

# For High-Fidelity PCR *Pfu* Beats *Taq* Every Time!

UNITED STATES: Stratagene Headquarters Stratagene Headquarters Stratagene Headquarters Stratagene Headquarters Strate Stratagene com AUSTRALIA: 1800-282-204 AUSTRALIA: 1800-282-204 AUSTRALIA: 1800-282-204 BRAZIL: 11 530 7833 CANADA: 905 713 1201 DEMMARK: 86 101055 FRANCE: 1 34 60 2424 DEFMANY: 0130-840911 HONG KONE: 5785839 SRAEL: 37621687 TALY: 258013409 IAPAK: [Toyobo] 3 3660 4819 or 6 348 3785 Funanchi) J 55841 1522

(Funakoshi) 3 5684 1622 (Funakoshi) 3 5684 1622 MALAYSIA: 27031883 THE NETHERLANDS: 33 4950094 NORWAY: 22115090 PORTUGAL: 1-4581641 ROC: 2 684 0:066 or 2 720 2215 SINGAPORE: 2730895 SPAIN: 1728 0:3 33 SWEDEN: 6 684: 0845 SWITZERLAND: 3241105 THAILAND: 28080611 UNITER XINGDM: 6807.685520

#### Patent Pending

Purchase of these enzymes is accumanized by a license to use them in the object of the sections (PCR) proessing conjunctions with an Authorited hermail Cyclect Straagness PCR prodects are sold under licensing arrangemits with Roche Malecular Systems. Inc., E Hoffmann-La Roche Ltd. and Perkin Flare Convocation.

# *Pfu*<sup>\*</sup> polymerase for accurate PCR<sup>1\*</sup>

splee

Call Stratagene Or your Stratagene distributor for the complete picture... NATIVE Pfu DNA POLYMERASE Catalog #600135 (100U), #600136 (500U)

7.67

Accuracy (x10<sup>5</sup>)

Accuracy\* of PCR Polymerase

3.62

1.40

Taq

Hot Tub

Enzyme

1.05 1.21 1.25

Thr

0.35

\*Accuracy is represented as the a

0.17 Tma 3.76

RECOMBINANT Ptu DNA POLYMERASE Catalog #600153 (100U), #600154 (500U), #600159 (1000) Circle No. 40 on Readers' Service Card

STRATAGENE

P.GB-D

CRAYC

Caston

Introducing AmpliTaq Gold™



Co-implification of 8 human STR loci. L1, 2: male control DNA; L3, 4: female control DNA; L5: AmpliTaq negative control; L6, 7: male control DNA; L8, 9: female control DNA; L10: negative control.



Amplification of HIV-1 Control DNA. L2: 0 copies, AmpliTaq DNA Polymerase, No Hot Start; L3: 10 copies, AmpliTaq DNA Polymerase, No Hot Start; L4: 10 copies, AmpliTaq DNA Polymerase, manual Hot Start; L5: 10 copies, AmpliTaq Gold. For PCR performance with higher yield, better specificity and more reliable results, discover AmpliTaq Gold<sup>™</sup>.

This new version of AmpliTaq® DNA Polymerase provides the specificity of Hot Start PCR, without all the extra steps. In most cases, you can substitute AmpliTaq Gold directly in existing PCR amplification protocols—without re-optimization.

You'll find AmpliTaq Gold saves time and money with dramatically lower drop-out rates, improved specificity, and easier multiplexing.

It also gives you consistently better PCR results. Because AmpliTaq Gold remains inactive until heated, conditions that lead to primer-dimer formation and mispriming are eliminated.

And of course, you have the continued assurance of knowing that AmpliTaq Gold Circle No. 34 on Readers' Service Card

is backed by PE Applied Biosystems' exclusive

Where There's Gold,

You'll Find

Performance.

PCR Performance Guarantee.

So discover AmpliTaq Gold, and discover high performance PCR. To request information, call 1-800-327-3002. Outside the U.S. and Canada, contact your local PE Applied Biosystems representative. On the Internet, visit our home page at http://www.amplitaqgold.com, or e-mail pebio@perkin-elmer.com.

# **PE** Applied Biosystems

Europe Langen, Germany Tel: 49 6103 708 301 Fax: 49 6103 708 310 Japan Tokyo, Japan Tel: (0473) 80-8381 Fax: (0473) 80-8505 Latin America Mexico City, Mexico Tel: 52-5-651-7077 Fax: 52-5-593-6223 Australia Melbourne, Australia Tel: (03) 9212-8585 Fax: (03) 9212-8502

Perkin-Elmer PCR reagents are developed and manufactured by Roche Molecular Systems, Inc., Branchburg, New Jersey, U.S.A.



AmpliTag Gold is a trademark and AmpliTag is a registered trademark of Roche Molecular Systems, Inc. The PCR process is covered by patents owned by Hoftmann-La Roche, Inc. and F.Hottmann-La Roche Ltd. PE Applied Biosystems is a trademark and Perkin-Elmer is a registered trademark of The Perkin-Elmer Corporation. The Perkin-Elmer Corporation is ISO 9001 certified.



## The Ares-Serono Foundation Fellowships in Biomedicine

## **1997 Award Announcement**

### **FELLOWSHIPS IN IMMUNOLOGY**

Two Fellowships will be awarded by The Ares-Serono Foundation for postdoctoral training pertaining to studies in the field of immunology. The grants are awarded based on an international competition. The applications submitted should focus on research areas of neuroimmunology and autoimmunity. Fellowships may be held at any academic or research institution with appropriate degree programs.

