**, *Bibliothèque nationale de France (National Library of France) IDentifier*.

## Cc

**CARO ID**, *Common Anatomy Reference Ontology IDentifier*.

**CAS RN**, *Chemical Abstracts Service Registry Number*.

**CEPH ID**, *CEPHalopod ontology IDentifier*.

**CHEBI ID**, *CHemical Entities of Biological Interest IDentifier*.

**ChEMBL ID**, *Chemical European Molecular Laboratory IDentifier*.

**CMPO ID**, *Cellular Microscopy Phenotype Ontology IDentifier*.

**COL ID**, *Catalogue Of Life IDentifier*.

**CSID**, *ChemSpider IDentifier*.

**CPT Code**, *Current Procedural Terminology Code*.

## Dd

**DiseasesDB ID**, *Diseases DataBase IDentifier*.

**DOI**, *Digital Object Identifier*.

**DOID**, *Disease Ontology IDentifier*.

**DRON ID**, *DRug Ontology IDentifier*.

**DrugBank ID**, *DrugBank IDentifier*.

**DrugCentral ID**, *DrugCentral IDentifier*.

**DSSTox ID**, *Distributed Structure-Searchable Toxicity IDentifier*.

## Ee

**ECHA InfoCard ID**, *European CHemicals Agency InfoCard IDentifier*.

**EMAP ID**, *Edinburgh Mouse Atlas Project IDentifier*.

**EMAPA ID**, *Edinburgh Mouse Atlas Project Abstract IDentifier*.

**Ensembl Exon ID**, *Ensembl Exon IDentifier*.

**Ensembl Gene ID**, *Ensembl Gene IDentifier*.

**Ensembl Protein ID**, *Ensembl Protein IDentifier*.

**Ensembl Transcript ID**, *Ensembl Transcript IDentifier*.

**EOL ID**, *Encyclopedia of Life IDentifier*.

**EPPO ID**, *European and mediterranean Plant Protection Organization IDentifier*.

## Ff

**FAO ID***, Fungal Anatomy Ontology IDentifier*.

**FLOPO ID**, *FLOra Phenotype Ontology IDentifier*.

**FMA ID**, *Foundational Model of Anatomy IDentifier*.

**Freebase ID**, *Freebase IDentifier*.

**FYPO ID**, *Fission Yeast Phenotype Ontology IDentifier*.

## Gg

**GeneReviews ID**, *GeneReviews IDentifier*.

**GENO ID**, *GENotype Ontology IDentifier*.

**GI Number**, *GenInfo Number*.

**GND ID**, *Gemeinsame NormDatei (Integrated Authority File) IDentifier*.

**GO Accession**, *Gene Ontology Accession*.

**GO Term**, *Gene Ontology Term*.

## Hh

**HAO ID**, *Hymenoptera Anatomy Ontology IDentifier*.

**HMDB ID**, *Human Metabolome DataBase IDentifier*.

**HPO ID**, *Human Phenotype Ontology IDentifier*.

## Ii

**ICD-10-CM Code**, *International Classification of Diseases, Tenth Revision, Clinical Modification Code*.

**ICD-9-CM Code**, *International Classification of Diseases, Ninth Revision, Clinical Modification Code*.

**IDO ID**, *Infectious Disease Ontology IDentifier*.

**IEDB Epitope ID**, *Immune Epitope DataBase Epitope IDentifier*.

**InChI**, *International Chemical Identifier*.

**INN**, *International Nonproprietary Name*.

**ITIS TSN**, *Integrated Taxonomic Information System Taxonomic Serial Number*.

**IUPAC Name**, *International Union of Pure and Applied Chemistry Name*.

## Jj

**JAN**, *Japanese Accepted Name*.

**JSTOR Topic ID**, *Journal STORage Topic IDentifier*.

## Kk

## Ll

## Mm

**MA ID**, *Mouse Anatomy IDentifier*.

**MedDRA ID**, *Medical Dictionary for Regulatory Activities IDentifier*.

**MedDRA Term**, *Medical Dictionary for Regulatory Activities Term*.

**MedlinePlus ID**, *MedlinePlus IDentifier*.

**MeSH Registry Number**, *Medical Subject Headings Registry Number*.

**MeSH Term**, *Medical Subject Headings Term*.

**MeSH Tree Number**, *Medical Subject Headings Tree Number*.

**MeSH UID**, *Medical Subject Headings Unique IDentifier*.

**MF ID**, *Mental Functioning ontology IDentifier*.

**MFMO ID**, *Mammalian Feeding Muscle Ontology IDentifier*.

**MFOMD ID**, *Mental Functioning Ontology, Mental Disease IDentifier*.

**MGI ID**, *Mouse Genome Informatics IDentifier*.

**MIRNAO ID**, *MIcroRNA Ontology IDentifier*.

**MonDO ID**, *Monarch Disease Ontology IDentifier*.

**MP ID**, *Mammalian Phenotype ontology IDentifier*.

**MSW ID**, *Mammal Species of the World IDentifier*.

## Nn

**NBN System Key**, *National Biodiversity Network System Key*.

**NCBI GeneID**, *NCBI Gene IDentifier*.

**NCBI TaxID**, *NCBI Taxonomy IDentifier*.

**NDC**, *National Drug Code*.

**NDF-RT ID**, *National Drug File – Reference Terminology IDentifier*.

**NDL Auth ID**, *National Diet Library of japan Authority IDentifier*.

**NKCR AUT ID**, *Národní Knihovna České Republiky (National Library of the Czech Republic) AUThority database IDentifier*.

