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Open Access Databases and Search Engines for Life Science: An Overview

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Abstract-The Life Sciences is an interdisciplinary branch of Science. With growing amounts of Life Science data available and coming in from a variety of input points and burgeoning over time, figuring out approaches to best manage, establish, and control data so that it can be evaluated to extract significant and advantageous information is a challenge. In this paper, we describe the major open access databases and search engines useful in Life Science setting for finding and retrieving articles in academic journals, archives or other congregations of scientific and other articles.

Index Terms- BioOne; Database; DOAJ; Google Scholar; Index Copernicus; Intute; Life Science; Open access; SciELO; Science.gov

1. INTRODUCTION

A database is a systematized collection of data and search engines are basically software program that help us to find what we are looking for on the internet .In recent years, Biological databases have significantly established a lot, and became a part of the biologist's daily toolbox. Biological databases are libraries of data, collected from scientific research, experimentations and published literatures of life science. Open access databases maintain database of world-wide scholarly content and allow unrestricted online access to peer-reviewed scholarly research. Primarily they are envisioned for scholarly journal articles, but is also provided for a rising number of theses, scholarly monographs and book chapters that helps researchers find the utmost quality literature relevant to their work.

2. SOME IMPORTANT OPEN ACCESS DATABASES FOR LIFE SCIENCES

2.1 Index Copernicus

Index Copernicus (IC) is an online database of user contributed information including scientist profiles, scientific institutions, projects and publications.Index Copernicus was established in 1999 in Poland and was named after Nicolaus Copernicus. The database is operated by Index Copernicus International and is a specialized platform for encouraging scientific attainments, besides supporting national and international collaboration amongst scientists, publishers of scientific journals and scientific entities. IC Scientists, IC Publishers Panel, IC Institutions and IC Journal Master List are important products of IC. The IC Scientists currently comprises around 300 thousand profiles of scientists. The IC Publishers Panel is a unique tool, it enables the process of publishing scientific journals. With the support of the IC Publishers Panel editors can proficiently manage the editorial by easing

acquisition, choice of articles to magazines and editing. Whereas the IC Institutions is the perfect tool for scientific objects, research institutes, universities and other entities conducting research to management scientific research and development work. It also lets reporting and observing the progress of the career development of researchers. The IC Journal Master List is scientific journal .There are currently more than 7000 journals from around the world, including about 700 from the Polish. The journals listed in this database positively estimated a multidimensional parameter, providing a great quality. More information about CI can be obtained at en.indexcopernicus.com/ [1]

2.2 DOAJ

The Directory of Open Access Journals (DOAJ) is a website that lists open access journals and is maintained by Infrastructure Services for Open Access (IS4OA). DOAJ was founded in 2003 by Lars Bjørnshauge and he was also a Director of Libraries at Lund University from 2001 to 2011.Other team members of DOAJ are Sonja Braje, Dominic Mitchell and Rickard Zeylon. Projects Background lies on the proliferation of freely accessible online journals, the progress of subject specific pre- and e-print archives and collections of learning objects. The aim of the DOAJ is to surge the visibility and ease of use of open access scientific and scholarly journals, thus promoting their augmented usage and impact. According to DOAJ currently there are 77 Journals and 174446 articles in Life Sciences. More information can be found at http://www.doaj.org/oai [2]

2.3 SciELO

SciELO (*Sci*entific *E*lectronic *L*ibrary *O*nline) is a Bibliographic database and a digital library of open access journals. It is an electronic library covering a nominated collection of Brazilian scientific journals. Development of the SciELO began in 1997 and in 1998 it went live. The library is a fundamental part of a project being developed by FAPESP - Fundação de Amparo à Pesquisa do Estado de São Paulo, in partnership with BIREME - the Latin American and Caribbean Center on Health Sciences Information. At present there are twelve countries in the SciELO network and its journal collections: Argentina, Brazil, Colombia, Chile, Costa Rica, Cuba, Spain, Mexico, Portugal, Peru, South Africa and Venezuela. According to SciELO currently the database comprehends 1,161 open access scientific journals, 33,304 issues (journal numbers), 487,517 scientific articles and 10,818,452 citations. For further information go to www.scielo.org [3]