#### Fellowship Terms

- Full-time postdoctoral training
- 2 years of support
- USD 40,000 annual grant towards expenses for postdoctoral training

#### Eligibility

- Preference will be given to candidates applying for their first postdoctoral training
- Applicants must have completed his/her PhD or MD degree no later than the start date of the fellowship
- Ability to communicate fluently in English (verbal and written)

#### Schedule

Application deadline:	February 28th, 1997
Grants announced:	June 30th, 1997
Fellowships start:	October 1997

For the Application Form and Eligibility Guidelines, please contact:

Maria Grazia Calì Secretary of the Board PO Box 7228 00100 Rome (Nomentano), Italy Fax +39-6-70384577 Internet address: http://www.serono.ch E-mail address: ares-serono.foundation@pn.itnet.it



## **Sponsored 1997 Scientific Workshops**

PARACRINE MECHANISMS IN FEMALE REPRODUCTIVE FUNCTION Seville, Spain

June 27-28, 1997

### **Scientific Organizers**

P. Bouchard (F) Hôpital St. Antoine, Paris, France A. Pellicer (E) Istituto Valenciano de Infertilidad, Valencia, Spain F. Petraglia (I) Università di Pisa, Italy

#### DEVELOPMENTAL ENDOCRINOLOGY

Centre Médical Universitaire, Geneva, Switzerland September 18-20, 1997

#### **Scientific Organizers**

P.C. Sizonenko (CH) Université de Genève, Switzerland M. Aubert (CH) Université de Genève, Switzerland

## **HIV-1** AND GAMETES

University of Siena "Certosa di Pontignano", Siena, Italy October 15-17, 1997

#### **Scientific Organizer**

B. Baccetti (I) Università di Siena, Italy

For FURTHER INFORMATION *Mailing Address:* M.G. Calì, Secretary of the Board, P.O. Box 7228, 00100 Rome (Nomentano) Italy Tel.: +39-6-70384 694/506/721 - Fax: +39-6-70384 577

*E-mail Address:* ares-serono.foundation@pn.itnet.it

#### Internet Address:

http://www.serono.ch

Circle No. 15 on Readers' Service Card

ISSN 0036-8075 **13 DECEMBER 1996** VOLUME 274 NUMBER 5294



NEWS & COMMENT





1828 Are they being misinformed?



1841 & 1870

Homo erectus hangs on in Java

Green Education Under Fire	1828	
Gibbons Warns of Decline in R&D	1830	
Political Sails Are Up for Revamping DOE	1831	
U.K.: Lab Privatization Program in Tatters	1831	
Funding Inequality Threatens Novel	1832	
Collaboration Across Continents	1833	
RESEARCH NEWS		
Can Chip Devices Keep Shrinking?	1834	2
Fly Sex Drive Traced to fru Gene	1836	
Could Stellar Ash Revise Cosmic Ages?	1837	
Endocrine Disrupters: Scientists Angle for Answers	1837	
Dissecting How Presenilins Function— and Malfunction	1838	
Do-It-Yourself Supercomputers	1840	
Homo erectus in Java: A 250,000-Year 💌 Anachronism	1841	
Unscrambling Time in the Fossil Record $\blacksquare$	1842	
DE	PART	

PERSPECTIVES		
Learning Rediscovered E. Bates and J. Elman		1849
Crossing the Hydrophobic Barrier: Insertion of Membrane Proteins D. M. Engelman		1850
Plasticity of a Different Feather? A. J. Doupe		1851
The Metal-Insulator Transition in Correlated Disordered Systems E. Abrahams and G. Kotliar		1853
ARTICLE	22	8.000.00M
Functions of Ceramide in Coordinating Cellular Responses to Stress Y. A. Hannun		1855
RESEARCH ARTICLE		None and No.
Structure of Staphylococcal α-Hemolysin, a Heptameric Transmembrane Pore L. Song, M. R. Hobaugh, C. Shustak, S H. Bayley, J. E. Gouaux	<b>5</b> . C	<b>1859</b> Cheley,
REPORTS	57.5	
Forcing of Atlantic Equatorial and Subpolar Millennial Cycles by Precession A. McIntyre and B. Molfino	n	1867
MENTS		
RANDOM SAMPLES Faculty Ambivalence on Affirmative Action Support for Black Hole, Oussar Link • Pur	1 • • ]	843 More

THIS WEEK IN SCIENCE 1813 1819 Preparing Children for the Future ness • NSF Creates Layperson Award • Undersized Protein, Oversized Heart • Deasbestosization • U.K. 1821 Genetics Group Established Plagiarism in China: C. Cao • U.S.-Chinese Collaborations: P. R. Renne • Paleoindians in the Bra-**BOOK REVIEWS** 1846 zilian Amazon: S. Fiedel; T. D. Dillehay; B. J. The Life and Legacy of G. I. Taylor, reviewed by C. Meggers; A. C. Roosevelt Wunsch • 3 K, S. Dodelson • The Chaperonins, R. I. Morimoto • Vignettes • Browsings 1827

**PRODUCTS & MATERIALS** 

1935

AAAS Board of Directors

Rita R. Colwell Retiring President, Chairman Jane Lubchenco President Mildred S. Dresselhaus President-elect

Sheila Jasanoff William A. Lester Jr. Simon A. Levin Marcia C. Linn Michael J. Novacek Anna C. Roosevelt Jean E. Taylor Nancy S. Wexler

EDITORIAL

LETTERS

SCIENCESCOPE

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, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 1996 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): \$102 (\$55 allocated to subscription). Domestic individual is hearting (51 learned) \$200. Encipe performance of the Advance and the Advance of \$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$100 (\$10 institutional subscription (51 issues): \$250. Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$90. 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.** 

SCIENCE • VOL. 274 • 13 DECEMBER 1996

1810

#### COVER

Snapshot of the magnetic field inside Earth's core simulated by a geodynamo model. Magnetic lines of force are gold where they are inside, or blue where they are outside, the solid inner core. The Earth's axis of rotation is vertical in this image. The field is directed inward at the inner core north pole (top) and outward at the south pole (bottom). The maximum magnetic intensity is about 30 millitesla. See page 1887 and a related report on page 1883. [Image: G. A. Glatzmaier and P. H. Roberts]