## Oo

**OAE ID**, *Ontology of Adverse Events IDentifier*.

**OGG ID**, *Ontology of Genes and Genomes IDentifier*.

**OMIM Number***, Online Mendelian Inheritance in Man Number*.

**OMP ID**, *Ontology of Microbial Pheotypes IDentifier*.

**ORDO ID**, *Orphanet Rare Disease Ontology IDentifier*.

**OVAE ID**, *Ontology of Vaccine Adverse Events IDentifier*.

## Pp

**PDB ID**, *Protein Data Bank IDentifier*.

**PLANA ID**, *PLANAria-ontology IDentifier*.

**PMCID**, *PubMed Central reference IDentifier*.

**PMID**, *PubMed IDentifier*.

**PO ID**, *Plant Ontology IDentifier*.

**PR ID**, *PRotein ontology IDentifier*.

**PSH**, *Polytemathematic structured Subject Heading*.

**PubChem AID**, *PubChem Assay IDentifier*.

**PubChem CID**, *PubChem Compound IDentifier*.

**PubChem SID**, *PubChem Substance IDentifier*.

## Qq

**Quora Topic ID**, *Quora Topic IDentifier*.

## Rr

**RSID**, *Reference SNP IDentifier*.

**RTECS Number**, *Registry of Toxic Effects of Chemical Substances Number*.

**RXCUI**, *RxNorm Concept Unique Identifier*.

## Ss

**SMILES**, *Simplified Molecular-Input Line-Entry System*.

**SNOMED CT Concept ID**, *Systematized Nomenclature of Medicine – Clinical Terms Concept IDentifier*.

**SYMP ID**, *SYMPtom ontology IDentifer*.

## Tt

## Uu

**UBERON ID**, *UBER anatomy ONtology IDentifier*.

**UMLS CUI**, *Unified Medical Language System Concept Unique Identifier*.

**UNII**, *UNique Ingredient Identifier*.

**UniProtKB AC**

**UniProtKB AC/ID**

**UniProtKB ID**

**USAN**, *United States Adopted Name*.

**USP**, *United States Pharmacopeia*.

## Vv

**VOID**, *Vaccine Ontology IDentifier*.

## Ww

**Wikidata Accession**

**Wikipedia Accession**

## Xx

**XAO ID**, *Xenopus Anatomy Ontology IDentifier*.

## Yy

## Zz

**ZFA ID**, *ZebraFish Anatomy ontology IDentifier*.

**ZVG ID**.

# List of Identifiers by Object

*The section is incomplete*.

## Adverse Event Identifiers

**MedDRA ID**, *Medical Dictionary for Regulatory Activities IDentifier*.

**MedDRA Term**, *Medical Dictionary for Regulatory Activities Term*.

## Anatomical Structure Identifiers

**AEO ID**, *Anatomical Entity Ontology IDentifier*.

**AOD ID**, *Alcohol and Other Drug thesaurus IDentifier*.

**BNCF Thesaurus ID**, *Biblioteca Nazionale Centrale di Firenze (National Central Library of Florence) Thesaurus IDentifier*.

