

SCIENCE



1822

What sets apart the sexes?

NEWS

Conflict Marks Crime Conference	1808
French Budget: Research Given an 'Apparent Increase'	1809
Democrats Urge Clinton to Stand Up for R&D Programs	1810
Commission Proposes New Definition of Misconduct	1811
International Experts Help Probe Haiti's Bloody Past	1812
Tracing Croatia's 'Disappeared'	1812
Mass Migration Plan for Neutrinos	1813
Chambon Builds Institute With U.S. Funds and Eye for Detail	1814
Riding the Waves of Molecular Biology	1815
Butterfly Biomechanics: Wing Scales May Help Beat the Heat	1816
Another Blow Weakens EMF-Cancer Link	1816

Is the Most Distant Galaxy a Star Factory? 1817

Is Hale-Bopp the Next Great Comet? 1818

SPECIAL NEWS REPORT

SEX DETERMINATION

Tracing How the Sexes Develop	1822
Snaring the Genes That Divide the Sexes for Mammals	1824
How Males and Females Achieve X Equality	1826

PERSPECTIVES

Tuning into Better Catalysts	1833
J. A. Labinger	
Baculovirus Bounty	1834
L. E. Volkman	

ARTICLE

From Molecular Diversity to Catalysis: Lessons from the Immune System	1835
P. G. Schultz and R. A. Lerner	

DEPARTMENTS

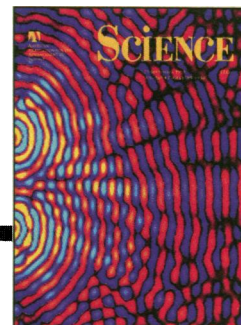
THIS WEEK IN SCIENCE	1797	RANDOM SAMPLES	1819
EDITORIAL	1799	Jewish Breast Cancer Gene? • Lasker Honors T Cell Pioneers • Lady in Amber • Potential Animal Model for AIDS • Folding Proteins Fast • Materials Science—Live on the Net • Shrinking National Labs	
Science in the Stationary Phase		BOOK REVIEWS	1891
A. Kornberg		<i>Crusading for Chemistry</i> , reviewed by P. T. Carroll • <i>Factories of Death</i> , A. D. Coox • <i>Corals in Space and Time</i> , R. W. Grigg • Books Received • Publishers' Addresses	
LETTERS	1801	INSIDE AAAS	1897
Multiple-Use Physics Facilities: J. C. Browne and R. Pynn; J. M. Carpenter; L. Rosen • The Endangered Species Act: P. F. Torrence • Garlic and Mosquitoes: F. Crowe • "Not-Even-a-Draft?": R. L. Park; Editors • Pioneering Work: W. Fiers; J. C. Venter		PRODUCTS & MATERIALS	1899
SCIENCESCOPE	1807	QUARTERLY INDEX	1901

Board of Reviewing Editors

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

Propagating acoustic strain waves depicted by magnetic resonance imaging (MRI). The dual-source interference pattern arose from 500-hertz mechanical shear waves applied to a tissue-simulating gel at two points (54 millimeters apart, at left). The MRI technique used

can quantitatively depict mechanical waves with amplitudes on the order of hundreds of nanometers and could lead to the development of a medical imaging modality that emulates the clinical technique of palpation. See page 1854. [Image: Richard L. Ehman]



RESEARCH ARTICLE

Hemoglobin Allosteric Resonance Raman Spectroscopy of Kinetic Intermediates 1843

V. Jayaraman, K. R. Rodgers, I. Mukerji, T. G. Spiro

REPORTS

Understanding C-H Bond Oxidations: H[•] and H⁻ Transfer in the Oxidation of Toluene by Permanganate 1849

K. A. Gardner and J. M. Mayer

Global Distribution of Persistent Organochlorine Compounds 1851

S. L. Simonich and R. A. Hites

Magnetic Resonance Elastography by Direct Visualization of Propagating Acoustic Strain Waves 1854

R. Muthupillai, D. J. Lomas, P. J. Rossman, J. F. Greenleaf, A. Manduca, R. L. Ehman

Anisotropy and Spiral Organizing Centers in Patterned Excitable Media 1857

O. Steinbock, P. Kettunen, K. Showalter

Replicator Neural Networks for Universal Optimal Source Coding 1860

R. Hecht-Nielsen

Circadian Oscillations of Cytosolic and Chloroplastic Free Calcium in Plants 1863

C. H. Johnson, M. R. Knight, T. Kondo, P. Masson, J. Sedbrook, A. Haley, A. Trewavas

Modulation of Transcription Factor Ets-1 DNA Binding: DNA-Induced Unfolding of an α Helix 1866

J. M. Petersen, J. J. Skalicky, L. W. Donaldson, L. P. McIntosh, T. Alber, B. J. Graves

A Specialized Pathway Affecting Virulence Glycoconjugates of *Leishmania* 1869

A. Descoteaux, Y. Luo, S. J. Turco, S. M. Beverley

Interaction of Tyrosine-Based Sorting Signals with Clathrin-Associated Proteins 1872

H. Ohno, J. Stewart, M.-C. Fournier, H. Bosshart, I. Rhee, S. Miyatake, T. Saito, A. Gallusser, T. Kirchhausen, J. S. Bonifacino

Jak-STAT Signaling Induced by the *v-abl* Oncogene 1875

N. N. Danial, A. Pernis, P. B. Rothman

Lateral Interactions in Primary Visual Cortex: A Model Bridging Physiology and Psychophysics 1877

M. Stemmler, M. Usher, E. Niebur

An Internal Model for Sensorimotor Integration 1880

D. M. Wolpert, Z. Ghahramani, M. I. Jordan

FFA-1, a Protein That Promotes the Formation of Replication Centers Within Nuclei 1883

H. Yan and J. Newport

Inhibition of ICE Family Proteases by Baculovirus Antiapoptotic Protein p35 1885

N. J. Bump, M. Hackett, M. Hugunin, S. Seshagiri, K. Brady, P. Chen, C. Ferenz, S. Franklin, T. Ghayur, P. Li, P. Licari, J. Mankovich, L. Shi, A. H. Greenberg, L. K. Miller, W. W. Wong

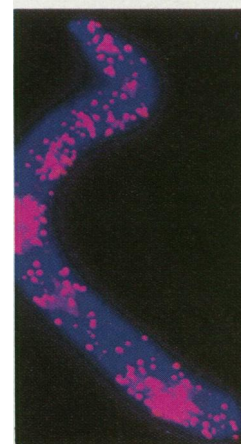
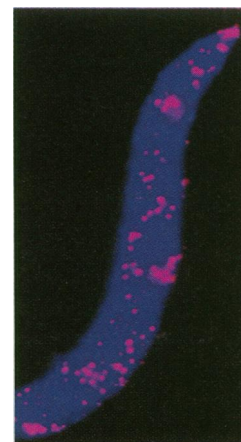
TECHNICAL COMMENTS

Honeybees and Magnetoreception 1888

H. Nichol and M. Locke; J. L. Kirschvink and M. M. Walker; M. H. Nesson; C.-Y. Hsu and C.-W. Li

1883

Control of DNA replication center formation



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 1811, Danbury, CT 06813-1811. 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 \$3.00 per article is paid directly to CCC, 27 Congress Street, Salem, MA 01970. The identification code for Science is 0036-8075/83 \$3.00. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.

Science

269 (5232)

Science **269** (5232), 1797-1900.

ARTICLE TOOLS

<http://science.sciencemag.org/content/269/5232>

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.