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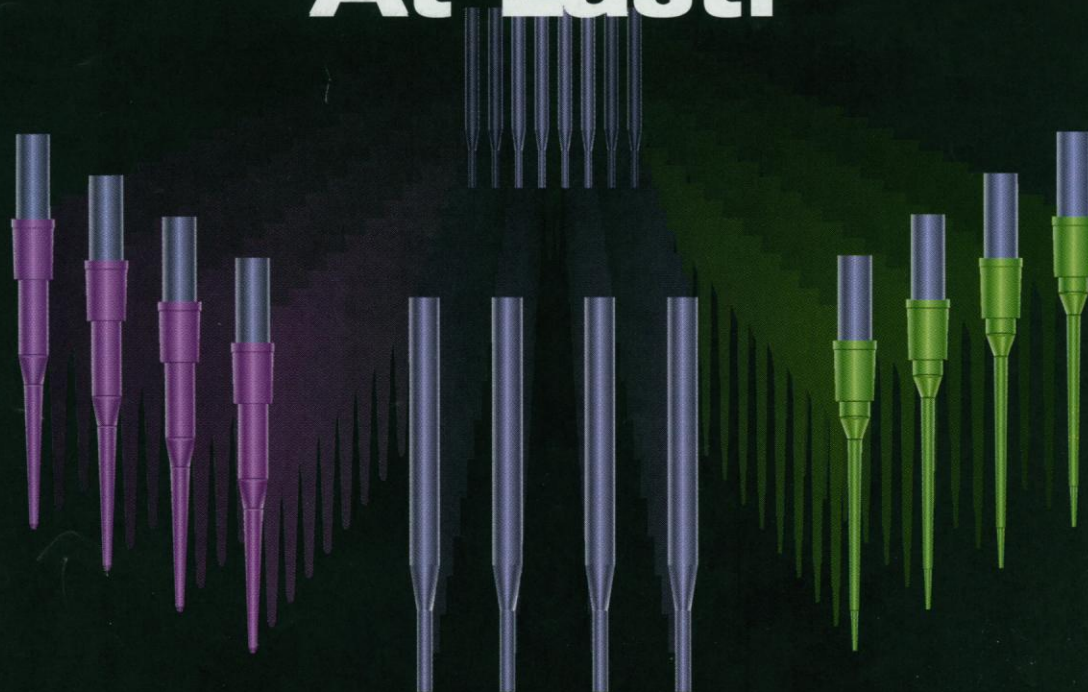
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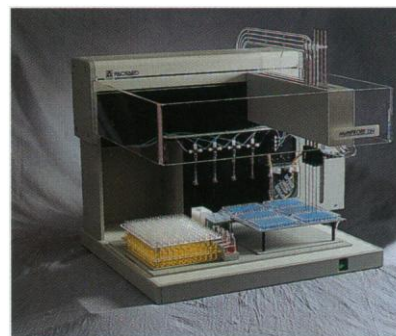
### Molecular Biology

For molecular biology applications, VersaTip can automatically pick up micro tips to handle very small volumes, switch to larger

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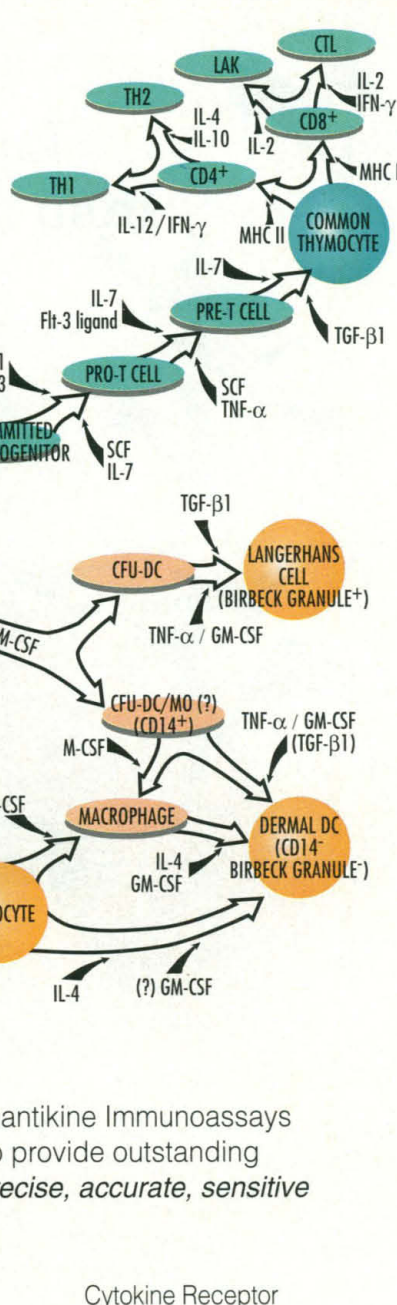
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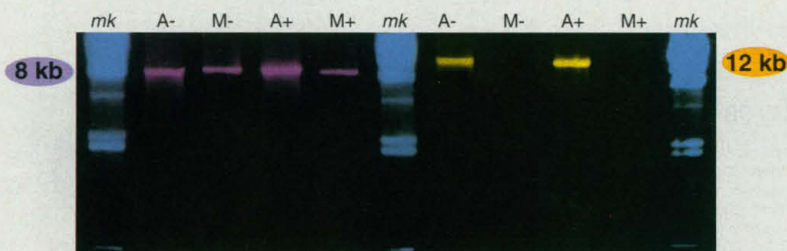
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RT reactions were carried out under optimum conditions for each enzyme, AMV RTase and MMLV RTase, in duplicate. One sample from each pair was followed by RNase H treatment. Then using two different primer pairs for 8 kb and 12 kb amplification, PCR was performed with *TaKaRa LA Taq* for AMV RTase products and Long distance DNA polymerase for MMLV RTase products respectively. No full length cDNA of 12 kb was detected with MMLV RTase.

