
THE BIOTECHNOLOGY DIRECTORY

1989

**Products, Companies,
Research and Organizations**

J. COOMBS & Y. R. ALSTON

- | | |
|-------------------------------|--------------------------------------|
| * Industrial Microbiology | * Recovery, separation, purification |
| * Genetic Engineering | * Diagnostics |
| * Pharmaceuticals/health care | * Analysis, Synthesis |
| * Fermentation | * Oil recovery, Mineral leaching |
| * Waste treatment | * Tissue and cell culture |
| * Biomass (systems) | * Veterinary products |

STOCKTON
PRESS

THE BIOTECHNOLOGY DIRECTORY 1989

**Products, Companies,
Research and Organizations**

J. COOMBS & Y. R. ALSTON

**STOCKTON
PRESS**

© Macmillan Publishers Ltd, 1989

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means without permission.

Published in the United States and Canada by
STOCKTON PRESS, 1989
15 East 26th Street
NEW YORK, N.Y. 10010, USA

The Library of Congress has catalogued this serial publication as follows:

Library of Congress Cataloguing in Publication Data

Coombs, J.

The international biotechnical directory, 1984

Includes index

1. Biochemical engineering — Directories.

I. Title.

TP248.3.C66 1983 660'.63'025 83-12138

ISBN 0-935859-50-0

Published in the United Kingdom by
MACMILLAN PUBLISHERS LTD
(Journals Division), 1989
Distributed by Globe Book Services Ltd
Brunel Road, Houndmills
Basingstoke, Hants RG21 2XS, England

ISBN 0-333-46745-0

LONZA



Bull's-eye!

The risk of missing the mark when shopping for intermediates is considerable: Will quality and price be right, will delivery deadlines be kept, are there no built-in environmental liability risks?

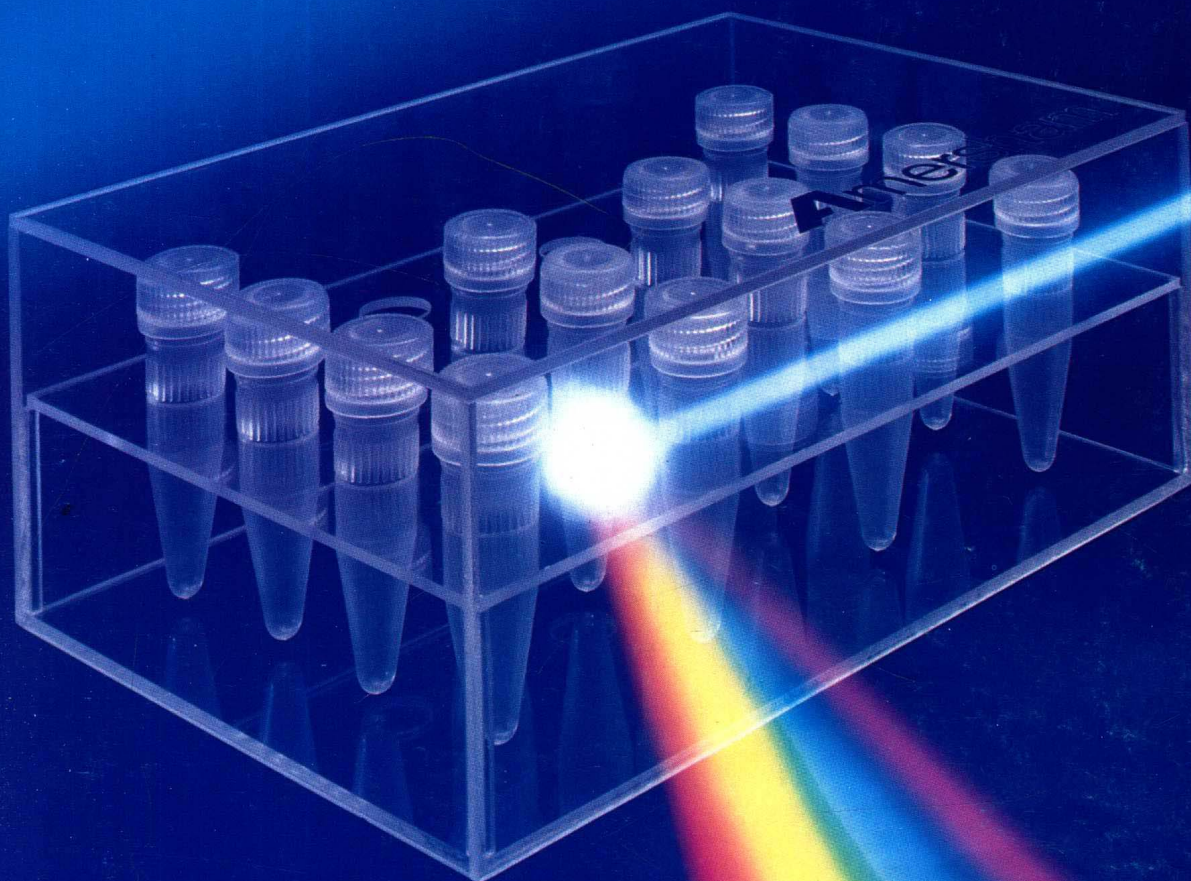
With LONZA you are always on target. Our intermediates for pharmaceutical, agro-chemical, synthetics, dyestuff and pigment products are backed by a high-powered,