	10.5	
Latest Homo erectus of Java: Potential 🗾 1 Contemporaneity with Homo sapiens in Southeast Asia C. C. Swisher III, W. J. Rink, S. C. Antón, H Schwarcz, G. H. Curtis, A. Suprijo, Widiasmore	H. P.	CD5-Mediated Negative Regulation 1906 of Antigen Receptor–Induced Growth Signals in B-1 B Cells G. Bikah, J. Carey, J. R. Ciallella, A. Tarakhovsky, S. Bondada
Dynamical Signature of the Mott- Hubbard Transition in Ni(S,Se) <sub>2</sub>	1 <b>874</b>	Quantal Duration of Auditory Memories 🗾 1909 S. J. Chew, D. S. Vicario, F. Nottebohm
Rosenbaum, X. Yao, J. M. Honig	1. 1.	Ethylene as a Signal Mediating the 1914 Wound Response of Tomato Plants
Hf-W Isotopic Evidence for Rapid 1 Accretion and Differentiation in the Early Solar System	876	P. J. O'Donnell, C. Calvert, R. Atzorn, C. Wasternack, H. M. O. Leyser, D. J. Bowles
DC. Lee and A. N. Halliday		Immunologic NO Synthase: Elevation1917in Severe AIDS Dementia and Induction
Polymorphs of Alumina Predicted by 1 First Principles: Putting Pressure on the Ruby Pressure Scale K. T. Thomson, R. M. Wentzcovitch, M. S Bukowinski	1 <b>880</b> 5. T.	by HIV-1 gp41 D. C. Adamson, B. Wildemann, M. Sasaki, J. D. Glass, J. C. McArthur, V. I. Christov, T. M. Dawson, V. L. Dawson
Planet Within a Planet: Rotation       1         of the Inner Core of Earth       1         Wj. Su, A. M. Dziewonski, R. Jeanloz	883	Reduction of Voltage-Dependent Mg <sup>2+</sup> 1921 Blockage of NMDA Current in Mechanically Injured Neurons L. Zhang, B. A. Rzigalinski, E. F. Ellis, L. S. Satin
Rotation and Magnetism of Earth's1Inner CoreG. A. Glatzmaier and P. H. Roberts	887	Multiple Extracellular Elements of CCR5 1924 and HIV-1 Entry: Dissociation from Response to Chemokines
Tomography of the Source Area of the 1995 Kobe Earthquake: Evidence for	891	R. E. Atchison, J. Gosling, F. S. Monteclaro, C. Franci, L. Digilio, I. F. Charo, M. A. Goldsmith
Fluids at the Hypocenter? D. Zhao, H. Kanamori, H. Negishi, D. Wiens		Statistical Learning by 8-Month-Old <b>7</b> 1926 Infants
Paleontology and Chronology of Two Evolutionary Transitions by Hybridization in the Bahamian Land Snail Cerion	894	TECHNICAL COMMENTS
G. A. Goodfriend and S. J. Gould		DNA Looping and Lac Repressor–CAP 1929 Interaction
Nanocapillarity and Chemistry in       1         Carbon Nanotubes       D. Ugarte, A. Châtelain, W. A. de Heer	897	M. Perros and T. A. Steitz; M. G. Fried and J. M. Hudson; <i>Response</i> : M. Lewis
Ca <sup>2+</sup> -Dependent Protein Kinases and Stress Signal Transduction in Plants J. Sheen	900	The Loss of Atmosphere from Mars1932R. E. Johnson and M. Liu; Response: D. M. Kassand Y. L. Yung
NF-AT–Driven Interleukin-4 1 Transcription Potentiated by NIP45 M. R. Hodge, H. J. Chun, J. Rengarajan, A. R. Lieberson, L. H. Glimcher	1 <b>903</b> Alt,	Alzheimer's Precursor Protein and the Use of Bathocuproine for Determining Reduction of Copper(II) L. M. Sayre; <i>Response</i> : G. Multhaup

Indicates accompanying feature

Change of address: allow 4 weeks, giving old and new addresses and 8-digit account number. Change of address: allow 4 weeks, giving old and new addresses and 8-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 \$4.00 per article is paid directly to CCC, 222 Rosewood Drive, Darvers, MA 01923. The identification code for *Science* is 0036-8075/83 \$4.00. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

# **On the Web**

Access to Science Online is changing soon. Find out now how to gain access in 1997: http://www.sciencemag.org/

SCIENCE • VOL. 274 • 13 DECEMBER 1996

1842 &

**Evolution caught in** 

1894

the act



# Introducing BioLite<sup>™</sup>: A luminescent labeling and detection assay kit for the quantification of cells, particles, and microorganisms.

BioLite<sup>1</sup>, a long-lived "glow" type signal assay kit, allows you to carry out high throughput cell adhesion, chemotactic or infection studies in the microplate format. With BioLite, you simply pre-label your cells, particles, or microorganisms of interest using the label provided. Perform your assay; wash any non-adherent, non-bound, or non-invasive labeled cells or microorganisms free; add the BioLite detection reagent; and measure the produced signal.

BioLite labeling is rapid, permanent, cell-type independent, and does not require long incubation times. The assay simplicity and high detection sensitivity with BioLite enables the use of microplate technology for easy handling and high throughput analysis. And, with a half-life of several hours, BioLite allows you to prepare multiple microplates at the same time for compound screening assays or to measure plates at multiple time points.

<sup>1</sup>Patent pending

Combined with the TopCount<sup>™</sup> microplate scintillation and luminescence counter, BioLite assays can be performed in either the 96- or 384-well microplate format for batch processing of cellular or microbiological assays. TopCount enables you to



analyze 12 samples simultaneously. It also provides temperature control and stackers to hold up to 40 microplates.

Switch on BioLite for:

- Rapid, non-isotopic labeling and detection
- Long-lived luminescent signal (half-life of several hours)
- High sensitivity
- A label that binds equally well to all cell types
- A label that does not interfere with cell adhesion kinetics or membrane receptor function



Packard Instrument Company, 800 Research Parkway, Meriden, CT 06450 U.S.A. Tel: 203-238-2351 Toll Free: 1-800-323-1891 FAX: 203-639-2172 Web Site: http://www.packardinst.com Email: webmaster@packardinst.com



Packard International Offices:

Australia, Mt Waverley 61-3-9543-4266; Austria, Vienna 43-1-2702504; Belgium, Brussels 32-2-4668210; Canada, Ontario 1-800-387-9559; Central Europe, Schwadorf, Aus. 43 456 2230 015; Denmark, Greve 45-42909023; France, Rungis (33) 1 46.86.27.75; Germany, Dreieich (49) 6103 385-151; Italy, Milano 39-2-33910796/7/8; Japan, Tokyo 81-3-3866-5850; Netherlands, Groningen 31-50-5413360; Tilburg (013) 5423900; Russia, Moscow, 7-095-259-9632; Switzerland, Zurich (01) 481 69 44; United Kingdom, Pangbourne, Berks (44) 01734 844981. Circle No. 26 on Readers' Service Card

# This Week in Science

edited by BROOKS HANSON

# Heinrich events go south?

Heinrich events mark abrupt episodes of discharge of icebergs from the continental ice sheet covering North America during the last glaciation. The climatic causes of these events and whether they are local or hemispheric in scale are not clear. McIntyre and Molfino (p. 1867) show that peaks in abundance of a marine alga in a highresolution climate record from the equatorial Atlantic Ocean spanning the last 45,000 years are coeval, within age-resolution, of the last several Heinrich events. They suggest that the cycles, which occurred about every 8400 years, are caused ultimately by variations in Earth's orbit.

