

eHealth

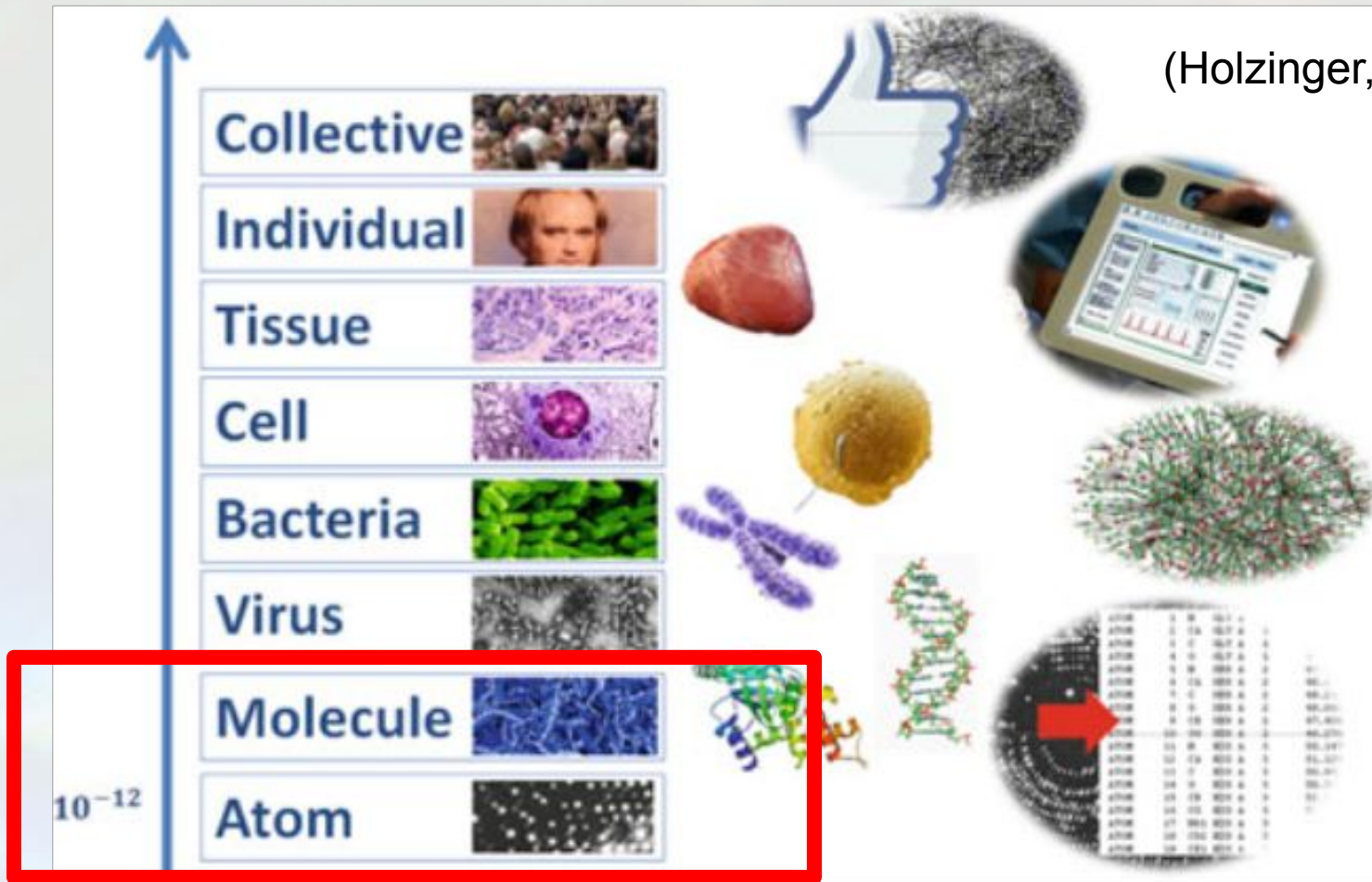
Life in Scales and Data Sources

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Institute of Computing – UNICAMP
August 2019

The background of the slide is a blurred image. It features a magnifying glass in the foreground, with its lens focused on a globe of the Earth. The globe shows continents and oceans. The overall image is out of focus, creating a soft, ethereal atmosphere. The text 'Life in Scales' is centered over this background.

Life in Scales

(Holzinger, 2014)



A pair of glasses with a dark frame and clear lenses is resting on a vibrant green leaf. The leaf is covered with several clear water droplets of varying sizes. The background is a soft-focus, bright green, suggesting a natural outdoor setting. The overall image has a fresh, clean, and natural aesthetic.

Building Life

Francis Crick

- British molecular biologist, biophysicist, and neuroscientist
- Co-discoverer of the structure of the DNA molecule in 1953
- Nobel Prize in Physiology or Medicine

(Wikipedia, 2018)

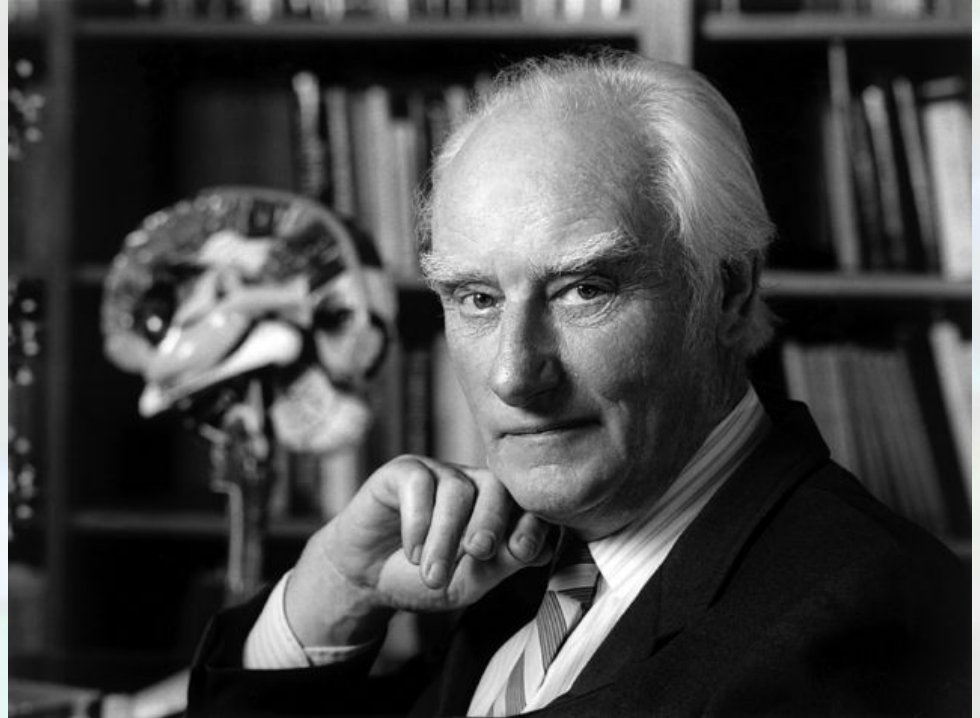
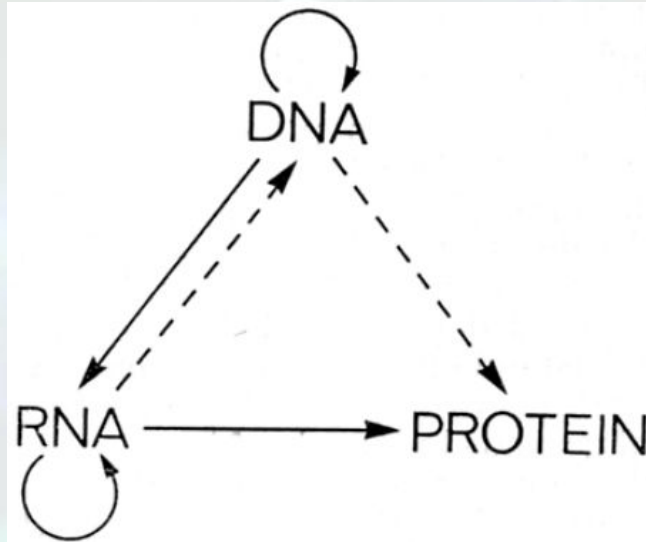


Photo: Marc Lieberman - Siegel RM, Callaway EM: Francis Crick's Legacy for Neuroscience: Between the α and the Ω . PLoS Biol 2/12/2004: e419. <https://dx.doi.org/10.1371/journal.pbio.0020419>

Central Dogma of Molecular Biology

(Crick, 1970)

"The central dogma of molecular biology deals with the detailed residue-by-residue **transfer of sequential information**. It states that such information cannot be transferred back from protein to either protein or nucleic acid."



Phenotype

- Sets of organism observable characteristics
- Expression of organism's genotype interacting with the environment