mk  $\lambda$  Hind III marker  
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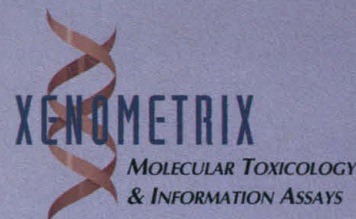
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Ames II identifies missense mutational spectra caused by mutagens without the need to sequence. Low spontaneous reversion frequencies allow detection of mutagens at lower concentrations without loss of sensitivity to a large range of doses.



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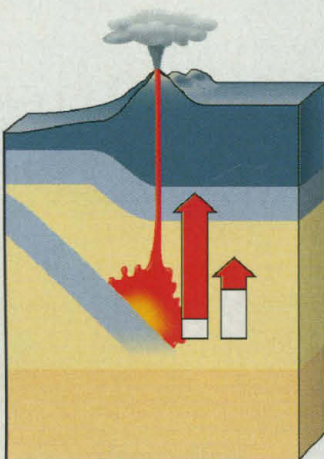


**476**

Dark visions

**498 & 521**

Crustal chronology



## NEWS & COMMENT

The Perils of Partnership **468**  
Peer Review Lands Safely in Russia **469**  
Russians Tread Boards to Sell Their  
Wares **470**

Embryologists Dismayed by Sanctions  
Against Geneticist **472**

Pig-Human Transplants Barred for Now **473**

Science Academies Set Joint Agenda **473**

NRC Panel Enters the Fight Over  
Tagging Explosives **474**

Germany: Leaders Protest Cuts  
in Science Support **475**

## RESEARCH NEWS

Visions of Black Holes **476**  
Black-Hole Observations:  
The Gathering Darkness **477**

Planetary Science: An Icy World  
Looks Livelier **478**

Much-Studied Butterfly Winks Out  
on Stanford Preserve **479**

Photons Add Up to Better Microscopy **480**

More Powerful Pulses Please and Puzzle **481**

Designing Therapies That Target  
Tumor Blood Vessels **482**

## PERSPECTIVES

Early Evolution of Continents **498**  
A. W. Hofmann

Science and the Protection of  
Endangered Species **499**  
H. R. Pulliam and B. Babbitt

eIF4G: A Multipurpose Ribosome  
Adapter? **500**  
M. W. Hentze

## ARTICLE

Modeling the Exchanges of Energy,  
Water, and Carbon Between Continents  
and the Atmosphere **502**  
P. J. Sellers, R. E. Dickinson, D. A. Randall, A.  
K. Betts, F. G. Hall, J. A. Berry, G. J. Collatz,  
A. S. Denning, H. A. Mooney, C. A. Nobre,  
N. Sato, C. B. Field, A. Henderson-Sellers

## DEPARTMENTS

THIS WEEK IN SCIENCE **453**

EDITORIAL **459**  
Brain, Drugs, and Society  
M. S. Gazzaniga

LETTERS **461**  
Multiple Authorship: B. White; J. Knight • "Clear  
and Present Danger": K. K. S. Pillay • Graduate  
Students' Rights: E. Dimbach • EMF Statement: R.  
A. Froesch • Combining Expert Opinions: H. R.  
Arkes, J. L. Mumpower, T. R. Stewart • Estonian  
Physicist: Active and Productive: J. Aaviksoo;  
K. Rebane • Growth Hormone Research and  
Therapy: C. Grunfeld and M. Papadakis; P. M.  
Conn and C. Y. Bowers

SCIENCESCOPE **467**

RANDOM SAMPLES **485**  
Medical Use of Marijuana to Be Studied—Again •  
Early Peek at a Cellular Porthole • U.S., Japan Split  
Japan Prize • Russian Scientists Plummet in the  
Polls • Eco-Solution to Airport Bird Pests • Univer-  
sal Vector? • Darwin's Angst

BOOK REVIEWS **495**  
*Monad to Man*, reviewed by F. J. Ayala • *Volcanoes of  
the Solar System and Volcano Instability on the Earth  
and Other Planets*, J. B. Garvin • *Nerve Growth and  
Guidance*, D. Jay • Books Received

PRODUCTS & MATERIALS **561**

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## COVER

Ten endangered species. An analysis of the geographic distribution of endangered species in the United States revealed that most are concentrated in a few regions of the country. However, the "hot spots" of potential extinction for different species groups rarely overlap.

