

1591 This Week in *Science*

Editorial

1593 Frontiers in Biotechnology

Letters

1599 Citation Counting: T. C. MORRILL; R. M. BATEMAN ■ Satellite Oceanography in the 1980s: R. E. CHENEY AND B. C. DOUGLAS ■ Regulation of Biotechnology: H. I. MILLER, R. H. BURRIS, A. K. VIDAVER ■ The Trabi: Not a Problem: K. KONOPKA ■ *Journal of Biological Chemistry* and Protein Crystallization Papers: H. TABOR ■ Antinoise and Energy Expenditure: J. T. DURKIN

ScienceScope

1603 CEBAF schedule uncertainty; feds formalizing DNA fingerprinting rules; etc.

News & Comment

1604 A "Chilly Climate" for Women?
1606 Scientists Get Mad at OSI: Richards Panel Out of the Loop? ■ Did Imanishi-Kari Get a Fair "Trial"?
1608 French Ban Immunotherapy Treatment Steps Toward a Cooler Greenhouse
1609 To Stop Kuwait's Fires, First Clear the Mines
1610 Ad Hoc Team Revives SSC Competition
1611 Gene Mapping Japan's Number One Crop
1612 *Briefings*: Back to the Future ■ A Tasty Tufted Tuber ■ Women's Health: A World Crisis ■ Researcher's Legal Battle Ends ■ The SIDS-Seal Connection ■ A Nuclear Cure for Nuclear Waste ■ When Do You Send Blue Roses?

Research News

1614 A Genetic Survey of Vanishing Peoples ■ Scientific Split Over Sampling Strategy
1616 Yanomami People Threatened
1617 A Core-Mantle Link?
1618 Gambling on a Shortcut to Genome Sequencing
1619 A Well-Rounded Worm: 220 Kilobases and Counting ■ The Education of *C. elegans* ■ Roundworm as Canary?
1620 Can Earth's Internal Heat Drive Ocean Circulation?

Articles

Frontiers in Biotechnology

1643 Recent Advances in the Polymerase Chain Reaction: H. A. ERLICH, D. GELFAND, J. J. SNINSKY
1651 Complementary DNA Sequencing: Expressed Sequence Tags and Human Genome Project: M. D. ADAMS, J. M. KELLEY, J. D. GOCAYNE, M. DUBNICK, M. H. POLYMERPOULOS, H. XIAO, C. R. MERRIL, A. WU, B. OLDE *et al.*
1657 Monoclonal Antibodies in Diagnosis and Therapy: T. A. WALDMANN
1662 Vaccinia Virus: A Tool for Research and Vaccine Development: B. MOSS
1668 Toward a Science of Metabolic Engineering: J. E. BAILEY

■ SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 1991 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$82 (\$50 allocated to subscription). Domestic institutional subscription (51 issues): \$150. Foreign postage extra: Canada \$46, other (surface mail) \$46, air freight \$90. First class, airmail, school-year, and student rates on request. Change of address: allow 6 weeks, giving old and new addresses and 11-digit account number. Postmaster: Send change of address to Science, P.O. Box 2033, Marion, OH 43305-2003. Single copy sales: \$6.00 per issue prepaid includes surface postage; Guide to Biotechnology Products and Instruments, \$20. Bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$1 per copy plus \$0.10 per page is paid directly to CCC, 27 Congress Street, Salem, Massachusetts 01970. The identification code for Science is 0036-8075/83 \$1 + .10. Science is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

■ The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objectives are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, to advance education in science, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.



COVER Inspired by Leonardo da Vinci's "Proportions of the Human Figure According to Vitruvius," the cover image symbolizes that the creativity of scientists is at the center of technological advances. Scientists' curiosity about biological processes has often led to discoveries that proved useful for biotechnology. One-half of the figure's appendages are robot-like, showing that technology is an extension of its creator. The figure holds a flask of microorganisms, an antibody, and oligonucleotide primers, representing some of the tools of biotechnology discussed in this issue; the fistful of dollars signifies the entrepreneurial aspect of biotechnology. See pages 1643 to 1681. [Illustration by Julie Cherry]

Research Article

- 1675 Network Rigidity and Metabolic Engineering in Metabolite Overproduction: G. STEPHANOPOULOS AND J. J. VALLINO

- 1682 Class II Aminoacyl Transfer RNA Synthetases: Crystal Structure of Yeast Aspartyl-tRNA Synthetase Complexed with tRNA^{Asp}: M. RUFF, S. KRISHNASWAMY, M. BOEGLIN, A. POTERSZMAN, A. MITSCHLER *et al.*