**CARO ID**, *Common Anatomy Reference Ontology IDentifier*.

**CCPSS ID**, *Canonical Clinical Problem Statement System IDentifier*.

**CEPH ID**, *CEPHalopod ontology IDentifier*.

**EHDAA2 ID**, *Human Developmental Anatomy Abstract IDentifier*.

**EMAP ID**, *Edinburgh Mouse Atlas Project IDentifier*.

**EMAPA ID**, *Edinburgh Mouse Atlas Project Abstract IDentifier*.

**Encyclopædia Britannica Online ID**.

**FBbt ID**, *FlyBase anatomy ontology (drosophila gross anatomy ontology) IDentifier*.

**FMA ID**, *Foundational Model of Anatomy IDentifier*.

**Freebase ID**, *Freebase IDentifier*.

**HAO ID**, *Hymenoptera Anatomy Ontology IDentifier*.

**JSTOR Topic ID**, *Journal STORage Topic IDentifier*.

**LCSH**, *Library of Congress Subject Heading*.

**MA ID**, *Mouse Adult gross anatomy IDentifier*.

**MeSH Term, Croatian**, *Croatian Medical Subject Headings Term*.

**MeSH Term, Czech**, *Czech Medical Subject Headings Term*.

**MeSH Term, Dutch**, *Dutch Medical Subject Headings Term*.

**MeSH Term, English**, *English Medical Subject Headings Term*.

**MeSH Term, Finnish**, *Finnish Medical Subject Headings Term*.

**MeSH Term, French**, *French Medical Subjects Headings Term*.

**MeSH Term, German**, *German Medical Subject Headings Term*.

**MeSH Term, Italian**, *Italian Medical Subject Headings Term*.

**MeSH Term, Japanese**, *Japanese Medical Subject Headings Term*.

**MeSH Term, Latvian**, *Latvian Medical Subject Headings Term*.

**MeSH Term, Norwegian**, *Norwegian Medical Subject Headings Term*.

**MeSH Term, Polish**, *Polish Medical Subject Headings Term*.

**MeSH Term, Portuguese**, *Portuguese Medical Subject Headings Term*.

**MeSH Term, Russian**, *Russian Medical Subject Headings Term*.

**MeSH Term, Spanish**, *Spanish Medical Subject Headings Term*.

**MeSH Term, Swedish**, *Swedish Medical Subject Headings Term*.

**MeSH Tree Number**, *Medical Subject Headings Tree Number*.

**MeSH UID**, *Medical Subject Headings Unique IDentifier*.

**MFMO ID**, *Mammalian Feeding Muscle Ontology IDentifier*.

**NCI Thesaurus ID**, *National Cancer Institute Thesaurus IDentifier*.

**NEU ID**, *NEUronames Brain Hierarchy IDentifier*.

**PLANA ID**, *PLANAria ontology IDentifier*.

**Read Code, Clinical Terms Version 3**.

**SNOMED International Version 3.5**, *Systematized Nomenclature Of MEDicine International Version 3.5 (1998) (SNMI)*.

**SNOMED-II, 1982 Update**, *Systematized Nomenclature Of MEDicine II, 1982 Update (SNM)*.

**TA98 ID**, *Terminologia Anatomica 1998 IDentifier*.

**TA98 Latin Term**, *Terminologia Anatomica 1998 IDentifier*.

**TADS ID**, *Tick gross Anatomy IDentifier*.

**TGMA ID**, *The Gross Mosquito Anatomy IDentifier*.

**Thesaurus of Psychological Index Terms ID**, *Thesaurus of Psychological Index Terms IDentifier*.

**UBERON ID**, *UBER anatomy ONtology IDentifier*.

**UMLS CUI**, *Unified Medical Language System Concept Unique Identifier*.

**UWDA ID**, *University of Washington Digital Anatomist IDentifier*.

**WBbt ID**, *WormBase anatomy ontology (c. elegans gross anatomy) IDentifier*.

**Wikipedia Accession, Arabic**.

**Wikipedia Accession, Azerbaijani**.

**Wikipedia Accession, Basque**.

**Wikipedia Accession, Breton**.

**Wikipedia Accession, Bosnian**.

**Wikipedia Accession, Catalan**.

**Wikipedia Accession, Chinese**.

**Wikipedia Accession, Chinese (Min Nan)**.

**Wikipedia Accession, Croatian**.

**Wikipedia Accession, Czech**.

**Wikipedia Accession, Danish**.

**Wikipedia Accession, Divehi**.

**Wikipedia Accession, Dutch**.

**Wikipedia Accession, English**.

**Wikipedia Accession, English (Simple)**.

**Wikipedia Accession, Esperanto**.

**Wikipedia Accession, Finnish**.

**Wikipedia Accession, French**.

**Wikipedia Accession, Galician**.

**Wikipedia Accession, German**.

**Wikipedia Accession, Greek**.

**Wikipedia Accession, Hebrew**.

**Wikipedia Accession, Hungarian**.

**Wikipedia Accession, Indonesian**.

**Wikipedia Accession, Italian**.

**Wikipedia Accession, Japanese**.

**Wikipedia Accession, Korean**.

**Wikipedia Accession, Latin**.

**Wikipedia Accession, Latvian**.

**Wikipedia Accession, Lithuanian**.

**Wikipedia Accession, Macedonian**.

**Wikipedia Accession, Newari**.

**Wikipedia Accession, Norwegian**.

**Wikipedia Accession, Persian**.

**Wikipedia Accession, Polish**.

**Wikipedia Accession, Portuguese**.

**Wikipedia Accession, Romanian**.

**Wikipedia Accession, Russian**.

**Wikipedia Accession, Scots**.

**Wikipedia Accession, Serbo-Croatian**.

**Wikipedia Accession, Spanish**.

**Wikipedia Accession, Slovak**.

**Wikipedia Accession, Slovenian**.

**Wikipedia Accession, Swedish**.

**Wikipedia Accession, Telugu**.

**Wikipedia Accession, Thai**.

**Wikipedia Accession, Turkish**.

**Wikipedia Accession, Ukrainian**.

**Wikipedia Accession, Vietnamese**.