See page 550 and the Perspective on page 499. [Photos: Scrub mint (*Dicerandra frutescens*, low center), Thomas Eisner; others, U.S. Fish and Wildlife Service. Collage: Preston Morrighan]



## REPORTS

### The Breakdown of Olivine to Perovskite and Magnesio-wüstite 510

Y. Wang, I. Martinez, F. Guyot, R. C. Liebermann

### Transformation in Garnet from Orthorhombic Perovskite to LiNbO<sub>3</sub> Phase on Release of Pressure 513

N. Funamori, T. Yagi, N. Miyajima, K. Fujino

### An Fe<sub>2</sub>O<sub>3</sub> Diamond Core Structure for the Key Intermediate Q of Methane Monooxygenase 515

L. Shu, J. C. Nesheim, K. Kauffmann, E. Münck, J. D. Lipscomb, L. Que Jr.

### Detection and Characterization of the Cumulene Carbenes H<sub>2</sub>C<sub>5</sub> and H<sub>2</sub>C<sub>6</sub> 518

M. C. McCarthy, M. J. Travers, A. Kovács, W. Chen, S. E. Novick, C. A. Gottlieb, P. Thaddeus

### Niobium/Uranium Evidence for Early Formation of the Continental Crust 521

P. J. Sylvester, I. H. Campbell, D. A. Bowyer

### Regulation of NF-κB by Cyclin-Dependent Kinases Associated with the p300 Coactivator 523

N. D. Perkins, L. K. Felzien, J. C. Betts, K. Leung, D. H. Beach, G. J. Nabel

### A Legume Ethylene-Insensitive Mutant Hyperinfected by Its Rhizobial Symbiont 527

R. V. Penmettsa and D. R. Cook

### Measuring Serotonin Distribution in Live Cells with Three-Photon Excitation 530

S. Maiti, J. B. Shear, R. M. Williams, W. R. Zipfel, W. W. Webb

### Vascular System Defects and Impaired Cell Chemokinesis as a Result of Gα<sub>13</sub> Deficiency 533

S. Offermanns, V. Mancino, J.-P. Revel, M. I. Simon

### DCP-1, a *Drosophila* Cell Death Protease Essential for Development 536

Z. Song, K. McCall, H. Steller

### Requirement for the Transcription Factor LSIRF/IRF4 for Mature B and T Lymphocyte Function 540

H.-W. Mitrücker, T. Matsuyama, A. Grossman, T. M. Kündig, J. Potter, A. Shahinian, A. Wakeham, B. Patterson, P. S. Ohashi, T. W. Mak

### Still life, a Protein in Synaptic Terminals of *Drosophila* Homologous to GDP-GTP Exchangers 543

M. Sone, M. Hoshino, E. Suzuki, S. Kuroda, K. Kaibuchi, H. Nakagoshi, K. Saigo, Y.-i. Nabeshima, C. Hama

### Tumor Infarction in Mice by Antibody-Directed Targeting of Tissue Factor to Tumor Vasculature 547

X. Huang, G. Molema, S. King, L. Watkins, T. S. Edgington, P. E. Thorpe

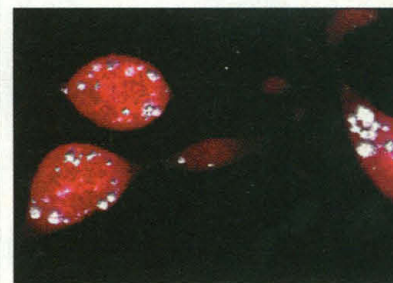
### Geographic Distribution of Endangered Species in the United States 550

A. P. Dobson, J. P. Rodriguez, W. M. Roberts, D. S. Wilcove

## TECHNICAL COMMENTS

### Measuring Biogenic Carbon Flux in the Ocean 554

P. Boyd and P. Newton; *Response*: R. B. Rivkin, L. Legendre, D. Deibel, J.-É. Tremblay, B. Klein, K. Crocker, S. Roy, N. Silverberg, C. Lovejoy, F. Mesplé, N. Romero, M. R. Anderson, P. Matthews, C. Savenkoff, A. Vézina, J.-C. Theriault, J. Wesson, C. Bérubé, R. G. Ingram



## 480 &amp; 530

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## On the Web

Enhanced Perspective on endangered species by H. Ronald Pulliam and Bruce Babbitt, Secretary of the Interior  
<http://www.sciencemag.org/science/content/vol275/issue5299/499.htm>



Just Arrived!

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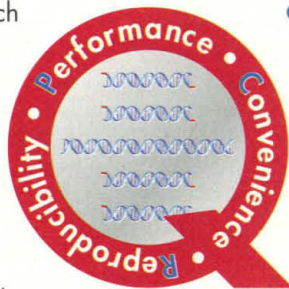


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# THIS WEEK IN SCIENCE

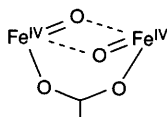
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## Mantle duet

Two reports probe the dynamics of the phase transition at a depth of about 660 kilometers separating the upper and lower mantle. Wang *et al.* (p. 510) suggest that the transformation of olivine in the upper mantle to magnesiowüstite and perovskite, which characterize the lower mantle, is blocked at temperatures below about 1000 kelvin. This result may provide estimates of temperatures in subducted slabs. Funamori *et al.* (p. 513) examined the transformation of garnet, which is the host of most of the aluminum in the upper mantle, to perovskite. Their data suggest that perovskite is also the host for aluminum in the lower mantle.

## Iron oxide core

While chemists try to find more economical ways to convert natural gas to liquid fuels, the bacterial enzyme methane monooxygenase converts 1 billion



tons of this greenhouse gas to methanol each year. Shu *et al.* (p. 515) present spectroscopic evidence that the key oxidizing species is an Fe<sub>2</sub>(μ-O)<sub>2</sub> core that forms a diamond structure.

## What's next in climate models

Successful weather forecasting and climate simulation depend on the parameterization of land-atmosphere interactions in atmospheric general circulation models. In recent years, much progress has been made

## Tracing early crust

When continental crust forms from the mantle, the composition of the remaining mantle changes. One key trace element ratio for inferring the amount of crust that has formed is the niobium/uranium ratio because continental crust sequesters U more strongly than it does Nb. Sylvester *et al.* (p. 521) measured this ratio in 2.7-billion-year-old volcanic rocks in Australia to infer the amount of crust that formed early in Earth's history. One interpretation of the data is that large amounts of crust had formed by this time, as also discussed by Hofmann in a Perspective on p. 498.

toward a realistic representation of the energy, water, and carbon exchange between biosphere and atmosphere, aided by improved data from field experiments and satellite studies. Sellers *et al.* (p. 502) review the progress from the early, first-generation models to modern, sophisticated third-generation models, and present an outlook on the future of climate modeling and especially modeling climate change.

