

Some studies on Hosts Offering Biotechnology Databases

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Abstract:

Databases may be searched online through appropriate networks and gateways by direct connection or through a host (online service, vendor). Access to a wide range of biotechnology databases is available to anyone equipped with a computer fitted with a modem linked through a telecommunications network to hosts offering biotechnology databases. It is necessary to have a license agreement with hosts which then authorize the user a password. With this password, the user has access to the host computer and can request access to the database of interest. If the user has access to Internet, he can directly access many databases in genetics and molecular biology.

Keywords: Bioinformatics, molecular, host, networks, DBMS.

1. Introduction

The availability of high-quality, up-to-date and comprehensive information is an important requirement in biotechnology and its applications in the ever widening fields of medicine, pharmacy, agriculture, food industry and the environmental sciences. Advances in biotechnology, especially in genome research, depend to an increasing extent on which required information is made available and how it is used. The growing amount of data, especially the genome projects, deliver an enormous number of sequence data, meaning that collecting, processing and disseminating these data is only possible with the help of modern information technology and international co-operation[1].

Modern biotechnology is highly information-dependent and uses a wide variety of information sources and information technologies[2]. The consequences of rapid developments in biotechnology with its tremendous volume of data and in informatics with its potential for processing and using data are:

1. In relation to research –
 - the creation of a new scientific field: Bioinformatics
2. In relation to infrastructures –
 - very large databases and smaller, more highly specialized databases
 - highly sophisticated software for processing and using these databases
 - efficient communication networks for access to databases and information exchange
 - establishment of information centers for collection, processing and distribution of information
 - comprehensive information services

Many databases are available in various types of media: Online via a number of networks and hosts, or on CD-ROM, diskette, magnetic tape, or as a printed version. The overall growth in the online database industry during the past year can be traced through the statistics: 300 online databases were registered in the 1979 edition of *Directory of Online Database*[5]. In the 1993 edition, the Gale Directory of Databases registered profiles more than 5200 online databases, among them about 250 with relevance to biotechnology, and more than 3200 database products offered in portable form, among them about 150 with relevance to biotechnology (MAR-CACCIO, 1993). The number of records stored in these databases increased from 52 million (1975) to about 5 billion (1993)[5,7].

2. Methodology

There are many international hosts offering databases for biotechnology. The most important hosts are:

- **DIALOG Information Services, Inc., USA** offering more than 450 online databases and CD-ROMs (DIALOG OnDisc), In the fields of biosciences and biotechnology: BIOSIS, LIFE SCIENCES Collection, DERWENT Biotechnology Abstracts, CEABA, PASCAL, BioBusiness, BioCommerce Abstracts and Directory, MEDLINE, EMBASE, Pharmline, CA, FSTA, CAB Abstracts, Enviroline, World Patents Index, Science Citation Index, Predicasts, CLAIMS, etc.

- **Data-Star, Switzerland**
Offering more than 300 online databases. In the fields of biosciences and biotechnology: BIOSIS, CEABA, BioBusiness, BIKE, BioCommerce Abstracts and Directory, DERWENT Biotechnology Abstracts, Immunoclone Database, MEDLINE, EMBASE, Pharmline, CA, FSTA, CAB Abstracts, Enviroline, Science Citation Index, Predicasts, etc.
- **STN International (Scientific and Technical Information Network with Service Centers in Europe, USA and Japan)**
Offering more than 160 online databases. In the fields of biosciences and biotechnology: BIOSIS, CEABA, DERWENT Biotechnology Abstracts, World Patents Index, BIOBUSINESS, LIFESCI, MEDLINE, CA, EMBASE, GenBank, FSTA, AQUASCI, CABA, etc.
- **ESA-IRS Information Retrieval Service, Italy**
offering more than 200 online databases. In the fields of biosciences and biotechnology: BIOSIS, CAB Abstracts, CA, PASCAL, FSTA, INSPEC, AGRIS, ASFA, ENVIROLINE, etc.
- **DIMDI (German Institute for Medical Information and Documentation, Köln, Germany)**
offering more than 80 online databases. In the fields of biosciences and biotechnology: BOSIS, MEDLINE, EMBASE, BIKE, IMMUNOCLONE DATABASE, CANCERLIT, AIDSLINE, CAB Abstracts, AGRICOLA, AGRIS, FSTA, BIOETHICSLINE, SCISEARCH, CURRENT CONTENTS, etc.

Special hosts for biosciences and biotechnology:

