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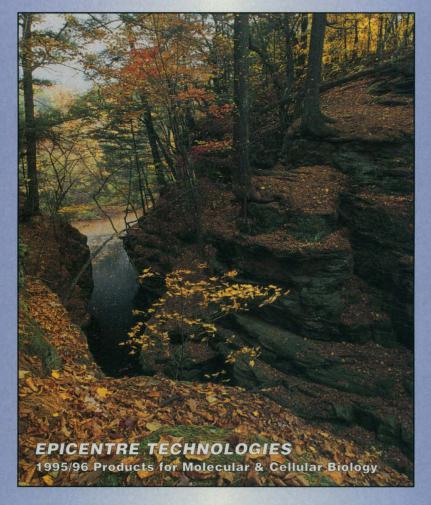
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COVER

A section of iris agate (75 micrometers thick) as viewed in cross-polarized light. Blue bands alternate with more refractive pink bands over several length scales. The banding reflects modulations in the density of defects within fibers of chalcedony (a form of quartz) oriented

perpendicular to the banding. The field of view measures ~2.9 millimeters across. See page 1562. [Photo: P. J. Heaney. Specimen from the Mojave Desert, California, U.S. National Museum specimen number 87415]



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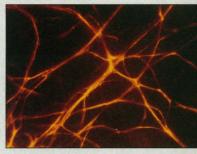
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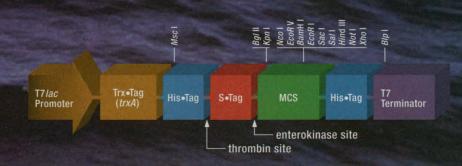
\*LaVallie, E.R., DiBlasio, E.A., Kovacic, S., Grant, K.L., Schendel, P.F. and McCoy, J.M., (1993) Bio/Technology 11, 187-193.

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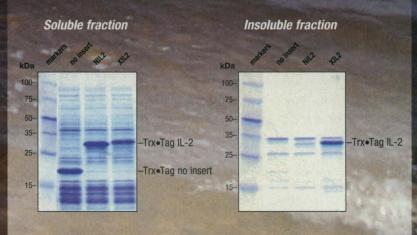
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\*\*Derman, A.I., Prinz, W.A., Belin, D. and Beckwith, J., (1993) Science 262, 1744-1747,



# **Expression of soluble Interleukin-2** cloned in pET TRX (pET-32)



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# THIS WEEK IN SCIENCE

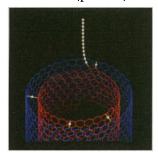
edited by PHIL SZUROMI

## **Both ways now**

Organic thin-film transistors (TFTs) based on thiophene oligomers may find use as low-cost, low-power devices for display applications. These devices generally work as p-channel transistors, but Dodabalapur et al. (p. 1560) have built a field-effect device that can work in both p- and n-channel modes, a configuration that can be used to improve lifetimes and power dissipation. They used αhexathienylene and C<sub>60</sub> as the p- and n-type materials, respectively, but point out that other compounds could be used as well.

# Atomic carbon wires

Individual carbon nanotubes can act as sources for low-voltage field emission of electrons. Rinzler *et al.* (p. 1550) found



that after laser evaporation or oxidative etching, the opened nanotube could field-emit at biases of less than 80 volts. The emission is episodic; they suggest that the emission does not come from the double-walled nanotube itself but from a carbon chain or wire that extends from the tip and that is released where an atom that bridges the walls is displaced. Field emission desorbs this wire.

# Getting N to it

Introducing noncarbon atoms into fullerene cages could alter their properties and produce

# **Climate signals from the Southern Hemisphere**

Although the record of the last glacial maximum and subsequent deglaciation has been detailed in the Northern Hemisphere, where abrupt climate fluctuations such as the Younger Dryas are recognized, less is known of the response in the Southern Hemisphere. Comparison and correlation of events between the hemispheres is critical for understanding the causes of deglaciation and controls on global climate. Lowell *et al.* (p. 1541) present an extensive radiocarbon-dated record of glacial advances and retreats and coeval faunal changes in the Chilean Andes. With additional data from New Zealand, they recognize eight episodes of advance that appear to be coeval with pulses of extensive ice-rafting in the Northern Hemisphere. These climate changes may reflect a global atmospheric signal rather than a regional cause.

new materials for organic electronics and superconductivity. Gas-phase compounds incorporating nitrogen atoms into  $C_{60}$  and  $C_{70}$  have been reported, but producing isolated compounds has been difficult. Hummelen et al. (p. 1554) have now synthesized ( $C_{59}$ N)<sub>2</sub> through a route in solution that mimics the gasphase ion chemistry.