Genotype to Phenotype

Phenotype



Genotype



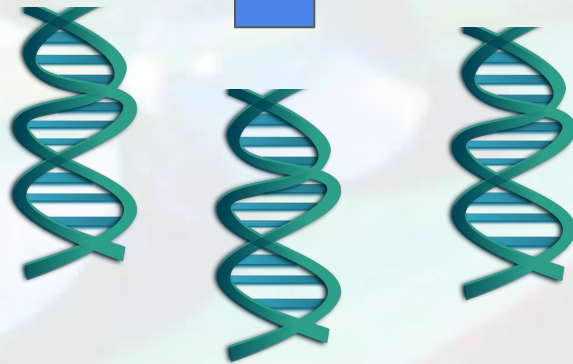
Genotype to Phenotype

Phenotype

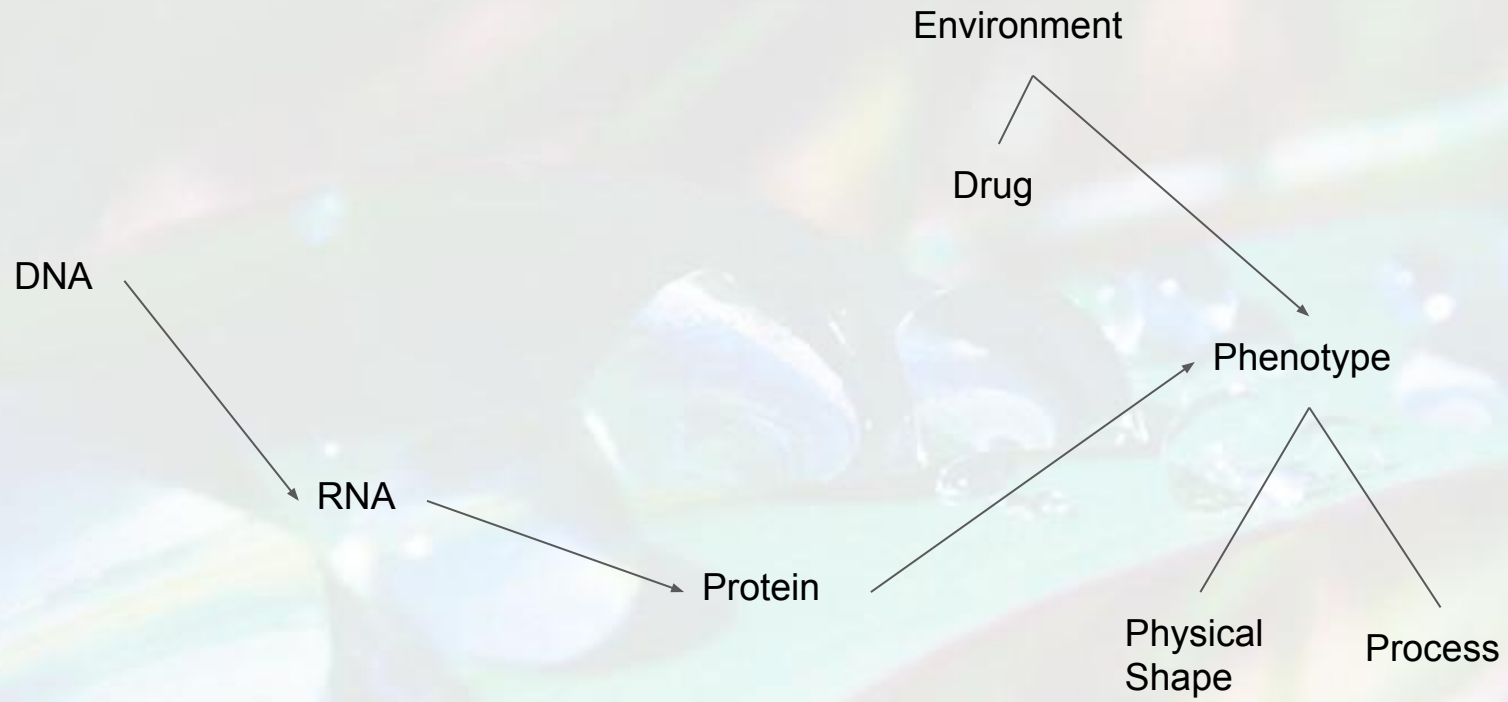


Descrição

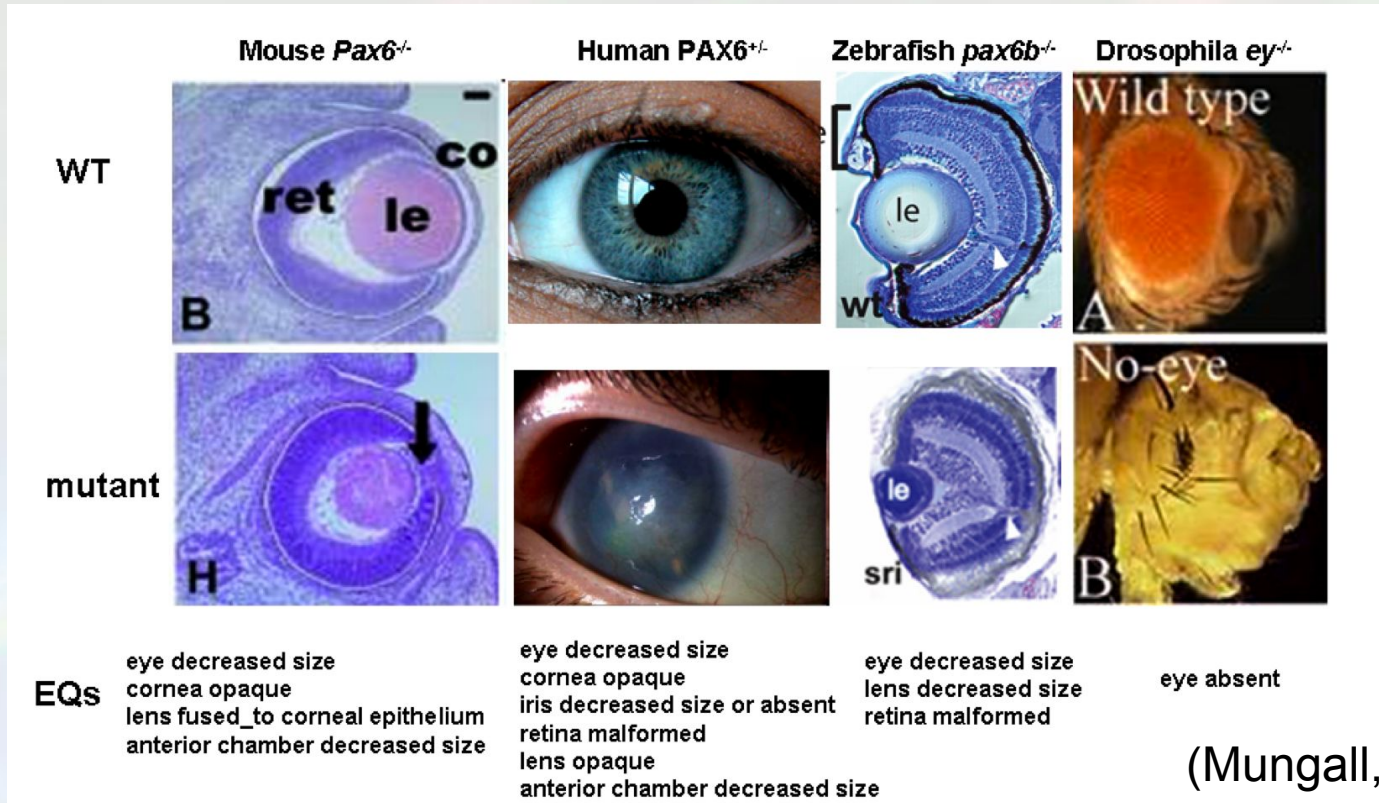
Genotype



Código

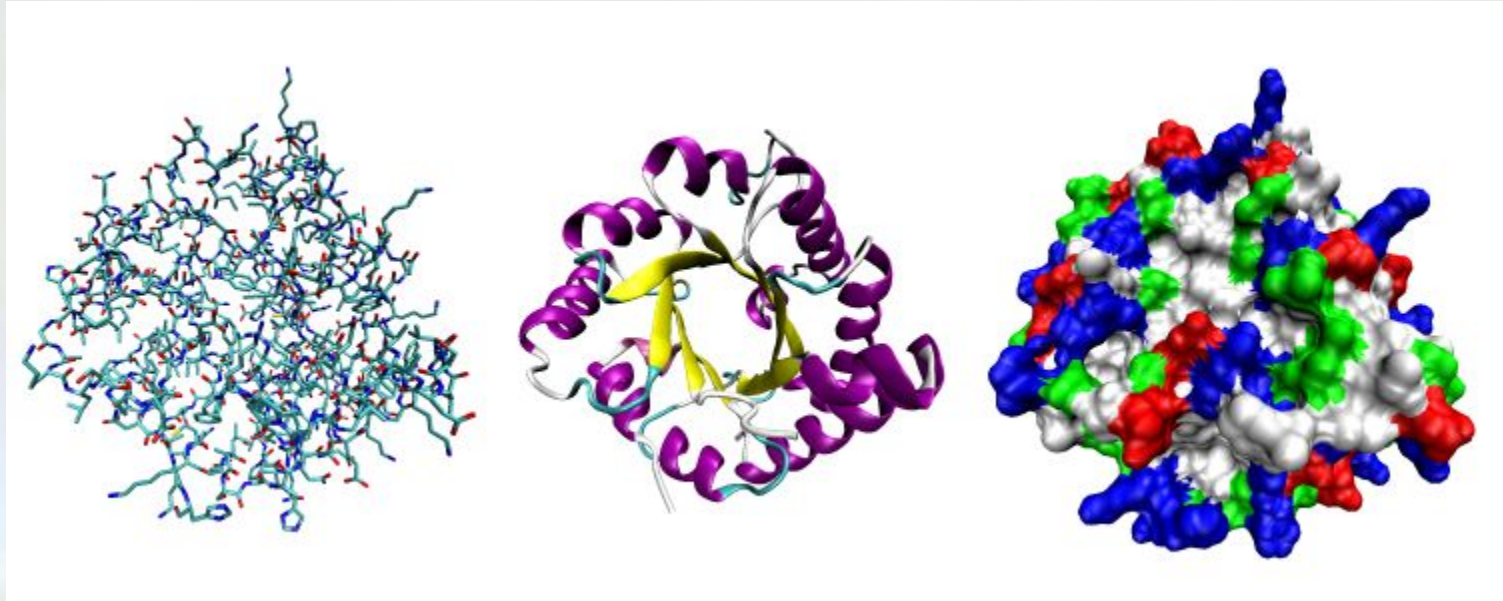


Complexity: From Genes to Phenotypes



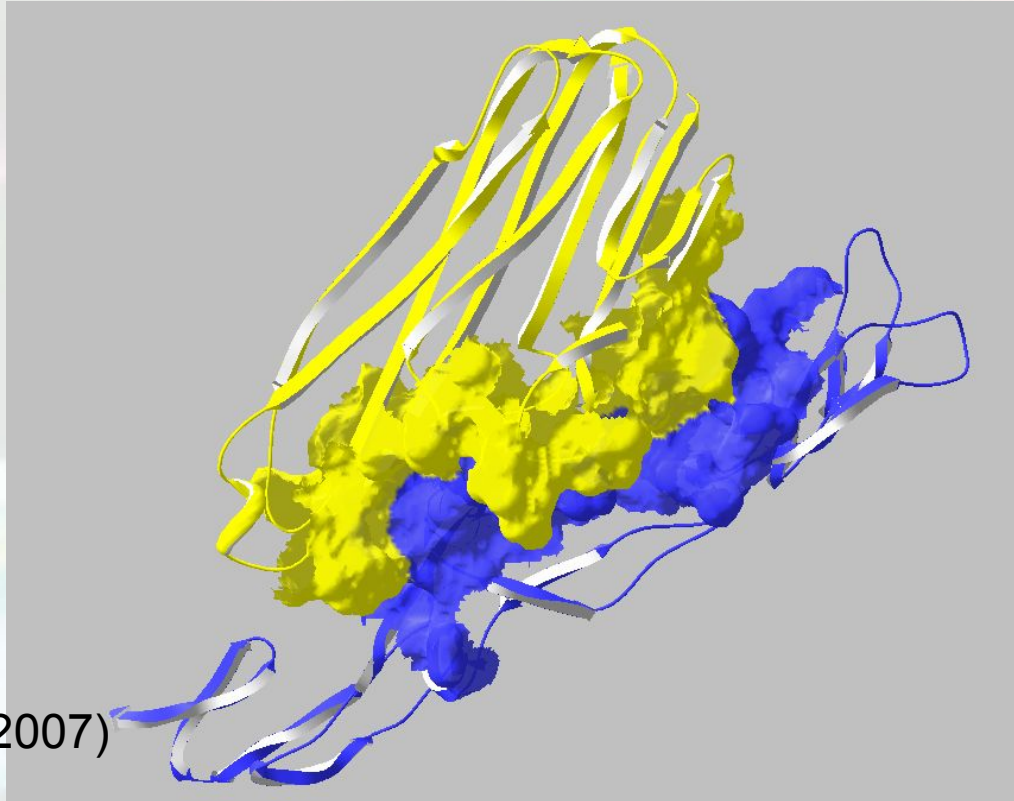
(Mungall, 2009)

Protein



By Opabinia regalis - Self created from PDB entry 1TIM using the freely available visualization and analysis package VMD, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=1068554>

TNF and its Receptor



(Wiltgen et al., 2007)

Protein–Protein Interactions in Virus–Host Systems

(Brito, A. F., & Pinney, 2017)

"To study virus-host protein interactions, knowledge about viral and host protein architectures and repertoires, their particular evolutionary mechanisms, and information on relevant sources of biological data is essential."

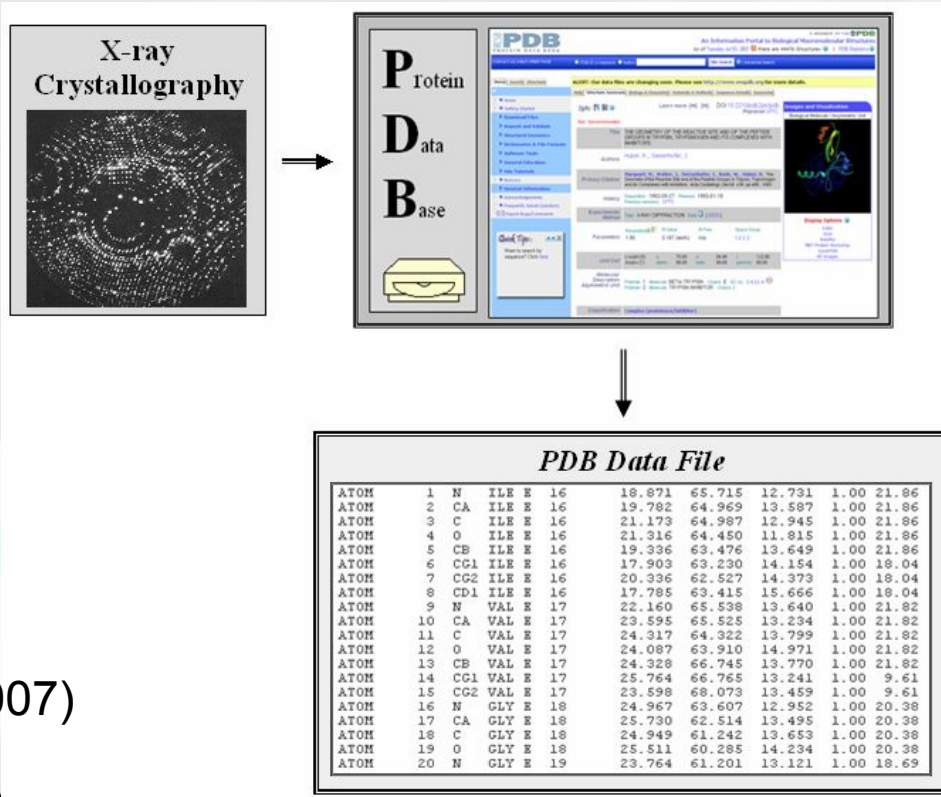
"From a biomedical perspective, blocking such interactions is the main mechanism underlying antiviral therapies."



Data Sources

Protein Data Base

<http://www.rcsb.org/>



(Wiltgen et al., 2007)

From June 20, 2018 all traffic will be automatically redirected to HTTPS. [More information](#) or [view this page using https](#)

UniProtKB - P01375 (TNFA_HUMAN)

Basket

Display

BLAST Align Format Add to basket History

Feedback Help video Other tutorials and videos

Entry

Publications

Feature viewer


Feature table

All None

- Function
- Names & Taxonomy
- Subcellular location
- Pathology & Biotech
- PTM / Processing
- Expression

Protein **Tumor necrosis factor**Gene **TNF**Organism *Homo sapiens (Human)*Status  Reviewed - Annotation score: ●●●●● - Experimental evidence at protein levelⁱ

Functionⁱ

Cytokine that binds to TNFRSF1A/TNFR1 and TNFRSF1B/TNFR. It is mainly secreted by macrophages and can induce cell death of certain tumor cell lines. It is potent pyrogen causing fever by direct action or by stimulation of interleukin-1 secretion and is implicated in the induction of cachexia. Under certain conditions it can stimulate cell proliferation and induce cell differentiation. Impairs regulatory T-cells (Treg) function in individuals with rheumatoid arthritis via FOXP3 dephosphorylation. Upregulates the expression of protein phosphatase 1 (PP1), which dephosphorylates the key 'Ser-418' residue of FOXP3, thereby inactivating FOXP3 and rendering Treg cells functionally defective (PubMed:23396208). Key mediator of cell death in the anticancer action of BCG-stimulated neutrophils in combination with DIABLO/SMAC mimetic in the RT4v6 bladder cancer cell line (PubMed:22517918).  3 Publications







The TNF intracellular domain (ICD) form induces IL12 production in dendritic cells.  1 Publication

GO - Molecular functionⁱ

-  cytokine activity  Source: BHF-UCL
-  identical protein binding  Source: BHF-UCL
-  protease binding  Source: BHF-UCL
-  transcription regulatory region DNA binding  Source: UniProtKB
-  tumor necrosis factor receptor binding  Source: BHF-UCL

View the complete GO annotation on QuickGO ...

GO - Biological processⁱ

-  activation of cysteine-type endopeptidase activity involved in apoptotic process  Source: UniProtKB
-  activation of MAPK activity  Source: BHF-UCL
-  activation of MAPKKK activity  Source: BHF-UCL

TNF - UniProt
<https://www.uniprot.org/>



Drugs

Pair Analysis



Share



Added



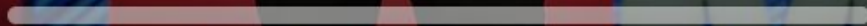
Liked



Rate

Russ Altman *at* TEDMED 2015

What really happens when you mix medications?



14:42



DrugBank

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

 DRUGBANK

Browse ▾

Search ▾

Downloads

About ▾

Help ▾

Blog

Contact Us

WHAT ARE YOU LOOKING FOR?

Tylenol



Drugs



Targets



Pathways



Indications

 DRUGBANK

The DrugBank database is a unique bioinformatics and cheminformatics resource that combines detailed drug data with comprehensive drug target information.

The latest release of DrugBank (version 5.0.11, released 2017-12-20) contains 11,002 drug entries including 2,504 approved small molecule drugs, 943 approved biotech (protein/peptide) drugs, 109 nutraceuticals and over 5,110 experimental drugs. Additionally, 4,910 non-redundant protein (i.e. drug targets) are included in the database. For more information, please visit the DrugBank website.

PDB & DrugBank

- Search by Drugs & Drug Targets
 - http://www.rcsb.org/pages/search_features#search_drugs

U.S. Food & Drug Administration

Adverse Event Reporting Systems (AERs)

- Drug Approvals and Databases
 - <https://www.fda.gov/Drugs/InformationOnDrugs/>

The screenshot shows the U.S. Food & Drug Administration website. The header includes the U.S. Department of Health and Human Services logo, the FDA logo, and the text 'U.S. FOOD & DRUG ADMINISTRATION'. There is a search bar and navigation links for 'Home', 'Food', 'Drugs', 'Medical Devices', 'Radiation-Emitting Products', 'Vaccines, Blood & Biologics', 'Animal & Veterinary', 'Cosmetics', and 'Tobacco Products'. The main content area is titled 'Drug Approvals and Databases' and features a dropdown menu for 'Approved Drugs'. A sidebar on the left lists 'Resources for You' including 'FDA Online Label Repository' and 'Drug Trials Snapshots'. The main content area contains a list of search options with links to more information about each database.

