

# THE INTERNATIONAL BIOTECHNOLOGY DIRECTORY

# THE INTERNATIONAL BIOTECHNOLOGY DIRECTORY

## 1991

Products, Companies,  
Research and Organizations

J. COOMBS & Y. R. ALSTON

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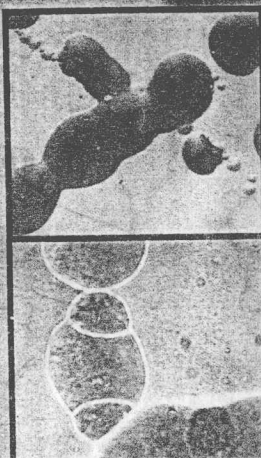
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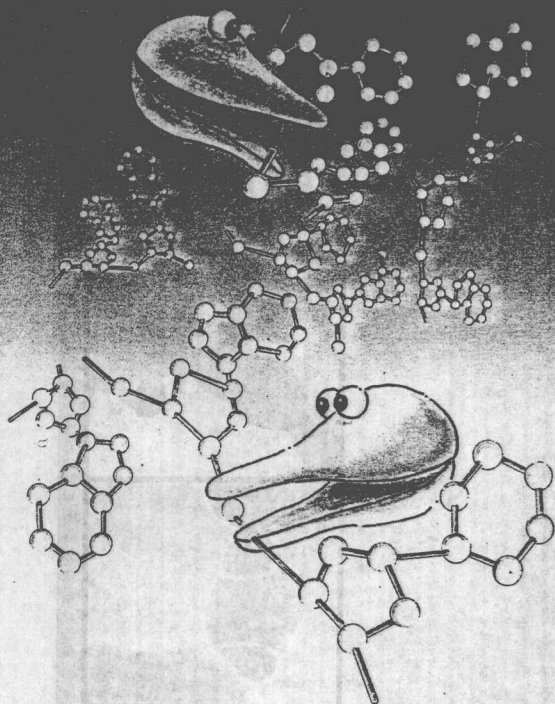
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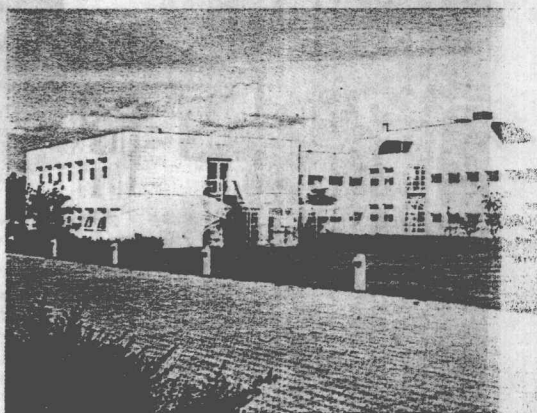
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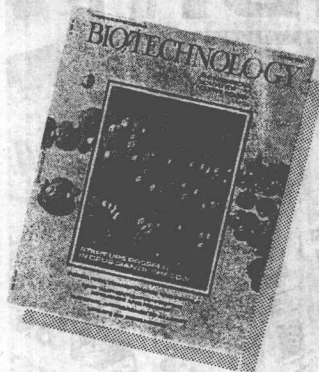
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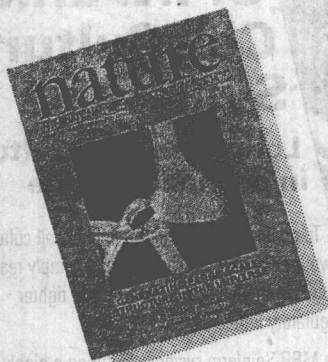
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## Preface to the Seventh Edition

This seventh edition of the Biotechnology Directory reflects the continuing need to update the activities of the industry. So once again numerous additions and revisions have been made - there are over 700 completely new entries in the Directory, while a further 3100 have been updated and 335 companies deleted. The significant rise in the number of new products and procedures reflects the growing concern for the environment and pollution control, as well as the development of new techniques for DNA amplification. As a result new products categories have been added to the Buyers Guide and the number of company products listed has been substantially increased.