## Early recycling efforts

How continents formed, grew, and persisted during the first several billion years of Earth's history has been uncertain and controversial. Relicts of early continents are preserved as Archean cratons in the cores of major continents. Bowring and Housh (p. 1535) overview recent isotopic evidence from these cratons, as well as from lunar samples, and suggest that recycling of continental crust became important early and that early continents were expansive.

# Following the mating response

Pheromone binding to the receptor in Saccharomyces cerevisiae activates a signaling pathway that activates a series of

protein kinases. A similar mitogen-activated protein (MAP) kinase cascade transmits signals in mammalian cells. The By subunits of a heterotrimeric guanine nucleotide binding protein (G protein) link the receptor to activation of the MAP kinase cascade. Whiteway et al. (p. 1572) show that the  $\beta$  subunit of the G protein binds to a molecular scaffold protein known as Ste5p. Specific regions of Ste5p associate with the various enzymes of the MAP kinase cascade. Localization and association of the G protein with the other proteins of the MAP kinase cascade via Ste5p binding may allow signal transmission from the activated receptor.

## A check on growth

Integrins function in adhesion of cells to the extracellular matrix and also activate signal transduction pathways within cells. The integrin  $\beta_1$  subunit exists in alternatively spliced form known as  $\beta_{1C}$ , and Meredith Jr. et al. (p. 1570) report that this form has a different subcellular localization than that of the  $\beta_1$  subunit. Expression of  $\beta_{1C}$  inhibits progression of cells through the cell cycle. The growth inhibitory effect

appears to result from signaling through the altered cytoplasmic domain of the  $\beta_{IC}$  subunit.

# **Transmission specialist**

The SNARE hypothesis, proposed a couple of years ago, postulates that in each targeted fusion event, both membranes that are to fuse will contain a "SNARE," a fusion receptor that "docks" the vesicle and target membrane. During synaptic transmission, synaptic vesicles fuse with the neuronal plasma membrane. Skehel et al. (p. 1580) have identified a novel t-SNARE, or target membrane SNARE, that is likely to be a key component in allowing targeted synaptic vesicle fusion with the neuronal plasma membrane. The protein is confined to the central nervous system of Aplysia, and presynaptic injection of antibodies that recognize the new t-SNARE blocked synaptic transmission.

# Overcoming sex discrimination

Female recipients of organs or bone marrow from male donors who match at the major histocompatibility (H) locus may still reject the transplant because of the presence of the minor H-Y antigen on male tissues. Wang et al. (p. 1588; see news story by Pennisi, p. 1515) have used microcapillary liquid chromatography and electrospray mass spectrometry to identify a human H-Y antigen presented by the class I major histocompatibility complex molecule HLA-B7. The 11-residue antigen is derived from SMCY, a protein from a conserved gene on the Y chromosome, and is similar to the homologous SMCX gene on the X chromosome.

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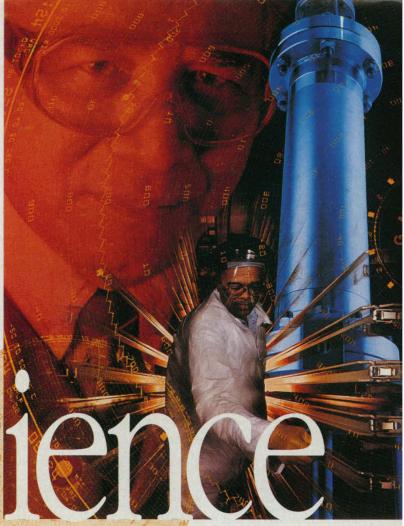