experienced process research, process development and biotechnology team and an advanced centralized analytical service. We will never compete with your finished products for which we supply intermediates. And you are free of waste-management worries for these intermediates because we take care of them, in strict compliance with Swiss environmental regulations.

LONZA. To help you hit the mark.

LONZA LTD, Organic Chemicals, CH-4002 Basle, Switzerland, Telephone 061 518111, Telex 965 960, Telefax 061 5187 33
Sales offices in: Cheltenham (GB), Milan (I), Nanterre (F), Rotterdam (Benelux), Barcelona (E), Fair Lawn NJ (USA), Tokyo (J), Hongkong (HK)
LONZA is a company of the Alusuisse Group.

Amersham – serving biotechnology



At Amersham we're uniquely placed to help tomorrow's advances in biotechnology just as we played a key role in yesterday's.

Our products helped crack the DNA code which paved the way for genetic engineering.

Today we provide more products for the development of biotechnology than for anything else. And we supply them to just about every biotechnology company, pharmaceutical house, university and research institute in the world. Our range is continually being extended and improved and includes:

- Cloning and sequencing systems
- Restriction and modifying enzymes
- Nucleic acid and protein labelling systems
- Reagents for immunology
- Products for cell biology
- Growth factors and lymphokines

Amersham International plc
Amersham UK

Amersham

UK Sales Aylesbury (0296) 395222 Amersham Australia PTY Ltd Sydney 888-2288 Amersham Belgium SA/NV Brussels (2) 538 9194
Amersham Buchler GmbH & Co KG Braunschweig West Germany (05307) 8080 Amersham Canada Ltd Oakville, ONT (416) 842 2720
Amersham Corporation Arlington Heights, IL USA (312) 364 7100 Amersham Denmark ApS Birkerød 02-82 02 22 Amersham France SA Paris (1) 69.28.83.00
Amersham Japan Tokyo (03) 816 6161 Amersham Nederland BV Houten 03403 76660 Amersham Norway Sandvika 02-54 63 18
Amersham Sweden AB Solna 08-734 08 00

MULTI-ENZYME SPECTRUM OF ACTIVITY

Biozyme Laboratories Limited has for the last fifteen years developed methods for the simultaneous extraction and isolation of several enzymes from the same raw material, each further purified to the highest level for diagnostic, pharmaceutical and immunochemical applications.

Several of our products have the highest specific activity commercially available, e.g.

Alkaline
Phosphatase
(6000 U/ mg

protein Diethanolamine

37°C), Glycerophosphate

Dehydrogenase (400 U/mg

protein), Glutamate
Dehydrogenase (90 U/mg
protein).

Multi-enzyme extraction enables us to be the largest producer of several of the enzymes listed in our brochure.

To obtain our latest catalogue please telex or write to our address given below.

Diagnostics

Beta-Glucosidase,
Alpha-Glucosidase,
Glycerol-3-Phosphate,
Dehydrogenase,
Glutamate Dehydrogenase,
Malate Dehydrogenase,
Lactate Dehydrogenase,
Urease,
Uricase,
Cholesterol Esterase,
Aldehyde Dehydrogenase.

Immunolabelling

Alkaline Phosphatase,
Glucose Oxidase,
Peroxidase - Basic Isozymes.
Peroxidase - Acidic Isozymes.

Other Applications

Lipoamide Dehydrogenase,
Alcohol Dehydrogenase.