U.S. Department of Health and Human Services

U.S. FOOD & DRUG ADMINISTRATION

A to Z Index | Follow FDA | En Español

Search FDA

Home | Food | Drugs | Medical Devices | Radiation-Emitting Products | Vaccines, Blood & Biologics | Animal & Veterinary | Cosmetics | Tobacco Products

Drugs

Home > Drugs > Drug Approvals and Databases

Drug Approvals and Databases

Approved Drugs

Resources for You

- FDA Online Label Repository
- Drug Trials Snapshots

REMS website version 2.0 launches successfully
Table provides links to [Risk Evaluation and Mitigation Strategies](#)

- [Acronyms and Abbreviations Search](#)
More information about the database
- [Approved Risk Evaluation and Mitigation Strategies \(REMS\)](#)
- [Bioresearch Monitoring Information System \(BMIS\) Search](#)
More information about the database
- [Clinical Investigator Inspection List \(CLIL\) Search](#)
More information about the database
- [Dissolution Methods Database Search](#)
More information about the database
- [Drug Establishments Current Registration Site Search](#)
More information about the database
- [Drug Safety Labeling Changes \(SLC\)](#)
More information about the database
- [Drug Shortages](#)
More information about the database
- [Drugs@FDA Search](#)
More information about the database
- [FDA Adverse Event Reporting System \(FAERS\) Quarterly Data Files](#)

U.S. Food & Drug Administration

Adverse Event Reporting Systems (AERs)

- FAERS - FDA Adverse Event Reporting Systems
 - <https://www.fda.gov/Drugs/InformationOnDrugs/ucm135151.htm>

The screenshot shows the FDA's website for the Adverse Event Reporting System (FAERS). The page is titled "FDA Adverse Event Reporting System (FAERS)" and is part of the "Drugs" section. It includes a search bar, navigation tabs for various FDA categories, and a list of links for additional information. The page is updated as of 06/09/2017 and provides assistance in multiple languages.

U.S. Department of Health and Human Services

FDA U.S. FOOD & DRUG ADMINISTRATION

A to Z Index | Follow FDA | En Español

Search FDA

Home | Food | Drugs | Medical Devices | Radiation-Emitting Products | Vaccines, Blood & Biologics | Animal & Veterinary | Cosmetics | Tobacco Products

Drugs

Home > Drugs > Drug Approvals and Databases

Drug Approvals and Databases

Approved Drugs

SHARE | TWEET | LINKEDIN | PIN IT | EMAIL | PRINT

FDA Adverse Event Reporting System supports the FDA's post-marketing safety surveillance program for all marketed drug and therapeutic biologic products. It contains adverse event reports FDA has received from manufacturers as required by regulation along with reports received directly from consumers and healthcare professionals. We provide downloadable files only; you cannot search the database online.

Dates of Coverage: January 2004 - present
Update Frequency: Quarterly

Additional Information

- [FDA Adverse Event Reporting System \(FAERS\)](#)
Background information and details about FAERS.
- [Quarterly Data Files from the FDA Adverse Event Reporting System \(FAERS\)](#)
Raw data extracted from the AERS and FAERS databases.
- [Reporting an Adverse Event or Medication Error to FDA](#)
MedWatch: The FDA Safety Information and Adverse Event Reporting Program

Page Last Updated: 06/09/2017
Note: If you need help accessing information in different file formats, see [Instructions for Downloading Viewers and Players](#).
Language Assistance Available: Español | 繁體中文 | Tiếng Việt | 한국어 | Tagalog | Русский | العربية | Kreyòl Ayisyen | Français | Polski | Português | Italiano | Deutsch | 日本語 | فارسی | English

Online Mendelian Inheritance in Man (OMIM)

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

“[...] catalog of human genes and genetic disorders and traits, with a particular focus on the gene-phenotype relationship.” (Wikipedia, 2018)

Mendelian Trait

“Mendelian trait is one that is controlled by a single locus in an inheritance pattern. In such cases, a mutation in a single gene can cause a disease that is inherited according to Mendel's laws. Examples include sickle-cell anemia, Tay-Sachs disease, cystic fibrosis and xeroderma pigmentosa.” (Wikipedia, 2018)

HIV-1 Human Interaction Database

<https://www.ncbi.nlm.nih.gov/genome/viruses/retroviruses/hiv-1/interactions/browse/>

NCBI Resources How To

Sign in to NCBI

Retroviruses

Search NCBI

Search

HIV-1 Human Interaction Database

Browse

About

Help

Publications

Releases

HIV-1 Interactions: Browse and Download Data

Filters

HIV protein

ALL

Protein interaction

All interaction types

Replication interaction

All interaction types

Download

View NCBI Gene records

Items 1 - 20 of 18069

<< First

< Prev

Page

1

of 904

Next >

Last >>

HIV-1

Interaction

Human genes

Details

[Asp](#)

binds

[HLA-A](#)

[more..](#)

[Asp](#)

binds

[HLA-B](#)

[more..](#)

[Asp](#)

enhances

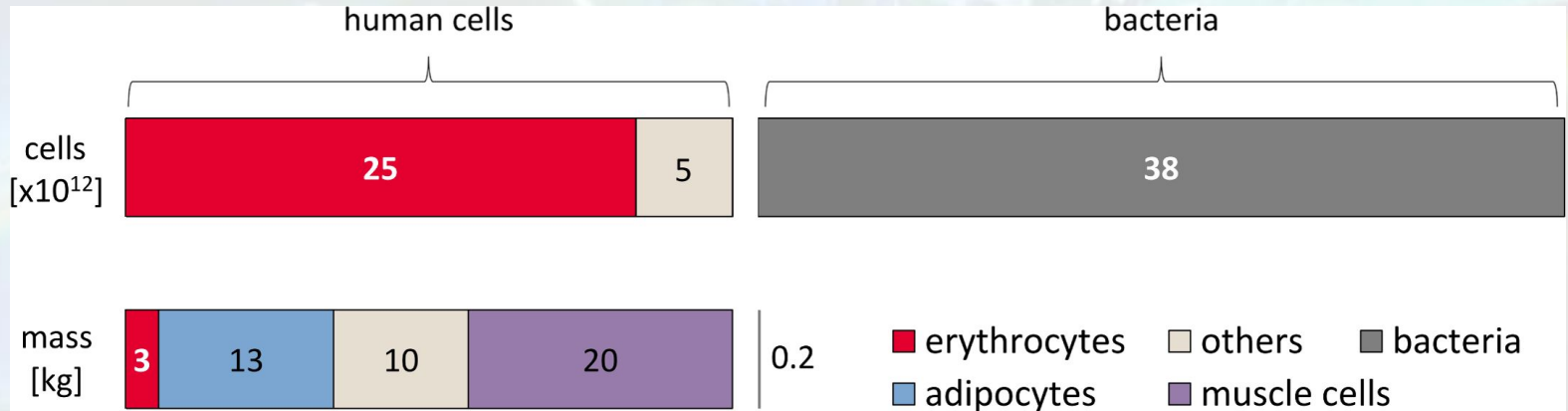
[IFNG](#)

[more..](#)

Estimates of Cells in Human Body

- Reference man
 - 70 kilograms
 - 20–30 years old
 - 1.7 metres tall
- 30 trillion human cells
- 39 trillion bacteria

(Sender et al., 2016)



NIH Human Microbiome Project

<https://hmpdacc.org/>

NIH Human Microbiome Project



Characterization of the microbiomes of healthy human subjects at five major body sites, using 16S and metagenomic shotgun sequencing.

Enter HMP1



Characterization of microbiome and human host from three cohorts of microbiome-associated conditions, using multiple 'omics technologies.

Enter iHMP

HMP₁

<https://hmpdacc.org/hmp/>

- Initial Phase (2008)
- 300 healthy individuals
- Sites on the human body
 - nasal passages
 - oral cavity
 - Skin
 - gastrointestinal tract
 - urogenital tract
- 16S rRNA sequencing
- Metagenomic whole genome shotgun (wgs) sequencing
- Over 14.23 terabytes of data

The background of the slide is a blurred photograph of a laboratory. It shows various pieces of glassware, including beakers and flasks, some containing liquids. There are also some white containers and what appears to be a pipette or similar instrument. The overall scene is out of focus, creating a soft, scientific atmosphere.

Model Organisms

Model Organisms

- "Most of our knowledge about the basic properties of metabolism, growth, and division in living cells is a result of studies on species described as '**model organisms**'".
- These species include:
 - bacterium *Escherichia coli*
 - bakers' yeast (*Saccharomyces cerevisiae*),
 - the fruit fly (*Drosophila melanogaster*)
 - the nematode worm (*Caenorhabditis elegans*)
 - the mouse (*Mus musculus*)
 - the thale cress (*Arabidopsis thaliana*)

(Oliver et al., 2016)

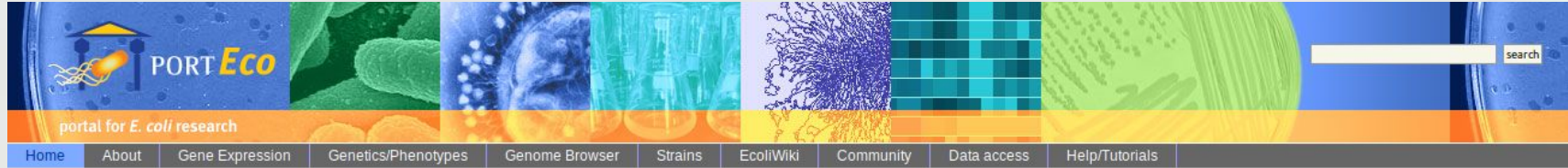
Model Organism Databases (MOD)

- "Model organism databases (MODs) host the genomic and functional information produced by organism-specific research projects and provide query and visualization tools to access these data"

(Oliver et al., 2016)

PortEco

<http://www.porteco.org/>



WHAT CAN I DO?

Find data for a particular gene

Enter a list of genes and test for enriched functions

separate IDs by newline

Find and analyze datasets

Currently Unavailable

PortEco is a next-generation data resource for the bacterial model organism, *Escherichia coli*

[\[Read more...\]](#)

PortEco Resources

- Pathway/Genome Databases for 130 *E. coli* genomes are available at [BioCyc.org](#) including curated databases for *E. coli* B Rel 606 and *E. coli* W3110
- [EcolHouse](#) provides a publicly queryable MySQL database warehouse for *E. coli* data
- [Community features](#) including colleague search, event calendar, job postings
- *E. coli* systems models at [BioModels](#)
- [PortEco data downloads](#) and database access
- PortEco also supports manual curation of [Gene Ontology](#) terms from published papers at [EcoCyc](#)

PortEco News and Events

PortEco needs letters of support

[PortEco blog > PortEco: by jimhu \(4 years ago\):](#)
Dear Colleagues, Since taking on the project in 20...[\[Read more...\]](#)

New version of the MG1655 sequence at Genbank

EcoCyc

<https://ecocyc.org/>



LOGIN | Why Login? | Create New Account

Enter a gene, protein, metabolite or pathway...

Quick Search

Gene Search

Searching *Escherichia coli* K-12 substr. MG1655 (EcoCyc) [change organism database](#)

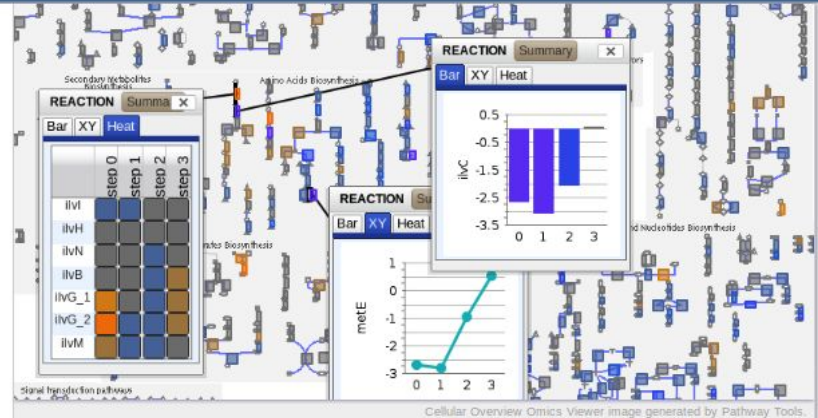
Sites ▾ Search ▾ Genome ▾ Metabolism ▾ Analysis ▾ SmartTables ▾ Help ▾

EcoCyc *E. coli* Database

EcoCyc is a scientific database for the bacterium *Escherichia coli* K-12 MG1655. The EcoCyc project performs literature-based curation of the entire genome, and of transcriptional regulation, transporters, and metabolic pathways.

New to EcoCyc? Take the [guided tour](#) of the EcoCyc.org Web site, watch our free online instructional videos, or read our 2017 article: "[EcoCyc: reflecting new knowledge about *Escherichia coli* K-12](#)"

[EcoCyc User Guide >>](#)



Gene Expression Data Analysis

Multiple tools are available in this website for analysis of gene expression data.

[Learn More](#)

Extending Worms Life

<https://www.npr.org/2015/05/22/408027400/how-do-you-make-an-elderly-worm-feel-young-again>

TED RADIO HOUR

A journey through fascinating ideas, astonishing inventions, and new ways to think and create. Based on riveting TEDTalks from the world's most remarkable minds.



How Do You Make An Elderly Worm Feel Young Again?

+ Queue

May 22, 2015 - 8:24 AM ET

Heard on TED Radio Hour

Download

Embed

Transcript

NPR/TED STAFF



A *C. elegans* mutant that lives twice as long as wild type

- "WE have found that mutations in the gene **daf-2** can cause fertile, active, adult *Caenorhabditis elegans* hermaphrodites to **live more than twice** as long as wild type." (Kenyon et al., 1993)


Caenorhabditis elegans




WormBase

<https://www.wormbase.org>

Welcome to WormBase - [need help?](#)

My WormBase (0 ) [Login](#) [For Developers](#) [Contact Us](#)

WormBase Version: WS263


Search directory... [for a gene](#) 

[About](#) [Directory](#) [Tools](#) [Downloads](#) [Community](#) [Support](#) [Submit Data](#) [Micropublication](#) [ParaSite](#)

browse *Blast and more*

Explore Worm Biology

facilitating insights into nematode biology

control what you see on the page *skip tutorial* *see a ? click on it to save to My Wormbase*

Page Content

- News
- Discussion
- Activity
- Gene name changes
- Meetings

My WormBase

News

[Please specify allele and strain names in publications](#) Tue, 10 Apr 2018
WormBase curates data from published papers and attaches different types of data such as phenotype, overview, expression, human disease model, etc., to genetic

[Sir John Sulston](#) Thu, 15 Mar 2018
We mourn the passing of one of the founders of our field. John Sulston was personally responsible for establishing the use of *C. elegans* to study development –

[WormBase Release WS263](#) Thu, 08 Mar 2018
We would like to announce the availability of the WormBase WS263 release on the WormBase website and FTP. Some of the highlights of this release are: **New**

[View More](#)

Gene name changes

Below are changes in gene names since the previous release **WS262**. Gene name changes for each release since WS252 are archived [here](#).

