AMERICAN
ASSOCIATION FOR THE
ADVANCEMENT OF
SCIENCE

# Science

ISSN 0036-8075 4 JANUARY 1991 VOLUME 251 NUMBER 4989

#### 7 This Week in Science

Editorial	9	New Year's Resolutions and Future Shock
Letters	10	Carcinogens and Human Health: Part 2: D. P. RALL; B. N. AMES AND L. S. GOLD ■ Cold Spring Harbor: J. CAIRNS
News & Comment	19 23 24 25 26 27	NSF Centers Rise Above the Storm ■ A QUEST for Novel Electronics ■ New Alliances, New Technology ■ In Search of "Dark Matter" Fight Over Data Disrupts Michigan State Project SSC Detectors: Yes, No, Maybe Research Papers: Who's Uncited Now? Leroy Hood Says No Will Canada Build on Earlier TRIUMF?  Briefings: Rehabilitation for Burt? ■ NASA's Wish List ■ Science Money Woes in the U.S.S.R.
Research News	28 30 31	Making 3-D Movies of the Heart Cosmologists Begin to Fill in the Blanks On the Road to Mandelate Racemase
Perspective	33	Mechanisms of Alternative Pre-mRNA Splicing: T. MANIATIS
Articles	39 46 53	Free Radicals Within the Antarctic Vortex: The Role of CFCs in Antarctic Ozone Loss: J. G. Anderson, D. W. Toohey, W. H. Brune The Dynamics of the Stratospheric Polar Vortex and Its Relation to Springtime Ozone Depletions: M. R. Schoeberl and D. L. Hartmann Spot-Scan Imaging in Transmission Electron Microscopy: K. H. Downing
Research Articles	60	Atomic Structure of Ferredoxin-NADP <sup>+</sup> Reductase: Prototype for a Structurally Novel Flavoenzyme Family: P. A. KARPLUS, M. J. DANIELS, J. R. HERRIOTT

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.

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 © 1990 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): \$80. Domestic institutional subscription (51 issues): \$150. Foreign postage extra: Canada \$46, other (surface mail) \$46, air mail via Amsterdam \$85. 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 1723, Riverton, NJ 08077. Single copy sales: Current issue, \$3.50; back issues, \$5.00; Biotechnology issue, \$6.00 (for postage and handling, add per copy \$0.50 U.S., \$1.00 all foreign); Guide to Biotechnology Products and Instruments, \$20 (for postage and handling add per copy \$1.00 U.S., \$1.50 Canada, \$2.00 other foreign). 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:



COVER Containment of elevated concentrations of the ClO free radical (shown in green) in the stratosphere above the Antarctic continent occurs within the wind jet generated by cooling during the austral winter night. Isolation of the vortex, that region poleward of the wind field maximum, is an important element in the case linking chlorofluorocarbon release to ozone destruction over Antarctica. See page 39. [Artwork by Joseph Spatola]

## Reports

- Observational Evidence for a Possible New Diffusion Path: B. R. HACKER AND I. M. CHRISTIE
- Long-Term Human B Cell Lines Dependent on Interleukin-4 and Antibody to CD40: J. BANCHEREAU, P. DE PAOLI, A. VALLÉ, E. GARCIA, F. ROUSSET
- 72 Expression cDNA Cloning of the KGF Receptor by Creation of a Transforming Autocrine Loop: T. MIKI, T. P. FLEMING, D. P. BOTTARO, J. S. RUBIN, D. RON, S. A. AARONSON
- Generation of Calcium Oscillations in Fibroblasts by Positive Feedback Between Calcium and IP<sub>3</sub>: A. T. HAROOTUNIAN, J. P. Y. KAO, S. PARANJAPE, R. Y. TSIEN
- 78 Glycosylphosphatidylinositol: A Candidate System for Interleukin-2 Signal Transduction: D. D. EARDLEY AND M. E. KOSHLAND
- Whole Animal Cell Sorting of Drosophila Embryos: M. A. KRASNOW, S. Cumberledge, G. Manning, L. A. Herzenberg, G. P. Nolan
- Inhibition of Morphine Tolerance and Dependence by the NMDA Receptor Antagonist MK-801: K. A. TRUJILLO AND H. AKIL
- Critical Structural Elements of the VP16 Transcriptional Activation Domain: W. D. Cress and S. J. Triezenberg
- Three-Dimensional Structures of Acidic and Basic Fibroblast Growth Factors: X. ZHU, H. KOMIYA, A. CHIRINO, S. FAHAM, G. M. FOX, T. ARAKAWA, B. T. HSU, D. C. REES

## Technical Comments

Model Simulation of Mid-Cretaceous Ocean Circulation: K. B. FÖLLMI AND M. DELAMETTE; E. J. BARON AND W. H. PETERSON

## Inside AA

Making Connections, reviewed by N. GERSTEL ■ The Superfluid Phases of Helium 3, J. W. SERENE ■ Squid as Experimental Animals, W. F. GILLY ■ Books Received

### Products & Materials

Pyrogen Removal and Detection Products ■ Software for Amino Acid Analysis ■ Illumination System ■ Graphics Software ■ Ductless Fume Hood ■ In-Vivo Electrochemistry System ■ HPLC Column Oven ■ Literature

Information to Contributors is found on pages 35-37.

#### **Board of Directors**

Richard C. Atkinson Retiring President,

Donald N. Langenberg

Leon M. Lederman President-elect

Mary Ellen Avery Francisco J. Ayala Eugene H. Cota-Robles Robert A. Frosch Joseph G. Gavin, Jr. John H. Gibbons Beatrix A. Hamburg Florence P. Haseltine

William T. Golden Treasurer

Richard S. Nicholson Executive Officer

#### **Editorial Board**

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

# **Board of Reviewing**

John Abelson Frederick W. Alt Don L. Anderson Stephen J. Benkovic Gunter K-J Blobel Henry R. Bourne James J. Bull Kathryn Calame Charles R. Cantor Ralph J. Cicerone John M. Coffin Robert Dorfman Bruce F. Eldridge Paul T. Englund Fredric S. Fay

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

Harry A. Fozzard

Charles S. Levings III Richard Losic John C. McGiff Anthony R. Means Mortimer Mishkin Roger A. Nicoll William H. Orme-Johnson III Carl O. Pabo Yeshayau Pocker

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



251 (	(4989)
-------	--------

Science 251 (4989), 7-99.

ARTICLE TOOLS http://science.sciencemag.org/content/251/4989

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

Use of this article is subject to the Terms of Service