#### Zipping around

It was recently shown by Song and Richards that the Earth's inner core is spinning faster than the mantle by about 1° per year. Su et al. (p. 1883), using independent observations of 29 years of seismic waves traveling through the core, suggest that the inner core is indeed rotating faster, perhaps by as much as 3° per year ahead of the mantle. Glatzmaier and Roberts (p. 1887; cover) simulated the geodynamo and find that the inner core's superrotation may be explained by the coupling of the inner core's magnetic field with an eastward-moving thermal wind in the fluid outer core.

#### Slippery when wet

The cause of the magnitude 7.2 Kobe, Japan, earthquake in January 1995 is unknown. Zhao *et al.* (p. 1891) developed a

#### **Quickly ironed out**

Following the Big Bang, debris accreted together in the inner solar system to form planetesimals. Lee and Halliday (p. 1876) measured <sup>182</sup>W isotopic anomalies in meteorites, which are produced by decay of <sup>182</sup>Hf (half-life of 9 million years), to date the accretion and segregation of iron cores (which prefer W relative to Hf) in some of these parent bodies. The tungsten isotopic anomalies of iron meteorites (perhaps representing cores) are similar to anomalies in metal grains in ordinary chondrites (silicate mantle and crust). This result suggests that the parent bodies and their cores formed at the same time and within a few million years of the origin of the solar system.

tomographic model of the velocity structure of the crust beneath the epicenter and the extended aftershock zone. Their images show that the hypocenter of the earthquake was in



a distinctive zone, characterized by low P-wave and S-wave velocities and a high Poisson's ratio, suggestive of the presence of fluids that may have helped facilitate the earthquake.

#### Wounded reaction

Plants respond to being wounded by increasing the production of proteinase-inhibitor genes, which in turn block the feeding of insects that caused the damage. O'Donnell *et al.* show (p. 1914) that the signals regulating expression of these genes include ethylene as well as jasmonates. Ethylene production is detectable shortly after wounding and well before changes in the transcription of the proteinase-inhibitor genes are detected.

#### Fits of forgetfulness

Adult zebra finches are capable of recognizing and remembering songs of other birds, and the duration of the memory varies with song type. Chew et al. (p. 1909; see Perspective by Doupe, p. 1851) monitored neuronal activity in the auditory centers of awake zebra finches while they were presented with various songs. An unexpected finding was that the birds appeared to forget the song only at six narrow windows with durations of 1 to 4 hours during 4 days of testing. These windows marked periods of gene expression and protein synthesis that were required to maintain the longer lasting memories. Thus, it appears that remembering these songs depends on quantized waves of macromolecular synthesis.

#### Extended damage

After traumatic brain injury, changes in the permeability of neurons to various ions can contribute to the extent of actual damage to neurons. Zhang *et al.* (p. 1921) show that one part of this change involves the calcium channel known as the NMDA-type glutamate receptor. After neurons have been subjected to traumatic stress, the molecular characteristics of the NMDA receptor change such that the channel becomes more permeable to calcium ions. This influx of calcium ions in turn promotes further neuronal damage.



#### **Tiny test tubes**

The inner cavities of carbon nanotubes could be utilized for the controlled production of encapsulated nanostructures and as small test tubes. However, numerous problems remain, such as the controlled filling of the tubes and the reactivity of the tube walls. Ugarte et al. (p. 1897) studied the filling of nanotubes with a molten silver salt and showed that a minimum tube diameter of about 4 nanometers is required. The decomposition of the silver salt within the tubes to form silver particles leads to high pressures in the tubes and to production of oxidizing gases that erode the tube walls.

#### Start me up

Expression of cytokines such as interleukin-4 (IL-4) requires several transcription factors, including members of the NF-AT family (nuclear factor of activated T cells), but low levels of cytokine expression in reconstituted systems suggests that unknown proteins act in NF-AT-mediated transcription. Hodge et al (p. 1903) have now identified a protein, NIP45, that shows little similarity to other known proteins, but that, in combination with the NF-AT protein and c-maf, activated the IL-4 promoter. Transient overexpression of these proteins in B cells led to endogenous production of IL-4.

SCIENCE • VOL. 274 • 13 DECEMBER 1996

Go To http://www.sciencemag.org

# GET ON THE FAST TRACK... Science Online

# SCIENCE Online helps keep you out in front!

- Full-text SCIENCE on the day of publication, research papers and news articles with hyperlinks from citations to related abstracts in Medline
- ScienceNOW daily science news briefings

SCIENCE ONLINE

- SCIENCE's Next Wave a new design, plus new career advice column, an Asian forum, and expanded news section written by young scientists worldwide
- Perspectives enhanced with links to related research and background information
- SCIENCE Professional Network career related services, including a powerful new engine to search jobs by discipline, position, organization, and region
- SCIENCE Electronic Marketplace the latest product information from the world's leading science manufacturers and suppliers, plus hyperlinks to advertiser's web sites



Join thousands of your AAAS colleagues and turn to SCIENCE Online to research your interest areas right at your desk.

**Science Online** 

http://www.sciencemag.org

## Starting in 1997, only AAAS members will be able to gain access to SCIENCE Online. If you are already a member, upgrade now for just \$12. If you are not yet a member, you can still join AAAS and get SCIENCE Online for \$12.