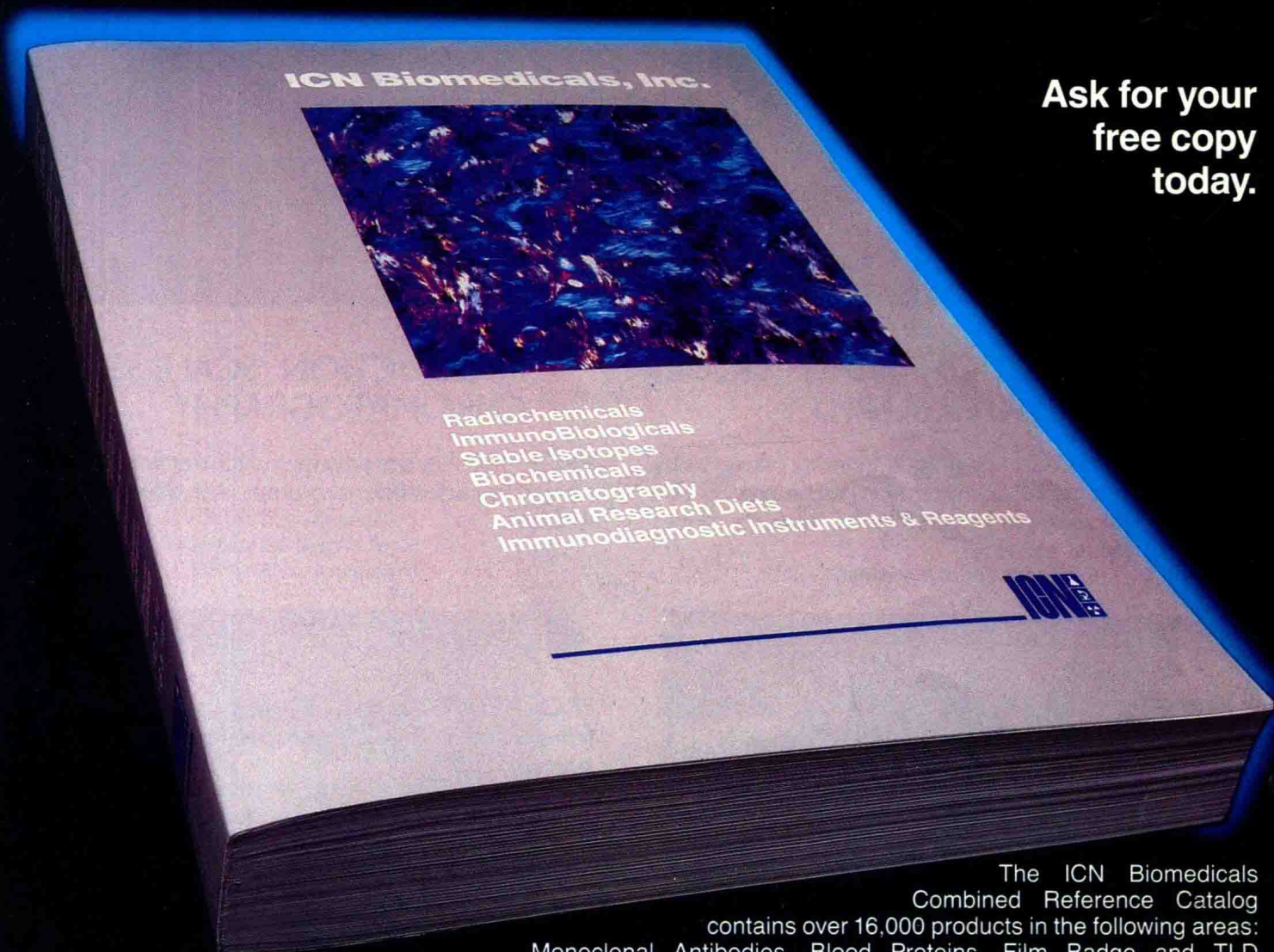
biozyme

LABORATORIES LIMITED GREAT BRITAIN

Unit 6, Gilchrist-Thomas Estate,
Blaenavon, Gwent NP4 9RL, South Wales, Great Britain
Tel. No: 0495 790678. Telex: 497731 A B "BIOZYM G"

Your Personal Copy of the New ICN Biomedicals Combined Reference Catalog Is Waiting.