Genes with new primary names

Search: [Save table](#)

Show entries

New primary name	Gene ID	Sequence
ascc-1	WBGene00016019	C23H3.3
ddx-52	WBGene00011032	R05D11.4
efr-3	WBGene00016311	C32D5.3
fubp-3.1	WBGene00007534	C12D8.1

Zebrafish - ZFIN

<https://zfin.org/>



The Zebrafish Information Network

Research

General Information

ZIRC

Downloads Login



Follow

Search ZFIN

bmp2a, hindbrain development disrupted, pax morpholino

Go



Genes / Markers / Clones

Nomenclature Conventions
Obtain approval for gene names

BLAST at ZFIN

GBrowse genome browser

Gene Expression

Antibodies

Mutants / Knockdowns / Transgenics

Wild-Type Lines
Line Designations
Submit mutant/transgenic line names

Constructs

Anatomy / GO / Human Disease

Anatomy Atlases and Resources

Publications

Author Guidelines

Community

Wiki: Protocols, Antibodies
Jobs, Meetings, Newsgroup
People, Labs, Companies

Zebrafish International Resource Center

Request: Fish Lines, ESTs/cDNAs, Monoclonal
Antibodies, The Zebrafish Book, Paramecia

Submit Fish Lines

Health Services

Genomics

Data mining: ZebrafishMine, BioMart
Browse genome: ZFIN, Ensembl, Vega,
GRC, UCSC, NCBI, FishMap
BLAST: ZFIN, Ensembl, NCBI, MGH
Find cDNAs and ESTs at ZGC

More Zebrafish Genome Resources
Other Fish Genomes and Model Organism
Databases

Zebrafish Programs

ZF-HEALTH, Husbandry Resources, more...

News

Hands-on workshop: Exploring Zebrafish
Genome Data Apr 5, 2018
IZFS Board Nominations for Officers and
Directors Reminder Apr 3, 2018
ZFIN Newsletters, News Archive

Mouse - MGI

<http://www.informatics.jax.org/>



[About](#) [Help](#) [FAQ](#)

Mouse Genome Informatics



Search ▾ Download ▾ More Resources ▾ Submit Data Find Mice (IMSR)  Analysis Tools Contact Us Browsers

Keywords, Symbols, or IDs

Quick
Search

Or use topic specific search and analysis tools:



Genes



Phenotypes & Mutant Alleles



Human-Mouse: Disease Connection



Gene Expression Database (GXD)



Recombinase (cre)



Function

MGI is the international database resource for the laboratory mouse, providing integrated genetic, genomic, and biological data to facilitate the study of human health and disease.

[About Us](#) [MGI Publications](#)



MGI is now annotating disease models to the Disease Ontology (DO) and offers a new Disease Ontology Browser.

Term with siblings

ciliopathy +

chondrodysplasia punctata +
chromosomal disease +
Coffin-Siris syndrome
Cornelia de Lange syndrome
malignant hyperthermia
maturity-onset diabetes of the young
maturagenic disease +

Child terms(s)

Joubert syndrome +
Meckel syndrome
primary ciliary dyskinesia +

Fly - FlyBase

<http://flybase.org/>

FlyBase FB2017_05

FB2018_02, released Apr 3, 2018

A Database of *Drosophila* Genes & Genomes



Home Tools Downloads Links Community Species About Help Archives

J2G Jump to Gene

Go

BLAST

GBrowse

Resources

RNA-Seq

Vocabularies

ImageBrowse

Batch Download

FlyBase 2.0: It's here!



FLYBASE 2.0
IT'S HERE!

1:26



FAST-TRACK
YOUR PAPER



FLYBASE
NEWS



FLY BOARD



FlyBase needs your help — Yearly Website Access Fee!

The NHGRI is significantly reducing the funding of FlyBase by 15% this year (which, with rising costs is normalized to 20%), and 20% (normalized to 30%) onward. With these cuts, we will not be able to deliver high quality, essential curation and tools. We are calling on you to help by implementing a scaled **FlyBase website access fee per person / per year**:

U.S. and U.K.	\$150.00
All other countries	\$300.00
Commercial	\$750.00

PLEASE COMPLETE THIS [FORM](#).

More details [HERE](#) on our current funding situation and why we are implementing a fee-based approach. Questions? See this [FAQ](#) or [email us](#). Optional general tax-deductible contributions [here](#).

Thank you for your help to sustain FlyBase!

Rat - Rat Genome Database (RGD)

<https://rgd.mcw.edu/>

The screenshot displays the RGD website interface. At the top, a dark blue navigation bar contains links for Help, Publications, Poster Archive, FTP Download, REST API, Citing RGD, Contact Us, and a Sign In button. Below this is a search bar with the placeholder text "Enter Search Term..." and a magnifying glass icon, followed by a link to "Advanced Search (OLGA)".

The main content area features the RGD logo on the left, which includes a stylized DNA helix and a rat's head. To the right of the logo are the logos for the "Gene Editing Rat Resource Center" and the "ALLIANCE OF GENOME RESOURCES (FOUNDING MEMBER)".

A horizontal menu below the logos contains the following categories: HOME, DATA, ANALYSIS & VISUALIZATION, DISEASES, PHENOTYPES & MODELS, GENETIC MODELS, PATHWAYS, and COMMUNITY.

Below the menu is a dark blue bar with links for Search RGD, Grant Resources, Citing RGD, About Us, and Contact Us.

On the right side of the page, there is a "Find us on Facebook" button with the Facebook logo.

The main content area is divided into several sections, each with a representative image and a brief description:

- Genes**: Map positions, functions and more. The image shows a genomic map with a red arrow pointing to a gene.
- Strains**: Search Strains. The image shows a black mouse.
- QTL**: Phenotypes & Traits linked to the genome. The image shows a bell curve with a shaded area under it.
- Function**: Gene Ontology, Phenotype, Pathway. The image shows a diagram of a rat's internal organs.
- Diseases**: Genes, QTL & Strains related to Disease. The image shows a diagram of a rat's heart and lungs.
- Phenotypes & Models**: Phenotype data, Assays, Husbandry and more. The image shows a bar chart with red bars.

Yeast - *Saccharomyces* Genome Database (SGD)

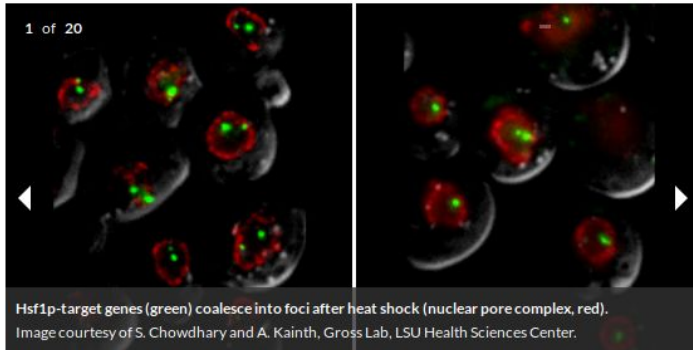
<https://www.yeastgenome.org/>

SGD *Saccharomyces* GENOME DATABASE

Analyze ▾ Sequence ▾ Function ▾ Literature ▾ Community ▾

About Blog Download Help YeastMine

search: actin, kinase, glucose



About SGD

The *Saccharomyces* Genome Database (SGD) provides comprehensive integrated biological information for the budding yeast *Saccharomyces cerevisiae* along with search and analysis tools to explore these data, enabling the discovery of functional relationships between sequence and gene products in fungi and higher organisms.

Try this!

Meetings

[31st VHYC Yeast Conference](#)
April 16 to April 17, 2018 -
Leuven, Belgium

[Fungal Pathogen Genomics](#)

New & Noteworthy

[In Memoriam: André Goffeau - April 12, 2018](#)
It was with great sadness that we learned that André Goffeau, renowned yeast researcher and Professor at the Université Catholique de Louvain in Belgium, passed away on April 2, 2018. Prof. Goffeau

Tweets by @yeastgenome

SGD Project
@yeastgenome
Full set of curated #yeast protein (and other) complexes, aka the yeast #complexome, now available at the @complexportal at the @amblab1 check it out!

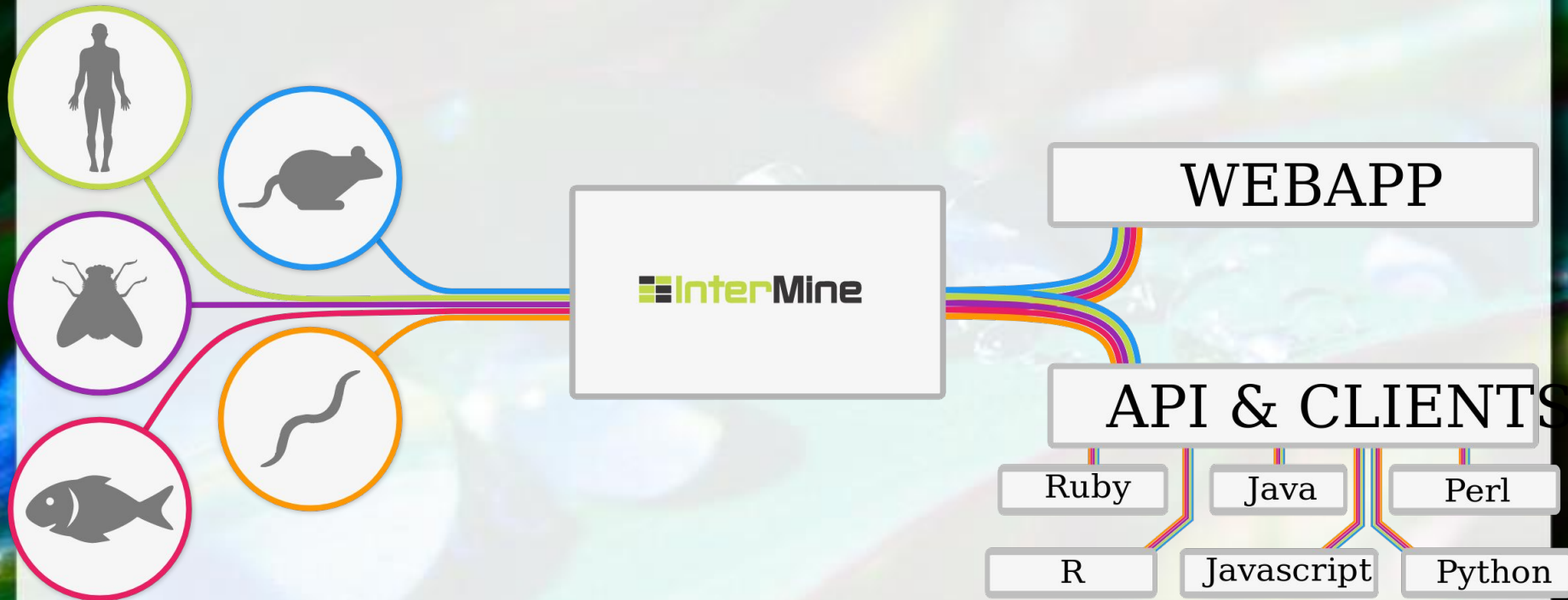
Alliance of Genome Resources

<http://www.alliancegenome.org/>



Intermine

<http://intermine.org/>



WormMine

<http://intermine.wormbase.org/tools/wormmine/>

WormBase WormMine WS263 Intermine data mining platform for *C. elegans* and related nematodes

Home Templates Lists QueryBuilder Regions Data Sources API MyMine Log in

Search WormMine e.g. aap-1, WP:CE18491 GO

Search

Search WormMine. Enter **names, identifiers or keywords** for genes, proteins, transcripts, ontology terms etc.

SEARCH

Analyze a list

Enter a **list** of identifiers of the same type. (aka: all genes, or all proteins).

Gene

[advanced](#)

ANALYSE

First Time Here?

WormMine integrates many types of data for *C. elegans*. You can run flexible queries, export results and analyse lists of data.

TAKE A TOUR

GENOMICS PROTEINS EXPRESSION GENETIC VARIATIONS PHENOTYPES GENE ONTOLOGY REAGENTS

Query for genomics:

- Gene ➔ Proteins
- Chromosome Interval ➔ Genes
- Transcript Type, Species ➔ Genes

Digital Patient

- "a technological framework that, once fully developed, will make it possible to create a **computer representation of the health status of each citizen** that is descriptive and interpretive, integrative and predictive." Discipulus Consortium (2013)



eVip
Electronic Virtual Patients
<https://virtualpatients.eu/>

Referatory

<https://virtualpatients.eu/referatory/>

electronic

Virtual Patients

Co-funded by the European Commission



[HOMEPAGE](#)

[ABOUT EVIP »](#)

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Search...



Referatory

These eVIP virtual patients are available to use, by clicking on the URL link. In some cases this will immediately open the case in its original virtual patient player, in other cases you will be guided to a form, where you will be able to register for free and then open the case. There are several different type of players so don't be surprised if the different VPs open in very different player systems.

In addition to the URL link, the VPs are all available as a content package, which conforms to the virtual patient ANSI-accredited standard. To use these packages, you will need to import them into a suitable virtual patient player i.e. a player which is able to accept VP standard-compliant content. This will require the support of a suitably-experienced learning technologist.