Access our online form through the AAAS WWW site: http://www.aaas.org/membership/meminfo.htm... Or fill out and mail the coupon below... Or fax your coupon to us at (202) 842-1065... Or call (202) 326-6417 to order today.

#### MEMBERSHIP UPGRADE

□ YES, I want instant access to SCIENCE Online. Please upgrade my membership to include the full-text SCIENCE Online at the special introductory rate of only \$12. (Offer good through 12/31/96. Access to SCIENCE Online is for one full year.)

#### NEW MEMBERSHIP WITH SCIENCE ONLINE

□ Please sign me up for AAAS membership and the special introductory rate for the full-text of SCIENCE Online. Membership includes 51 weekly issues of SCIENCE and one-year access to SCIENCE Online:

	U.S.	Europe, Asia, Pacific & Other	Canada	Mexico/ Caribbean
Regular Member	🗆 \$114	□ \$204	🗆 \$179.99	🗆 \$169
Postdoctoral/Resident	🗆 \$ 89	🗆 \$179	🗆 \$153.24	🗆 \$144
Full-Time Student	□\$67	🗆 \$157	🗆 \$129.70	\$122

#### NEW MEMBERSHIP WITHOUT SCIENCE ONLINE

🗔 Please sign me up fo	r AAAS membership.	. Membership inc	ludes 51 weekly issu	es of SCIENCE.
Regular Member	□ \$102	🗆 \$192	🗆 \$167.99	🗆 \$157
Postdoctoral/Resident	🗆 \$ 77	🗆 \$167	🗆 \$141.24	🗆 \$132
Full-Time Student	🗆 \$ 55	🗆 \$145	🗆 \$117.70	🗆 \$110

Rates are valid until 12/31/96. \$55 allocated to SCIENCE. Canadian rate includes GST# 125488122. Please allow six weeks for receipt of first issue of Science. International exchange rates for credit card transactions are set by your credit card company, not by AAAS.

□ Check enclosed (payable to "AAAS") for: \$ \_\_\_\_

🗆 Charge S	to my: 🗆 Visa	🗆 MasterCard	American Express

CARD	#	

SIGNATURE

NAME

STATE/COUNTRY

#### MEMBERSHIP ID # (IF CURRENT MEMBER)

INSTITUTION

STREET ADDRESS

CITY

MAIL TO: AAAS—Membership Services 1200 New York Avenue, NW Washington, DC 20005 Circle No. 22 on Readers' Service Card **OR FAX TO:** (202) 842-1065

EXP. DATE

S6AE3

ZIP/POSTAL CODE

# DNA - GENETIG SEQUENCING - ANALYSIS

# One System... One Solution

#### INCREASED SEQUENCING PRODUCTIVITY

DNA sequencing productivity immediately goes up when you add a LI-COR infrared system to your lab! Read lengths extend to 800-1200 bases per sample with superior accuracy.

#### HIGH GENETIC ANALYSIS THROUGHPUT

For genotyping or forensics, LI-COR systems deliver up to 1800 genotypes per day (over 5000 on an expanded system!) Plus, results are presented in true autoradiogram format for highest accuracy.



4000LS Long ReadIR<sup>™</sup> DNA Sequencer

## Find out how easily LI-COR systems integrate into multi-user labs! Ask for our new application note series.

## EASY-TO-USE

LI-COR systems are ideal for multiuser labs. Dedicated operators are not needed because anyone can learn to use the system.

#### ECONOMICAL

LI-COR systems are also a better value for both sequencing and genetic analysis. Affordable system prices, outstanding reliability and more sequencing data per sample make these infrared systems less expensive to own and operate.

1-800-645-4267

(Toll Free U.S. and Canada) e-mail: biohelp@bio.licor.com Visit our web site at: www.licor.com



LI-COR, Inc. • 4308 Progressive Ave. • Lincoln, Nebraska 68504 USA • Phone: 402-467-0700 • FAX: 402-467-0819 Japan: (81) 422 45 5130; Germany, Austria: (49) 80 92 82 89 0; Switzerland: (41) 61 416 06 16; United Kingdom: (44) 181 614 1000; Spain: (34) 3 201 44 11; France: (33) 1 64 46 2400; Netherlands, Belgium: (31) 294 283119; Australia: (61) 2 417 8877; New Zealand: (64) 9 366 3999; Taiwan (R.O.C.): (886) 2 393 4231; Korea: (82) 2 547 1758; Denmark, Norway, Sweden: (45) 86 10 10 55; Italy: (39) 2 4819 6819 Circle No. 35 on Readers' Service Card

# http://www.sciencemag.org/ Eľ

#### MEMBERSHIP/CIRCULATION

Director: Michael Spinella Deputy Director: Marlene Zendell

Member Services: Donald Crowl, Manager; Mary Curry, Supervisor; Pat Butler, Laurie Baker, Yvette Carter Representatives

Marketing: Dee Valencia, Manager; Jane Pennington, Europe Manager; Hilary Baar, Assistant Manager; Lauri Sirois, Coordinator

Research: Renuka Chander, Manager

Business and Finance: Robert Smariga, Manager; Nina Araujo de Kobes, Kimberly Parker, Coordinators Computer Specialist: Charles Munson

#### ADVERTISING AND FINANCE

Associate Publisher: Beth Rosner Advertising Sales Manager: Susan A. Meredith Recruitment Advertising Manager: Janis Crowley Business Manager: Deborah Rivera-Wienhold Finance: Randy Yi, Senior Analyst, Connie Dang, Fi-

nancial Analyst Marketing: John Meyers, Manager; Allison Pritchard,

Associate

Electronic Media: David Gillikin, Manager; Mark Croatti, Crystal Young, Production Associates Product Advertising: Carol Maddox, Traffic Manager;