Every year the volume of new and amended information is considerable and almost daunting. Once again the use of computerized data-handling has been increased and the firmer editorial control maintained, which we hope will be reflected in continued improvement in quality as well as quantity. The sheer volume of material scanned, means that the next edition must be started as soon as the previous one has gone to press. It is therefore all the more important that our readers help keep us informed of changes and additions in their organizations. We continue to welcome comments, which will be used in compiling the eighth edition. We encourage you, therefore, to send us promotional literature for specific products or services, as well as company or annual reports and to complete and return the questionnaire which appears in the directory

J Coombs and  
Y R Alston

August 1990



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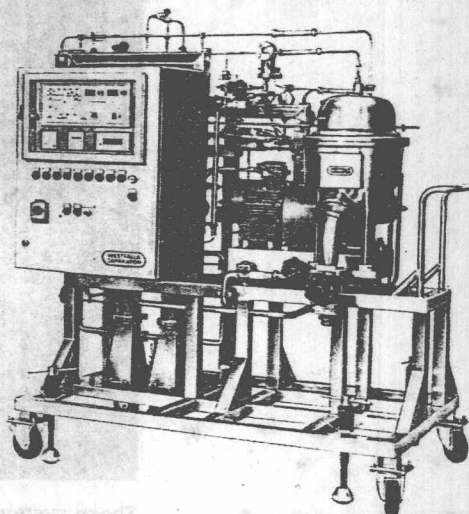
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# Introduction

The *Directory* covers biotechnology in Western Europe, North America, Brazil, Australasia and Japan. It provides both an overview of the extent of the present interest in this subject and a catalogue whereby suppliers of materials and services as well as major research activities can be identified.

In compiling this information a rather broad view of those areas of science and technology which can be regarded as being part of what is now established as biotechnology has been taken. In spite of the fact that the concept of biotechnology has now been with us for a decade or so there is still no universal agreement as to what exactly is meant by the term and a number of different concepts have evolved as follows:

(1) Biotechnology has been used as an alternative term for industrial microbiology. It has been taken to include those aspects of biology, chemistry and engineering which have to be combined in order to develop an industrial process aimed at conversion of suitable raw material (generally of a biological origin) to a commercially viable end product where the catalyst consists of, or is derived from, living cells (microorganisms or cell cultures from other organisms). In this case biotechnology covers reactor design, production of the biological catalysts, preparation of the feedstock and recovery of the desired product.

(2) Biotechnology has been used in such a way as to become synonymous with novel techniques based on recombinant DNA (genetic engineering) the formation of hybridomas and generation of monoclonal antibodies, the molecular biology of protein synthesis, cell and tissue culture and the use of other *in vitro* techniques which permit manipulation of biological organisms in such a way that they may be induced to produce totally new products, or to produce known compounds but in much greater quantities than normal.

(3) In a wider context biotechnology has been taken not only to include manufacturing processes, both traditional and new, but also to embrace aspects of animal and human health care, waste and pollution management, advanced plant breeding, enhanced oil recovery, mineral leaching, diagnostics and analytical equipment, biosensors, bioelectronics, biomass energy systems and so on.

In selecting entries for this *Directory* all three interpretations have been taken into account, including both the older established manufacturing processes based on fermentation to produce antibiotics, organic acids, brewers' yeast and alcoholic beverages, and the new concepts such as biomass energy and genetic engineering.

The book is divided into three parts:

- I International Organizations and Information Services
- II Government Organizations, Associations and Societies
- III Companies, Research Institutes and University Departments

The third part is extended to include a detailed 'buyers guide' which lists many of the major products and/or areas of research covered by those concerns listed in part III in addition to a series of indexes which i) lists the names of the part III entries in alphabetical order, ii) lists all the product classifications in alphabetical order and iii) lists the major classifications under group headings such as agriculture, food/feedstocks, or waste treatment.

## Part I International Organizations and Information Services

The potential of biotechnology is such that it will have dramatic effects in most areas of our lives within the next decade: it will influence changes in raw material used, as well as patterns of labour, health, energy, agriculture and food productions. To realize this potential will require cooperation between nations, with the international organizations playing an important role in such areas as the safety aspects of genetic engineering and establishment of uniform guidelines for release of manipulated organisms, patent protection, establishment of culture collections, seed banks and germplasm collections, regulation of food supplies, aspects of world and community health, and the promotion of information exchange and technology transfer as well as encouraging joint research projects. In many of these areas existing organizations have taken on the responsibility of dealing with specific problems or needs arising from biotechnology. In addition, more specialized bodies (such as the European Federation of Biotechnology) have been set up. Within the European Community, biotechnology has been identified as one of the key areas for research within the 'Framework' programme which will encompass and extend the previous activities under FAST, the concertation Unit for Biotechnology and the Bioengineering Programme of DG XII. The United Nations has supported the establishment of a significant number of microbial research centres (MIRCEN) around the world as well as the formation of the International Centre for Genetic Engineering and Biotechnology with facilities in New Delhi (India) and Trieste (Italy).