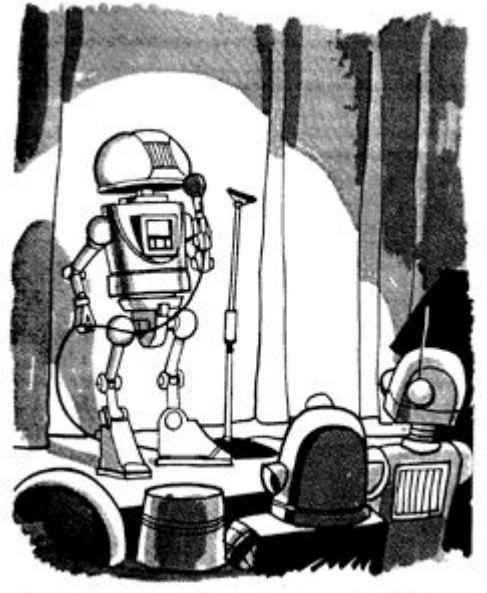
Search For:

Displaying 340 virtual patients

Title	Keywords	Language	Institution	License	Content Package	URL
Catherine Miller	Meningitis, Bacterial Meningitis, Sepsis	English	St George's, University of London			Link
Anna-Lena Olofsson	Failure to thrive	English	St George's, University of London			Link
John M	Idiopathic thrombocytopenic purpura, Bruises, Immunoglobulin	English	St George's, University of London			Link
Florian	Prematurity, Respiratory distress syndrome,	English	St George's, University of London			Link

Semantic Web

“... the idea of having data on the web defined and linked in a way that it can be used by machines not just for display purposes, but for automation, integration and reuse of data across various applications.”

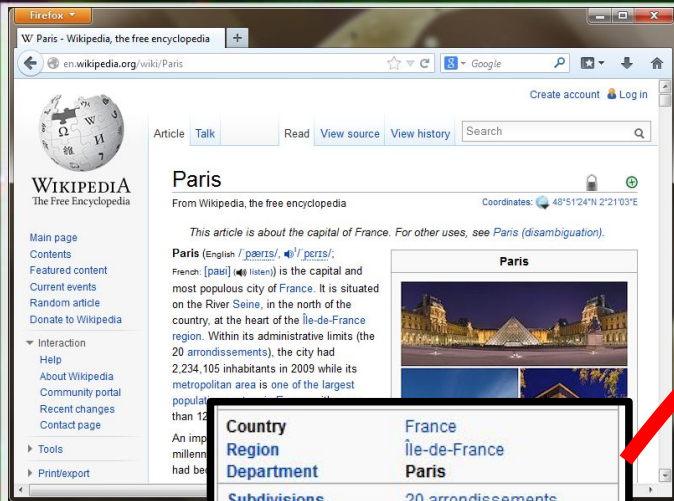


W3C Semantic Web Activity Group, 2011



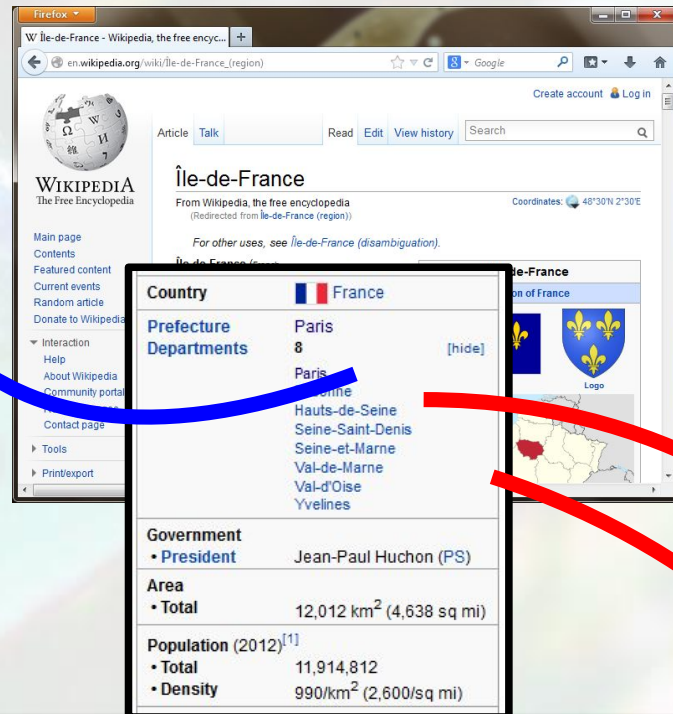
Linked Data

Wikipedia



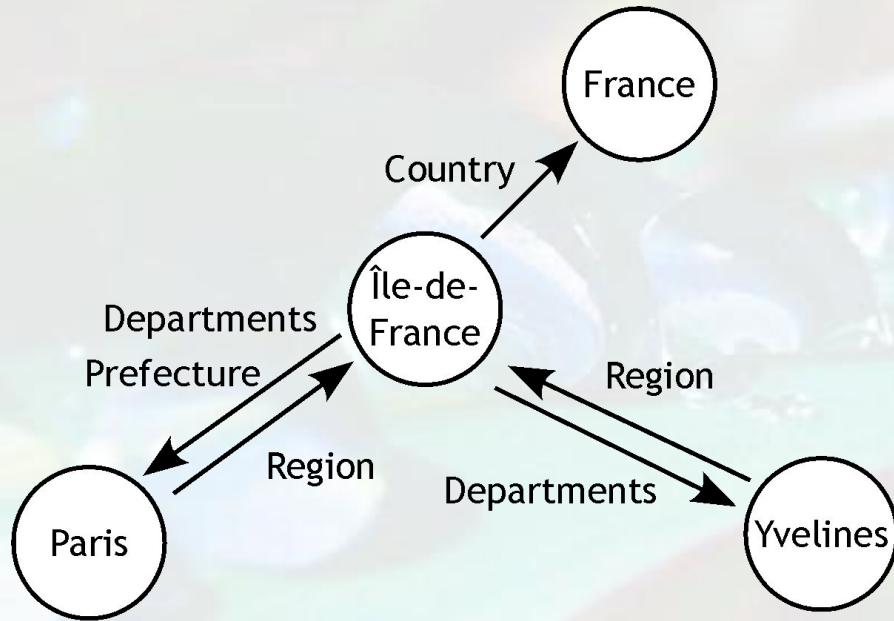
Country	France
Region	Île-de-France
Department	Paris
Subdivisions	20 arrondissements
Government	
• Mayor (2008–14)	Bertrand Delanoë (PS)
Area ^[1]	
• Urban (2010)	2,844.8 km ² (1,098.4 sq mi)
• Metro (2010)	17,174.4 km ² (6,631.1 sq mi)
• Land ¹	105.4 km ² (40.7 sq mi)
Population (2010) ^[5]	
• Rank	1st in France

Infobox

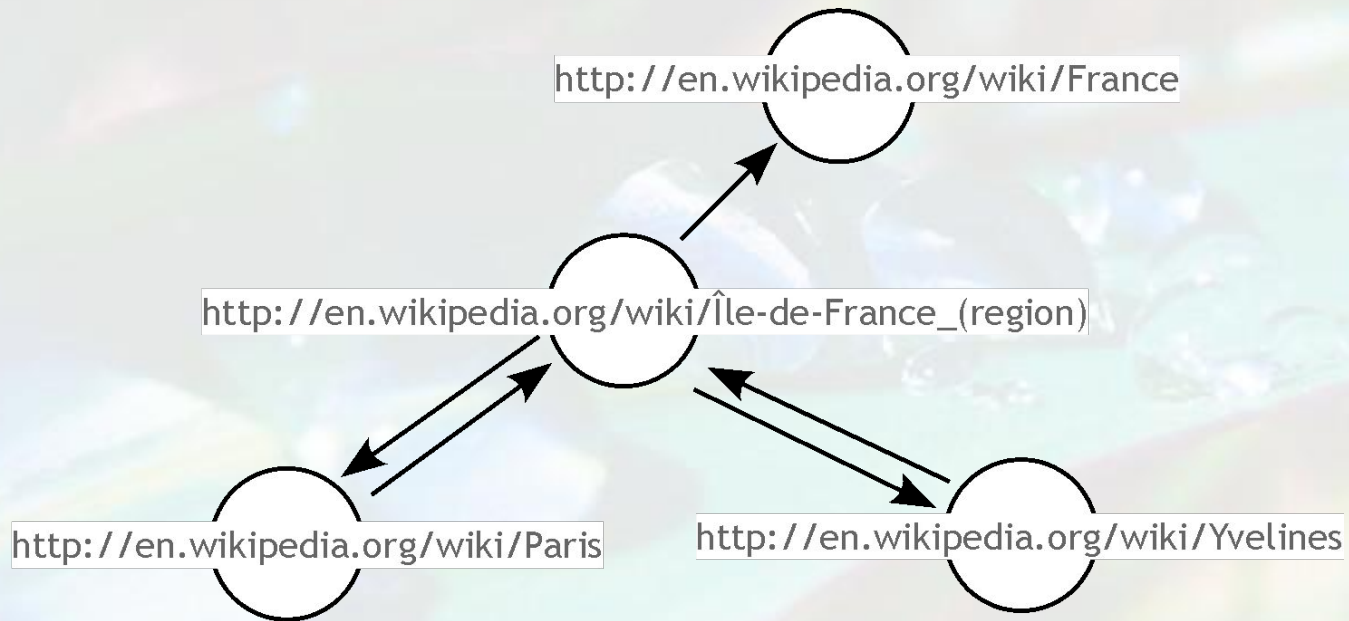


Country	 France
Prefecture	Paris
Departments	8 [hide]
	Paris
	Seine
	Hauts-de-Seine
	Seine-Saint-Denis
	Seine-et-Marne
	Val-de-Marne
	Val-d'Oise
	Yvelines
Government	
• President	Jean-Paul Huchon (PS)
Area	
• Total	12,012 km ² (4,638 sq mi)
Population (2012) ^[1]	
• Total	11,914,812
• Density	990/km ² (2,600/sq mi)

DBPedia



DBPedia (URIs)



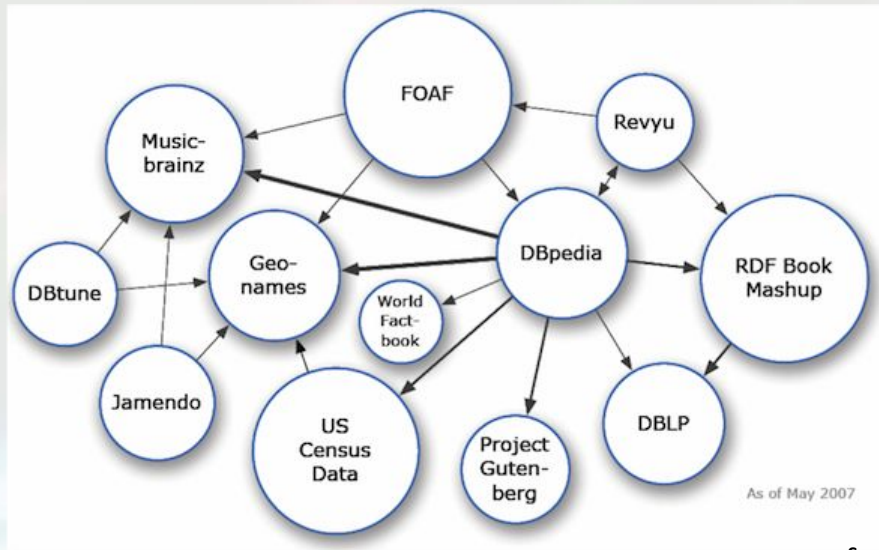
DBPedia - English

- **4.58 million things**
- **4.22 million classified in a consistent ontology**
 - 1,445,000 persons
 - 735,000 places (478,000 populated)
 - 411,000 creative works
 - 123,000 music albums; 87,000 films; 19,000 video games
 - 241,000 organizations