## Impotent immunocytes

Mittrücker *et al.* (p. 540) show that mice deficient in the transcription factor IRF4 (formerly known as LSIRF) have difficulty in mounting both humoral and cell-mediated immune responses: serum immunoglobulin levels are low and antitumor responses are lacking. The precise nature of the defect is unclear but it affects both T and B cells. Lymphocytes appear to develop normally in young animals but continue to accumulate in lymphoid organs, causing lymphadenopathy, while failing to be activated upon challenge. These findings, which would not have been predicted from previous studies of IRF4, may provide a new opportunity to study the thorny problem of lymphocyte homeostasis.

## Control of cell division

The transcription factor NF-κB regulates genes that participate in the cellular response to stress and infection, generation of certain cancers, and control of HIV gene expression. Perkins *et al.* (p. 523) show how activation of NF-κB may be coupled to control of the cell division cycle. NF-κB associates with a transcriptional co-activator called p300; p300 in turn interacts with cyclin-cyclin-dependent kinase (CDK) complexes that regulate progression through the cell cycle. Inhibition of cyclin-CDK activity increased NF-κB-dependent gene expression. The interactions of proteins in these complexes apparently provides coupling of transcriptional regulation to control of the cell cycle.

## Tumor therapy: The clot thickens

Tumors must have an adequate blood supply to sustain their growth, and strategies aimed at interrupting this blood supply are being explored as possible cancer therapies. Huang *et al.* (p. 547; see News story on p. 482) have used antibody technology to target a shortened form of tissue factor, a protein that helps initiate blood clot formation, to tumor blood vessels. Treatment of tumor-bearing

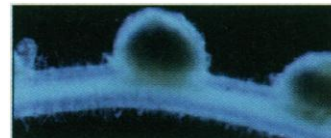
mice with the targeted tissue factor produced clots in the tumor blood vessels, and the resultant blockage caused complete regression of the tumors in over one-third of the mice.

## Still life in action

During development, axons extend from the neuronal cell body to the target, where the axon terminal changes to form synapses. Sone *et al.* (p. 543) screened *Drosophila* for mutations in which this process is defective. Mutations of the *Still life* gene showed abnormal motor activity, as well as defects, in both axon extension and synapse development. The *still life* gene encodes a guanine nucleotide exchange factor that is localized in the synaptic terminals, where it affects the actin cytoskeleton.

## A beneficial infection

The symbiotic interaction between rhizobia and legumes begins with an infection of plant by bacterium. Some of those infections go on to develop into the nodules that are critical for nitrogen fixation. Penmetza and Cook (p. 527) have identified a mutation that limits the abil-



ity of a plant to control the persistence of rhizobial infections but evidently does not affect susceptibility to initial infection. Plants carrying the mutation, *sickle*, are defective in the perception of ethylene and generate an excessive number of nodules.