- **Microbial Strain Data Network (MSDN)** is an international network of microbial, cell line, and biotechnology information resources and offers among others the following databases and services: MSDN Directory, MiCIS, WDC Database, Hybridoma Databank, Animal Virus Information System, Brazilian Tropical Database; Databases with Catalogue Information (ATCC Catalogues, DSM Catalogue, NCYC/NCFB Catalogue, ECACC Catalogues, CBS/NCC Catalogue, Czech Catalogues, Russian Catalogues, etc.); Databases with Newsletter Information (Biotech Knowledge Sources, European Biotechnology Information Service, Biotechnology Courses); Databases with Nomenclature Information (DSM Bacterial Nomenclature Database, Bacterial Nomenclature); Bulletin Board Biodiversity Information Network, Information Resource on Release of Organisms); Electronic mail Service.
- **GENIUSnet at the German Cancer Research Center, Heidelberg, Germany** offers more than 30 online databases in the fields of biosciences and biotechnology: EMBL Data Library, GenBank, PIR International, SWISS-Prot, Protein Data Bank, Genome Data Base, OMIM Online Mendelian Inheritance, VecBase, HIV-base, HIV-Prot, IF-Prot, 5s RNA DataBank, AluBase, EPD, ReBase, etc.
- **ICECC Information Center for European Culture Collections, Braunschweig, Germany** offers more than 10 online databases in the fields of biosciences and biotechnology: MiCIS, DSM, MINE, etc.
- **Human Genome Information Resource (HGIR, USA)** develops and offers databases containing information on nucleotide probes, restriction fragments, physical and genetic maps, etc.
- **Life Science Network from BIOSIS (USA)** provides access to more than 80online databases in the fields of biosciences and biotechnology : BIOSIS Previews, BioExpress, BioBusiness, ATCC Catalogues Database, Biology Digest Online, CA Search, Life Sciences Collection, MEDLINE, World patents Index, etc.
- **Biosafety Information Network & Advisory Service (BINAS, United Nations Industrial Development Organization)** as an information network which will help meet an increasing need to standardize regulatory procedures for release of genetically modified organisms into the environment. The service will develop databases on existing guidelines, regulations and standards for the use and release of genetically engineered organisms.
- **BioLine Publications, UK** provides online access through the Internet network to journals, reposts, conference proceedings and newsletters in biosciences and biotechnology.

Which special services are offered by these hosts?

Most hosts also offer an extensive range of support services to assist in searching:

- Advanced front-end software packages that help searching online
- Cross-searching of complementary databases
- Help Desk to assist in online searching
- Comprehensive range of user aids and manuals
- Document Delivery Service for articles and patents that are referenced
- Seminars, training programs and workshops
- Electronic Mail Systems that allow sending and receipt of text messages online.

Each host has agents in most countries who provide technical support and training. They provide information to all those who are concerned with online access to databases in the field of biotechnology.

In addition to hosts (see Sect, 3) and database producers, there are a number of information centers offering information services in the fields of biotechnology. Information services for biotechnology include: Production and marketing of databases, publications, information brokerage, workshops and seminars, consultancy services, document delivery, etc.

Some examples for information centers offering information services for biotechnology are:

USA: National center for Biotechnology information at the National Library of Medicine, Plant Genome Data and Information Center at the National Agricultural Library, BIOSciences Information Service, Institute for Biotechnology Information at the North Carolina Biotechnology Center, Human Genome Information Resource

UK: The British Library Biotechnology Information Service, European Bioinformatics Institute, BioCommerce Data Ltd, Royal Society of Chemistry Information Services

Germany: FachInformationsZentrum CHEMIE (FIZ CHEMIE, Information Center for Chemistry), Berlin

Italy: International Center for Genetic Engineering and Biotechnology

Switzerland: Biocomputing Biocenter, University of Basel

India: Biotechnology Information System Network (BTNET) with distributed information centers

3. Result

Increased use of databases for

- basic research (e.g., in genome research),
- applied research (e.g., for molecular modeling),
- technology transfer and improvement of innovations (e.g., to transfer research results to practical commercial applications and to help to introduce innovative technologies to the marketplace),
- coordination of national and international research programs (e.g., for the avoidance of duplicate work),
- competition analysis (e.g., for information concerning the marketability of products),
- improving the public perception of biotechnology (e.g., for the objective assessment of experiments in genetic engineering).

The use of databases and other information sources as an aid to increase the public perception of biotechnology: The lack of public acceptance of biotechnology is also a result of the lack of information, since there is a direct link between information and attitude. Researchers in the public perception of biotechnology agree that attempts to improve access to scientific information are highly desirable (GRINDLEY and BENNETT, 1993). Specific measures should be taken to enhance public perception mostly through the availability of objective information, especially in connection with biotechnology's impact on human health through the development of new pharmaceutical, diagnostic, and other medical products.

Conclusions for biotechnology information

The development and the use of databases become increasingly important to biotechnology in research and development, in industry, and in the public eye. The particular importance of biotechnology information is especially obvious in connection with the necessity of molecular biology databases. This can be seen from the high value of information in the frame of genome projects, as the U.S. Human Genome Program and the U.S. Plant Genome Research Program, which include large-scale projects combining mapping and sequencing with data collection and distribution.

The "information highway" exists per se in form of a highly developed information infrastructure, and the political changes brought the advantage that we have no unbridgeable frontiers. The task of biotechnology is to draw a map, not only in genome research, but also in the field of biotechnology information and bioinformatics with the aim of targeting the information highway. The combination of biotechnology and information technology is a challenge for both fields and should be a strategy for the future.

4. Conclusion

It is necessary to establish databases in specialized areas which are not yet covered, together with referral database systems containing information of the type "Who-What-Where" building one of the bases of information brokerage; and serving as worldwide guides which stewards the user through the information landscape to the desired information. Highly developed information networks and services are required for the creation and use of databases as well as for communication purpose.

5. References

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