The rate of growth of biotechnology is such that it is impossible to assimilate all information available from primary sources. This has led to a proliferation of abstracting services, on-line database and newsletters. As will all areas of biotechnology, some have already ceased publication. However, the continued existence of others indicates that, although relatively expensive, they meet the needs of those wishing for a rapid and concise overview of what is happening with an emphasis on commercial aspects.

These publications, with contents not subjected to any type of peer review, are in addition to the many new titles which have emerged from publishers of established scientific journals. Some of these apparently new journals are in fact derived simply by changing the name of an existing series, whereas as others are completely new, reflecting the emphasis of research in a particular direction.



In this *Directory* both types of source material are listed. In general, the periodicals listed are those published in the English language or with English summaries and include both journals dedicated to biotechnology and those which contain some articles of relevance within the wider framework of biology, agriculture or medicine. The reason for this is that a number of the older, well-established publications attract the most important papers in a variety of fields, including biotechnology, whereas the proliferation of new journals has led to a deficiency in reports of high-quality original research. A further factor which is detracting from biotechnology literature at present relates to the question of patents and prior disclosure. In the past the primary objective of much academic research has been publication in a reputable journal. In some areas this is no longer the case, and the first indication of an important breakthrough may now be found in snippets of sometimes unattributed information presented in the newsletters.

To further aid the reader, the international organizations and information services each have an index listing the entries alphabetically under general categories of interest: agriculture, analytical systems and diagnostics, biological products, chemicals, consultancy services, energy and minerals, enzymes, equipment and chemicals to facilitate biotechnology, fermentation, food/feedstuffs, genetics, health care, home and commercial products and waste treatment.

## Part II Government Organizations, Associations and Societies

Part II presents entries which cover, alphabetically by country, central government organizations, learned societies, professional institutes and trade associations. Where the government department or ministry provides specific services or is responsible for various research facilities, these are also listed in the third part of the *Directory* in order that their services may be determined by reference to the products index or Buyers Guide.

## Part III Companies and Organizations: Products and areas of research

Entries in part III comprise companies, research institutes and university departments which have been arranged in alphabetical order by country (for the USA, alphabetically by state). Entries for universities and research institutes include not only designated centres of biotechnology, but also institutes and departments with relevant activities in molecular biology, medicine, agriculture, waste treatment and biomass energy.

The companies have been selected from three groups of activity:

(1) The well-established manufacturers of specific products, the consultancy firms and the engineering contractors etc. where activities can be fairly well defined.

(2) The new biotechnology companies. Some of these as yet have no commercial products, have published little factual information about their activities and vary greatly in size and facilities from a few people with one room of their own, through ventures supported through the backup of extensive university or institutional research capabilities, to major undertakings with purpose-built laboratories funded through venture capital funds and share offerings.

(3) The multinational companies. In some cases their activities may be difficult to fit into the framework based on country and product: activities in a given country may be restricted to the manufacture of only a few products (not necessarily employing biotechnology) plus distribution facilities for a much wider range of products. Other multinationals may be distinguished by the fact that they do not, as yet, have a significant product range based on biotechnology, but are making large investments through donations to universities, joint ventures with research institutes or other companies, or acquisition of smaller companies. For the sake of consistency subsidiaries and agents for such companies are included in the lists for individual companies. Independent agents supplying goods or services are also listed.

The Products, Research and Services Buyers Guide consists of a listing of the products and services supplied and/or researched by the companies and other organizations listed in Part III of the *Directory*. It is arranged alphabetical order by product and each product is followed by a list of relevant companies, research institutes and university departments including their country of origin.