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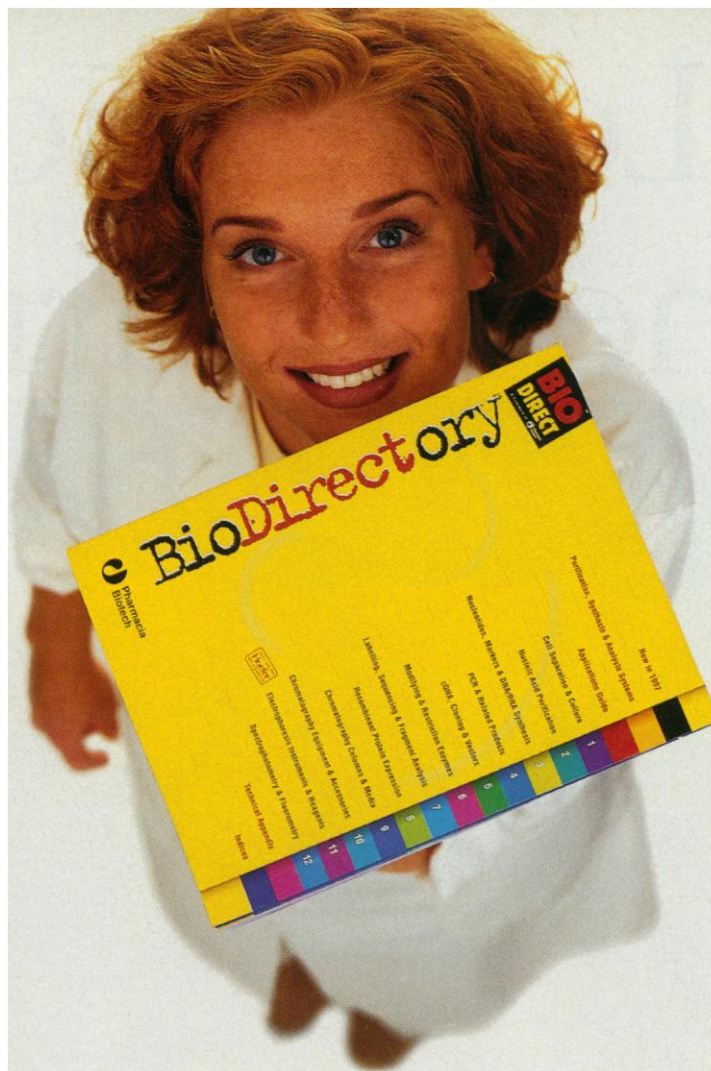
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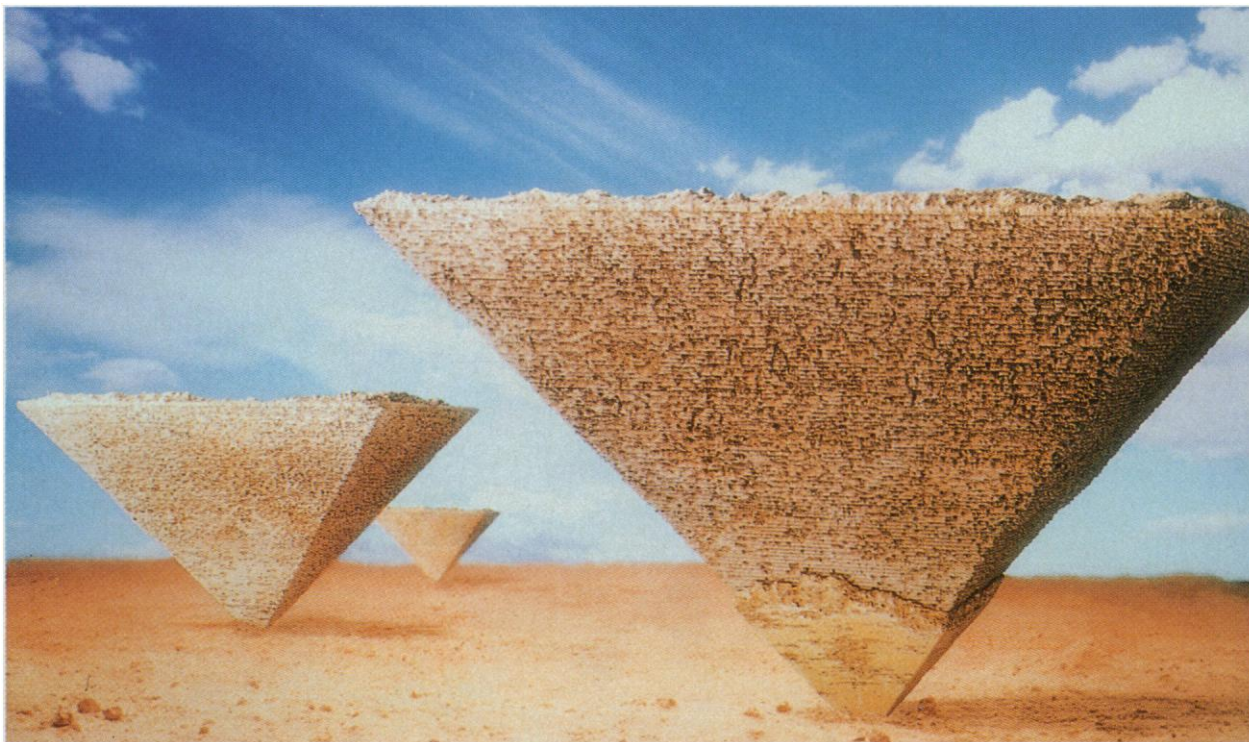
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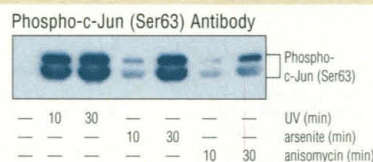
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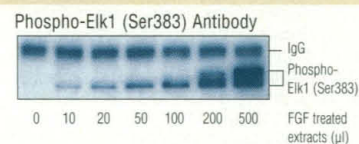
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## Analysis Using: SAPK/JNK assay kit



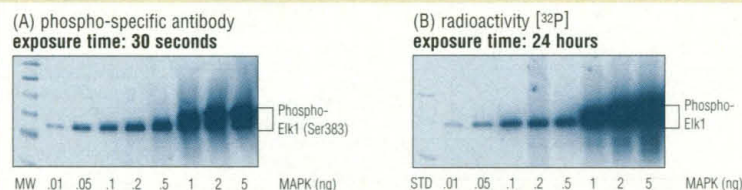
SAPK/JNK activity in extracts of treated SK-N-MC cells was analyzed by c-Jun "pull down"/kinase assay. Phosphorylation of c-Jun at Ser63 was visualized by immunoblotting with phospho-c-Jun (Ser63) antibody.

## MAPK assay kit



MAP Kinase activity in extracts of FGF-treated SK-N-MC cells was analyzed by phospho-MAPK antibody IP/Kinase assay using Elk1 as a substrate. Phosphorylation of Elk1 at Ser383 was visualized by immunoblotting with phospho-Elk1 (Ser383) antibody.

## Sensitivity Comparison: phospho-specific antibody vs. radioactivity



MAPK-induced phosphorylation of Elk1 was measured by quantitative immunoblotting with phospho-specific Elk1 (Ser383) antibody (A) and compared to direct measurement of phosphate incorporation using [<sup>32</sup>P]-ATP (B). MW = NEB's Biotinylated Protein Marker, Cat. No. 7710.