Natalie Britt. Sales Associate

Product Advertising Sales: East Coast/E. Canada: Richard Teeling, 201-904-9774, FAX 201-904-9701 • Midwest/Southeast: Elizabeth Mosko, 773-665-1150, FAX 773-665-2129 · West Coast/W. Canada: Neil Boylan, 415-673-9265, FAX 415-673-9267 · UK, Scandinavla, France, Italy, Belgium, Netherlands: Andrew Davies, (44) 1-457-838-519, FAX (44) 1-457-838-898 • Germany/Switzerland/Austria: Tracey Peers, (44) 1-260-297-530, FAX (44) 1-260-271-022 • Japan: Mashy Yoshikawa, (81) 3-3235-5961, FAX (81) 3-3235-5852 Recruitment Advertising: Terri Seiter Azie, Sales and Production Operations Manager; Celeste Miller, Sales Supervisor; Eric Banks, Troy Benitez, Bren Peters-Minnis, Bethany Ritchey, Sales; Debbie Cummings, European Sales Manager; Wendy Green, Production Associate; Nicole Robinson, Advertising Assistant Recruitment Advertising Sales: US: Janis Crowley, 202-326-6532, FAX 202-289-6742 · Europe: Debbie Cummings, (44) 1223-302067, FAX (44) 1223-576208 • Australia/New Zealand: Keith Sandell, (61) 02-922-2977, FAX (61) 02-922-1100 • Japan: Mashy Yoshikawa, (81) 3-3235-5961, FAX (81) 3-3235-5852

Assistant to Associate Publisher: Nancy Hicks Permissions: Lincoln Richman Exhibits Coordinator: Arlene Ennis

Send materials to Science Advertising, 1200 New York Avenue, NW, Washington, DC 20005.

#### SCIENCE EDITORIAL BOARD John J. Hopfield F. Clark Howell

Paul A. Marks

Yasutomi Nishizuka

Helen M. Ranney

Bengt Samuelsson

Robert M. Solow

Edward C. Stone

James D. Watsor

Richard N. Zare

Charles J. Arntzen	
David Baltimore	
J. Michael Bishop	
William F. Brinkman	
E. Margaret Burbidge	
Pierre-Gilles de Gennes	
Joseph L. Goldstein	
Mary L. Good	
Harry B. Gray	

Published by the American Association for the Advancement of Science (AAAS), Science serves its readers as a forum for the presen-tation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews-are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

■ 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.

#### **INFORMATION RESOURCES**

#### SUBSCRIPTION SERVICES

For change of address, missing issues, new orders and renewals, and payment questions, please contact AAAS at Danbury, CT: 800-731-4939 or Washington, DC: 202-326-6417, FAX 202-842-1065. Mailing addresses: AAAS, P.O. Box 1811, Danbury, CT 06813 or AAAS Member Services, 1200 New York Avenue, NW, Washington, DC 20005 · Other AAAS Programs: 202-326-6400

#### **REPRINTS & PERMISSION**

Reprints: Ordering/Billing, 800-407-9191; Correc-tions, 202-326-6501 • Permissions: 202-326-7074, FAX 202-682-0816

#### INTERNET ADDRESSES

science\_editors@aaas.org (for general editorial queries); science\_news@aaas.org (for news queries); science\_letters@aaas.org (for letters to the editor); science\_reviews@aaas.org (for returning manuscript reviews); science@science-int.co.uk (for the Europe Office); membership@aaas.org (for member services); science\_classifieds@aaas.org (for submitting classified advertisements); science\_advertising@aaas.org (for product advertising)

**INFORMATION FOR CONTRIBUTORS** See pages 93-94 of the 5 January 1996 issue or

Frederick W. Alt

Don L. Anderson

Technology

Seth Blair

Piet Borst

Madison

David E. Bloom

Henry R. Bourne

Francisco

Michael S. Brown

Kathryn Calame

David Clapham

Parkville

John M. Coffin

Medicine

Madison

Chemie

Paul J. Crutzen

F. Fleming Crim

Michael Ashburner Univ. of Cambridge

tephen J. Benkovic

Pennsylvania State Univ. Alan Bernstein

Mount Sinai Hospital. Toronto

Univ. of Wisconsin,

Harvard Institute for

International Development

The Netherlands Cancer Institute

Univ. of California. San

Univ. of Texas South-

western Medical Center James J. Bull

Physicians & Surgeons Dennis W. Choi

of Medicine, St. Louis

Mayo Foundation

Univ. of Melbourne,

Tufts Univ. School of

Univ. of Wisconsin

Max-Planck-Institut für

James E. Dahlberg Univ. of Wisconsin Medical

National Institute of Mental

School, Madison

Robert Desimone

Health. NIH

Adrienne E. Clarke

Univ. of Texas at Austin

Columbia Univ. College of

Washington Univ. School

Children's Hospital, Boston

California Institute of

#### BOARD OF REVIEWING EDITORS

Paul T. Englund Johns Hopkins Univ. School of Medicine G. Ertl Max-Planck-Gesellschaft Richard G. Fairbanks Lamont-Doherty Earth Observatory Robert E. Fay U.S. Bureau of the Census Douglas T. Fearon Univ. of Cambridge Harry A. Fozzard The Univ. of Chicago Roger I. M. Glass Centers for Disease Control Stephen P. Goff Columbia Univ. College of Physicians & Surgeons Peter N. Goodfellow SmithKline Beecham, UK Peter Gruss Max Planck Institute of Biophysical Chemistry Philip C. Hanawalt Stanford Univ. Paul Harvey Univ. of Oxford M. P. Hassell Imperial College at Silwood Park Nobutaka Hirokawa Univ. of Tokvo Tomas Hökfelt Karolinska Institutet Tasuku Honjo Kyoto Univ. Susan D. Iversen Univ. of Oxford Eric F. Johnson The Scripps Research Institute Elliott Kieff Harvard Univ. Judith Kimble Univ. of Wisconsin, Madisor Stephen M. Kosslyn Harvard Univ. Michael LaBarbera The Univ. of Chicago Nicole Le Douarin Institut d'Embryologie Cellulaire et Moléculaire du CNRS