Reports

- 1690 Impacts, Tsunamis, and the Haitian Cretaceous-Tertiary Boundary Layer: F. J.-M. R. MAURRASSE AND G. SEN
- 1693 Identification of Widespread Pollution in the Southern Hemisphere Deduced from Satellite Analyses: J. FISHMAN, K. FAKHRUZZAMAN, B. CROS, D. NGANGA
- 1696 Identity Elements for Specific Aminoacylation of Yeast tRNA^{Asp} by Cognate Aspartyl-tRNA Synthetase: J. PÜTZ, J. D. PUGLISI, C. FLORENTZ, R. GIEGÉ
- 1700 Prevention of Xenograft Rejection by Masking Donor HLA Class I Antigens: D. FAUSTMAN AND C. COE
- 1703 Selective Elimination of HIV-1-Infected Cells with an Interleukin-2 Receptor-Specific Cytotoxin: R. W. FINBERG, S. M. WAHL, J. B. ALLEN, G. SOMAN, T. B. STROM, J. R. MURPHY, J. C. NICHOLS
- 1705 Requirement of Heparan Sulfate for bFGF-Mediated Fibroblast Growth and Myoblast Differentiation: A. C. RAPRAEGER, A. KRUFKA, B. B. OLWIN
- 1708 Identification of p53 as a Sequence-Specific DNA-Binding Protein: S. E. KERN, K. W. KINZLER, A. BRUSKIN, D. JAROSZ, P. FRIEDMAN, C. PRIVES, B. VOGELSTEIN
- 1711 Mapping of DNA Instability at the Fragile X to a Trinucleotide Repeat Sequence p(CCG)_n: E. J. KREMER, M. PRITCHARD, M. LYNCH, S. YU, K. HOLMAN, E. BAKER, S. T. WARREN, D. SCHLESSINGER, G. R. SUTHERLAND *et al.*
- 1715 Structural Determinants of Ion Flow Through Recombinant Glutamate Receptor Channels: T. A. VERDOORN, N. BURNASHEV, H. MONYER, P. H. SEEBURG, B. SAKMANN
- 1718 Facilitation of the Induction of Long-Term Potentiation by GABA_B Receptors: D. D. MOTT AND D. V. LEWIS

Book Reviews

- 1727 The Invisible Hand, reviewed by L. G. NEUBERG ■ The Creation of the Anglo-Australian Observatory, R. W. SMITH ■ The Physics of Musical Instruments, D. E. HALL ■ Combustion, O. I. SMITH ■ Books Received

Products & Materials

- 1731 Transgenic Mice ■ Organics Removal and Concentration Kit ■ Configurations Adapter for 3-D Imaging ■ Primer Design Software ■ DNA and Protein Sequence Analysis Software Updated ■ Dot Blotter ■ Visual Comparison of Chromatograms ■ Literature

Board of Directors

Donald N. Langenberg
*Retiring President,
Chairman*

Leon M. Lederman
President

F. Sherwood Rowland
President-elect

Mary Ellen Avery
Francisco J. Ayala
Eugene H. Cota-Robles
Robert A. Frosch
Joseph G. Gavin, Jr.
Florence P. Haseltine
Jeanne M. Shreeve
Warren M. Washington

William T. Golden
Treasurer

Richard S. Nicholson
Executive Officer

Editorial Board

Charles J. Arntzen
Elizabeth E. Bailey
David Baltimore
William F. Brinkman
E. Margaret Burbidge
Pierre-Gilles de Gennes
Joseph L. Goldstein
Mary L. Good
Harry B. Gray
John J. Hopfield
F. Clark Howell
Paul A. Marks
Yasutomi Nishizuka
Helen M. Ranney
Robert M. Solow
Edward C. Stone
James D. Watson

Board of Reviewing Editors

John Abelson
Frederick W. Alt
Don L. Anderson
Stephen J. Benkovic
Floyd E. Bloom
Henry R. Bourne
James J. Bull
Kathryn Calame
Charles R. Cantor
Ralph J. Ciccerone
John M. Coffin
Robert Dorfman
Bruce F. Eldridge
Paul T. Englund
Fredric S. Fay

Douglas T. Fearon
Harry A. Fozzard
Theodore H. Geballe
Roger I. M. Glass
Stephen P. Goff
Corey S. Goodman
Stephen J. Gould
Eric F. Johnson
Stephen M. Kosslyn
Konrad B. Krauskopf
Charles S. Levings III
Richard Losick
Anthony R. Means
Mortimer Mishkin
Roger A. Nicoll
William H. Orme-Johnson III
Yeshayau Pocker

Dennis A. Powers
Erkki Ruoslahti
Thomas W. Schoener
Ronald H. Schwartz
Terrence J. Sejnowski
Thomas A. Steitz
Robert T. N. Tjian
Emil R. Unanue
Geerat J. Vermeij
Bert Vogelstein
Harold Weintraub
Zena Werb
George M. Whitesides
Owen N. Witte
William B. Wood
Keith Yamamoto

Science

252 (5013)

Science **252** (5013), 1591-1731.

ARTICLE TOOLS

<http://science.sciencemag.org/content/252/5013>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.