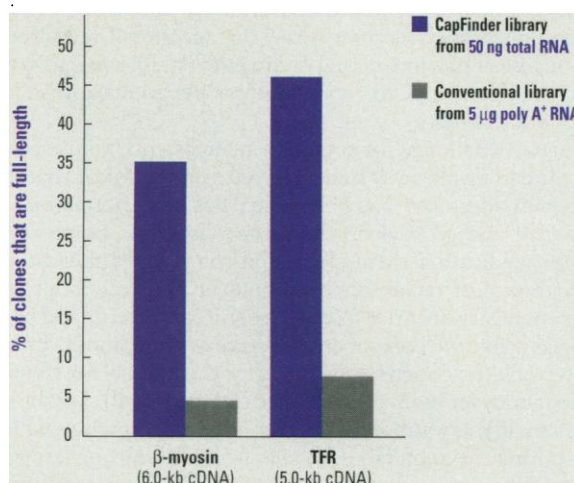
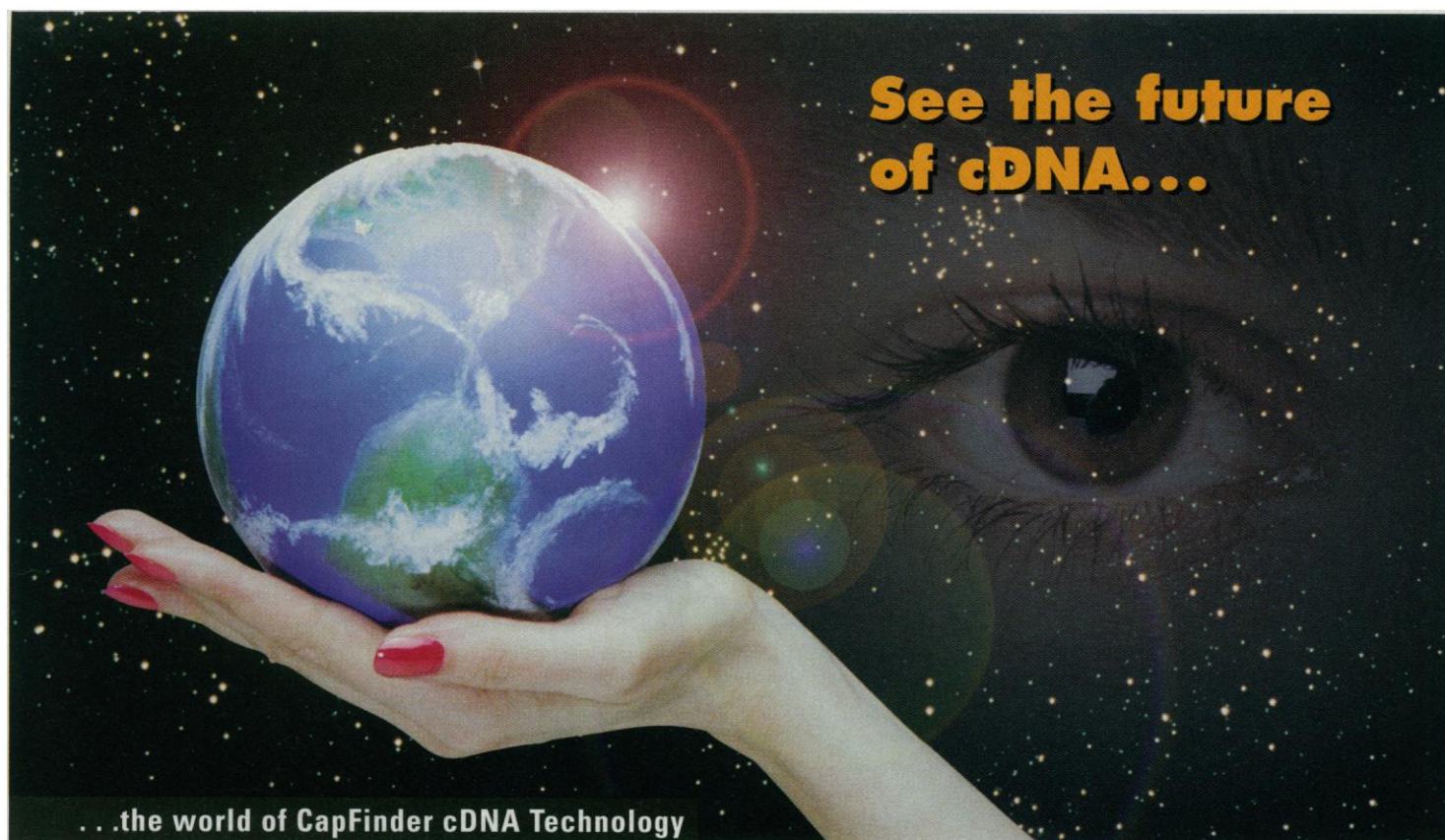
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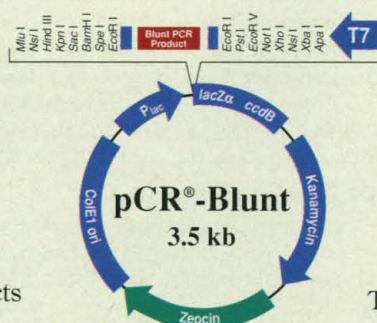
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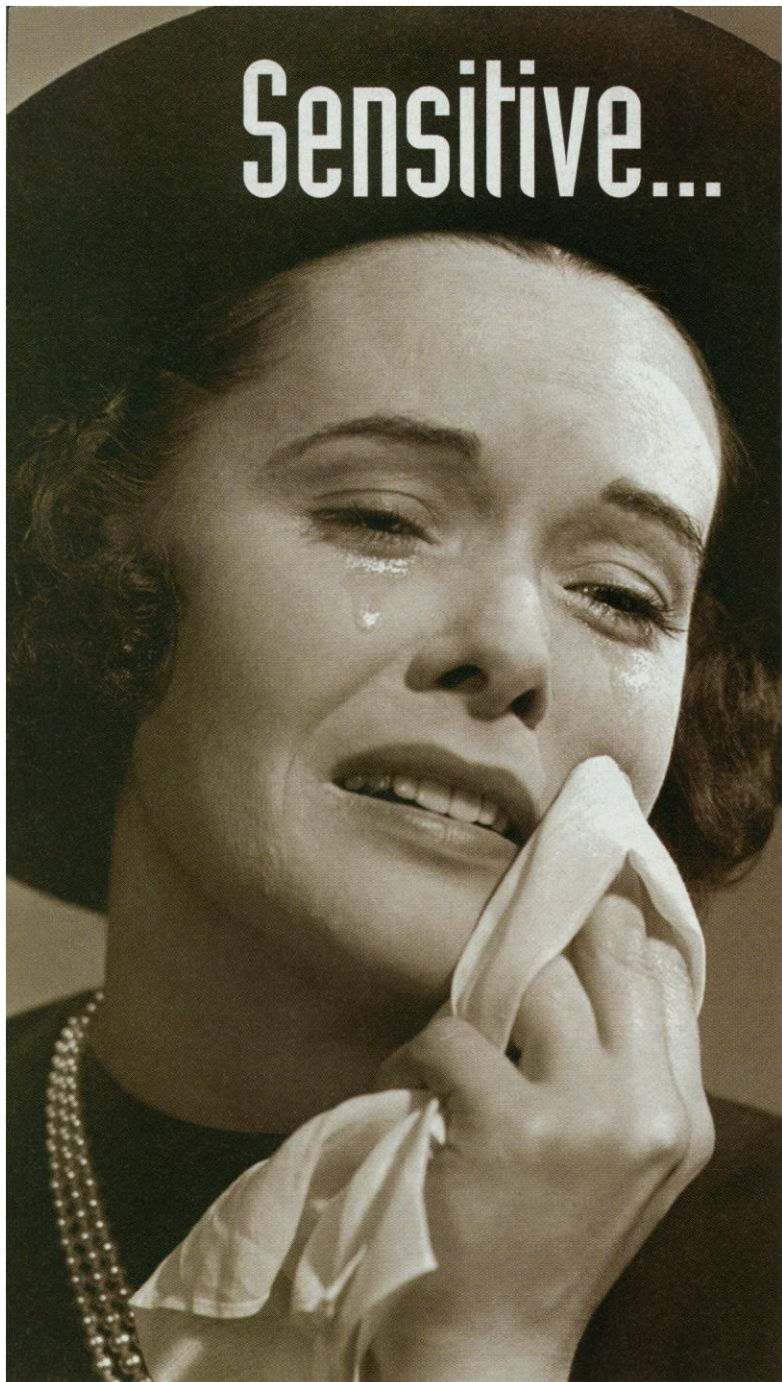
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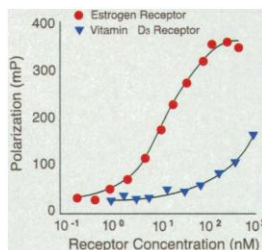
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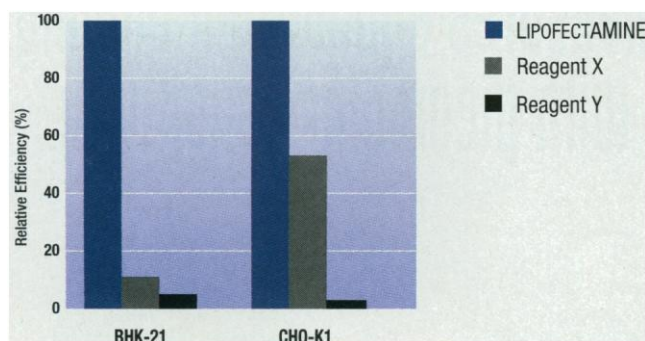