DBpedia - International

- 125 languages
- 38.3 million things
- 23.8 million interlinked with English

Linked Data 05/2007

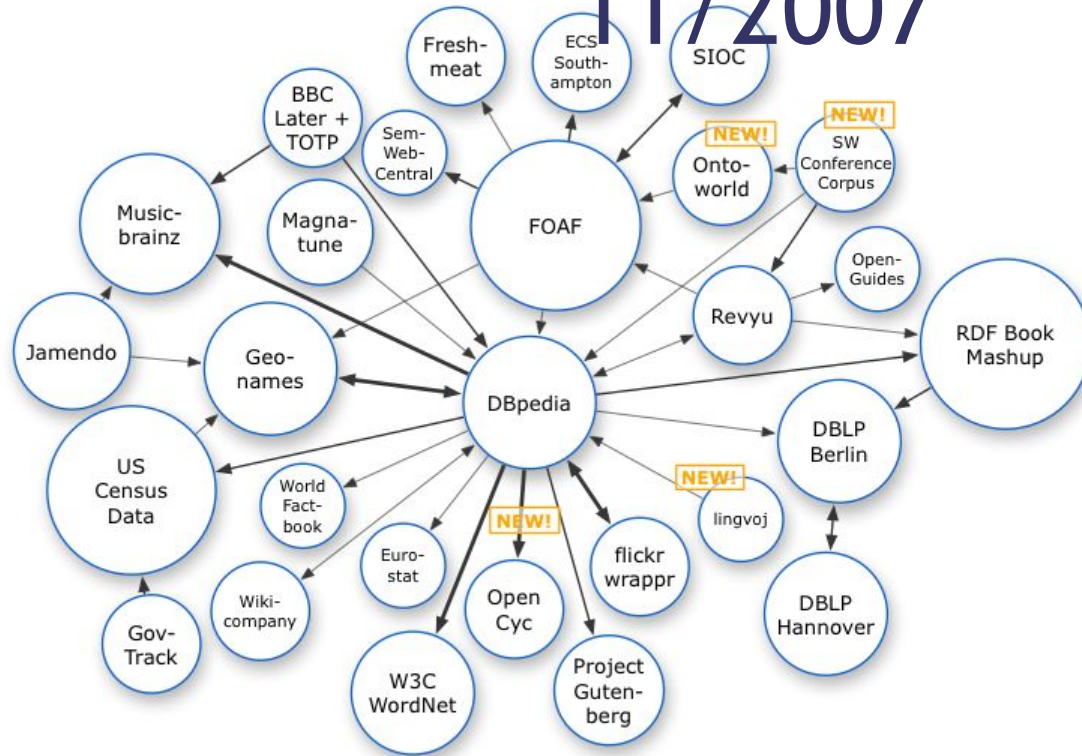


Source: <http://lod-cloud.net/>

Datasets published following Linked Data 'format': **05/2007**

Linked Data

11/2007

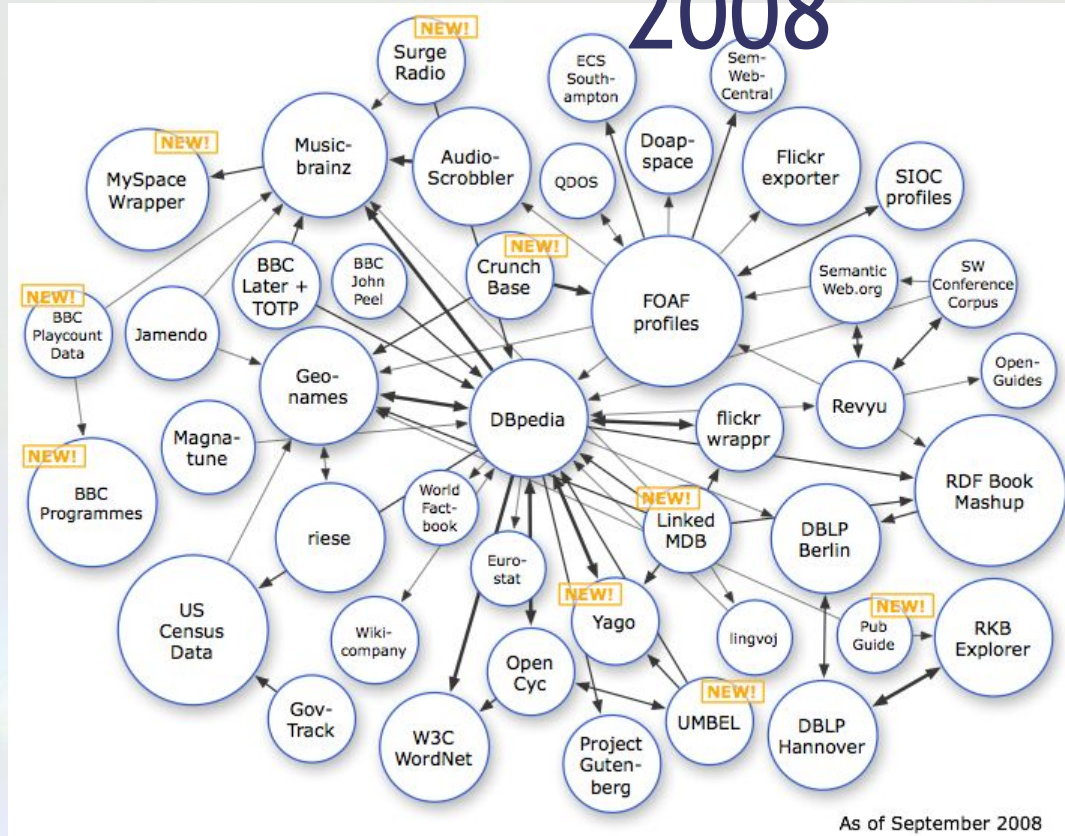


Source: <http://lod-cloud.net/>

Datasets published following Linked Data 'format': **11/2007**

Linked Data

2008

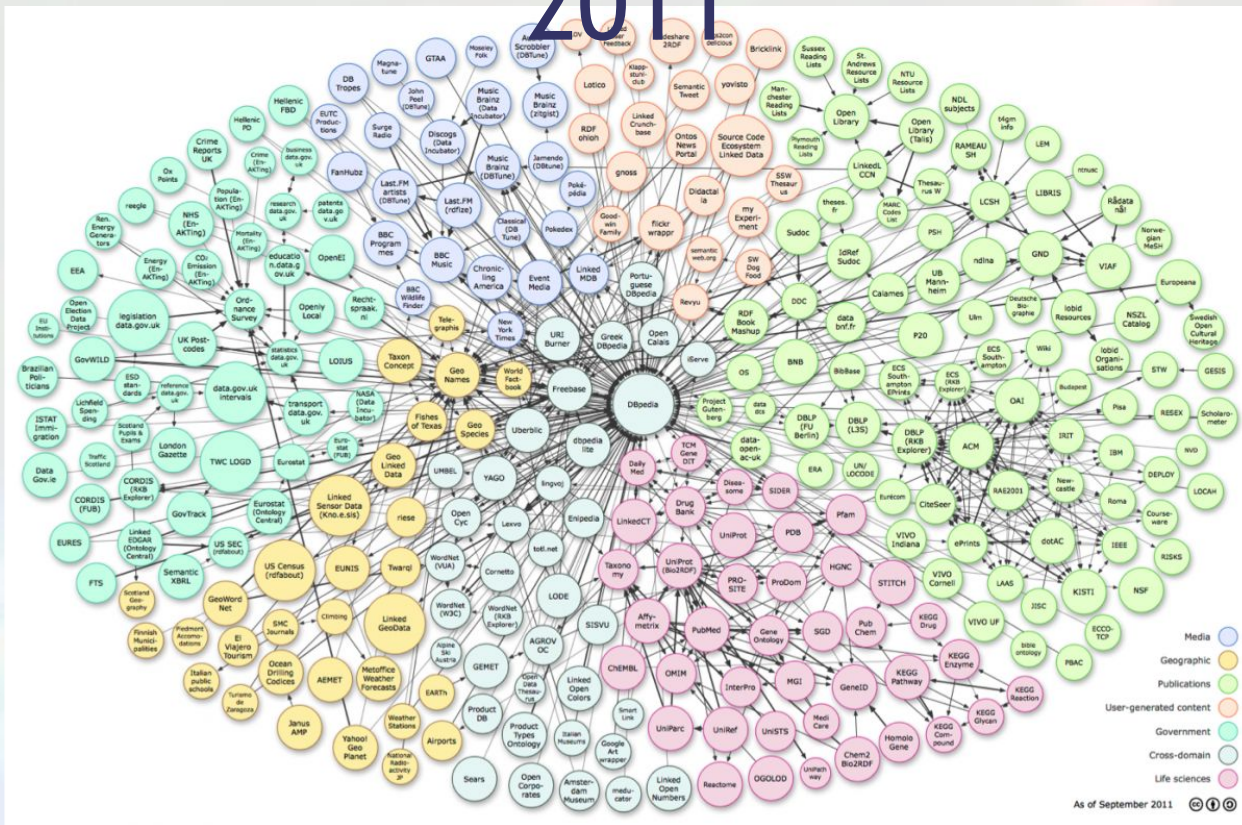


Source: <http://lod-cloud.net>

Datasets published following Linked Data 'format': **2008**

Linked Data

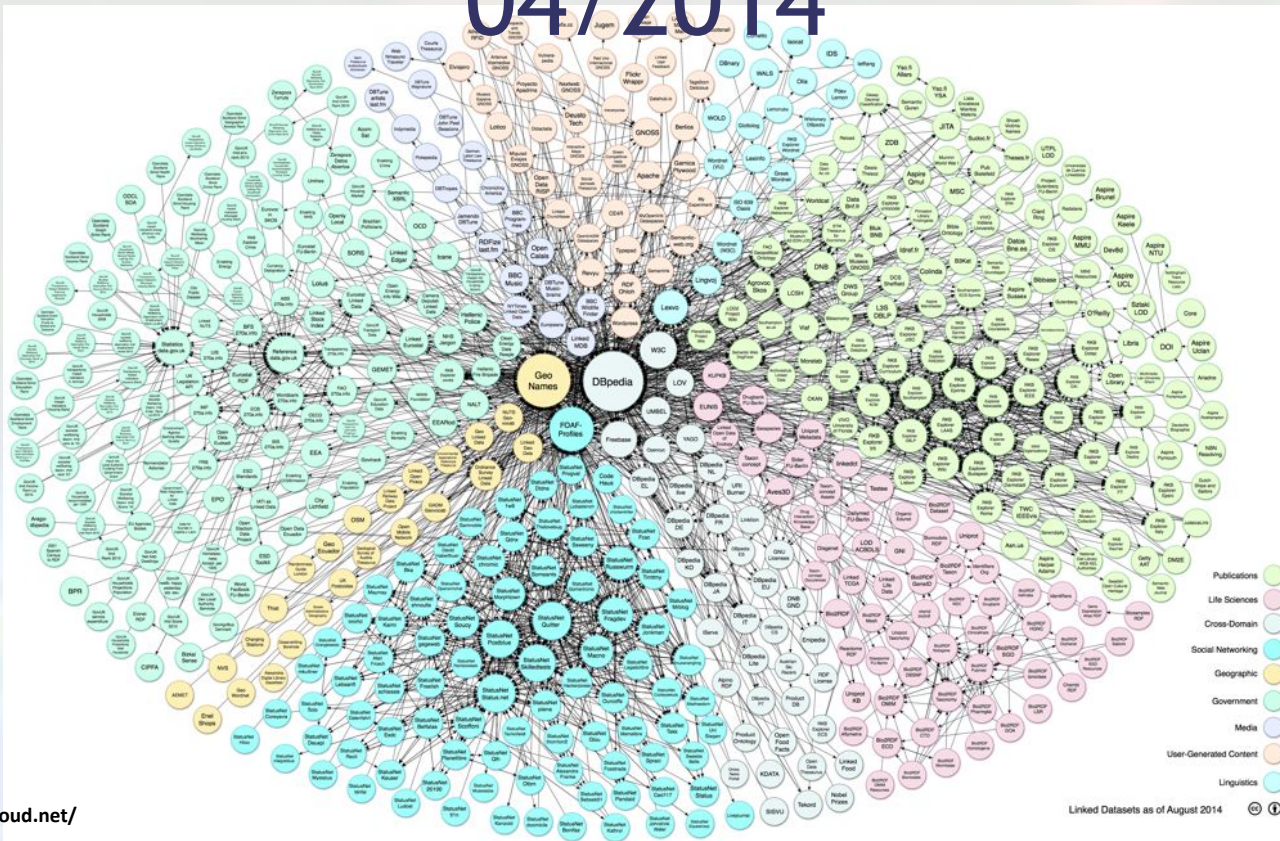
2011



Datasets published following Linked Data 'format': 2011

Linked Data

04/2014

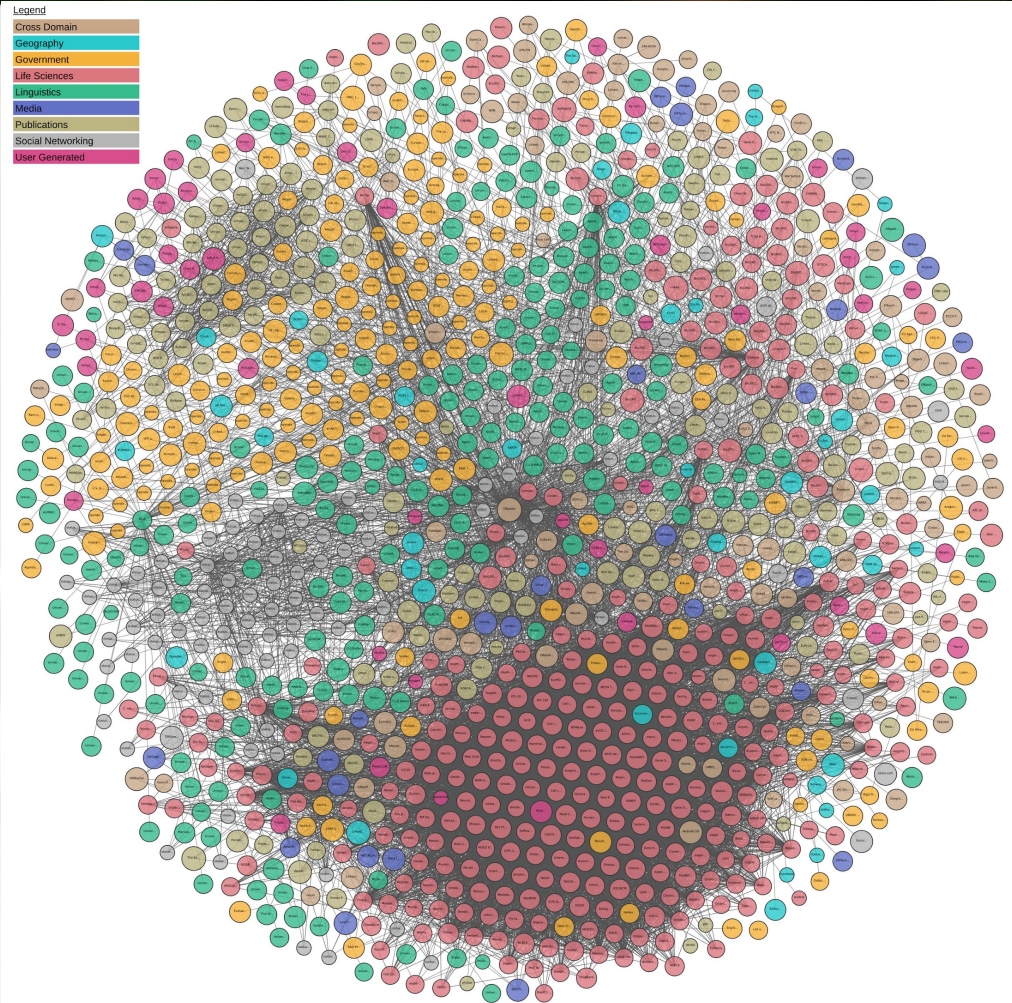


Linked Data 03/2019

1,239 datasets

16,147 links

<https://lod-cloud.net/>



Medical Subject Headings (MeSH)

<https://www.nlm.nih.gov/mesh/meshhome.html>

- “National Library of Medicine's controlled vocabulary thesaurus.”
- used by the MEDLINE/PubMed article database
- 28,000 descriptors
- 90,000 entry terms