**Wikidata Accession**.

**WikiSkripta ID**, *WikiSkripta IDentifier*.

**XAO ID**, *Xenopus Anatomy Ontology IDentifier*.

**ZFA ID**, *ZebraFish Anatomy IDentifier*.

## Assay Identifiers

**BAO ID**, *BioAssay Ontology IDentifier*.

**ChEMBL ID**, *Chemical European Molecular Laboratory IDentifier*.

**PubChem AID**, *PubChem Assay IDentifier*.

## Clinical Trial Identifiers

**NCT ID**, *National Clinical Trial IDentifier*.

## Compound Identifiers

**Beilstein Registry Number**.

**CAS RN**, *Chemical Abstracts Service Registry Number*.

**ChEBI ID**, *Chemical Entities of Biological Interest IDentifier*.

**ChEMBL ID**, *Chemical European Molecular Laboratory IDentifier*.

**CSID**, *ChemSpider IDentifier*.

**InChI**, *IUPAC International Chemical Identifier*.

**InChI, Standard**, *Standard IUPAC International Chemical Identifier*.

**InChI Key**, *IUPAC International Chemical Identifier Key*.

**InChI Key, Standard**, *Standard IUPAC International Chemical Identifier Key*.

**IUPAC Name**, *International Union of Pure and Applied Chemistry Name*.

**KEGG COMPOUND ID**, *Kyoto Encyclopedia of Genes and Genomes Compound IDentifier*.

**LINCS ID**, *Library of Integrated Network-based Cellular Signatures IDentifier*.

**MeSH Term, English**, *English Medical Subject Headings Term*.

**MeSH UID**, *Medical Subject Headings Unique IDentifier*.

**MMDB ID**, *Molecular Modeling DataBase IDentifier*.

**Molecular Formula**.

**PDB Ligand ID**, *Protein Data Bank Ligand IDentifier*.

**PDBeChem ID**, *Protein Data Bank in Europe Chemical component IDentifier*.

**PubChem CID**, *PubChem Compound IDentifier*.

**PubChem SID**, *PubChem Substance IDentifier*.

**SMILES**, *Simplified Molecular-Input Line-Entry System*.

**SMILES, Canonical**, *Canonical Simplified Molecular-Input Line-Entry System*.

**SMILES, Isomeric**, *Isomeric Simplified Molecular-Input Line-Entry System*.

**UNII**, *UNique Ingredient Identifier*.

**Wikidata Accession**.

**Wikipedia Accession, English**, *English Wikipedia Accession*.

## Disease Identifiers

**DiseasesDB ID**, *Diseases DataBase IDentifier*.

**DO Term**, *Disease Ontology Term*.

**DOID**, *Disease Ontology IDentifier*.

**eMedicine ID**, *eMedicine IDentifier*.

**Freebase ID**, *Freebase IDentifier*.

**GND ID**, *Gemeinsame NormDatei (Integrated Authority File) IDentifier*.

**ICD-9-CM Code**, *International Classification of Diseases, Ninth Revision, Clinical Modification Code*.

**ICD-10-CM Code**, *International Classification of Diseases, Tenth Revision, Clinical Modification Code*.

**IDO ID**, *Infectious Disease Ontology IDentifier*.

**internetmedicin.se ID**, *internetmedicin.se IDentifier*.

**JSTOR Topic ID**, *Journal STORage Topic IDentifier*.

**KEGG DISEASE ID**, *Kyoto Encyclopedia of Genes and Genomes Disease IDentifier*.

**MedlinePlus ID**, *MedlinePlus IDentifier*.

**MeSH UID**, *Medical Subject Headings Unique IDentifier*.

**MFOMD ID**, *Mental Functioning Ontology, Mental Disease IDentifier*.

**MonDO ID**, *Monarch Disease Ontology IDentifier*.

**NCI Thesaurus ID**, *National Cancer Institute Thesaurus IDentifier*.

**NDL Auth ID**, *National Diet Library of japan Authority IDentifier*.

**OMIM Number**, *Online Mendelian Inheritance in Man Number*.

**ORDO ID**, *Orphanet Rare Disease Ontology IDentifier*.

**PatientPlus ID**, *PatientPlus IDentifier*.

**Quora Topic ID**, *Quora Topic IDentifier*.

**SNOMED-CT ID**, *Systematized Nomenclature of MEDicine Clinical Terms IDentifier*.

**UMLS CUI**, *Unified Medical Language System Concept Unique Identifier*.

## Drug Identifiers

**AMPID**, *Alchemy Marked Product IDentifier*.

**ANDA ID**, *FDA Abbreviated New Drug Application IDentifier*.

**ATC Code**, *Anatomical Therapeutic Chemical Code*.

**BAN**, *British Accepted Name*.

**CVX**, *Vaccine administered Code*.

**DrugBank ID**, *DrugBank IDentifier*.

**DrugCentral ID**, *DrugCentral IDentifier*.

**EMA Product Number**, *European Medicines Agency Product Number*.

**FDA Approved Name**.

**GCN**, *Generic Code Number*.

**GCN\_SEQNO**, *Generic Code SEQuence Number*.

**GFC**, *Generic Formula Code*.

**GPPC**, *Generic Product Packing Code*.

**HIC\_SEQN**, *Hierarchical Ingredient Code SEQuence Number*.

**INN**, *International Nonproprietary Name*.

**JAN**, *Japanese Accepted Name*.

**KEGG DRUG ID**, *Kyoto Encyclopedia of Genes and Genomes Drug IDentifier*.

**MeSH Term, English**, *English Medical Subject Headings Term*.

**MeSH UID**, *Medical Subject Headings Unique IDentifier*.

**MMSL Code**, *Multum MediaSource Lexicon Code*.

* **BD**, *fully-specified drug BranD name that can be prescribed*.
* **BN**, *fully-specified drug Brand Name that cannot be prescribed*.
* **CD**, *Clinical Drug*.
* **GN**, *Generic drug Name*.
* **IN**, *name for an INgredient*.