**Ask for your
free copy
today.**



The ICN Biomedicals Combined Reference Catalog contains over 16,000 products in the following areas:
Monoclonal Antibodies, Blood Proteins, Film Badge and TLD Services, Enzymes, Human IgG Subclass Kits, Growth Factors and other Tissue Culture Reagents, Laboratory Accessories, NMR Solvents, Electrophoresis Reagents, Ultra Pures, Aluminas, Silicas, Animal Research Diets & Components, Pipetting Instruments, Gamma Counters, Immunodiagnostic Reagents, Automated RIA, Immunochemicals, Iodinated Products, Standards/Sources, Nuclides, Liquid Scintillation Cocktails, ^{35}S -, ^{32}P -, ^{14}C -, and ^3H Labeled Compounds.

ICN Biomedicals, Inc.

(800) 854-0530

P.O. Box 19536, Irvine, CA 92713



P R O C H R O M

A SIMPLE WAY
TO SUCCEED...

IN INDUSTRIAL
PURIFICATION

PRODUCTION SCALE LIQUID CHROMATOGRAPHY

PROCHROM offers the unique benefits provided by the dynamic axial compression technique⁽¹⁾. The column diameters in installed HPLC systems ranges from 11 cm to 45 cm.

EXPERTISE

PROCHROM can scale up your application to a cost effective production level.

PRODUCTION SCALE GAS CHROMATOGRAPHY

PROCHROM is the only manufacturer with the technology to pack efficient columns with diameters up to 100 cm.

SERVICE

PROCHROM provides all necessary services; from analytical development to large scale design and start up.

CALL
PROCHROM S.A.

at (317) 852-4654 USA or (33) 83 31 22 44 FRANCE

and discover why our systems are successfully used in USA, EUROPE, JAPAN...

(1) PROCHROM is the only licensee of
the patented axial compression technique.

USA + CANADA
1160 Hornaday Road
Brownsburg IN 46112
USA
Fax. (317) 852-4655



EUROPE
(Headquarters)
B.P. 9 54250 Champigneulle
FRANCE
Fax. (33) 83 31 20 51

Automated Nucleic Acid Extraction with
minimal time and effort



Model 340A

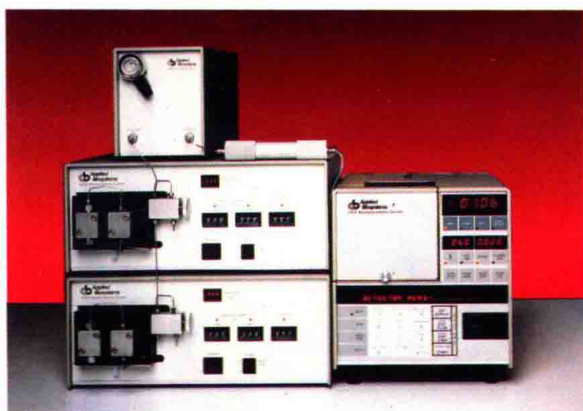
Fully Automated Low Cost DNA Synthesizer