Harvey F. Lodish Whitehead Institute for Biomedical Research **Richard Losick** Harvard Univ. Reinhard Lührmann Institut für Molekularbiologie und Tumorforschung der Philipps-Universität Ruth Lynden-Bell Queen's Univ., Belfast Seth Marder California Institute of Technology Diane Mathis Institut de Chimie Biologique, Strasbourg Susan K. McConnell Stanford Univ. Anthony R. Means Duke Univ. Medical Center Stanley Meizel Univ. of California, Davis Shigetada Nakanishi Kvoto Univ. Kim Nasmyth Research Institute of Molecular Pathology, Vienna Roger A. Nicoll Univ. of California, San Francisco Staffan Normark Swedish Institute for Infectious Disease Control Bert W. O'Malley Baylor College of Medicine Stuart L. Pimm The Univ. of Tennessee, Knoxville Yeshayau Pocker Univ. of Washington, Seattle Ralph S. Quatrano Univ. of North Carolina, Chapel Hill Martin Raff Univ. College London Douglas C. Rees California Institute of Technology T. M. Rice ETH-Hönggerberg, Zünch David C. Rubie Universität Bayreuth Erkki Ruoslahti The Burnham Institute, CA

National Institute of Allergy and Infectious Diseases, NIH Terrence J. Sejnowski Salk Institute Christopher R. Somerville Carnegie Institute of Washington Thomas A. Steitz Yale Univ. Michael P. Stryker Univ. of California. San Francisco Cliff Tabin Harvard Medical School John Jen Tai Academia Sinica, Taiwan Tomoyuki Takahashi Univ. of Tokyo Masatoshi Takeichi Kyoto Univ. Keiji Tanaka RIKEN Institute David Tilman Univ. of Minnesota, St. Paul Robert T. N. Tjian Univ. of California, Berkeley Yoshinori Tokura Univ. of Tokyo Emil R. Unanue Washington Univ. School of Medicine, St. Louis Derek van der Kooy Univ. of Toronto Geerat J. Vermeij Univ. of California, Davis Bert Vogelstein Johns Hopkins Oncology Center Arthur Weiss Univ. of California, San Francisco Zena Werb Univ. of California, San Francisco George M. Whitesides Harvard Univ. Owen N. Witte Univ. of California, Los

access http://www.sciencemag.org/science/home/ con-info.shtml.

#### **EDITORIAL & NEWS CONTACTS**

North America Address: 1200 New York Avenue, NW, Washington, DC 20005

Editorial: 202-326-6501, FAX 202-289-7562 News: 202-326-6500, FAX 202-371-9227 . Bureaus: Berkeley, CA: 510-841-1154, FAX 510-841-6339, San Diego, CA: 619-942-3252, FAX 619-942-4979, Chicago, IL: 312-360-1227, FAX 312-360-0537, Boston, MA: 617-566-7137, FAX 617-734-8088

#### Europe

Headquarters: 14 George IV Street, Cambridge, UK CB2 1HH; (44) 1223-302067, FAX (44) 1223-302068 Paris Correspondent: (33) 1-49-29-09-01, FAX (33) 1-49-29-09-00

#### Asia

Japan Office: Carl Kay, Esaka-cho 5-chome 11-10, Suita-shi, Osaka 564 Japan; (81) 6-368-1925, FAX (81) 6-368-6905; science@magical.egg.or.jp • News Bureau: (81) 3-3335-9925, FAX (81) 3-3335-4898 • China Office: Hao Xin, (86)10-6255-9478; science@public3.bta.net.cn

Gottfried Schatz Biozentrum, Basel Jozef Schell Max-Planck-Institut für Zuchtungforschung Ronald H. Schwartz Angeles

# Lstep Bibliographies in Microsoft®Word with the new EndNoteAdd-in

## Create a bibliography in one step:

With the new EndNote Add-in (included in EndNote Plus 2.1 or higher), you simply choose *Format Bibliography* from Word's *Tools* menu and EndNote will create your bibliography instantly! You don't have to close the document, scan it, or save a formatted copy under a different name.

## Keep track of only one document:

When formatting bibliographies, there's no need to keep track of two separate versions of the same document (i.e., your working copy and the formatted copy).

# Revise the same document as many times as you need:

The **EndNote Add-in** has no problem with last-minute revisions that you've made to your document. Each time you choose *Format Bibliography*, the **EndNote Add-in** will automatically update your citations and bibliography in your document.

EndNote2



To create a bibliography, simply select

Format Bibliography from Word's Tools menu.



## **Available for Macintosh and now for Windows!**

Speedy 32-bit processing Works under Windows 3.1, Windows 95, Windows NT and Macintosh Works with Microsoft Word 6 and 7 (Win-





WINDOWS MICHAELE MAC OS Windows NT, Windows 95 and the Mac OS. All trademarks are property of their respective companies. Mac and the Mac OS logo are trademarks of Apple Computer, Inc. Microsoft Windows and the Windows logo are registered trademarks of Microsoft Corporation.

© Copyright 1996, Niles & Associates, Inc



dows); 5 and 6 (Macintosh) **EndNote** is compatible with WordPerfect and other word processors (no Addin) **Encludes** bibliographic styles for more than 300 journals **EndLink** (sold separately) imports from more than 100 online databases and CD-ROMS

"If you use Word and you do scholarly publishing, you need EndNote Plus. Recommended." – Jerry Pournelle, *Byte*, September 1996

"... the most powerful citation manager you can find, short of a personal librarian." — PC Magazine, December 1995

"Despite its power, EndNote Plus remains surprisingly easy to learn and use." — Macworld, April 1995

800 Jones Street Berkeley California 94710 USA Phone 800.554.3049 or 510.559.8592 Fax 510.559.8683 E-mail: info@niles.com World Wide Web: http://www.niles.com Australia (+61) 66.58.3674 Germany (+49) (0) 69.970841.11 Japan (+81) 3.3384.8861 Scandinavia (+46) 481.511.23 UK (+44) (0) 1865.784800 Reference Manager<sup>•</sup> Users Can Now Switch to EndNote<sup>•</sup> In One Step

Users of Reference Manager have asked us for a simple way to convert their data into EndNote. We've done it! Simply click a button and EndNote will automatically convert your Reference Manager database into an EndNote database. It's that easy! And your Reference Manager files are not affected by this conversion.

And that's not all! If you use Microsoft Word, you can enjoy the benefits of the EndNote Add-in right away! You can convert your Microsoft Word documents containing Reference Manager citations into papers with EndNote citations. Now you're ready to format your bibliographies in just one step!

As a user of Reference Manager you qualify for a competitive upgrade. Call us for details. All of our products are backed by a simple 30-Day Money-Back guarantee.