2.4 Worldwide Science

Worldwide Science was released in 2007 and was established by the U.S. Department of Energy's Office of Scientific and Technical Information. Worldwide Science is global Science access comprised of national and international scientific databases and portals. It is multilingual and it also translates globally-dispersed multilingual scientific literature. It implements federated searching to offer its reportage of global Science and research results. It permits anybody with internet access to launch a single-query search of national scientific databases and portals in more than 70 countries. More information about Worldwide Science can be downloaded at http://worldwideScience.org [4], [5]

2.5 Intute

Intute is a free online web service that helps to find web resources to study and research.Intute was created in July 2006 by a consortium of seven universities located in the UK, working together with a whole host of partners. Intute provides access to online

resources, via a large database of resources. This process also incorporated the Virtual Training Suite, a series of continuously updated, free online Internet training tutorials for over 65 subject areas. Individual resource is reread by an academic expert in the topic, who marks a short review of between 100 to 200 words, and articulates via several metadata fields. In July 2010 Intute provided 123,519 records and the same year its funding was significantly reduced and in August 2011 it was closed. The website will remain available for three more years following its closure. However the site will not be retained or updated and no additional resources will be added. More information can be found at www.intute.ac.uk/ [6]

3. SOME IMPORTANT SEARCH ENGINES FOR LIFE SCIENCES

3.1 Bioinformatic Harvester

Bioinformatic Harvester is a bioinformaticmeta search engine which is a web based tool. It is named 'Harvester' that bulk-collects bioinformatic data on human proteins from various databases and prediction servers. It was developed in 2011 by Urban Liebel, BjörnKindler.The information on every single protein is assembled on a single HTML page as a combination of database screen-shots and plain text. A complete text Meta search engine works analogous to Google, lets screening of the whole genome proteome for existing protein functions and predictions in a few seconds. It can relate and check the quality of diverse database entries and prediction algorithms on a particular page. A feedback forum allows users to comment on Harvester and to report database inconsistencies. This database is currently operational for *Arabidopsis thaliana*, *Drosophila*, human, mouse, rat and zebra fish based information. It cross links approximately 50 major Bioinformatics resources and collects several types of information like text based information, graphical elements etc. It is freely available to the academic community at http://harvester.embl.de.[7]

3.2 BioOne

BioOne is a global, unremunerative publisher carrying together scientific societies, publishers, and libraries to offer access to peer-reviewed, critical research in the biological, ecological, and environmental sciences. It was established in 1999 in Washington DC by five founding organizations—the American Institute of Biological Sciences (AIBS), the Scholarly Publishing &Academic Resources Coalition (SPARC), The University of Kansas, the Greater Western Library Alliance (GWLA), and Allen Press, Inc. Main aim of BioOne is to make scientific research more accessible through a growing portfolio of products including:
BioOne Complete- is a full-text aggregation of more than 80 peer-reviewed, scientific journals focused in the biological, ecological, and environmental sciences.
Elementa- Science of the Anthropocene. During this era of human impact Element publishes original research reporting new knowledge of the Earth's physical, chemical, and biological systems, feedbacks between human and natural systems. It is an open access scientific journal which was launched in 1999.It is available freely and immediately to the world.
BioOne is also made reachable at no cost to over 3,500 bodies in the developing world. Overall BioOne works for a community of over 140 societies in addition institutional publishers, 4,000 retrieving institutions, and millions of researchers globally. More information can be found at www.bioone.org/ [8],

3.3 Google Scholar

Google Scholar is a freely accessible web search engine that indexes the full text of scholarly literature across an array of publishing formats and disciplines. Released in November 2004, the Google Scholar index consists of maximum peer-reviewed online journals of Europe and America's biggest scholarly publishers, scholarly books and additional non-peer reviewed journals. Its functioning is similar to the freely available CiteSeerX and getCITED. Google Scholar too resembles the subscription-based tools, Thomson ISI's Web of Science and Elsevier's Scopus. It offers assembled search through a vast range of resources. The web address of google scholar is http://scholar.google.com/ [9]