Model 381A

The first name in DNA Instrumentation

High Performance
Separation System for
DNA/RNA Isolation



Model 152A

DNA Sequence Analysis System



Model 370A

Whatever your application, a Finn

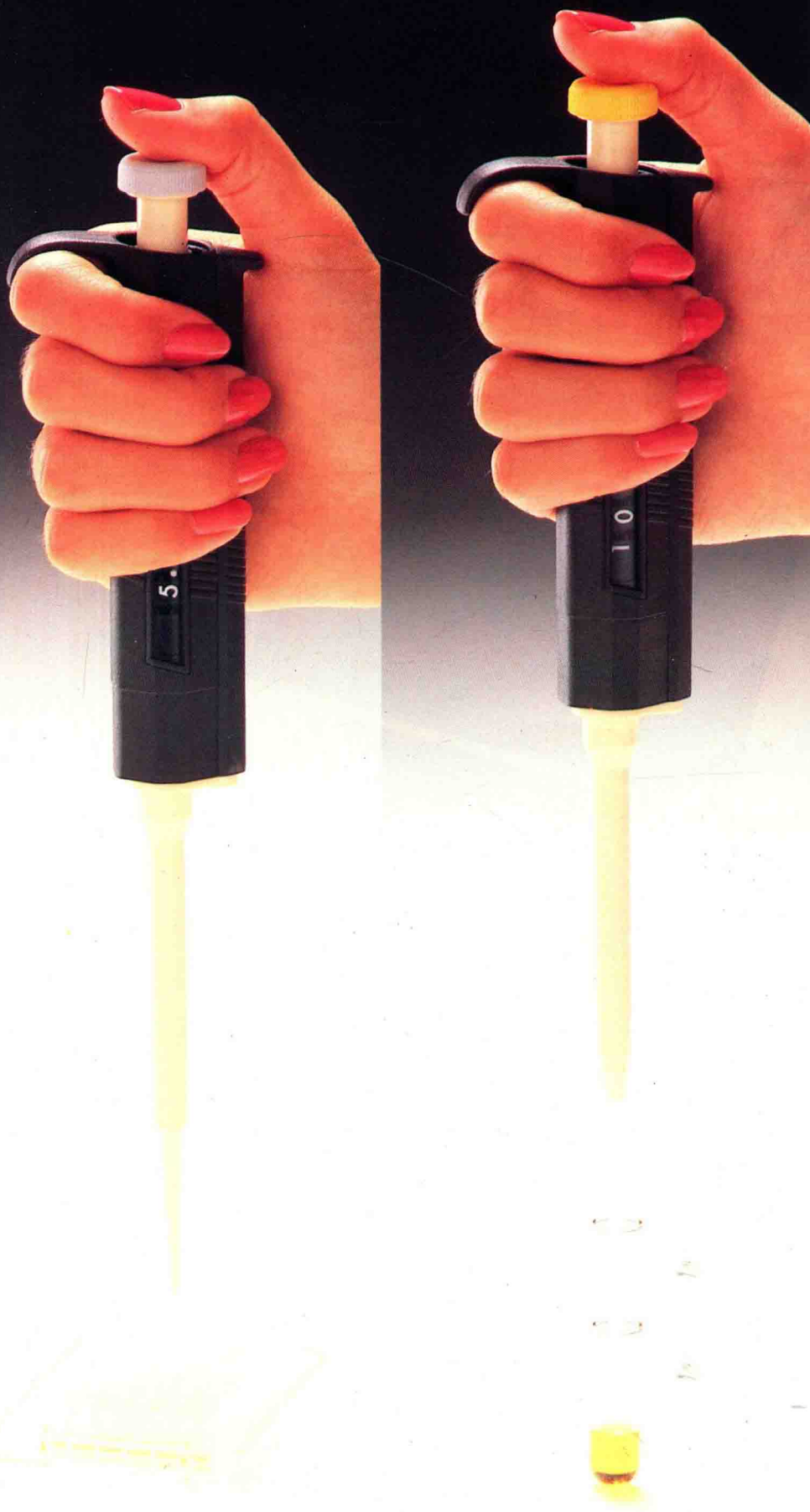


Finnpipettes from Labsystems.

Labsystems Oy, P.O. Box 8, 00881 Helsinki, Finland, tel. int'l. + 358-0-75821, telex 1002048 labys sf. Austria: Vienna, tel. 1-435901-0, Belgium: Antwerp, tel. 03-2312725. France: Paris, tel. 1-69079750. West Germany: Munich, tel. 089/5026027-9. Italy: Milan, tel. 2-2827541. Japan: Tokyo, tel. 03-355-5630. The Netherlands: Waddinxveen, tel. 01878-10233. Spain: Barcelona, tel. 3-2106461. Sweden: Stockholm, tel. 08-931370. UK: London, tel. 0895-38421. USA: Raleigh (919) 460 1800, (Toll Free) 800-572-8270.

Finnpipette's the answer.

From single-channel and multichannel pipettes through to the unique Diluter, Labsystems' Finnpipette range of liquid handling equipment offers you the widest choice on the market. The Digitals shown here for example go right down to $0.5 \mu\text{l}$. All with fully validated accuracy and precision. And because we understand the nature of your work, easy and above all comfortable to use. To ensure best results we also supply a full range of quality disposables and accessories. So whatever field you're working in – clinical chemistry, microbiology, genetechnology – take a tip and start using Finnpipettes.



Ease of use and comfort – Simply turn the thumb button. It clicks to the desired volume. No scales to align. Instead check the clear, easy-to-read digital display and start pipetting. Without straining your hand... even after hours of use – thanks to the lightness and comfort common to all Finnpipettes.