**NDC**, *National Drug Code*.

**NUI**, *National Drug File Reference Terminology Unique Identifier[[4]](#footnote-4)*.

**RxCUI**, *RxNorm Concept Unique Identifier*.

* **BN**, *Brand Name*.
* **BPCK**, *Brand name PaCK*.
* **DF**, *Dose Form*.
* **DFG**, *Dose Form Group*.
* **ET**, *dose form Entry Term*.
* **GPCK**, *Generic PaCK*.
* **IN**, *INgredient*.
* **MIN**, *Multiple INgredient*.
* **PIN**, *Precise INgredient*.
* **PSN**, *PreScribable Name*.
* **SBD**, *Semantic Branded Drug*.
* **SBDC**, *Semantic Branded Drug Component*.
* **SBDF**, *Semantic Branded Drug Form*.
* **SBDG**, *Semantic Branded Dose form Group*.
* **SCD**, *Semantic Clinical Drug*.
* **SCDC**, *Semantic Clinical Drug Component*.
* **SCDF**, *Semantic Clinical Drug Form*.
* **SCDG**, *Semantic Clinical Dose form Group*.
* **SY**, *Synonym*.
* **TMSY**, *Tall Man lettering SYnonym*

**SNOMED-CT ID**, *Systematized Nomenclature of MEDicine Clinical Terms IDentifier*.

**SPL Set ID**, *Standard Product Label Set IDentifier*.

**UMLS CUI**, *Unified Medical Language System Concept Unique Identifier*.

**USAN**, *United States Accepted Name*.

**USP**, *United States Pharmacopoeia*.

**VUID**, *VHA Unique IDentifier*.

**Wikidata Accession**.

## Gene Identifiers

**Ensembl Gene ID**, *Ensembl Gene IDentifier*.

**FlyMine Primary Gene ID**, *FlyMine Primary Gene IDentifier*.

**FlyMine Secondary Gene ID**, *FlyMine Secondary Gene IDentifier*.

**HGNC Gene ID**, *HUGO Gene Nomenclature Committee Gene IDentifier*.

**HGNC Gene Symbol**, *HUGO Gene Nomenclature Committee Gene Symbol*.

**KEGG GENE ID**, *Kyoto Encyclopedia of Genes and Genomes Gene IDentifier*.

**MouseMine Primary Gene ID**, *MouseMine Primary Gene IDentifier*.

**MouseMine Secondary Gene ID**, *MouseMine Secondary Gene IDentifier*.

**NCBI Entrez Gene ID**, *National Center for Biotechnology Information Entrez Gene IDentifier*.

**OMIM Gene ID**, *Online Mendelian Inheritance in Man Gene IDentifier*.

**Pharos Gene ID**, *Pharos Gene IDentifier*.

**Vega Gene ID**, *Vega Gene IDentifier*.

**Wikidata Accession**.

**WikiGene ID**, *WikiGene IDentifier*.

## Genotype Identifiers

## Mutation Identifiers

## Patent Identifiers

## Pathway Identifiers

**KEGG EC PATHWAY ID**, *Kyoto Encyclopedia of Genes and Genomes reference metabolic pathway highlighting EC numbers Pathway IDentifier*.

**KEGG KO PATHWAY ID**, *Kyoto Encyclopedia of Genes and Genomes reference pathway highlighting KOs Pathway IDentifier*.

**KEGG MAP PATHWAY ID**, *Kyoto Encyclopedia of Genes and Genomes MAnually Drawn reference Pathway Pathway IDentifier*.

**KEGG RN PATHWAY ID**, *Kyoto Encyclopedia of Genes and Genomes reference metabolic pathway highlighting ReactioNs Pathway IDentifier*.

**WikiPathways ID**, *WikiPathways IDentifier*.

## Phenotype Identifiers

**HPO ID**, *Human Phenotype Ontology IDentifier*.

**MedDRA ID**, *Medical Dictionary for Regulatory Activities IDentifier*.

**MedDRA Term**, *Medical Dictionary for Regulatory Activities Term*.

**MeSH UID**, *Medical Subject Headings Unique IDentifier*.

**SNOMED-CT US ID**, *Systematized Nomenclature of MEDicine Clinical Terms, United States Edition, IDentifier*.

## Procedure Identifiers

**CPT ID**, *Current Procedural Terminology IDentifier*.

## Protein Identifiers

**DIP ID**, *Database of Interacting Proteins IDentifier*.

**DisProt ID**, *database of Protein Disorder IDentifier*.

**MINT ID**, *Molecular INTeration database IDentifier*.

**PDB ID**, *Protein Data Bank IDentifier*.

**PIR ID**, *Protein Information Resource IDentifier*.

**RefSeq Protein Accession**.

**STRING ID**, *Search Tool for the Retrieval of Interaction Genes/proteins IDentifier*.

**UniProtKB AC**, *UniProt KnowledgeBase ACcession*.

**UniProtKB ID**, *UniProt KnowledgeBase IDentifier*.

## Reference Identifiers

**DOI**, *Digital Object Identifier*.

**PII**, *Publisher Item Identifier*.

**PMCID**, *PubMed Central IDentifier*.

**PMID**, *PubMed IDentifier*.

**Wikidata Accession**.

## Symptom Identifiers

**SYMP ID**, *SYMPtom ontology IDentifier*.

**Wikidata Accession**.

## Taxon Identifiers

**COL ID**, *Catalogue Of Life IDentifier*.

**EOL ID**, *Encyclopedia Of Life IDentifier*.

**Index Fungorum ID**, *Index Fungorum IDentifier*.

**ITIS TSN**, *Integrated Taxonomic Information System Taxonomic Serial Number*.

**NCBI Taxonomy ID**, *National Center for Biotechnology Information Taxonomy IDentifier*.

**Paleobiology Database ID**, *Paleobiology Database IDentifier*.

**Scientific Name**.

**Vernacular Name**.

**Wikidata Accession**.

# Functions

*This section is incomplete*.

