# **Bioinformatics glossary based Database of Biological Databases: DBD**

Siva Kiran RR, Setty MVN, Hanumatha Rao G\*

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# Abstract

Database of Biological/Bioinformatics Databases (DBD) is a collection of 1669 databases and online resources collected from NAR Database Summary Papers (http://www.oxfordjournals.org /nar/database/a/) & Internet search engines. The database has been developed based on 437 keywords (Glossary) available in http://falcon.roswellpark.org/labweb/glossary.html. Keywords with their relevant databases are arranged in alphabetic order which enables quick accession of databases by researchers. Database description provides brief information about the database with a link to main web page. DBD is available online and can be accessed at http://www.biodbs.info.

**Keywords:** Databases, biological databases, bioinformatics databases, bioinformatics glossary

### Introduction

Molecular biology has witnessed an information explosion in the last two decades as a consequence of development of rapid DNA sequencing techniques. The concomitant progress in computer based technologies has enabled molecular biologists in general and bioinformatists in particular to cope with this information deluge. Information from various sources explicitly presented in the form of biological databases is generally maintained by many institutions. They vary widely in their content, format and access method [Kihler 2004]. Biological data are being deposited in a database and the need for data analysis has made molecular biology databases vital tools for research. Although several databases are reported in literature, many researchers are not aware of their availability and these databases were not effectively utilized (Ajay Babu et al. 2005).

# R.R. Siva Kiran, MVN Setty

Department of Biotechnology, M S Ramaiah Institute of Technology, Bangalore – 560054, India

#### G. Hanumatha Rao\*

Center for Biotechnology, Department of Chemical Engineering, University College of Engineering, Andhra University, Visakhapatnam-530 003, India.

\*Tel: 0091 891 284 4878; Fax: 0091 891 274 7969 Email: ghr777au@gmail.com Databases of Biological Databases such as **DOD** – Database of Databases (http://www.progenebio.in/DoD/DoD.htm), **MetaBase** - The Database of Biological Database (http://biodatabase.org) and **The Molecular Biology Database Collection** – **Updates** (Baxevanis 2000), published annually by journal entitled "Nucleic Acids Research" help researchers to identify and correlate important queries beside providing a common platform for various molecular biology databases. Databases in DOD, Metabase & others have been grouped into categories as conceived by the respective authors. For instance, DOD has grouped 719 databases into 14 major categories (Galperin 2005) while Metabase has grouped 1119 databases into 21 categories.

The uniqueness of the present DBD is the alphabetic listing of all databases based on technical terms (keywords) viz. http://falcon.roswellpark.org/labweb/glossary.html. This facilitates very quick access to the desired databases.





# Steps involved in construction of DBD (Figure 1)

- Extraction of suitable keywords from bioinformatics glossary website http://falcon.roswellpark.org/labweb/glossary.html.
- Typing the keyword along with the suffix "Database" in popular search engines like http://www.google.com, http://www.yahoo.com etc.

Alphabets	Total keywords	Total number of databases	Some major keywords with total number of database linked to DBD	
А	16	64	Alignment – 8, Alternative Splicing – 22, Annotation – 12, Agricultural – 4	
В	20	68	Bacterial – 8, Bacillus – 6, Binding – 6, Biochemical Pathway – 9, Biological databases listing - 11	
С	48	88	Caenorhabditis elegans – 5, Cancer – 14, Chromosome – 9, Cytogenetics – 3, Cluster - 4	
D	33	76	Disease – 12, Domain – 9, Drosophila -15, DNA – 18	
Е	25	86	<i>E.coli</i> – 14, Enzyme – 16, Eukaryotic – 8, EST – 11, Expression databases – 5, EBI – 3, Evolution - 3	
F	12	19	Fish – 3, Fly -3, Functional Genomics - 4	
G	15	77	Genome – 38, Gene & Gene Expression – 16, Genetics – 7, Germ - 6	
Н	25	93	HIV – 21, Homologous & Homology – 17, Human – 18, Haemophilus – 3, Higher taxon - 5	
Ι	23	56	Inhibitor - 10, Intron – 6, Isotope - 4	
J	Nil	Nil	Nil	
K	4	4	Kinases – 1, KEGG - 1	
L	9	32	Ligand – 23, Liver proteome - 1	
М	41	258	Motif - 10, Metabolic Pathway - 11, Microarray - 22, Microbial - 15, Mitochondrial - 25, Mouse - 30, Mutation - 40	
Ν	11	34	NMR - 5, Nucleic - 4, Nucleotide - 6	
0	11	38	Oligo – 38, Organelles - 7, Ortholog - 9	
Р	52	297	Parasite - 10, Pathway - 12, PCR - 8, Peptide - 34, Phenotype - 9, Plant - 5, Plasmid - 10, Primer - 10, Probe - 13, Promoter - 15, Protease - 12, Protein - 53, Proteome - 18	
Q	3	11	QSAR - 6, Quantitative trait loci - 4	
R	19	113	Radiation hybrid - 6, Rat - 20, Retrovirus - 5, RNA - 39, Ribosomal – 7, Rice - 17	
S	34	132	Sanger - 4, Sequence - 44, Signal Transduction - 8, SNP - 16, Species - 5, Structure - 13, Synapse - 3	
Т	19	47	Taxonomy - 3, Transcript - 5, tRNA - 3, Transgenic - 3, Tumor - 9, Tree - 3	
U	3	7	Unigene - 4, UniProt - 2	
V	5	31	Variation - 9, Virus - 16, Vector - 4	
W	3	4	Worm - 2	
Х	3	4	X chromosome - 2, Xenopus laevis - 1	
Y	2	25	Yeast - 23	
Z	1	5	Zea mays - 5	