Safety and durability – The streamlined unobtrusive tip ejector ensures safety even with biohazardous materials. And also prevents accidental detipping. Durable construction and space-age plastics mean longer bench life.



Accuracy and precision – Each Finnpipette arrives ready for use with its own accuracy validation certificate. What's more, recalibration can be carried out in your laboratory, quickly and easily.

Full range of quality disposables – for best results we recommend using Finntips. Made from clear contamination-free plastic, they are available vertically packed for added convenience in boxes, or bulk-packed in economically sized bags and trays.

TRIPOS MODELING TOOLS...

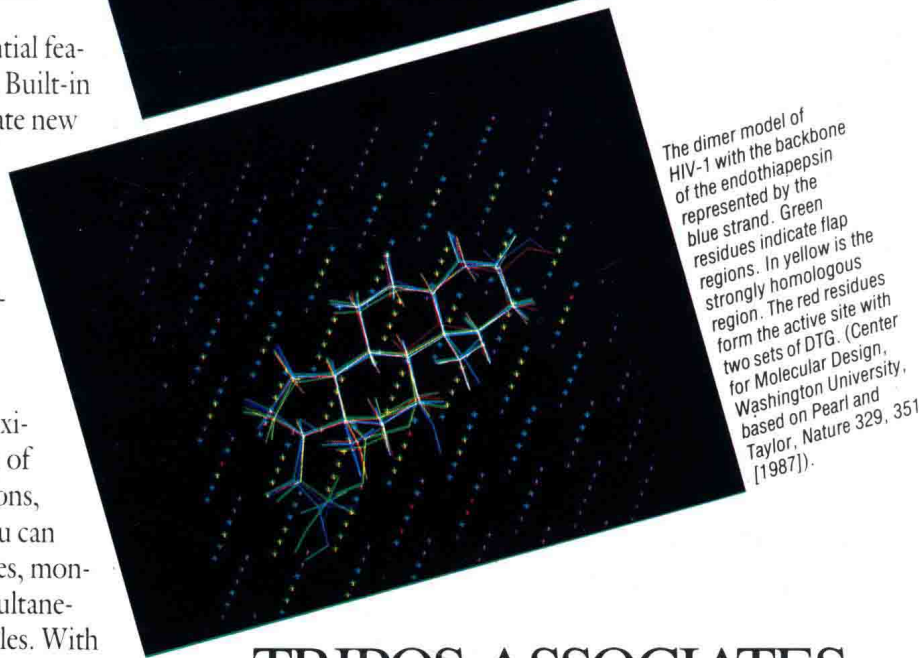
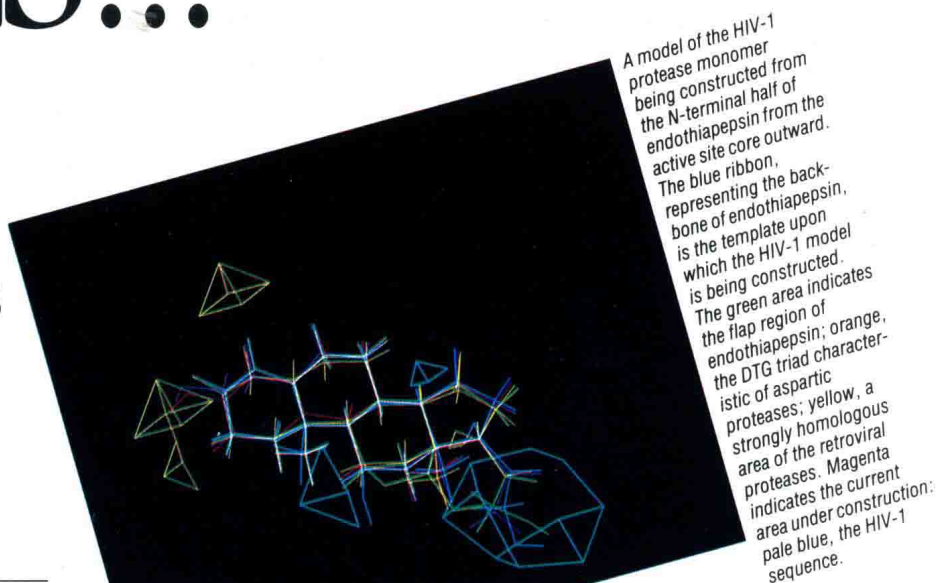
Advancing the Dimensions of Your Biotechnology Research

Monomer dictionaries define essential features of proteins and nucleic acids. Built-in molecular editors allow you to create new or modify existing monomers. Dynamic set definitions treat collections of atoms as a unit. An anneal function accelerates local geometry repair. All these are powerful tools available in SYBYL®/Biopolymer software.

