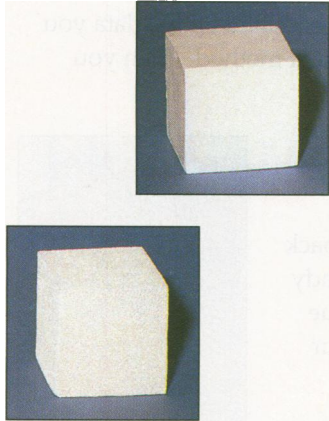
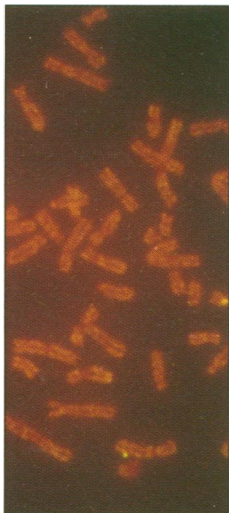


SCIENCE



1153
 Rough stuff



1178
 Molecular basis
 for SCID

NEWS

- Filtering a River of Cancer Data **1084**
 A Joint Russian-U.S. Investigation **1085**
- NIH Gets a Share of BRCA1 Patent **1086**
- Goldin Hopes to Trim Centers to Stave Off Program Cuts **1087**
- Erosion Study Finds High Price for Forgotten Menace **1088**
- Another Step Toward a Diamond-Beater **1089**
- Agencies Decry Fuzzy Science in Bill **1089**
- U.S. Oil and Gas Fields Double in Size **1090**

- Shedding Light on the Ticking of Internal Timekeepers **1091**
 Keeping PERfect Time **1092**

- Vertical Lasers Take Aim at New—and Colorful—Targets **1093**

SPECIAL NEWS REPORT

- The Defense Initiative of the 1990s Countering Nuclear Terrorism: Dwindling Capabilities? **1096**
1098
- The Front Line of Nuclear Defense Counterproliferation Initiative Blurs Agency Lines **1099**
1100

POLICY FORUM

- Post-Cold War Nuclear Dangers: Proliferation and Terrorism **1112**
 J. H. Nuckolls

PERSPECTIVE

- Punctuated Evolution of Embryos **1115**
 G. A. Wray

ARTICLES

- Environmental and Economic Costs of Soil Erosion and Conservation Benefits **1117**
 D. Pimentel, C. Harvey, P. Resosudarmo, K. Sinclair, D. Kurz, M. McNair, S. Crist, L. Shpritz, L. Fitton, R. Saffouri, R. Blair

- Prehistoric Extinctions of Pacific Island Birds: Biodiversity Meets Zooarchaeology **1123**
 D. W. Steadman

RESEARCH ARTICLE

- Head-On Collision Between a DNA Replication Apparatus and RNA Polymerase Transcription Complex **1131**
 B. Liu and B. M. Alberts

REPORTS

- Cooperative Organization of Inorganic-Surfactant and Biomimetic Assemblies **1138**
 A. Firouzi, D. Kumar, L. M. Bull, T. Besier, P. Sieger, Q. Huo, S. A. Walker, J. A. Zasadzinski, C. Glinka, J. Nicol, D. Margolese, G. D. Stucky, B. F. Chmelka

DEPARTMENTS

- THIS WEEK IN SCIENCE **1073**
- EDITORIAL **1075**
 The Opportunity Connection
- LETTERS **1077**
- SCIENCESCOPE **1083**
- RANDOM SAMPLES **1095**

- BOOK REVIEWS **1192**
The Evolutionary Biology of the Threespine Stickleback, reviewed by G. V. Lauder • *The Perfect Machine*, S. J. Dick • *Asteroids, Comets, Meteors 1993*, F. Vilas • *Vignette* • Books Received

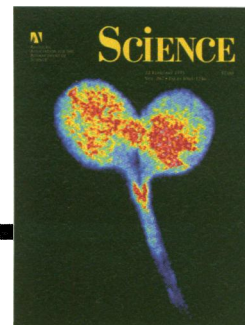
- INSIDE AAAS **1200**
- PRODUCTS & MATERIALS **1203**

Board of Reviewing Editors

- | | | | | | | |
|---------------------|-------------------|----------------------|------------------------|---------------------|-----------------------|----------------------|
| Frederick W. Alt | Kathryn Calame | Richard G. Fairbanks | Ira Herskowitz | Diane Mathis | T. M. Rice | Robert T. N. Tjian |
| Don L. Anderson | C. Thomas Caskey | Douglas T. Fearon | Eric F. Johnson | Anthony R. Means | David C. Rubie | Emil R. Unanue |
| Michael Ashburner | Dennis W. Choi | Harry A. Fozzard | Stephen M. Koslyn | Shigetada Nakanishi | Erkki Ruoslahti | Geerat J. Vermeij |
| Stephen J. Benkovic | John M. Coffin | Klaus Friedrich | Michael LaBarbera | Roger A. Nicoll | Gottfried Schatz | Bert Vogelstein |
| David E. Bloom | F. Fleming Crim | Theodore H. Geballe | Nicole Le Douarin | Stuart L. Pimm | Jozef Schell | Harold Weintraub |
| Floyd E. Bloom | Paul J. Crutzen | John C. Gerhart | Charles S. Levings III | Yeshayau Pocker | Ronald H. Schwartz | Arthur Weiss |
| Piet Borst | James E. Dahlberg | Roger I. M. Glass | Alexander Levitzki | Dennis A. Powers | Terrence J. Sejnowski | Zena Werb |
| Henry R. Bourne | Robert Desimone | Stephen P. Goff | Harvey F. Lodish | Ralph S. Quatrano | Ellen Solomon | George M. Whitesides |
| Michael S. Brown | Bruce F. Eldridge | Peter N. Goodfellow | Richard Losick | V. Ramanathan | Thomas A. Steitz | Owen N. Witte |
| James J. Bull | Paul T. Englund | Corey S. Goodman | Reinhard Lührmann | Douglas C. Rees | Michael P. Stryker | William A. Wulf |