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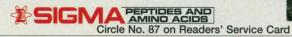
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BssH II         Avr II         NgoM I         BsrG I           BsiW I         Xba I         Kas I         BspE I           Xho I         Age I         Hind III         Mlu I           EcoR I         Aat II         Pst I         Eag I           Pst I         Nhe I         EcoR V         Nhe I           EcoR V         Hind III         BamH I         EcoR I         BamH I           Hind III         EcoR V         Nhe I         EcoR V           Nco I         Pst I         Eag I         Pst I           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
BsiW I         Xba I         Kas I         BspE I           Xho I         Age I         Hind III         Mlu I           EcoR I         Aat II         Pst I         Eag I           Pst I         Nhe I         EcoR V         Nhe I           EcoR V         Hind III         BamH I         EcoR I           BamH I         BamH I         EcoR I         BamH I           Hind III         EcoR V         Nhe I         EcoR V           Nco I         Pst I         Eag I         Pst I           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
Xho I         Age I         Hind III         Miu I           EcoR I         Aat II         Pst I         Eag I           Pst I         Nco I         EcoR V         Nhe I           EcoR V         Hind III         BamH I         EcoR I           BamH I         BamH I         EcoR I         BamH I           Hind III         EcoR V         Nhe I         EcoR V           Nco I         Pst I         Eag I         Pst I           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
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Pst I         Nco I         EcoR V         Nhe I           EcoR V         Hind III         BamH I         EcoR I           BamH I         BamH I         EcoR I         BamH I           Hind III         EcoR V         Nhe I         EcoR V           Nco I         Pst I         Eag I         Pst I           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
EcoR V         Hind III         BamH I         EcoR I           BamH I         BamH I         EcoR I         BamH I           Hind III         EcoR V         Nhe I         EcoR V           Nco I         Pst I         Eag I         Pst I           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
BamH I         BamH I         EcoR I         BamH I           Hind III         EcoR V         Nhe I         EcoR V           Nco I         Pst I         Eag I         Pst I           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
Hind III         EcoR V         Nhe I         EcoR V           Ncol         Pst I         Eag I         Pst I           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
Ncol         Pstl         Eagl         Pstl           Aat II         EcoR I         Mlu I         Hind III           Age I         Xho I         BspE I         Kas I
Aat II EcoR I Mlu I Hind III Age I Xho I BspE I Kas I
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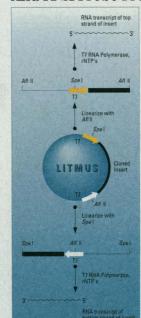
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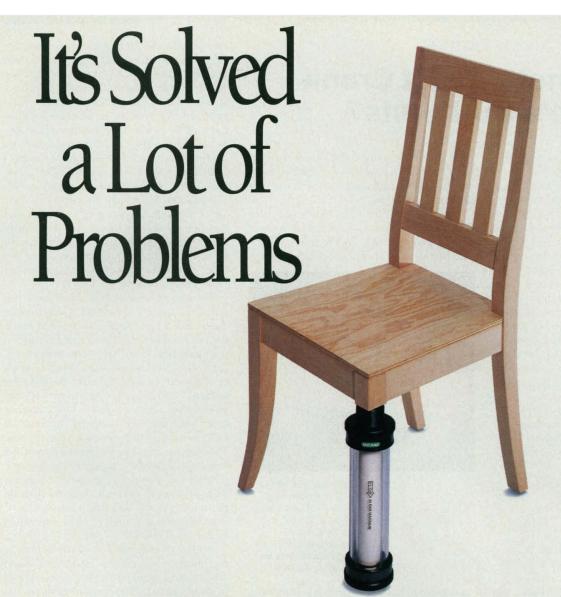
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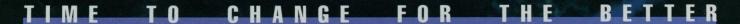
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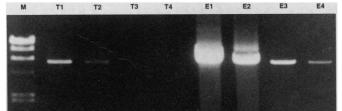
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4: 0.01 ng of Template/50 μl reaction M: λDNA/*Hin*d III Marker