**Table 1:** Alphabetical listing of the number of keywords with the total number of databases linked to DBD (Database of Biological Database)

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For example genome keyword can be typed as "Genome Database" in search engine.

- Collection of databases from "NAR Database Summary Papers-Alphabetical List" available in the website (http://www.oxfordjournals.org/nar/database/a/)
- Listing all databases in tables along with suitable keywords.

Figure 2: Screenshot of Database of Biological Databases (DBD)

DED

DATABASE OF BIOLOGICAL DATABASE

ABCDEFGHIJKUMHOPORS(

Keywords	Database Description	2.0
Abstract	Deja Vor A Database of Highly Similar and Digilizate Citations	http://spore.awmeil.edu/dejaru/
AceDB	A hierarchical database system for displaying promis data (Gaenschahdis elegand)	http://www.acedb.org/
Activity	Functional DNA/RNA site activity	http://www.ngs.hiotet.net.ru/ngs/system
Acerthosiphon pisum	Aphi (Base - Genomic database for the pea aphid (Acerthouphon pisum)	http-l/www.sphidbase.com/
Aedes sp.	Ander angypti Database	http://www.broad.mitedu/annotation/dis-
Alignment	Homologius Structure Alignment Database (HOMSTRAD)	http://www.cryst.bioc.cam.at.uk/-homstro
	Protein Alignments organized as Structural Superfamilies	http://caps.ncbs.res.in/campass/pass? htt
	EMBL-ALION Information for Submitters	http://www.ebs.ac.uk/ww.bl/Dubmciscion/al
	Standards Alignment Database Honeyage	http://standards.netacad-curries.net/how
	BAliBASE (sersion 2.0) A benchmark alignment database,	http ihips u strashg frifriProducts Datab
	The BCANPE VERIDON 2.3.9 protein sequence scanzing package · User Ouide	http://www.comphio.durides.ar.uk/Softwa
	TAD A tormalized structural alignment database improving sequence -structure alignments	http://portal.acm.org/citation.cfm?id=109
	A Multiple Alignment Database	http://www.daimi.au.dk/~besers/TBiB2000
	CDD: Oursted alignments of protein domains from Pfam, SMART and COO databases	http://www.nchi.nlm.mih.gov/Diructure/cdd
	CE: Combinatorial Extension method to compute and review 3D protein structure alignments	http Htl adar adairs html
Allele	Allele frequencies and DNA polymorphisms	http://alfred.med.yale.edu/
Alternative Splicing	ASDB-Alternative Oplining Database	http://hamelton.lbi.gool-teplitski/alt/
	EDAS EST Derived Alternative Building Database	http://www.ig-milk.ru/8006/EDAS/

# **Features of DBD:**

eed by clicking the first alphabet of the keyword

All keywords are arranged in alphabetic order as shown in Figure 2. Databases are listed along with the keywords (Table 1). The description of database has been reduced so as to accommodate more databases with keywords. Websites pertaining to bioinformatics keywords like Alignment, SQL, Base Pair, Blast, Biotechnology etc are also listed for helping researchers to reduce their time in finding suitable information. Tutorial websites are also

listed along with databases. The listed databases or tutorial websites are based solely on the display of the relevant websites present in search engines.

#### Conclusion

The primary aim of DBD is to provide an easy access to a number of databases, tutorial websites etc. based on keywords. Brief description about the databases and keyword helps the users to know the contents of the database, their respective keywords and database links. The DBD shall be updated periodically for the benefit of researchers and more bioinformatics/biology keywords will also be added to the database. We are confident, that the DBD will be highly useful tool in the hands of molecular biologists and bioinformaticians.

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