3.4 GoPubMed

GoPubMed is a knowledge-based search engine for biomedical texts. It allows significantly faster finding information needed through the use of biomedical background knowledge. The system was developed at the Dresden University of Technology by Michael Schroeder and his team at Tran insight .It retrieves citations according to the query given by the user and then the citations are linked in the "What"-category. During the retrieval GoPubMed fetches relevant abstracts in PubMed which contain the biomedical concepts related to the user's query. The technologies used in GoPubMed are generic and can in broad sense be applied to any kind of texts and any kind of knowledge bases. GoPubMed is one of the first Web semantic search engines. More information about this search engine can be found athttp://www.gopubmed.com/ [10]

3.5 Ingenta

Ingenta is the world's biggest resource for scholarly publications founded in 1998. Ingenta delivers technology and associated services to the publishing and information industries. Its software permits scholarly, financial and business publishers to make content available to online institutional and individual end users, under a variety of business models. It is perfect for publishers looking to put their content online for the first time which increases the global visibility of their publications. Today, Ingenta Connect has been delivered to over 13,500 publications and contains over 4.5 million articles. As yet, Ingenta has over 300 publisher customers, 25,000 institutional library customers and 2 million end users. Ingenta conveys over 1 million full text articles each month as well as supports over 31 million user sessions. More information can be found at http://www.ingentaconnect.com./ [11]

3.6 Mendeley

Mendeley is a free reference manager and academic social network. It was founded in November 2007 by three German PhDs and is based in London. Mendeley's first public beta version was released in August 2008.Here the user can make his own fully-searchable library in seconds, cite as he writes, and read and annotate PDFs on any device. It conglomerates Mendeley Desktop, a PDF and reference management and Mendeley Web for researchers. The basic version of Mendeley is free but requires registration of users. It was purchased from the Elsevier publishing company in 2013. For extra information go tohttp://www.mendeley.com [12]

3.7 Science.gov

Science.gov is a web_portal and specialized search engine. The first version of Science.gov was launched in December 2002, providing for the first time comprehensive public access and a unified search of the government's stores of scientific and technical data. Science.gov is an interagency inventiveness of 18 U.S. government science organizations within 14 Federal

agencies. Currently it is in its fifth generation. It delivers a search of over 38 databases from 14 federal science agencies and 200 million pages of scientific data with just one request. Its "Alert" service, allows users to receive e-mail alerts about current science progresses in their zones of interest. For more information go to www.science.gov/ [13]

3.8 VADLO

VADLO (Vud-lo) is a search engine for biology and biomedical tools, reagents, PowerPoint's, protocols, and bioinformatics resources. It is the fastest growing search engine in Biology. VADLO provides its services to all branches of life sciences, inclusive of Molecular Biology, Structural Biology, Zoology, Biochemistry, Genetics, Genomics, Proteomics, Botany, Evolutionary Biology, Biophysics, Biomedical Research, Cell Biology, and Biotechnology. VADLO is an autonomous search engine, not associated with Bing, Yahoo, and Google. For more information go to www.vadlo.com [14]

4. CONCLUSION

In today's domain, where too much of data are generated every day in science fields. It becomes very difficult to store, organize, retrieve and maintain the information. These search engines and databases manage experimental results and also improve search sensitivity, efficiency and join multiple data sets. So, every single person is using these search engines on a regular basis. They have become the spine of the internet and horses of the web. Therefore the significance of these search engines can't indeed be denied by anyone. On the other hand life science databases play a crucial role in life sciences. They offer users the opportunity to access a wide variety appropriate data. As these are free of cost for readers and their institutions they are free on the public internet. Therefore the main goal of aforesaid search engines and online databases is to allow anyone, anywhere and anytime, free access to the outcomes of scientific research in Life Sciences.

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