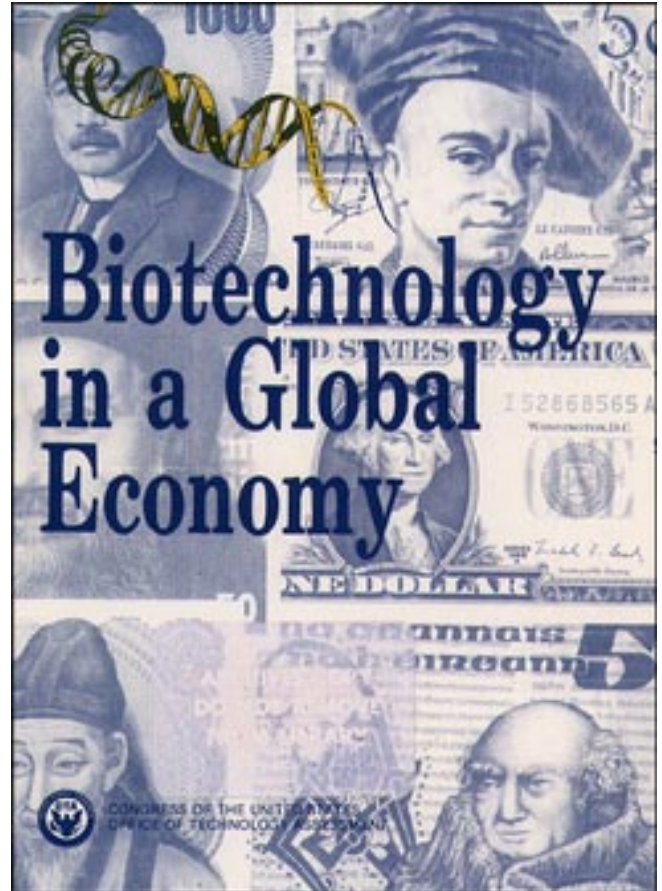


Biotechnology in a Global Economy

October 1991

OTA-BA-494

NTIS order #PB92-115823



Recommended Citation:

U.S. Congress, Office of Technology Assessment, *Biotechnology in a Global Economy, OTA-BA-494* (Washington, DC: U.S. Government Printing Office, October 1991).

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328

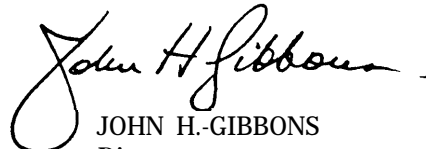
ISBN 0-16 -035541-9

Foreword

Since the discovery of recombinant DNA technology in the early 1970s, biotechnology has become an essential tool for many researchers and the underpinning of new industrial firms. Biotechnology—which has the potential to improve the Nation’s health, food supply, and the quality of the environment—is viewed by several countries as a key to the marketplace of the 21st century. In order to understand the potential of biotechnology in a global economy, it is first necessary to identify current and potential applications of biotechnology, and to learn how various Nations support and regulate the uses of biotechnology in commerce.

This report examines the impact of biotechnology in several industries, including pharmaceuticals, chemicals, agriculture, and hazardous waste clean-up; the efforts of 16 Nations to develop commercial uses of biotechnology; and the actions, both direct and indirect, taken by various governments that influence innovation in biotechnology.

The report was requested by the House Committee on Science, Space, and Technology; the Senate Committee on Agriculture, Nutrition, and Forestry; the Senate Committee on the Budget; and the Senate Committee on Governmental Affairs. OTA was assisted in preparing this study by a panel of advisers, experts from 16 countries who participated in an international conference, two workshop groups, and more than 140 reviewers selected for their expertise and diverse points of view on the issues covered in the report. OTA gratefully acknowledges the contributions of each of these individuals. As with all OTA reports, responsibility for the content of the final report is OTA’s alone. The report does not necessarily constitute the consensus or endorsement of the advisory panel, the workshop groups, or the Technology Assessment Board.



JOHN H. GIBBONS
Director

Biotechnology in a Global Economy Advisory Panel

Robert Reich, *Chair*
John F. Kennedy School of Government
Harvard University
Cambridge, MA

Alberto Adam
Vice President
International Agricultural Division
American Cyanamid Co.
Wayne, NJ

Brian Ager
Director, Senior Advisory Group on Biotechnology
Brussels, Belgium

Robert H. Benson
Senior Patent Attorney
Genentech, Inc.
South San Francisco, CA

Stephen A. Bent, Partner
Foley & Lardner
Alexandria, VA

Jerry Caulder
Chairman, President, and Chief Executive Officer
Mycogen Corp.
San Diego, CA

Peter F. Drake
Executive Vice President and
Director of Equity Research
Vector Securities International, Inc.
Deerfield, IL

Anne K. Hollander
Washington, DC

Michael Hsu
President
Asia/Pacific Bioventures Co.
New York, NY

Dennis N. Longstreet
President
Ortho Biotech
Raritan, NJ

Kenneth J. Macek
President
TMS Management Consulting
Framingham, MA

Lita L. Nelsen
Associate Director
Technology Licensing Office
Massachusetts Institute of Technology
Cambridge, MA

Richard K. Quisenberry
Vice President, Central Research
and Development
DuPont Experimental Station
Wilmington, DE

Sarah Sheaf Cabot
Biotechnology Licensing Consultant
Malvern, PA

James ??. Sherblom
Chairman and Chief Executive Officer
TSI Corp.
Worcester, MA

Donna M. Tanguay,
Willian, Brinks, Olds, Hofer, Gilson, & Lione
Washington, DC

William J. Walsh
Executive Vice President and Chairman
Currents International, Inc.
Oakton, VA

Thomas C. Wiegale*
Director
program for Biosocial Research
Northern Illinois University
DeKalb, IL

W. Wayne Withers,
Senior Vice President, Secretary and
General Counsel
Emerson Electric Co.
St. Louis, MO

* Deceased.

NOTE: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members. The panel does not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report and the accuracy of its contents.

OTA Project Staff-Biotechnology in a Global Economy

Roger C. Herdman, *Assistant Director, OTA
Health and Life Sciences Division*

Michael Gough, Biological Applications Program Manager

Gretchen S. Kolsrud, *Biological Applications Program Manager*¹

Kevin W. O'Connor, *Project Director*

Kathi E. Hanna, *Senior Analyst*

Margaret McLaughlin, *Analyst*

Randolph R. Snell, *Analyst*²

Suzie Rubin, *Research Analyst*

Editor

Bart Brown, Washington, DC

Support Staff

Cecile Parker, Office Administrator

Linda Rayford-Journiette, *Administrative Secretary*

Jene Lewis, Secretary

Contractors

Evan Berman, Arlington, VA

Sue Markland Day, University of Tennessee

Genesis Technology Group, Cambridge, MA

Kathi E. Hanna, Churchton, MD

Gregory J. Mertz, Washington, DC

Michael K. Hsu, Asia/Pacific Bioventures Co.

Tai Sire, Washington, DC

Paul J. Tauber, Ithaca, NY

William J. Walsh, Oakton, VA

Hal Wegner, Washington, DC

Aki Yoshikawa, University of California, Berkeley

¹Through September 1989.

²Through April 1990.