The result is rapid and uniquely flexible construction and manipulation of macromolecules, including insertions, deletions and point mutations. You can work with any number of molecules, monomers, atoms and bonds. And simultaneously build large and small molecules. With the dictionaries you can identify and alter secondary structures.

For molecular conformations, an optional search algorithm systematically generates possible conformations consistent with distance constraints (loop structures, alternative side positions, van der Waals radii).

Contact us today for information on the spectrum of SYBYL software products and compatible hardware, including PCs.



TRIPOS ASSOCIATES

A Subsidiary of Evans & Sutherland

In the United States:

1699 S. Hanley Road, Suite 303, St. Louis, Missouri 63144,
1-800-323-2960, (314) 647-1099

In Europe:

Stahlgruberring 32, D-8000 Munich 82, West Germany 89 429041
Gallop House, Hasler's Lane., Great Dunmow, Essex CM61XS, England (0371) 6191.
3, allée des Garays, F-91124 Palaiseau Z.I., France 1 69 201647

THE BIOTECHNOLOGY DIRECTORY

PENTEX*

Bovine and Human Biochemicals from MILES

Research or Bulk Quantities

Albumins

Globulins

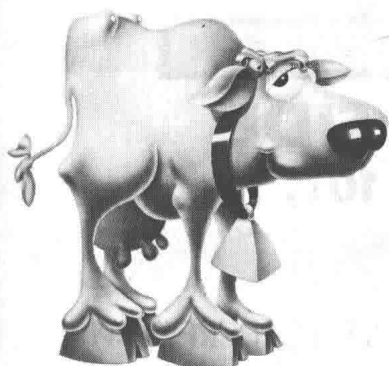
Transferrins

Ex-Cyte* (growth factor)

Aprotinin

Fibronectin

for Diagnostics and Cell Culture

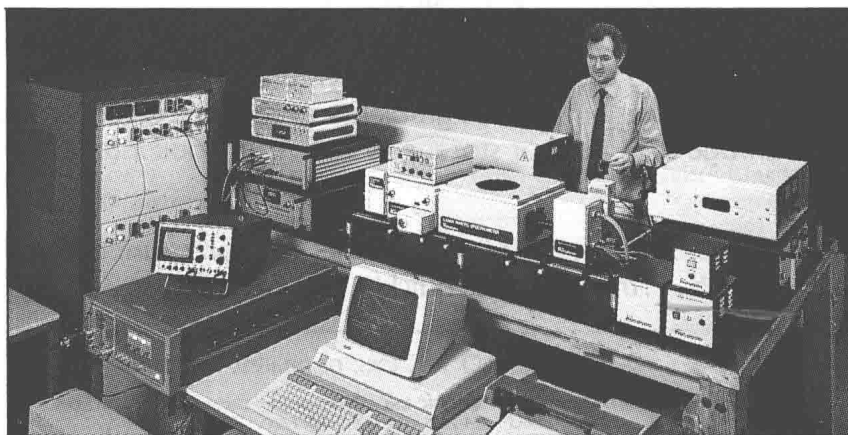


*Trademark of Miles Inc. USA

Miles Ltd. Stoke Court, Stoke Poges,
SL2 4LY, England.



Fast reactions from picoseconds to seconds are our speciality.



- Laser flash photolysis –
- Picosecond spectrometers –
- Nanosecond fluorescence systems –
- Flash photolysis –
- Stopped-flow –

**Applied
Photophys***

Applied Photophys Ltd., 203/205 Kingston Road, Leatherhead, Surrey KT22 7PB, Telephone: 0372 386537, Telex: 263641 (Photon G).

TIME

NOW CAN BE ON YOUR SIDE
With A Line Of Products From Bio 101, Inc.

WHY SHOULD IT BE SO TIME-CONSUMING OR DIFFICULT TO PERFORM ROUTINE EXPERIMENTAL PROCEDURES?

IT SHOULDN'T . . .

AND NOW IT ISN'T. BIO 101 INTRODUCES "QUICKITS" THAT ENABLE THE RESEARCH SCIENTIST TO SAVE VALUABLE TIME.