All the organizations mentioned in Part III are listed in an alphabetical index. The various products and services are detailed with complete cross-referencing in the Buyers Guide Alphabetical Index and further categories in the Classification Index on the basis of their relevance to the following areas of activity: agriculture, analytical systems and diagnostics, biological products, chemicals, consultancy services, energy and minerals, enzymes, equipment and chemicals to facilitate biotechnology, fermentation, food/feedstuffs, genetics, health care, home and commercial products and waste treatment. Since a given product may fall into several classifications categories some duplication will be found in the lists.

# How to use this Directory

The directory is divided into three parts: Part I is arranged in alphabetical order, and Parts II and III alphabetically by country.

## Part I International Organizations and Information Services

*International Organizations:* The entries are arranged alphabetically. As many of the organizations are listed under acronyms, the International Organizations Classification Index at the end of the section (pp 8-10) groups the organizations under the following subject headings to make the entries easier to find:

- Agriculture
- Analytical Systems and diagnostics
- Biological products
- Chemicals
- Energy and minerals
- Enzymes
- Equipment and chemicals to facilitate biotechnology
- Fermentation
- Food/feedstuffs
- Genetics
- Health care
- Home and commercial products
- Waste treatment

*Information Services:* The entries are arranged alphabetically under three headings:

- Databases and abstracting services
- Journals
- Newsletters

The Information Services Classification Index (pp 41-47) groups the entries under the same subject headings as the International Organizations Classification Index. The types of entries are indicated by codes (D - Databases, J - journals, N - newsletters).

## Part II Government Organizations and Societies

Entries covering government departments, learned societies, professional institutes and trade associations are listed country by country. Each country is subdivided into *Government Departments and Societies and Associations*. Many research organizations and university departments are also listed in Part III, and their research or services listed in the Buyers Guide to Part III

## Part III Companies and Organizations: Products and areas of research

This section (and the associated Buyers Guide) constitutes the main core of the directory. Individual companies, research institutes and university departments are listed alphabetically by country and described in terms of products and research activities. In the United States section the entries are listed alphabetically by state. The Alphabetical Index to Part III (pp 469-509) lists all the entries in alphabetical order, and indicates the country (and for the USA the state) under which the entry appears. Non-commercial organizations appear in italics to distinguish them from companies.

### Indexes

*Alphabetical Index to Part III:* Lists all the entries in Part III as detailed above.

*Buyers Guide Alphabetical Index:* Provides a summary of all the headings appearing in the Buyers Guide. Sub-categories are cross-referenced to the main headings.

*Products, Research and Services Buyers Guide:* Many of you will find this section the most useful since all the products, research and services provided by the companies and research groups in Part III are presented here.

The Buyers Guide consists of over 500 main categories in alphabetical order. Under each of these categories those companies, research institutes or university departments which provide the relevant products or services are listed. As in the Alphabetical Index to Part III the country (and for the USA, the state) where the entry appears is shown, and non-commercial organizations are indicated by italics.

Many of the main categories have subcategories; thus Fermentation Processes includes 17 subcategories such as Air Lift, Chemostats and Multi-stage - each of which has its own code letter. The code letters also appear after the entry names to indicate the areas in which the various organizations are active. The absence of a code letter implies that the organization is involved in all the activities associated with the main category.

*Buyers Guide Classification Index:* Lists all the main categories of the Buyers Guide with their subcategories under the same areas of interest as the Classification Indexes to Part I detailed above.

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# **Part I**

## **INTERNATIONAL ORGANIZATIONS AND INFORMATION SERVICES**



# INTERNATIONAL ORGANIZATIONS

## Association of the Cheese Processing Industries ASSIFONTE

Schedestrasse 11, D-5300 Bonn, Germany.  
Tel: 21 48 38 Telex: 0886625

## Association of the Cider and Fruit Wine Industries of the EC avenue de Cortenberg 172, B-1040 Brussels, Belgium. Tel: 735 81 70

## Association of the Dairy Industries of the EC ASSILEC

140 boulevard Haussmann, F-75008 Paris, France.  
Tel: 227 12 51 Cables: 280050

## Association Europeenne pour la Biomasse AEBIOM

APCA, 9 avenue George V, F-75008 Paris, France.  
Tel: 47 23 55 40

Established 1990 to further the utilization of biomass for energy in Europe by promoting and coordinating national initiatives and the activities of member biomass organizations and societies, organizing meetings, providing information etc and encouraging technology transfer.