If you would like to see how EndNote converts your Reference Manager files, you can download a free demo from our web site at http://www.niles.com. Questions? Call Niles & Associates at 510.559.8592 or email us at info@niles.com.

Circle No. 23 on Readers' Service Card

Reference Manager is a registered trademark of Institute for Scientific Information. EndNote is a registered trademark of Niles & Associates, Inc.,

# **Custom Peptides for Born Skeptics**



Let us Quote on Your Next Custom Peptide and We'll Send You Our New "Biologically Active" T-Shirt\*

Visit our World Wide Web Site http://www.genosys.com



www.upur results to an unpurified peptide, or to one that's guaranteed pure?

No, that's not a trick question. Because — for about what you pay for a crude product from other suppliers — you can get a fully characterized, guaranteed >70% pure custom peptide from Genosys.

You'll get proof of performance to convince even the most hardened skeptic: mass spectral analysis for composition, and HPLC verification of purity. Plus a cast-in-stone, 100% satisfaction guarantee. Of course, you can also choose higher levels of purity to suit your research, as well as the exact quantity you need. Along with just about any modification you can think of: MAPS, biotin, N–acetylation, C–amidation, phosphorylation, D–amino acids, or KLH / BSA conjugation. Hassle-free antisera services, too. And if you're doing mapping studies, you'll want to check out our time-saving SPOTs<sup>™</sup> custom peptide array system.

Skeptical? Call today to discuss your requirements. To erase all doubts, just place an order.

GENO

Genosys Biotechnologies, Inc. The Woodlands, TX U.S.A. Phone: [800] 853:3385 or [713] 363-3693 Fax: [713] 363-2212 eMail: info@genosys.com

Europe: Genosys Biotechnologies, Inc. Cambridge, UK Phone: (+44) (0) 1223 425622 Fax: (+44) (0) 1223 425966

eMail: genosys@genosys.co.uk Australia: AMRAD Pharmacia Biotech Phone: 008-252-265

New Zealand: AMRAD Pharmacia Biotech Phone: 0800-733-893 Norway: MedProbe

Phone: 47 2220 01 37 Taiwan: Cashmere Scientific Company Phone: 866-2-821-3004

\*Free T-Shirt while supplies last.

Circle No. 24 on Readers' Service Card

© 1996 Genosys Biotechnologies, Inc. BBC J96-302 D/M-3





# Something special is coming from QIAGEN!

QIAGEN, the leader in nucleic acid purification, now brings the same commitment to quality, service, and innovation to a new line of licensed products for PCR.

Each is developed with **your** needs in mind:

- robust PCR performance
- minimal reaction optimization
- guaranteed lot-to-lot reproducibility



Now sample preparation, PCR amplification, and PCR product purification are all supported by the exceptional QIAGEN quality and expert service that you know and trust.

# QIAGEN — Innovation Working for You

#### **QIAGEN** Inc.

9600 De Soto Avenue Chatsworth, CA 91311, USA Orders 800-426-8157 Fax 800-718-2056 Technical 800-362-7737



The PCR process is covered by U.S. Patents 4,683,195 and 4,683,202 and foreign equivalents owned by Hoffmann-La Roche AG. Circle No. 36 on Readers' Service Card

# THE CREDIT CARD YOU'LL CARRY INTO THE NEXT CENTURY



American Association for the Advancement of Science MBNA® PLATINUM PLUS CREDIT CARD

# It's like no credit card you currently carry.

- A credit line up to \$100,000, No Annual Fee, and a low introductory 5.9% Annual Percentage Rate (APR) for cash advance checks and balance transfers<sup>†</sup>
- Toll-free MBNA Platinum Plus service 24 hours a day
- Platinum Passage-a 24-hour toll-free travel service that . guarantees the lowest available published airfare at the time of booking
- Express delilvery for card replacement at no additional cost. Free additional card for family and friends.
- Free Lost Card Registry

- Purchase protection against theft or damage
- \$1,000,000 Common Carrier Travel Accident Insurance at no additional cost\*
- Free Year-End Summary of Charges
- Emergency cash and airline tickets, up to your available credit line, with free express delivery
- Credit line increase decisions in 15 minutes or less

Get the new standard in credit cards. CALLTOLL-FREE 1-800-457-3714 (Please mention priority code FVHZ when calling)

M B N A<sup>®</sup> PLATINUM PLUS



† The Annual Percentage Rate (APR) for purchases and ATM and Bank cash advances is 15.65%, which may vary. The current promotional APR offer for cash advance checks and balance transfers is 5.9% through your first five statement closing dates, commencing the month after your account is opened. When your minimum monthly payment is not received by the close of the first complete billing cycle following its Payment Due Date, or when the promotional offer expires, whichever occurs first, your APR for both new and outstanding cash advance balances (consisting of cash advance theck and balance transfers its 1.65%, which may vary. The surrent indexed APR for cash advance checks and balance transfers is 15.65%, which may vary. Transactions field for each advance checks and balance transfers is 15.65%, which may vary. Transaction fee for tree for Bank and ATM cash advances: 2% of each cash advance checks: 1% of each cash advance chacks: 1% of advance thacks: 1% of each cash advance transfers is 15.65%, which may vary. Transaction fee for tree purchase of wire transfers, noney orders, best, lottery tickes, and casino gaming tips: 2% of each such purchase (minimum \$2). Cash advance subscites and balance transfers is nondbly payments to your promotional APR balance(s) before your nonpromotional APR balance(s).
\* Certain restrictions apply to these and other benefits described in the advertisement is accurate as of 8/96. The information may have changed after that date. To find out what may have changed, call MBNA at 1-800-457-3714. Thr users, call 1-800-435-62. *Platinum Passage* travel services are provided to MBNA *Platinum Plat* Customers by, and are the responsibility of, an independently owned and operated travel agency. Visa is a federally registered service mark of Visa U.S.A. Inc., used pursuant to license. MBNA is a federally registered service mark of MBNA America Bank, N.A.

Platinum Passage travel services are p mark of Visa U.S.A. Inc., used pursu ©1996 MBNA America Bank, N.A. AAAS(ITTF)9/96

Circle No. 21 on Readers' Service Card