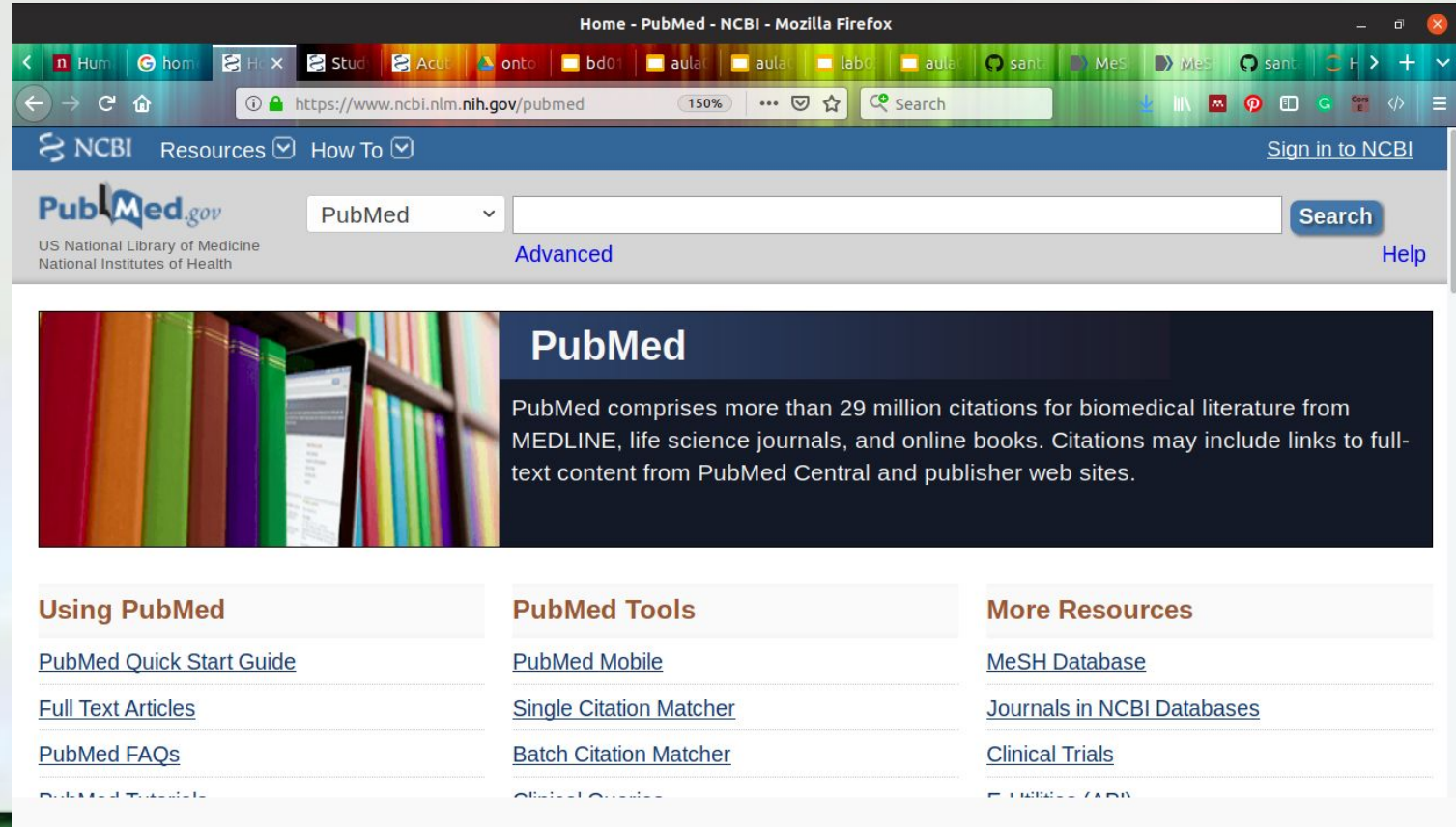
Hierarchical Tree

Myocardial Infarction

- MeSH Browser
 - <https://meshb.nlm.nih.gov/search>
- Myocardial Infarction
 - C14.280.647.500
 - C stands for Diseases
 - C14 Cardiovascular Diseases
 - C14.280 Heart Diseases
 - C14.2280.647 Myocardial Ischemia
- https://en.m.wikipedia.org/wiki/Medical_Subject_Headings

```
Cardiovascular Diseases [C14]
  Heart Diseases [C14.280]
    Myocardial Ischemia [C14.280.647]
      Acute Coronary Syndrome [C14.280.647.124]
      Angina Pectoris [C14.280.647.187] +
      Coronary Disease [C14.280.647.250] +
      Kounis Syndrome [C14.280.647.375]
      Myocardial Infarction [C14.280.647.500] -
        Anterior Wall Myocardial Infarction [C14.280.647.500.093]
        Inferior Wall Myocardial Infarction [C14.280.647.500.187]
        Non-ST Elevated Myocardial Infarction [C14.280.647.500.469]
        Shock, Cardiogenic [C14.280.647.500.750]
        ST Elevation Myocardial Infarction [C14.280.647.500.875]
        Myocardial Reperfusion Injury [C14.280.647.625]
```

PubMed



The image shows a screenshot of the PubMed website as viewed in a Mozilla Firefox browser. The browser's address bar shows the URL <https://www.ncbi.nlm.nih.gov/pubmed>. The page header includes the NCBI logo, navigation links for Resources and How To, and a sign-in link for NCBI. The main search area features the PubMed.gov logo, a search box with a dropdown menu set to 'PubMed', a search button, and links for 'Advanced' and 'Help'. Below the search area is a large banner with a background image of colorful books and a tablet. The banner contains the text: 'PubMed comprises more than 29 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.' Underneath the banner are three columns of links: 'Using PubMed' (PubMed Quick Start Guide, Full Text Articles, PubMed FAQs, PubMed Tutorials), 'PubMed Tools' (PubMed Mobile, Single Citation Matcher, Batch Citation Matcher, Clinical Queries), and 'More Resources' (MeSH Database, Journals in NCBI Databases, Clinical Trials, PubMed Central).

Home - PubMed - NCBI - Mozilla Firefox

NCBI Resources How To Sign in to NCBI

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed

Search

Advanced Help

PubMed

PubMed comprises more than 29 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.

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- [Full Text Articles](#)
- [PubMed FAQs](#)
- [PubMed Tutorials](#)

PubMed Tools

- [PubMed Mobile](#)
- [Single Citation Matcher](#)
- [Batch Citation Matcher](#)
- [Clinical Queries](#)

More Resources

- [MeSH Database](#)
- [Journals in NCBI Databases](#)
- [Clinical Trials](#)
- [PubMed Central](#)

PubMed MeSH Search

PubMed Search Builder

"Myocardial Infarction"
[Mesh] AND "Chest
Pain" [Mesh]

Add to search builder

AND ▾

Search PubMed

PubMed MeSH Search

Browser window: "Myocardial Infarction"[Mesh] AND "Chest Pain"[Mesh] - PubMed - NCBI - Mozilla Firefox

Address bar: [https://www.ncbi.nlm.nih.gov/pubmed/?term="Myocardial](https://www.ncbi.nlm.nih.gov/pubmed/?term=)

Search results for: "Myocardial Infarction"[Mesh] AND "Chest Pain"[Mesh]

Format: Summary | Sort by: Most Recent | Per page: 20

Search results: Items: 1 to 20 of 14939

Page 1 of 747

Filters: Manage Filters

Sort by: Best match | Most recent

Results by year

Download CSV

Titles with your search terms

Absence of chest pain and long-term mortality in patients with acute myocardial infarction [Open Heart. 2018]

Temporal Trends in Utilization of Cardiac Therapies and Outcomes [J Am Heart Assoc. 2018]

CT coronary angiography does not reduce mortality or myocardial infarction [BMJ Evid Based Med. 2018]

See more...

Article types: Clinical Trial, Review, Customize ...

Text availability: Abstract, Free full text, Full text

Publication dates: 5 years, 10 years, Custom range...

Species: Humans, Other Animals

Clear all

Show additional filters

1. [Effect of Prehospital Blood Draws on Length of Stay for Chest Pain Patients in the Emergency Department: A Pilot Study.](#)
DuCharme B, Macci Bires A, Montanye E, Khan M, DuCharme S, Linse M, Carlson JN. Crit Care Nurs Q. 2019 Apr;Jun;42(2):208-214. doi: 10.1097/CNQ.0000000000000257. PMID: 30807348 [Similar articles](#)

2. [Targeted metabolomic analysis of plasma metabolites in patients with coronary heart disease in southern China.](#)
Zhong Z, Liu J, Zhang Q, Zhong W, Li B, Li C, Liu Z, Yang M, Zhao P. Medicine (Baltimore). 2019 Feb;98(7):e14309. doi: 10.1097/MD.00000000000014309. PMID: 30762730 **Free PMC Article** [Similar articles](#)

3. [Spontaneous Coronary Artery Dissection Masquerading as Coronary Artery Stenosis in a Young Patient.](#)
Rawala MS, Naqvi STS, Yasin M, Rizvi SB. Am J Case Rep. 2019 Feb 6;20:159-162. doi: 10.12659/AJCR.913522. PMID: 30723187 **Free PMC Article**

Gene Ontology (GO)

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



Gene Ontology Consortium

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Downloads ▾

Tools ▾

About ▾

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Enrichment analysis

Your gene IDs here...

biological process

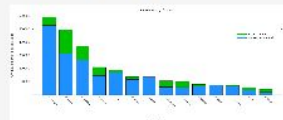
Homo sapiens

Submit

Help

Powered by [PANTHER](#)

Statistics



Gene Ontology Consortium

Search GO data

Search for terms and gene products...

Search

Ontology

[Filter classes](#)

[Download ontology](#)

Gene Ontology: the framework for the model of biology. The GO defines concepts/classes used to describe gene function, and relationships between these concepts. It classifies functions along three aspects:

molecular function

molecular activities of gene products

cellular component

Annotations

[Download annotations](#) (standard files)

[Filter and download](#) (customizable files <100k lines)

GO annotations: the model of biology. Annotations are statements describing the functions of specific genes, using concepts in the Gene Ontology. The simplest and most common annotation links one gene to one function, e.g. FZD4 + Wnt signaling pathway. Each statement is based on a specified piece of evidence. [more](#)

The mission of the GO Consortium is to develop an up-to-date, comprehensive, **computational model of biological systems**, from the molecular level to larger pathways, cellular and organism-level systems. [more](#)

Search documentation

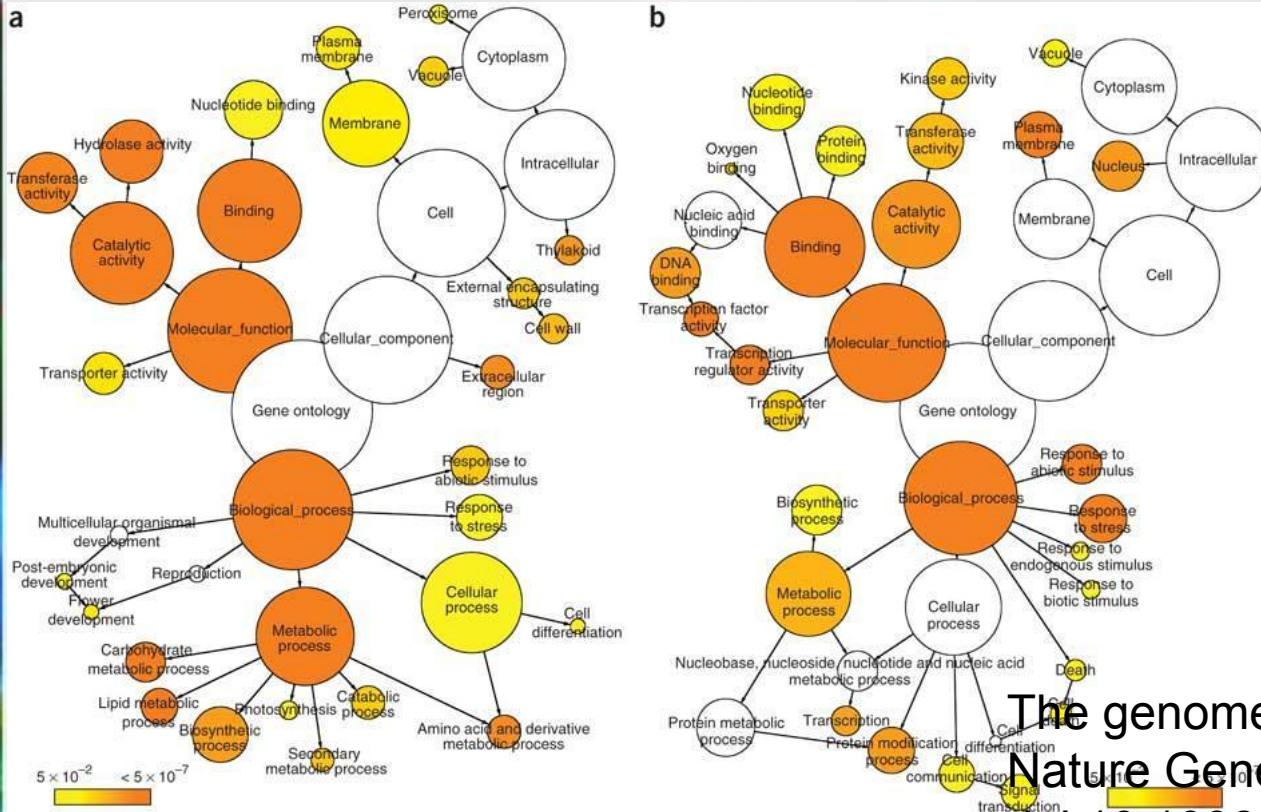
Search



What is the Gene Ontology?

- [An introduction to the Gene Ontology](#)
- [What are annotations?](#)
- [Enrichment analysis](#)
- [Downloads](#)

Gene Ontology



Biomedical Ontology

<https://www.bioontology.org/>



THE NATIONAL CENTER FOR
BIOMEDICAL ONTOLOGY

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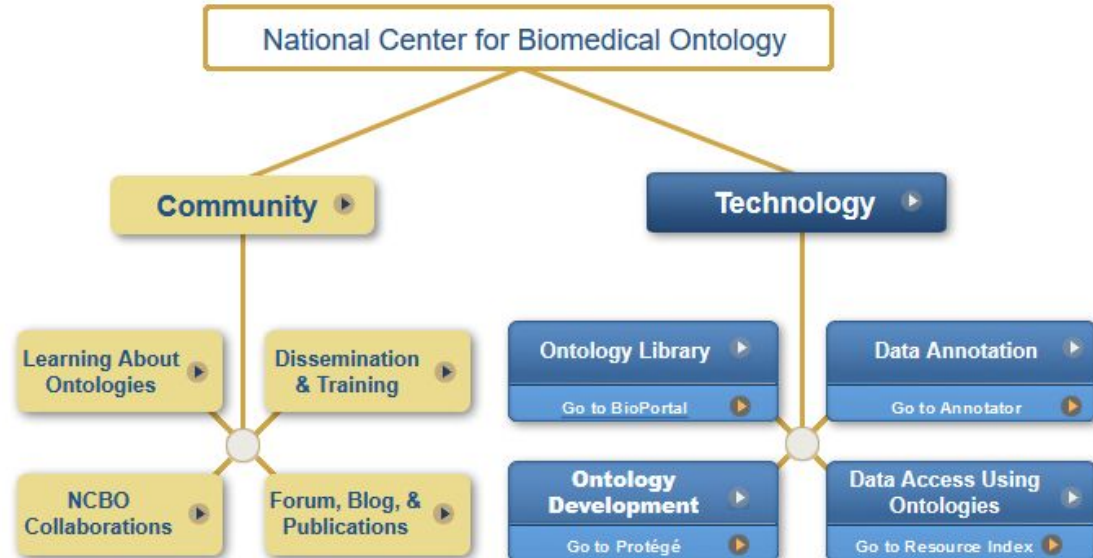
Community

