

Table of Contents

<i>Preface</i>	<i>xi</i>
<i>List of Contributors</i>	<i>xiii</i>
ONE	
From Biotechnology to Biotics: The Engineering of Molecular Machines	1
J. de Rosnay, <i>Institut Pasteur, Paris, France</i>	
TWO	
Strategies for Selection of Appropriate Biotechnologies for Industrial Applications	9
W. J. Harris, <i>Inveresk Research International, Ltd., Musselburgh, Scotland</i>	
THREE	
Government Guidelines	29
W. J. Gartland, Jr., <i>Office of Recombinant DNA Activities, National Institutes of Health, Bethesda, MD</i>	
FOUR	
Fermentation Reactions of Anaerobic Digestion	41
D. R. Boone, <i>Alberta Research Council, Edmonton, Alberta, Canada</i>	
FIVE	
The Microbiology of Anaerobic Digestion	52
E. C. Price, <i>New Jersey Institute of Technology, Newark, NJ</i>	
SIX	
Methods of Biogas Generation and Comparisons	60
E. C. Price and P. N. Cheremisinoff, <i>New Jersey Institute of Technology, Newark, NJ</i>	
SEVEN	
Composting of Agricultural Wastes	68
J. H. Crawford, <i>Loughry College of Agriculture & Food Technology, County Tyrone, N. Ireland</i>	
EIGHT	
Computer Simulation in Ethanol Fermentation	78
J. M. Lee, <i>Department of Chemical Engineering, Washington State University, Pullman, WA</i>	
NINE	
Acetic Acid Manufacture—Fermentation Alternatives	88
R. M. Busche, <i>Central Research & Development Department, E. I. du Pont de Nemours & Co., Wilmington, DE</i>	
TEN	
Biodegradation of Petroleum via Fermentation	103
D. Liu, <i>Biodegradation-Biotechnology Laboratory, National Water Research Institute, Burlington, Ontario, Canada</i>	

ELEVEN

- Biosensors in Fermentation and Environmental Control**135
 I. Karube, *Tokyo Institute of Technology, Nagatsuta, Midori-ku, Yokohoma, 227, Japan*

TWELVE

- Large-Scale Fermentation Development of Recombinant Microorganisms**156
 W. L. Muth, *Eli Lilly and Co., Indianapolis, IN*

THIRTEEN

- High Fructose Corn Syrup**165
 L. E. Coker, *The Hubinger Co., Keokuk, IA*
 K. Venkatasubramanian, *H. J. Heinz Company, Rutgers University, New Brunswick, NJ*

FOURTEEN

- Genetic Engineering in Yeast: Methods and Applications**172
 D. W. Morris and B. A. Roth, *Department of Genetics, Iowa State University, Ames, IA*

FIFTEEN

- Food Microbiology and Biotechnology—An Update**188
 D. L. Collins-Thompson, J. D. Cunningham, and J. T. Trevors, *Departments of Environmental Biology & Food Science, Ontario Agricultural College, University of Guelph, Guelph, Ontario, Canada*

SIXTEEN

- Soil Microbiology and Biotechnology**196
 B. Metting, *R&A Plant/Soil, Inc., Pasco, WA*

SEVENTEEN

- Plant Cells, Their Development and Secondary Metabolites**215
 R. B. van Huystee, *Department of Plant Sciences, University of Western Ontario, London, Ontario, Canada*

EIGHTEEN

- Genetically Engineered Fungi for Weed Control**221
 G. Turgeon and O. C. Yoder, *Department of Plant Pathology, Cornell University, Ithaca, NY*

NINETEEN

- Production of New Hybrid Plants Through Protoplast Fusion**231
 S. Gleddie and G. Setterfield, *Department of Biology, Carleton University, Ottawa, Ontario, Canada*
 W. A. Keller, *Research Station, Research Branch, Agriculture Canada, Ottawa, Ontario, Canada*

TWENTY

- Biotechnology: Applications to Genetics**243
 G. G. Khachatourians and T. L. Haffie, *University of Saskatchewan, Saskatoon, Sask., Canada*

TWENTY-ONE

- Cytogenetic Diagnosis of Genetic Defects**251
 A. B. Krepinsky, *Bio-Mutatech Inc., Woodbridge, Ontario, Canada*

TWENTY-TWO

- Monoclonal Antibodies to Bacterial Antigens**294
 E. B. Mackie and L. E. Bryan, *Department of Microbiology and Infectious Diseases, University of Calgary, Calgary, Alberta, Canada*
 B. M. Longenecker, *Department of Immunology, University of Alberta, Edmonton, Alberta, Canada*

TWENTY-THREE

- The Use of Anucleated Minicells in Biotechnology: An Overview**309
 G. G. Khachatourians, *University of Saskatchewan, Saskatoon, Sask., Canada*

TWENTY-FOUR

- Monoclonal IgM Antibodies in Cancer Research**320
 E. W. Lamon, A. S. Walia, and T. J. Powell, *Veterans Administration Hospital, Department of Surgery and Microbiology, Cancer Research and Training Center, University of Alabama in Birmingham, Birmingham, AL*

TWENTY-FIVE

Positive Selection of Cells Using Monoclonal Antibody-nutrient Conjugates341T. Block, *Department of Microbiology, Jefferson Medical College, Philadelphia, PA*M. Bothwell, *Department of Molecular Biology, Princeton University, Princeton, NJ*

TWENTY-SIX

Recombinant DNA Vaccines352R. E. Isaacson, *Department of Epidemiology and The Center for Molecular Genetics, University of Michigan, Ann Arbor, MI*