In addition to mapping of various identifiers, *Gnomics* also employs a series of attributes and properties in relation to the data the identifiers represent.

## Adverse Event Functions

TBA.

## Anatomical Structure Functions

This is a list of functions, attributes, and properties associated with the anatomical structure object.

### Anatomical Connections

TBA.

### Anatomical Location

TBA.

### Arterial Supply

TBA.

### Classes

TBA.

### Hypernym

TBA.

### Venous Drainage

TBA.

## Assay Functions

This is a list of functions, attributes, and properties associated with the assay object.

### Assay Type Description

TBA.

### Comment

TBA.

### Confidence Description

TBA.

### Confidence Score

TBA.

### Description

TBA.

### Protocol

TBA.

### Result

TBA.

## Clinical Trial Functions

This is a list of functions, attributes, and properties associated with the clinical trial object.

### Brief Summary

TBA.

### Brief Title

TBA.

### Completion Date

TBA.

### Country

TBA.

### Date First Received

TBA.

### Detailed Description

TBA.

### Official Title

TBA.

### Overall Status

TBA.

### Phase

TBA.

### Primary Completion Date

TBA.

### Start Date

TBA.

### Status

TBA.

### Study Type

TBA.

## Compound Functions

This is a list of functions, attributes, and properties associated with the compound object.

### AlogP

The calculated value for the lipophilicity of a molecule expressed as log (octanol/water partition coefficient). The method used here is that defined by Ghose and Crippen.

### Heavy atom count

TBA.

### Hydrogen bond acceptor (HBA) count

TBA.

### Hydrogen bond donor (HBD) count

TBA.

### Isotope atom count

TBA.

### Molecular weight (MW)

TBA.

### Monoisotopic mass

TBA.

### Nominal mass

TBA.

### Rotatable bond (RTB) count

The number of rotatable bonds in the molecule. Rotatable bonds, in this sense, are single bonds between heavy atoms. Ring bonds are not counted in this scenario.

### tPSA

TBA.

### XlogP

TBA.

## Disease Functions

This is a list of functions, attributes, and properties associated with the disease object.

### Category

TBA.

### Classes

TBA.

### Description

TBA.

### Medical Specialty

TBA.

### Named After

TBA.

## Drug Functions

This is a list of functions, attributes, and properties associated with the drug object.

### Ask Doctor

TBA.

### Ask Doctor or Pharmacist

TBA.

### Available Strength

TBA.

### Do Not Use

TBA.

### Dosage and Administration Table

TBA.

### Effective Time

TBA.

### Indications and Usage

TBA.

### Is Original Packager?

TBA.

### Keep out of Reach of Children?

TBA.

### Package Label Principal Display Panel

TBA.

### Prescribable

TBA.

### Product Type

TBA.

### Purpose

TBA.

### Questions

TBA.

### Stop Use

TBA.

### Version

TBA.

### Warnings

TBA.

### When Using

TBA.

## Gene Functions

This is a list of functions, attributes, and properties associated with the gene object.

### Chromosomal Position

TBA.

### Definition

TBA.

### Description

TBA.

### Gene Type

TBA.

### Map Location

TBA.

## Pathway Functions

This is a list of functions, attributes, and properties associated with the pathway object.

### Description

TBA.

### Pathway Class

TBA.

## Phenotype Functions

*The section is incomplete*.

This is a list of functions, attributes, and properties associated with the phenotype object.

## Protein Functions

*This section is incomplete*.

This is a list of functions, attributes, and properties associated with the protein object.

## Reference Functions

This is a list of functions, attributes, and properties associated with the reference object.

### Abstract

TBA.

### Journal

TBA.

### Title

TBA.

## Symptom Functions

*This section is incomplete*.

This is a list of functions, attributes, and properties associated with the symptom object.

## Taxon Functions

This is a list of functions, attributes, and properties associated with the taxon object.

### Actual evapotranspiration rate in geographic range

TBA.

### Onset of fertility

TBA.

### Parental care

TBA.

### Phylogenetics

TBA.

### Physiology

TBA.

### Population biology

TBA.

### Population trend

TBA.

### Potential evapotranspiration rate in geographic range

TBA.

### Precipitation in geographic range

TBA.

### Prenatal development duration

TBA.

### Procedures

TBA.

### Reproduction

TBA.

### Risk statement

TBA.

### Social group size

TBA.

### Social system

TBA.

### Systematics

TBA.

### Taxon biology

TBA.

### Taxonomic classification

TBA.

