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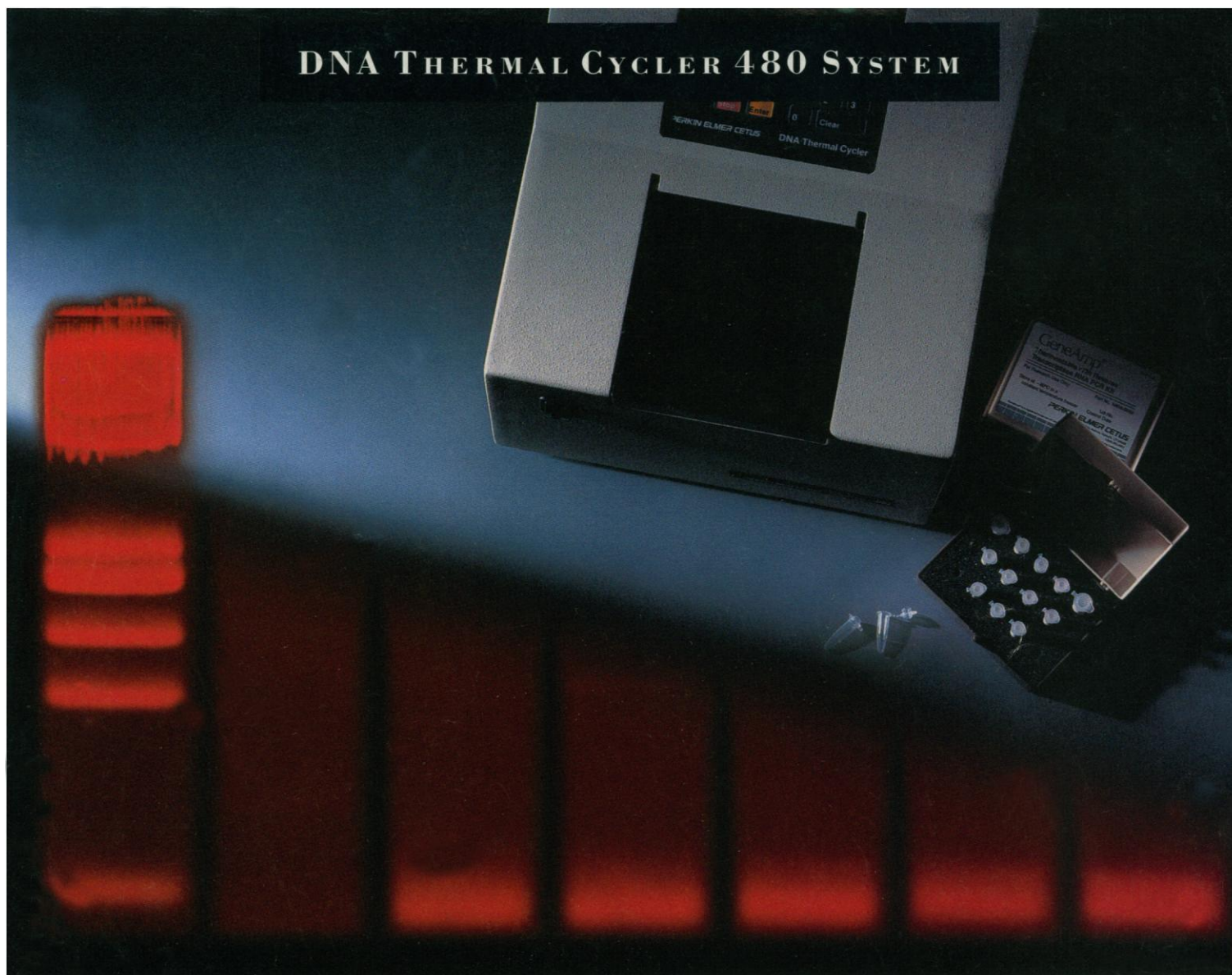
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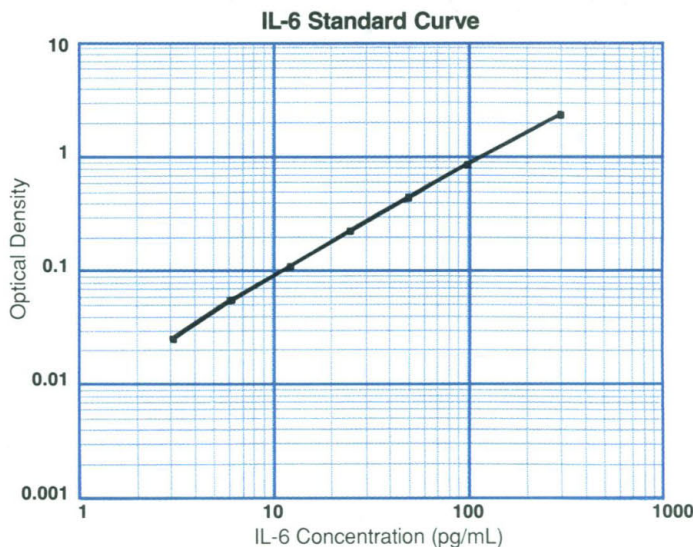
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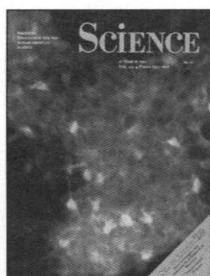
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COVER Fluorescence micrograph of neural cells that were generated in vitro from stem cells of the central nervous system of an adult mouse. Epidermal growth factor induced the proliferation of a multipotent progenitor. When given an appropriate substrate, these cells differentiated into neurons (orange) and astrocytes (green). See page 1707. [Micrograph by Samuel Weiss]