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Of Current Interest

- ▶ **Update:** Manager's Blog: Virtual Appliance 2.5 Released
- ▶ **Release:** NCBO BioPortal 5.3 Released
- ▶ **Release:** NCBO BioPortal 5.0 Released
- ▶ **Update:** Manager's Blog: BioPortal Software Updates
- ▶ **Release:** NCBO BioPortal 4.23 Released
- ▶ **News:** AgroPortal Web Service Released
- ▶ NCBO Webinar Announcements - Subscribe
- ▶ NCBO Software Support - Mailing List Archive
- ▶ More News & Events



BioPortal

<http://bioportal.bioontology.org/>



Welcome to BioPortal, the world's most comprehensive repository of biomedical ontologies

Search for a class

Enter a class, e.g. Melanoma



[Advanced Search](#)

Find an ontology

Start typing ontology name, then

[Browse Ontologies](#)

Ontology Visits (March 2019)



BioPortal Statistics

Ontologies

Classes

Resources Indexed

BioPortal Statistics

Ontologies 766

Classes 9,238,120

Resources Indexed 48

Indexed Records 39,537,360

Direct Annotations 95,468,433,792

Direct Plus Expanded Annotations 144,789,582,932

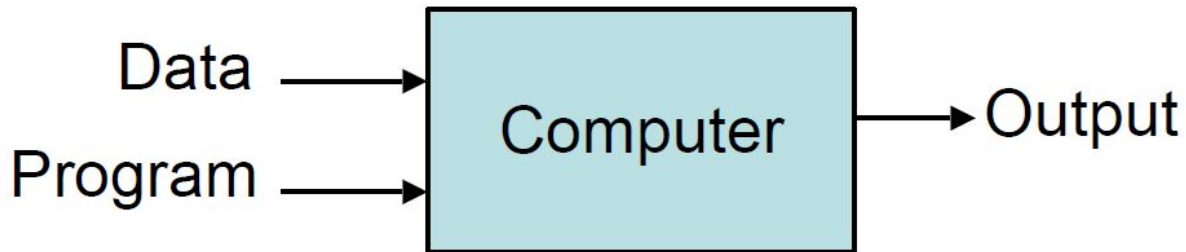
Human Phenotype Ontology

<http://human-phenotype-ontology.github.io/>

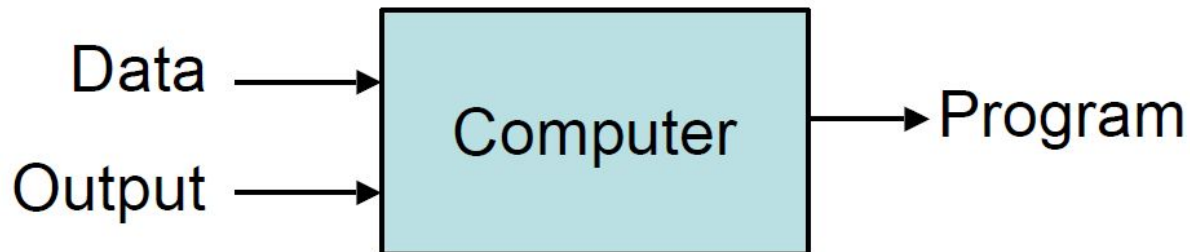
The background of the slide features a pair of glasses with a dark frame and light-colored lenses, resting on a vibrant green, textured surface. Numerous clear water droplets of various sizes are scattered across the surface, some reflecting light. The overall scene is brightly lit, creating a fresh and clean aesthetic.

Machine Learning

Traditional Programming



Machine Learning



(Domingos, 2017)

UCI



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Search

Repository Web



Machine Learning Repository

Center for Machine Learning and Intelligent Systems

[View ALL Data Sets](#)

Iris Data Set

Download: [Data Folder](#), [Data Set Description](#)

Abstract: Famous database; from Fisher, 1936



Data Set Characteristics:	Multivariate	Number of Instances:	150	Area:	Life
Attribute Characteristics:	Real	Number of Attributes:	4	Date Donated	1988-07-01
Associated Tasks:	Classification	Missing Values?	No	Number of Web Hits:	2512440

Source:

Creator:

R.A. Fisher

Donor:

Michael Marshall (MARSHALL%PLU '@' io.arc.nasa.gov)

<https://archive.ics.uci.edu/ml/datasets/iris>



Modeling Healthcare

Search NICE...



Improving health and social care through evidence-based guidance

Find NICE guidance

Browse guidance by area:

Conditions and diseases

Health protection

Lifestyle and wellbeing

Population groups

Service delivery, organisation and staffing

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Find journals and databases

Financial planning

Get involved

<https://www.nice.org.uk/>

NICE

<https://pathways.nice.org.uk/pathways/bacterial-meningitis-and-meningococcal-septicaemia-in-under-16s>

NICE National Institute for
Health and Care Excellence

NICE
Pathways

NICE
Guidance

Standards
and indicators

Evidence
services

Sign in

Search NICE's interactive flowcharts ...



Help

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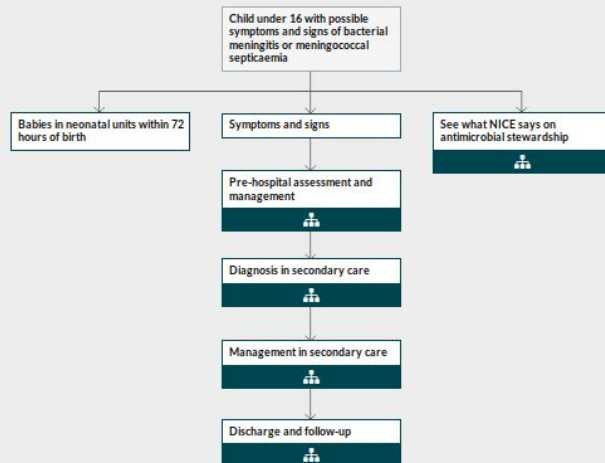
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Bacterial meningitis and meningococcal septicaemia in under 16s overview



Bacterial meningitis and meningococcal septicaemia in under 16s - everything NICE says in an interactive flowchart



About

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public

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Bacterial meningitis and meningococcal septicaemia in under 16s overview

Pre-hospital assessment and management of bacterial meningitis and meningococcal septicaemia

Diagnosis of bacterial meningitis and meningococcal septicaemia in secondary care

Management of bacterial meningitis and meningococcal septicaemia in secondary care

Discharge and follow-up for bacterial meningitis or meningococcal septicaemia

NICE

<https://pathways.nice.org.uk/pathways/heart-rhythm-conditions/heart-rhythm-conditions-overview#content=view-node:nodes-ventricular-arrhythmias>

NICE National Institute for
Health and Care Excellence

NICE
Pathways

NICE
Guidance

Standards
and indicators

Evidence
services

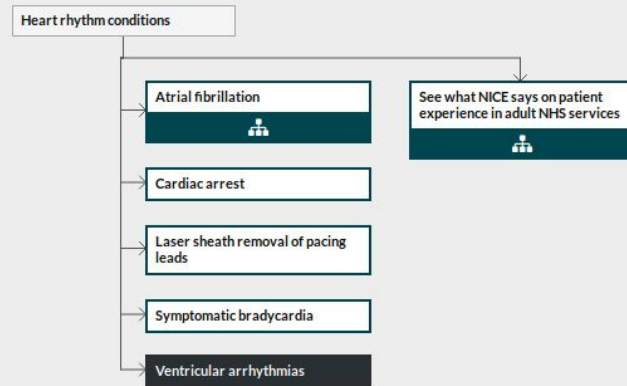
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Heart rhythm conditions overview



Heart rhythm conditions - everything NICE says in an interactive flowchart



Ventricular arrhythmias

Implantable cardioverter defibrillators and cardiac resynchronisation therapy

The following recommendations are from NICE technology appraisal guidance on [implantable cardioverter defibrillators and cardiac resynchronisation therapy for arrhythmias and heart failure](#).

Implantable cardioverter defibrillators are recommended as options for:


- treating people with previous serious ventricular arrhythmia, that is, people who, without a treatable cause:

**TAKE NOTICE: This Web site, AHRQ's National Guideline Clearinghouse,
will not be available after July 16, 2018.**

Federal funding through AHRQ will no longer be available to support the NGC as of that date. For additional information, read our full announcement.

We will continue to post summaries of new and updated evidence-based clinical practice guidelines until July 2, 2018. For any questions, please contact Mary Nix, mary.nix@ahrq.hhs.gov.



My Recent Searches: meningitis  Clear Recent Searches

<https://www.guideline.gov/>

AHRQ Search

U.S. Department of Health and Human Services
Agency for Healthcare Research and Quality
Advancing Evidence in Health Care

HHS.gov
AHRQ.gov

NATIONAL GUIDELINE CLEARINGHOUSE

SEARCH
1-1

Log into My NGC

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The AHRQ National Guideline Clearinghouse (NGC, guideline.gov) Web site will not be available after July 16, 2018 because federal funding through AHRQ will no longer be available to support the NGC as of that date. For additional information, read our full announcement.

1-20 of 21 results for
"Cardiology"

NARROW RESULTS Clear All

Meets 2013 Inclusion Criteria (11)
 Includes NEATS Assessment (1)
 U.S.-based Organizations (14)
 Addresses Multiple Chronic Conditions (4)

Publication Date

From: 2008 To: 2017

Apply

Target Population Characteristics

Age

Aged, 60 and over (17)
 Aged (65 to 79 years) (17)
 Middle Age (45 to 64 years) (17)
 Adult (19 to 44 years) (17)

Show More

Gender

Female (21)
 Male (21)

Clinical Specialty

Cardiology (21)
 Anesthesiology (1)
 Critical Care (7)
 Dermatology (1)

Show More

Organization

Name

American Academy of Neurology (1)
 American Association of Neurological and Electrodiagnostic Medicine (1)
 American College of Cardiology Foundation (2)
 American Heart Association (2)

Show More

Type

Academic Institution (3)
 Federal Government Agency [U.S.] (3)
 Medical Specialty Society (6)
 National Government Agency [Non U.S.] (4)

Show More

Guideline Category

Diagnosis (21)
 Counseling (5)

1 2

Next >

SORT BY: Relevance | Date SHOW: 20 | 50 | 100 Compare Summaries

Clinical Algorithm Diagnosis Cardiology

GUIDELINE SUMMARY NGC-010428 2014 MAR
Management of acute atrial fibrillation and atrial flutter in non-pregnant hospitalized adults. Compare
University of Michigan Health System

GUIDELINE SUMMARY NGC-010432 1998 NOV 1 (REVISED 2014-JUNE 10)
2014 AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Compare
American College of Cardiology Foundation, American Heart Association

GUIDELINE SUMMARY NGC-009974 2013 JUL
Myocardial infarction with ST-segment elevation. The acute management of myocardial infarction with ST-segment elevation. Compare
National Guideline Centre

GUIDELINE SUMMARY NGC-010473 2006 (REVISED 2014-JUN)
Atrial fibrillation: the management of atrial fibrillation. Compare
National Guideline Centre

GUIDELINE SUMMARY NGC-010500 2008 SEP (REVISED 2014-JUL)
Multiple Chronic Conditions Compare
Chronic kidney disease. Early identification and management of chronic kidney disease in adults in primary and secondary care.
National Guideline Centre

GUIDELINE SUMMARY NGC-010652 2014 MAR 15
An official American Thoracic Society clinical practice guideline: diagnostic, risk stratification, and management of pulmonary hypertension of sickle cell disease. Compare
American Thoracic Society

GUIDELINE SUMMARY NGC-009925 2013 JAN
KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. Compare
Kidney Disease: Improving Global Outcomes

GUIDELINE SUMMARY NGC-010545 2014 OCT 14
Evidence-based guideline summary: diagnosis and treatment of limb-girdle and distal dystrophies: report of the Guideline Development Compare



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Cardiac arrhythmias in coronary heart disease

[Current guidelines](#)

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Cardiac arrhythmias is a group of conditions in which the heartbeat is irregular. Symptoms include: palpitations or a pause between heartbeats; light-headedness; shortness of breath; and chest pain.

Remit and target users

This guideline provides evidence based recommendations for the management of cardiac arrest and the arrhythmias associated with acute coronary syndromes, chronic coronary heart disease and cardiac surgery. It excludes arrhythmias not associated with coronary heart disease such as supraventricular tachycardias associated with accessory pathways or dual atrioventricular (AV) nodal physiology, arrhythmias caused by inherited ion channel disorders (eg long QT syndrome, Brugada syndrome) and arrhythmias associated with non-ischaemic cardiomyopathies.

Guideline

[Full guideline \(PDF\)](#)

[Quick reference guide \(PDF\)](#)

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Contact us

moray.nairn@nhs.net

SIGN 94, February 2007

ISBN 1 899893 69 5

<http://www.sign.ac.uk/sign-94-cardiac-arrhythmias-in-coronary-heart-disease.html>



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Management of invasive meningococcal disease in children & young people

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The most common clinical manifestation of invasive meningococcal disease is meningitis, but up to 20% of patients will develop meningococcal septicaemia, associated with the highest mortality. The majority of deaths continue to occur in the first 24 hours and the recorded case fatality rate varies between 2.6% and 10% each year.

Remit and target users

This guideline makes recommendations on best practice in the recognition and management of meningococcal disease in children and young people up to 16 years of age. It addresses pre-hospital care, referral, diagnostic testing, disease management, follow-up care and rehabilitation and considers public health issues.

Guideline

[Full guideline \(PDF\)](#)

[Quick reference guide \(PDF\)](#)

[Apple app](#)

[Android app](#)

Supporting material

 [Register of Interests](#)

[Search narrative \(PDF\)](#)

[Equality Impact Assessment \(PDF\)](#)

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SIGN 102 May 2008

<http://www.sign.ac.uk/sign-102-management-of-invasive-meningococcal-disease-in-children-and-young-people.html>

Child presents with a possible diagnosis of IMD

UNWELL CHILD
with fever and non-specific symptoms

MENINGITIS
(fever, vomiting, headache, neck stiffness, photophobia)

SEPTICAEMIA
(fever, petechial/purpuric rash)

- Urgent referral to secondary care
- Administer parenteral antibiotics as soon as IMD suspected

Primary care assessment

- Address carer concerns, ask about non-specific symptoms and comparisons with usual behaviour.
- Full clinical examination.
- Assess carer's abilities to deal with uncertainty and participate in management. If the carer's capacity to share in the management is in doubt, this should increase the risk category and alter the management plan
- Consider local circumstances when assessing risk level.

DIAGNOSIS OF IMD

Not supported by assessment

unlikely but may still develop

likely

"Safety netting" = advise on symptoms or signs of deterioration and how to get help in an emergency

"Safety netting" plus arrange interval assessment

- Urgent referral to secondary care
- Administer parenteral antibiotics as soon as IMD suspected

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