### Taxonomy

TBA.

### Teat number

TBA.

### Temperature in geographic range

TBA.

### Terrestriality

TBA.

### Threats

TBA.

### Total life span

TBA.

### Trends

TBA.

### Trophic level

TBA.

### Trophic strategy

TBA.

### Type information

TBA.

### Uses

TBA.

### Weaning age

TBA.

### Weight

TBA.

## Tissue Functions

*This section is incomplete*.

This is a list of functions, attributes, and properties associated with the tissue object.

# Interaction Objects

*This section is incomplete*.

## Adverse Event 🡪 Phenotype

TBA.

## Phenotype 🡪 Taxon

TBA.

## Protein 🡪 Compound

TBA.

## Protein 🡪 Drug

TBA.

## Protein 🡪 Gene

TBA.

## Protein 🡪 Pathway

TBA.

## Protein 🡪 Tissue

TBA.

## Reference 🡪 Mutation

TBA.

## Reference 🡪 Patent

TBA.

## Reference 🡪 Pathway

TBA.

## Taxon 🡪 Phenotype

TBA.

## Taxon 🡪 Reference

TBA.

## Taxon 🡪 Tissue

TBA.

## Tissue 🡪 Anatomical Structure

TBA.

## Tissue 🡪 Protein

TBA.

## Transcript 🡪 Tissue

TBA.

# Search

The centerfold of *GNOMICS* focuses on its extensive search capabilities, itself focused on each given object’s specific properties.

## Adverse Events

*This section is incomplete*.

PARAMETERS:

* **Query**

## Anatomical Structure

*This section is incomplete*.

PARAMETERS:

* **Query**

## Assay

*This section is incomplete*.

PARAMETERS*:*

* **Query**
* Assay category
* Assay cell type
* Assay ChEMBL identifier
* Assay organism
* Assay strain
* Assay subcellular function
* Assay taxon identifier
* Assay test type
* Assay tissue
* Assay type
* Assay type description
* BAO format
* Cell ChEMBL identifier
* Confidence description
* Confidence score
* Description
* Document ChEMBL ID
* Target ChEMBL identifier
* Tissue ChEMBL identifier
* Relationship description
* Relationship type
* Score
* Source assay identifier
* Source identifier

## Cell Line

TBA.

## Clinical Trial

*This section is incomplete*.

PARAMETERS

* **Query**
* Accepts healthy volunteers indicator
* Acronym
* Amendment date
* Anatomic sites
* Arm description
* Arm name
* Arm type
* Brief title
* Brief summary
* CCR identifier
* CTEP identifier
* DCP identifier
* Condition
* Contact email
* Contact name
* Contract phone
* Count
* Country
* Current trial status
* Current trial status date (greater than or equal to)
* Current trial status date (less than or equal to)
* Download
* Exclude
* Full text
* From result
* Gender
* Generic contact
* Include
* Intervention
* Intervention code
* Intervention description
* Intervention synonyms
* Intervention type
* Maximum age in years (greater than or equal to)
* Maximum age in years (less than or equal to)
* Maximum age number (greater than or equal to)
* Maximum age number (less than or equal to)
* Maximum age unit
* Minimum age in years (greater than or equal to)
* Minimum age in years (less than or equal to)
* Minimum age number (greater than or equal to)
* Minimum age number (less than or equal to)
* Minimum age unit
* NCI identifier
* NCT identifier
* Official title
* Organization address line 1
* Organization address line 2
* Organization city
* Organization coordinates latitude
* Organization coordinates longitude
* Organization country
* Organization email
* Organization family
* Organization fax
* Organization name
* Organization name full text
* Organization phone
* Organization postal code
* Organization state or province
* Organization status
* Organization status date
* Organization-to-family relationship
* Organization TTY
* Output format
* Phase
* Primary purpose code
* Protocol identifier
* Record verification date (greater than or equal to)
* Record verification date (less than or equal to)
* Recruiting
* Recruitment status
* Recruitment status date
* Size
* Sponsor
* State
* Study identifier
* Study identifier type
* Study protocol type
* Trial identifier

## Compound

*This section is incomplete*.

PARAMETERS:

* **Query**

## Disease

*This section is incomplete*.

PARAMETERS:

* **Query**
* Filter type
* Fields type
* Sort type
* Operator type
* Start
* Limit
* Retrieve
* Format

## Drug

*This section is incomplete*.

PARAMETERS:

* **Query**

## Enzyme

TBA.

## Gene

*This section is incomplete*.

PARAMETERS:

* **Query**

## Genotype

TBA.

## Mutation

TBA.

## Patent

TBA.

## Pathway

*This section is incomplete*.

PARAMETERS:

* **Query**

## Phenotype

*This section is incomplete*.

PARAMETERS:

* **Query**

## Procedure

*This section is incomplete*.

PARAMETERS:

* **Query**

## Protein

*This section is incomplete*.