## CAB International

Wallingford, Oxfordshire OX10 8DE, UK.  
Tel: (0491) 32111 Telex: 847964

Farnham Royal, Slough SL2 3BN, UK, Tel: (02814) 2281

Supports four institutes: CAB International Institute of Entomology (CIE); CAB International Mycological Institute (CMI); CAB International Institute of Parasitology (CIP) and CAB International Institute of Biological Control (CIBC). Also supports 10 bureaux and provides information services, pest and disease identification services, biocontrol services and consultancy in agriculture and development. Carries out research in taxonomy and into the techniques and practical uses of biological control. Formerly the Commonwealth Agricultural Bureau.

## CAB International Institute of Biological Control

Imperial College, Silwood Park, Ascot, Berkshire SL5 7PY, UK.  
Tel: 0990 28426 Telex: 26587

Provides information and consultancy services in techniques of biological control as well as carrying out research.

## CAB International Mycological Institute

Ferry Lane, Kew, Surrey TW9 3AF, UK.  
Tel: 081 940 4086 Telex: 265871 Fax: 081 581 1676

Offers a range of services to biotechnologists and mycologists. Has 300,000 reference specimens of microfungi plus a culture collection of 12,000 different isolates. Other facilities include a library, on-line database, electron microscopy facilities and biochemical facilities as well as expertise in chemotaxonomy. Most of the former activities of the Biodeterioration Centre of the University of Aston have been transferred to this Institute. Also the official address secretariat for the International Mycological Association and the World Federation of Culture Collections.

## Central American Industrial and Technical Research Institute

Instituto Centro Americano de Investigacion y Tecnologia Industrial (ICAITI)

Avenida de la Reforma 4-47 Zona 10, Apartado Postal 1552, Guatemala.  
Tel: 310 631 Telex: 5312 icaiti

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41 Portland Place, London W1N 4BN, UK.

Promotes international cooperation in relation to medical and chemical research.

## CIRAD

Centre for International Cooperation in Agricultural Research and Development

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International Scientific Committee for Biotechnology International Council of Scientific Unions

51 boulevard de Montmorency, F-75016 Paris, France.

Tel: 1 45 25 03 29 Telex: 630553 Fax: 1 42 88 94 31

## COGENE

Committee on Genetic Experimentation

Institut Jacques Monod, 2 Place Jussieu, F-75251 Paris Cedex 05, France.

## Commission of the European Communities

JOULE Programme

DG XII - Biomass Energy, 200 rue de la Loi, Brussels B-1049, Belgium.

Tel: 2 235 11 11 Telex: 21877 comeu

Supports industrial and academic research through funding or counterpart funding of projects aimed at developing energy sources based on natural resources. Activities include aspects of plant breeding in relation to use of organic raw materials to produce fuels and chemicals as well as compost.

## Commission of the European Communities

Concertation Unit for Biotechnology in Europe (CUBE)

DG XII - CUBE, 200 rue de la Loi, Brussels B-1049, Belgium.

Tel: 2 235 11 11 Telex: 21877 comeu

Monitors developments in biotechnology, provides information and carries out assessments in order to assist the Biotechnology Steering Committee of the Commission, the interservices group responsible for coordination of biotechnology policies within the Commission's services. Also serves as a point of interaction between the Commission and biotechnology activities in the member states.

## Commission of the European Communities

BRIDGE Biotechnology Research for Innovation, Development and Growth in Europe

DG XII - F, 200 rue de la Loi, Brussels B-1049, Belgium.

Tel: 2 235 11 11 Telex: 21877 comeu

Provides funding for research and technology development in the area of biotechnology through collaborative projects between universities, institutes and industrial participants from member states. The programme, running from 1990 to 1994 continues and expands on the biomolecular engineering programme (1982-1986) and the biotechnology action programme (1985-1989).

## Commission of the European Communities

Division of Genetics and Biotechnology

DG XII - F2, 200 rue de la Loi, Brussels B-1049, Belgium.

Tel: 2 235 11 11 Telex: 21877 comeu

Provided funding and support for research in biotechnology through a series of research programmes which include the previous Biomolecular Engineering Programme (1982-86) and the Biotechnology Action Programme (1985-89) which covered basic enzyme engineering, second generation bioreactors, genetic engineering, in vitro cell culture, screening of new compounds of industrial interest and methods of risk assessment.