TWENTY-SEVEN

Natural Killer (NK) Cells and Their Reactivity with Monoclonal Antibodies360M. G. Golightly, *Department of Pathology, University Hospital, State University of New York, Stony Brook, NY*

TWENTY-EIGHT

Immunosome Technology: An Approach to Efficient and Safe Influenza and Rabies Vaccines370L. Thibodeau and A. Boudreault, *Centre de Recherche en Virologie, Institut Armand-Frappier, Québec, Canada*P. Perrin, *Institut Pasteur, Paris, Cédex 15, France*

TWENTY-NINE

Monoclonal Antibodies for the Diagnosis of Chlamydial, Gonococcal, and Herpesvirus Infection380M. R. Tam, L. C. Goldstein, and R. C. Nowinski, *Genetic Systems Corp., Seattle, WA*

THIRTY

Synthesis of Mammalian Proteins in Bacteria388E. Jay and J. Rommens, *Department of Chemistry, University of New Brunswick, Fredericton, New Brunswick, Canada*G. Jay, *Laboratory of Molecular Virology, National Cancer Institute, Bethesda, MD*

THIRTY-ONE

Production of Bifunctional Antibodies by Hybridoma Technology401K. G. Burnett, J. Martinis, and R. M. Bartholomew, *Hybritech Inc., San Diego, CA*

THIRTY-TWO

The Production of Monoclonal Antibodies Reactive Against Choline Acetyltransferase and Their Application for Studying Cholinergic Systems410B. H. Wainer and A. I. Levey, *Departments of Pathology, Pediatrics, and The Joseph P. Kennedy, Jr. Mental Retardation Research Center, University of Chicago, Chicago, IL*E. J. Mufson and M.-M. Mesulam, *Bullard and Denny-Brown Laboratories and the Behavioral Neurology Section of the Harvard Neurology Department and the Charles A. Dana Research Institute of the Beth Israel Hospital, Boston, MA*

THIRTY-THREE

Monoclonal Antibodies and Enzyme Immunofiltration423M. C. Glassy and H. H. Handley, *Department of Medicine, Theodore Gildred Cancer Center, University of California, San Diego, CA*

THIRTY-FOUR

Concentration and Purification of Viruses by Molecular Filtration and Ultracentrifugation Methods436P. Payment and M. Trudel, *Centre de Recherche en Virologie, Institut Armand-Frappier, Québec, Canada*

THIRTY-FIVE

Interferons: Manufacture and Application in Medicine451L. H. Kronenberg, *LEE BioMolecular Research Laboratories, Inc., San Diego, CA*

THIRTY-SIX

Spheroplast—As a Tool for Gene Transfer463K. Syono and S. Hasezawa, *Department of Pure & Applied Sciences, University of Tokyo, Tokyo, Japan*

THIRTY-SEVEN

Instrumentation for Automated Gene Fragment Synthesis	477
--	-----

R. M. Cook, *Biosearch Inc., San Rafael, CA*

THIRTY-EIGHT

Peptide Synthesis	487
--------------------------------	-----

C. M. Groginsky, *Vega Biotechnologies, Inc., Tucson, AZ*

R. A. Houghten, *Scripps Clinic & Research Foundation, La Jolla, CA*

THIRTY-NINE

Use of Monoclonal Antibodies to Detect <i>Salmonella</i>	519
---	-----

J. A. Mattingly, *Ohio State University, Dept. of Medical Microbiology and Immunology, Columbus, OH*

B. J. Robison, *Microbiology Laboratory, Ross Laboratories, Columbus, OH*

FORTY

Enzyme Immunoassay for the Detection of <i>Salmonella</i>	526
--	-----

B. Swaminathan, *Department of Foods and Nutrition, Purdue University, W. Lafayette, IN*

S. A. Minnich, *Department of Biology, Princeton University, Princeton, NJ*

FORTY-ONE

Enzyme Isolation and Purification	534
--	-----

P. R. Patel, *Diagnostic Chemicals Ltd., Charlottetown, Canada*

FORTY-TWO

Biosynthesis of Ergot Alkaloids	565
--	-----

Z. Rehacek, *Institute of Microbiology of the Czechoslovak Academy of Sciences, Prague 4, Czechoslovakia*

FORTY-THREE

The Syntheses of Insect Pheromones on Crosslinked Polystyrene	586
--	-----

C. C. Leznoff, *Department of Chemistry, York University, Toronto, Ontario, Canada*

FORTY-FOUR

Affinity Chromatography: Its Role in Industry	594
--	-----

J. R. Birch, C. R. Hill, and A. C. Kenney, *Celltech Ltd., Berkshire, U.K.*

FORTY-FIVE

Osmolality of Fluids	607
-----------------------------------	-----

H. L. Webster, *Wescor, Inc., Logan, UT*

FORTY-SIX

Salinity Tolerance	623
---------------------------------	-----

N. V. Raghava Ram and M. W. Nabors, *Department of Botany and Plant Pathology, Colorado State University, Fort Collins, CO*

FORTY-SEVEN

Organosilicones in Biological Systems	643
--	-----

R. C. Treadgold, *Research and Development Department, Dow Corning Ltd., Barry, South Glamorgan, Wales*

FORTY-EIGHT

Effects of Mercury Compounds on Unicellular Organisms	651
--	-----

P. N. Cheremisinoff and A. Schiff, *New Jersey Institute of Technology, Newark, NJ*

FORTY-NINE

Analysis of Receiving Waters (Microorganisms)	671
--	-----

P. Sereico, *New Jersey Institute of Technology, Newark, NJ*

Index