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T1 T2 T3 T4 E1 E2 E3 E4 M

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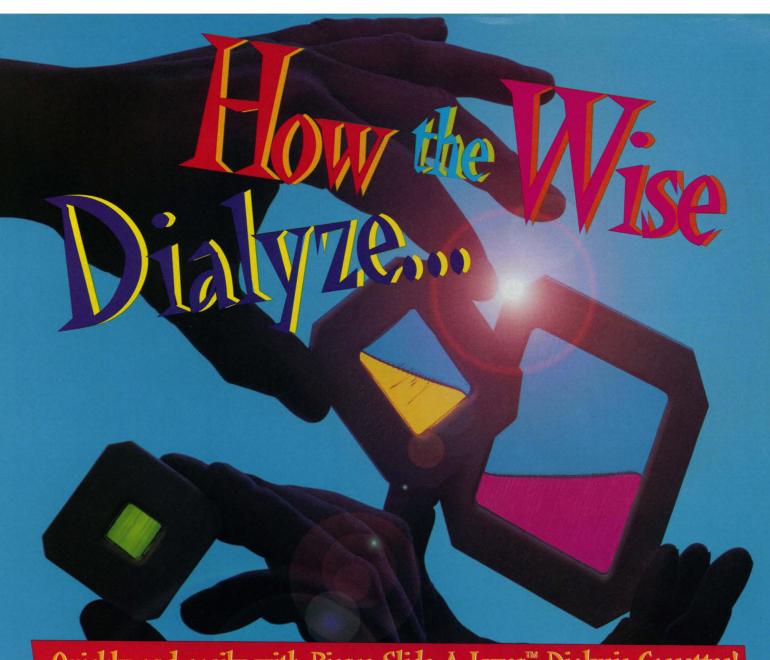
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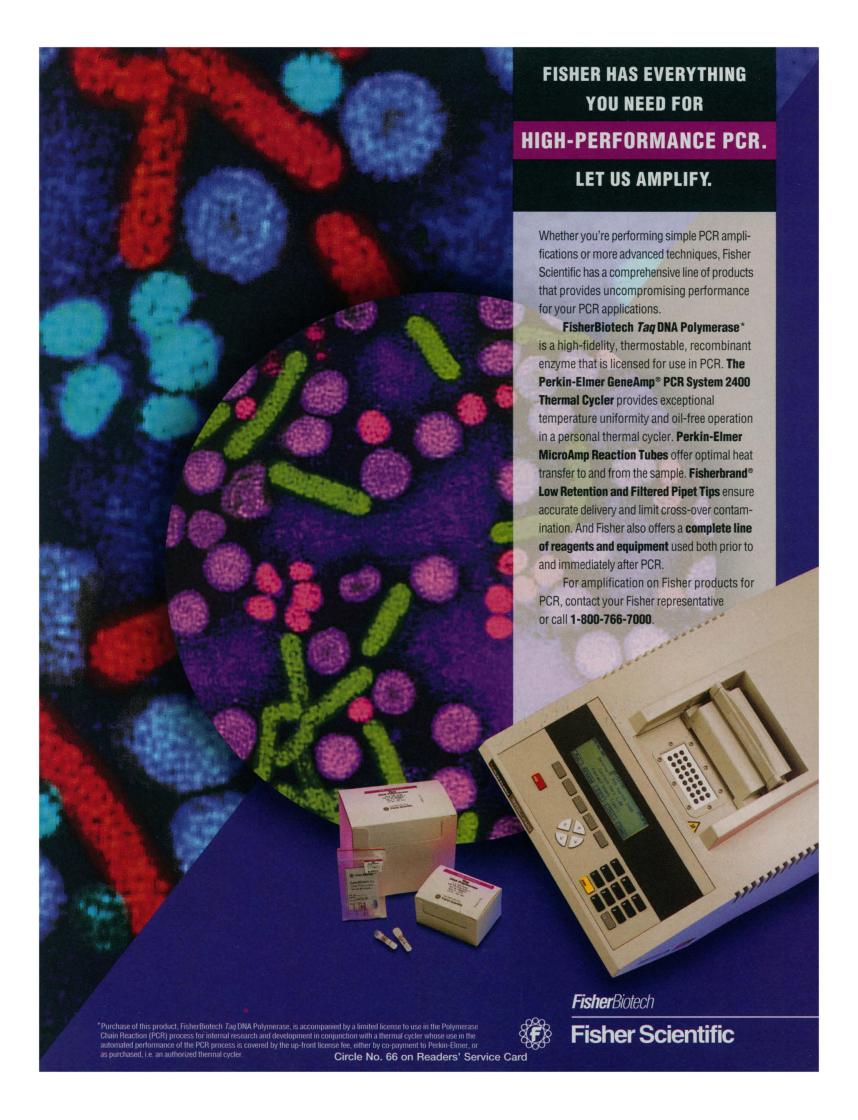
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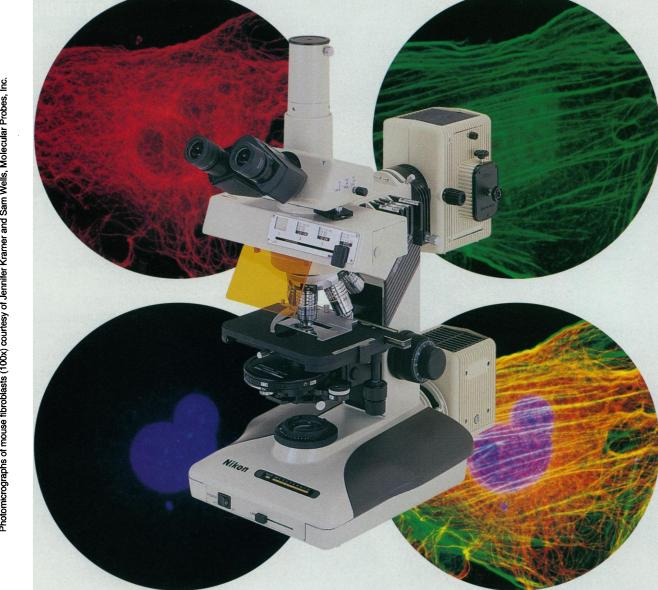
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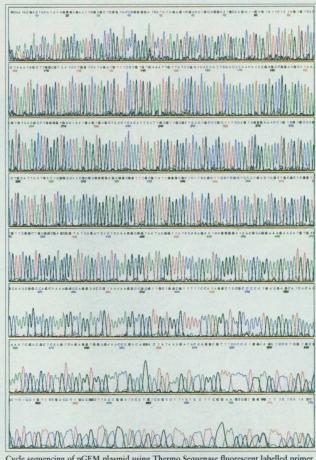
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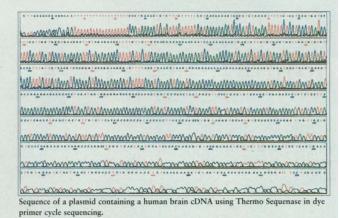
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March 20-22, 1996 - Florence, Italy