BIO 101 PRODUCT LINE INCLUDES:

<input checked="" type="checkbox"/> GENECLEAN™	DNA PURIFICATION KIT	Removes and purifies DNA from Agarose or solution in 15-20 minutes.
<input checked="" type="checkbox"/> CIRCLEPREP™	PLASMID PREP KIT	From bacterial colony to pure plasmid without cesium gradients.
<input checked="" type="checkbox"/> CIRCLEGROW™	TABLETS AND CAPSULES	Specially formulated high density growth media.
<input checked="" type="checkbox"/> JETRINSE™	VOLUMETRIC FLASK RINSER	New Jet-Action design for rinsing glassware.
<input checked="" type="checkbox"/> BIOFLOAT™	MICROCENTRIFUGE TUBE FLOAT	Perfect for the water bath, bench or as a storage system.

In the competitive research field where time can't be wasted, it's important for the researcher to always be aware of the most efficient and reliable methods. At Bio 101, Inc., we strive to create time saving products a scientist can count on day in and day out.

If you and your co-workers are tired of spending too much time purifying DNA from solution or agarose, purifying plasmid DNA from cultures by cesium chloride gradients, preparing bacterial culture media or looking for a decent microcentrifuge tube float or storage system, then look into Bio 101's product line.

Success often depends on who works the most effectively with their time. You can count on Bio 101 products to save valuable minutes in the lab . . . minutes that quickly add up to days.

BIO 101

"DURING THE COURSE
OF DOING RESEARCH,
CHECK WITH BIO 101 . . .
WE HAVE YOUR TIME
IN MIND."

BIO 101, INC., P.O. BOX 2284, LA JOLLA, CALIFORNIA 92038-2284
PHONE: 1-619-546-0556, 1-800-424-6101
TELEX: 990498 BIO 101 SDG **FAX:** 619-454-1799

Contact BIO 101, Inc., or nearest distributor.

STRATECH SCIENTIFIC Ltd., 50 Newington Green, London N.16., U.K.
Telephone: 01-354-2601, Telex: 268048, FAX: 1-354-3752
FUNAKOSHI PHARMACEUTICAL CO., Ltd., 2-3 Surugadai, Kanda, Chiyoda-Ku,
Tokyo, Telephone: Tokyo (03) 293-2352, Telex: J28489 FUNA, FAX: 81-3-295-5545,
BRESATEC, GPO Box 498, Adelaide, S. Australia 5001, Telephone (08) 228.5361,
Telex: AA89141, FAX: 08-223-3258.
BIO/CAN Scientific Inc., 2368 Dunwin Dr., Mississauga, Ontario, Canada L5L 1J9,
Telephone: 416-828-2455, 800-387-8125, FAX: 416-828-9422.

Preface to the fifth edition

This fifth edition of the INTERNATIONAL BIOTECHNOLOGY DIRECTORY re-establishes it as an annual publication, reflecting the continuing need for regular updating of activities in an industry which continues to expand in scope and number of companies or institutions attracted to invest time, money and skills. The layout of the book remains unchanged. However, once again numerous additions and revisions have been made, including many implemented on the basis of suggestions or information supplied by our readers. Particular attention has again been paid to those areas (North America, Japan and the EC) where the biotechnology business is most active enabling over 1000 new entries to be made in part III. In addition, over 1000 further entries have been updated and some 200 companies deleted. Part I has also grown, reflecting the continued increase in new journals and other information sources related to biotechnology. A similar increase of around 20% is also incorporated into the product categories listed in the Buyers' Guide.

The increased amount of information available each year, reflecting this continued growth is daunting. In spite of extensive efforts to keep up to date the book does have deadlines to meet and changes that we are unaware of may occur during the editorial period. The sheer volume of material scanned means that the new volume must be started as soon as the previous year goes to press. This means it is even more important that our readers help to keep us informed of changes or additions. We continue to welcome all comments, which will be used in compilation of the sixth edition. We encourage you, therefore, to send us promotional literature for specific products or services as well as company or annual reports.

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.

J Coombs and Y R Alston

September 1988

Introduction

This *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 materials (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 higher 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, bakers' 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 all 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 and feed 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 use, as well as patterns of labour, health, energy, agriculture and food production. 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 databases and newsletters. As with 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 the 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 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 the 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.