The firefly luciferase gene can serve as an effective reporter for gene expression in vivo. In this *Arabidopsis* seedling, the luciferase gene was fused to the promoter region of the *CAB2* gene, whose expression is regulated by light and the circadian clock. Expression is

greatest (red) in the cotyledons and absent (blue) in the root. See page 1161 and a related Report (page 1163) and News story (page 1091). [Luminescence image: S. Kay and A. Millar]



Near-Atomic Resolution Imaging of Ferroelectric Liquid Crystal Molecules on Graphite by STM 1144

D. M. Walba, F. Stevens, D. C. Parks, N. A. Clark, M. D. Wand

Optical Properties of the South Pole Ice at Depths Between 0.8 and 1 Kilometer 1147

P. Askebjerg, S. W. Barwick, L. Bergström, A. Bouchta, S. Carius, A. Coulthard, K. Engel, B. Erlandsson, A. Goobar, L. Gray, A. Hallgren, F. Halzen, P. O. Hulth, J. Jacobsen, S. Johansson, V. Kandhadai, I. Liubarsky, D. Lowder, T. Miller, P. C. Mock, R. Morse, R. Porrata, P. B. Price, A. Richards, H. Rubinstein, E. Schneider, Q. Sun, S. Tilav, C. Walck, G. Yodh

Viscous Dissipation in Three-Dimensional Convection with Temperature-Dependent Viscosity 1150

S. Balachandar, D. A. Yuen, D. M. Reuteler, G. S. Lauer

Visual Appearance of Matte Surfaces 1153

S. K. Nayar and M. Oren

Requirement of Carbon Dioxide for in Vitro Assembly of the Urease Nickel Metallocenter 1156

I.-S. Park and R. P. Hausinger

A Functionally Diverse Enzyme Superfamily That Abstracts the α Protons of Carboxylic Acids 1159

P. C. Babbitt, G. T. Mrachko, M. S. Hasson, G. W. Huisman, R. Kolter, D. Ringe, G. A. Petsko, G. L. Kenyon, J. A. Gerlt

Circadian Clock Mutants in *Arabidopsis* Identified by Luciferase Imaging 1161

A. J. Millar, I. A. Carré, C. A. Strayer, N.-H. Chua, S. A. Kay

The Regulation of Circadian Period by Phototransduction Pathways in *Arabidopsis* 1163

A. J. Millar, M. Straume, J. Chory, N.-H. Chua, S. A. Kay

A Role for Exonuclease I from *S. pombe* in Mutation Avoidance and Mismatch Correction 1166

P. Szankasi and G. R. Smith

PER Protein Interactions and Temperature Compensation of a Circadian Clock in *Drosophila* 1169

Z. J. Huang, K. D. Curtin, M. Rosbash

Binding Strength Between Cell Adhesion Proteoglycans Measured by Atomic Force Microscopy 1173

U. Dammer, O. Popescu, P. Wagner, D. Anselmetti, H.-J. Güntherodt, G. N. Misevic

A Regulatory Role for ARF6 in Receptor-Mediated Endocytosis 1175

C. D'Souza-Schorey, G. Li, M. I. Colombo, P. D. Stahl

DNA-Dependent Kinase (p350) as a Candidate Gene for the Murine SCID Defect 1178

C. U. Kirchgessner, C. K. Patil, J. W. Evans, C. A. Cuomo, L. M. Fried, T. Carter, M. A. Oettinger, J. M. Brown

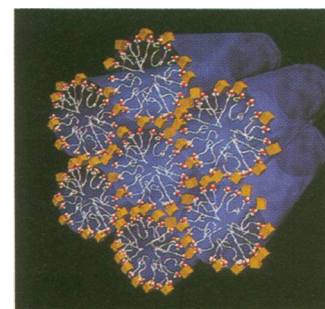
Absence of p350 Subunit of DNA-Activated Protein Kinase from a Radiosensitive Human Cell Line 1183

S. P. Lees-Miller, R. Godbout, D. W. Chan, M. Weinfeld, R. S. Day III, G. M. Barron, J. Allalunis-Turner

TECHNICAL COMMENTS

Alternatives to ^{35}S as a Label for the Differential Display of Eukaryotic Messenger RNA 1186

S. M. Trentmann, E. van der Knaap, H. Kende; P. Liang and A. B. Pardee



1138
Surfactants and silicates

AAAS Board of Directors

Francisco J. Ayala
Retiring President,
Chairman
Rita R. Colwell
President
Jane Lubchenco
President-elect

William A. Lester Jr.
Simon A. Levin
Michael J. Novacek

Anna C. Roosevelt
Alan Schriesheim
Jean E. Taylor
Chang-Lin Tien
Nancy S. Wexler

William T. Golden
Treasurer
Richard S. Nicholson
Executive Officer

■ **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 © 1995 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): \$97 (\$50 allocated to subscription). Domestic institutional subscription (51 issues): \$228. Foreign postage extra: Mexico, Caribbean (surface mail) \$53; other countries (air assist delivery) \$93. First class, airmail, student and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Printed in the U.S.A.

■ **Indicates accompanying feature**

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 43305-2033. **Single copy sales:** \$7.00 per issue prepaid includes surface postage; 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, MA 01970. The identification code for *Science* is 0036-8075/93 \$1 + .10. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

Science

267 (5201)

Science **267** (5201), 1073-1203.

ARTICLE TOOLS

<http://science.sciencemag.org/content/267/5201>

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.