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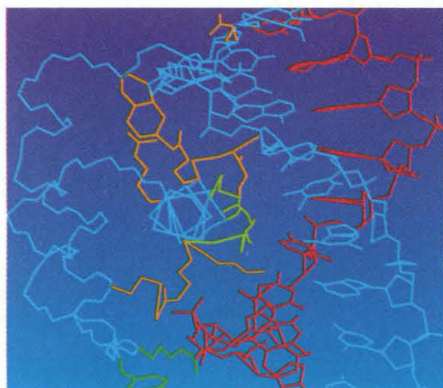
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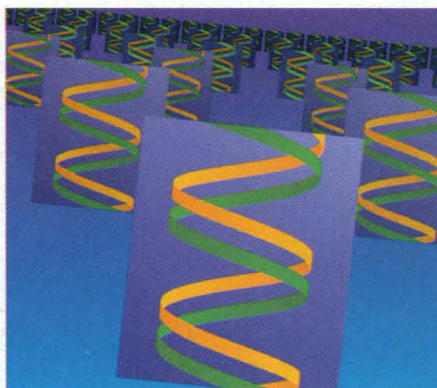
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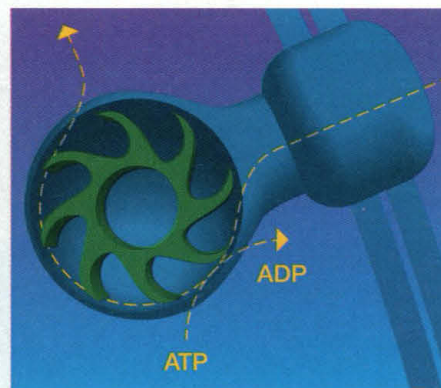
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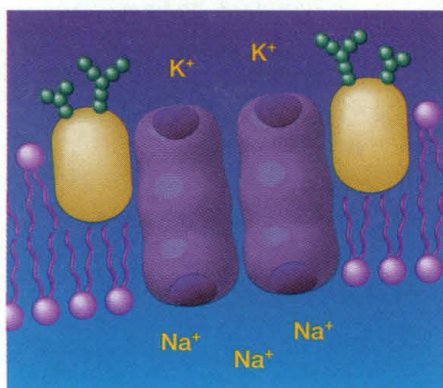
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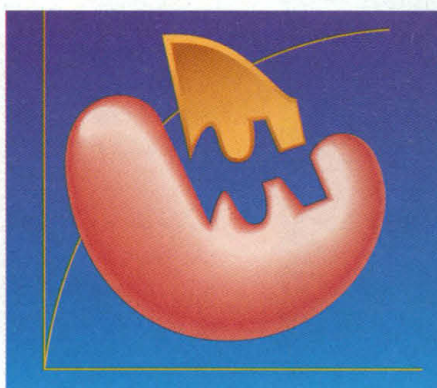
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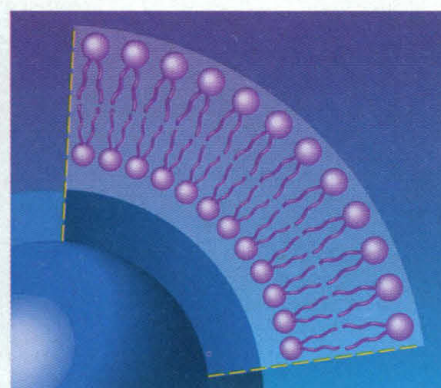
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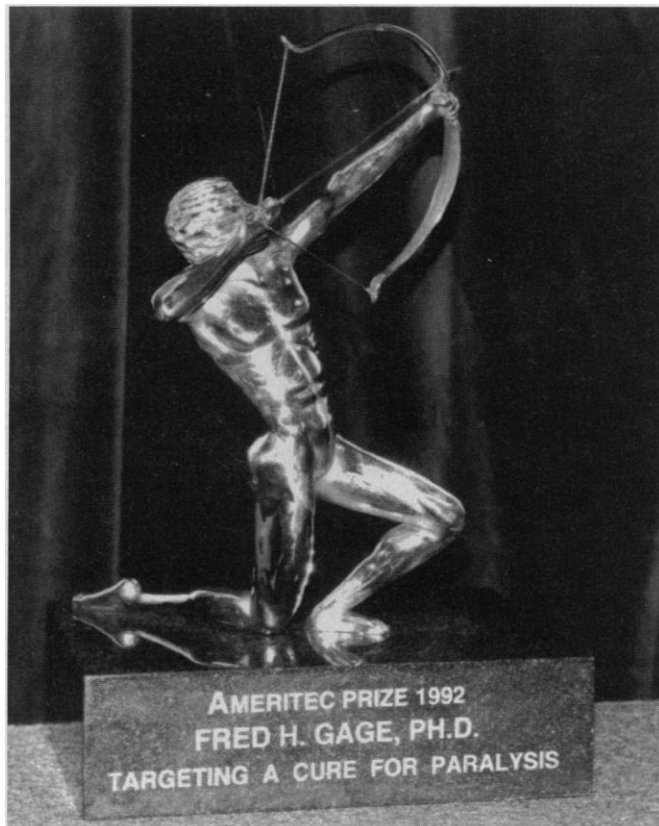
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# Invitation to Nominate for the "Ameritec Prize"