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S. Romagnani (I)

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#### **Scientific Sessions**

Regulation of Cytokine Production

Development and Functions of T Cell Subsets

Cell-associated and Secreted Cytokine Receptors

Signal Transduction by Cytokine Receptors

Cytokines in Tolerance and Autoimmunity

Cytokines in Infectious Diseases

### **Provisional List of Invited Speakers**

A. Abbas (USA) J-M. Dayer (CH) W. Leonard (USA) K. Murphy (USA) J. Banchereau (F) G. Duff (UK) D. Mason (UK) P. Openshaw (UK) R. Coffman (USA) F. Finkelman (USA) S. Romagnani (I) H. McDevitt (USA) D. Cosman (USA) R. Flavell (USA) A. Sher (USA) A. Mantovani (I) G. Crabtree (USA) D. Goeddel (USA) L. Moretta (I) T. Taniguchi (J) S. Kauffman (D) G. Trinchieri (USA)

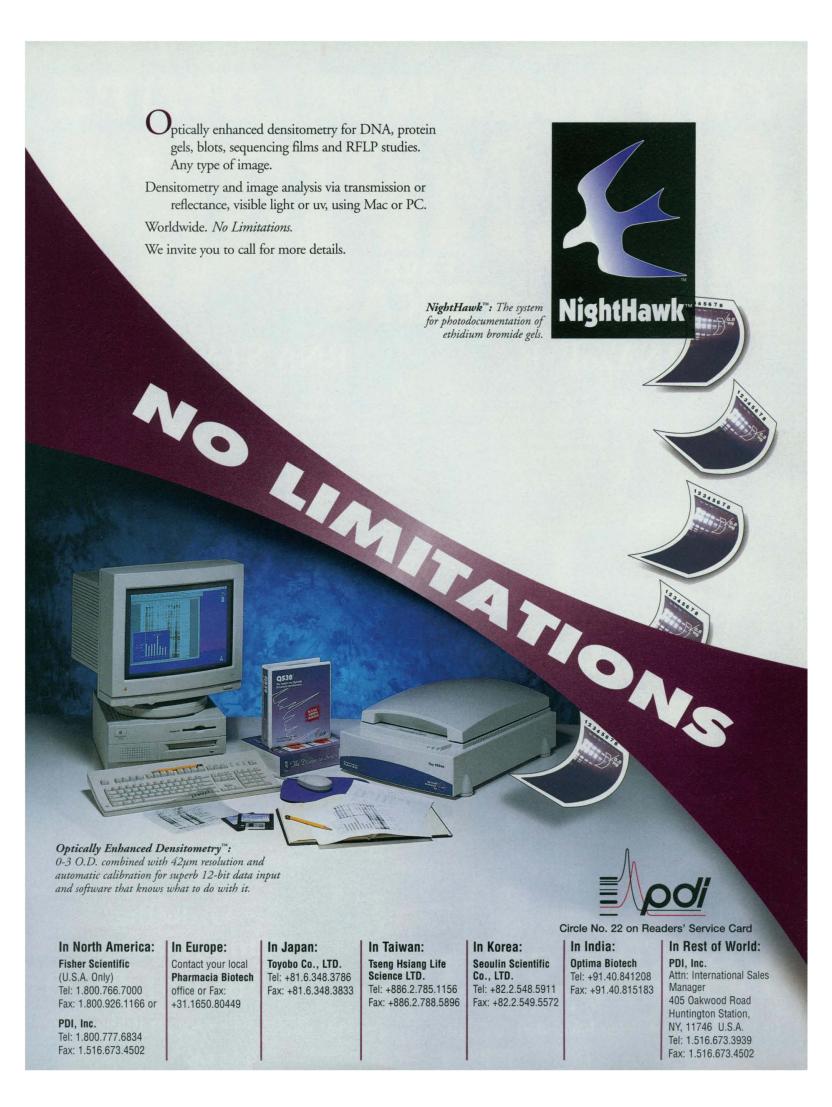
#### **Useful Information**

A limited number of free communications will be accepted for oral or poster presentation. Abstracts should be sent to: Prof. S. Romagnani, Istituto Clinica Medica - Viale Morgagni 85, Florence 50134, Italy, no later than December 31st, 1995.

For further information, registration and hotel reservation forms, please contact R. Cenci, The Ares-Serono Foundation, Via Casilina, 125, 00176 Rome, Italy, tel. +39-6-70384506 / fax +39-6-70384577

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Recipients of the 1994 awards were Peter A. Diamond (Massachusetts Institute of Technology) and Yuri I. Manin (Max Planck Institute) in economics and mathematics, respectively.

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Nominations for both prizes will be accepted until November 30, 1995. Nominating letters of no more than three pages should describe the nominee's professional experience, accomplishments, and qualifications for the award. A brief *curriculum vitae* of the nominee is helpful but not required. Nominations from experts in the field are preferred to institutional nominations; direct applications for the Nemmers Prize will not be accepted.

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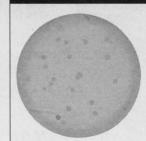
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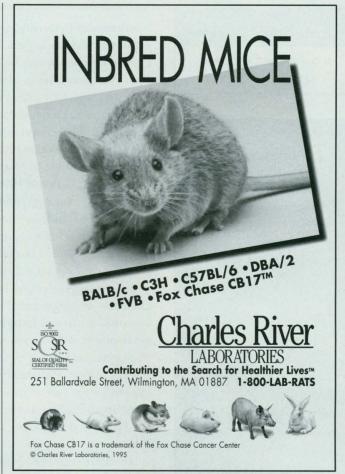
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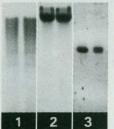