PARAMETERS:

* **Query**
* Accession
* Active
* Annotation
* Author
* CD antigen
* Citation
* Cluster
* Count
* Created
* Database
* EC
* Evidence
* Existence
* Family
* Fragment
* Gene
* Gene (Exact)
* GOA
* Host
* Identifier
* INN
* Interactor
* Keyword
* Length
* Lineage
* Mass
* Method
* Mnemonic
* Modified
* Name
* Organelle
* Organism
* Plasmid
* Proteome
* Proteome component
* Replaces
* Reviewed
* Scope
* Sequence
* Sequence modified
* Source
* Taxonomy
* Tissue
* Web

## Reference

*This section is incomplete*.

PARAMETERS:

* **Query**
* Affiliation
* All fields
* Article identifier
* Author
* Author identifier
* Book
* Completion date
* Conflict of interest
* Corporate author
* Create date
* EC/RN number
* Editor
* Entrez date
* Filter
* First author name
* Full author name
* Full investigator name
* Grant number
* Investigator
* ISBN
* Issue
* Journal
* Language
* Last author
* Location identifier
* MeSH date
* MeSH major topic
* MeSH subheadings
* MeSH terms
* Modification date
* NLM unique identifier
* Other term
* Pagination
* Personal name as subject
* Pharmacological action
* Place of publication
* PMID
* Publisher
* Publication date
* Publication type
* Secondary source identifier
* Subset
* Supplementary concept
* Text words
* Title and abstract
* Transliterated title
* UID
  + Notes: This is the same as PMID.
* Volume

## Symptom

*This section is incomplete*.

PARAMETERS:

* **Query**

## Taxon

*This section is incomplete*.

PARAMETERS:

* **Query**
* Cache TTL
* Exact
* Filter by hierarchy entry identifier
* Filter by string
* Filter by taxon concept identifier
* Page

## Tissue

TBA.

# Tutorials

*This section is incomplete*.

The tutorials are arranged basically by question. If there is a biological question or a technical question, it will hopefully be answered here.

# List of Supported Languages

*This section is incomplete*.

What follows is a list of support languages (available via any of the various identifier conversions), with ISO 639-2 and ISO 639-1 codes.

|  |  |  |  |
| --- | --- | --- | --- |
| **Language** | **ISO 639-2 Code** | **ISO 639-1 Code** | **Wikipedia Code** |
| Albanian | sqi | sq | sq |
| Arabic | ara | ar | ar |
| Aramaic | arc | arc | arc |
| Aymara | aym | ay | ay |
| Azerbaijani | aze | az | az |
| Bangla / Bengali | ben | bn | bn |
| Bashkir | bak | ba | ba |
| Basque | baq | eu | eu |
| Breton | bre | br | br |
| Bosnian | bos | bs | bs |
| Bulgarian | bul | bg | bg |
| Cantonese | N/A | N/A | zh\_yue |
| Catalan | cat | ca | ca |
| Central Kurdish | N/A | N/A | ckb |
| Chinese | chi | zh | zh |
| Chinese, Classical | N/A | N/A | zh\_classical |
| Chinese, Min Nan | N/A | N/A |  |
| Croatian | hrv | hr | hr |
| Czech | cze | cs | cs |
| Danish | dan | da | da |
| Divehi | div | dv | dv |
| Dutch | dut | nl | nl |
| English | eng | en | en |
| English, Simple | N/A | N/A | simple |
| Esperanto | epo | eo | ep |
| Finnish | fin | fi | fi |
| French | fre | fr | fr |
| Galician | glg | gl | gl |
| Georgian | geo | ka | ka |
| German | ger | de | de |
| Greek | gre | el | el |
| Hebrew | heb | he | he |
| Hungarian | hun | hu | hu |
| Ido | ido | io | io |
| Indonesian | ind | id | id |
| Irish | gle | ga | ga |
| Italian | ita | it | it |
| Japanese | jpn | ja | ja |
| Kazakh | kaz | kk | kk |
| Korean | kor | ko | ko |
| Latin | lat | la | la |
| Latvian | lav | lv | lv |
| Lithuanian | lit | lt | lt |
| Macedonian | mac | mk | mk |
| Newari | new | N/A | new |
| Norwegian | nor | no | no |
| Persian | per | fa | fa |
| Polish | pol | pl | pl |
| Portuguese | por | pt | pt |
| Romanian | rum | ro | ro |
| Russian | rus | ru | ru |
| Scots | sco | N/A | sco |
| Serbo-Croatian | N/A | N/A | sh |
| Slovak | slo | sk |  |
| Slovenian | slv | sl | sl |
| Spanish | spa | es | es |
| Swedish | swe | sv | sv |
| Tamil | tam | ta | ta |
| Telugu | tel | te | te |
| Thai | tha | th | th |
| Turkish | tur | tr | tr |
| Ukrainian | ukr | uk | uk |
| Vietnamese | vie | vi |  |
| Walloon | wln | wa | wa |
| Western Mari |  |  | mrj |
| Xhosa | xho | xh | xh |

1. NIH refers to culture in which using or buying existing information is avoided, largely due to external origins (in another country or company, for example) or royalty-type associated costs. The opposite ideology would be “proudly found elsewhere” (PFE). [↑](#footnote-ref-1)
2. Only utilized when a MeSH UID is not available (to the best of this author’s knowledge). [↑](#footnote-ref-2)
3. For chemicals and diseases. [↑](#footnote-ref-3)
4. Also referred to as NDF-RT ID. [↑](#footnote-ref-4)