The Ameritec Foundation is soliciting nominations for the 1997 Ameritec Prize.



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The Prize is awarded annually and is composed of three parts:

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Any interested party is invited to submit a nomination. Nomination forms may be obtained by telephone, fax or E-mail.

Nominations for the 1997 Ameritec Prize must be submitted before 30 March 1997. **Circle No. 42 on Readers' Service Card**

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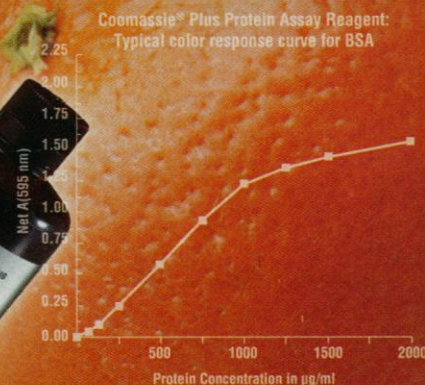
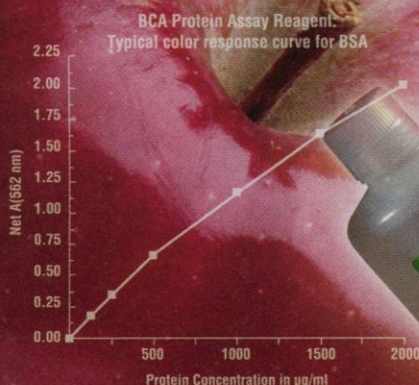
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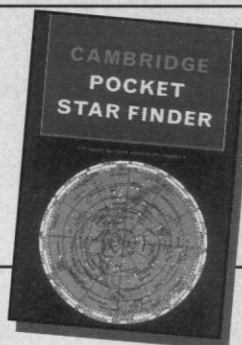
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