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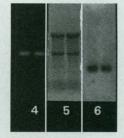
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The 1996 AAAS Annual Meeting will be held February 8 - 13 in Baltimore, Maryland.

#### THE AWARD

DOE/AAAS Fellows will be given economy class travel support to the conference along with lodging and per diem reimbursement for food and incidental expenses. The fellows will also participate in off-site visits to local agencies and institutes directly related to their research.

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Applications by ECE and FSU graduate students and post-doctoral scientists (within five years of completing their degree) who currently are actively conducting research in the areas of environmental contamination and health in geographic regions identified as being contaminated by radiation will be accepted. This would include resarchers in these regions specializing not only in the effects of radiation contamination on health but also other possible contributory causes (e.g., chemical contamination) of negative health effects (e.g., leukemia and other forms of cancers) in these regions. These individuals must be working at recognized scientific research institutions; must be able to speak, read, and write English with a moderate degree of fluency; and must be able to gain the permission of their governments to travel.

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Application materials should include all of the following: 1) a letter of intent by the applicant including name, affiliation, and address, telephone, and e-mail address, if any, where he/she can be reached; 2) an abstract of the proposed poster session including a brief description of the research question, research design, methods, results, discussion, and conclusions reached; 3) a curriculum vitae; and 4) two letters of support from professors or colleagues familiar with the applicant's

These materials must be submitted to AAAS by mail or fax no later than October 31, 1995. No late or incomplete applications will be considered. Send materials or inquiries to: Ms. Beth Boswell, AAAS, 1333 H Street, NW; Washington, DC 20005; tel: 202-326-6427; fax: 202-289-4958; bboswell@aaas.org.

Announcements of awardees will be made by late November 1995.

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