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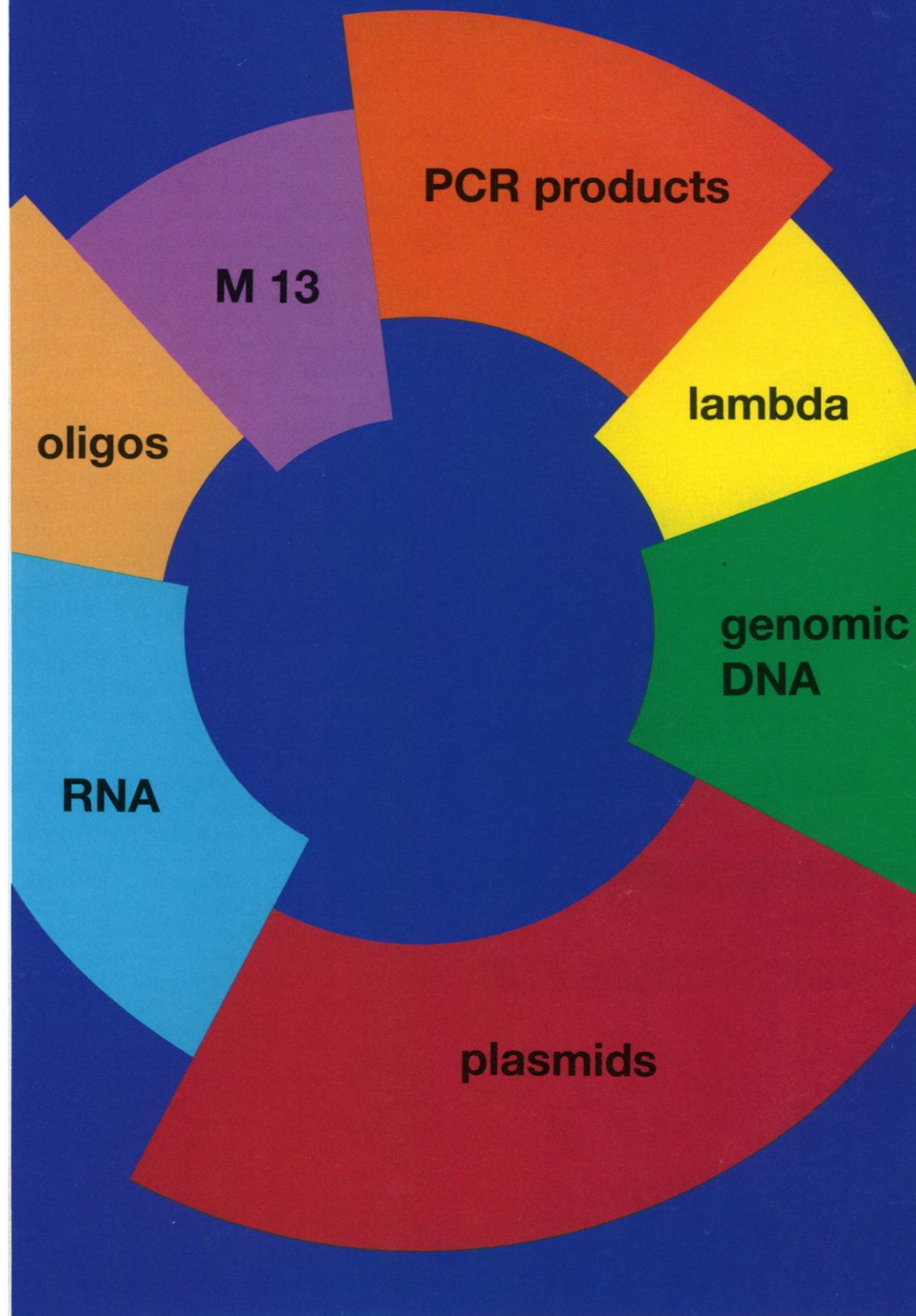
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This Week in SCIENCE

Raising the roof

The collision of India into Asia since about 50 million years ago (Ma) has uplifted the Himalayas and Tibetan Plateau. Knowledge of the timing of uplift has implications for paleoclimatology and geochemistry of the oceans and constrains tectonic models of the collision. Harrison *et al.* (p. 1663) review a variety of data, including Ar/Ar dates and establishment of drainage patterns, that suggest that rapid uplift commenced about 20 Ma and that the present topography was established by about 8 Ma. This history is most consistent with a model in which the collision was initially taken up by both thrusting and lateral extrusion of Indochina to the west and then shifted at 20 Ma primarily to the main thrust faults in the Himalayas.

Weighing the inner core

Earth's solid iron inner core resides in the molten iron outer core. Oscillations of the inner core can cause slight perturbation in Earth's gravitational field that might be detected at the surface, albeit with some difficulty. The period of the oscillations would provide an accurate estimate of the inner core density and radius. Smylie (p. 1678) reports a possible detection in four long gravimeter records from Europe. Although the signals in the records are weak (the oscillation is split into a triplet by Coriolis acceleration), the detection is supported by independent constraints on the amount of splitting expected and requires only slight adjustments to existing Earth models. The data yield an inner core density of 12.960 grams per cubic centimeter and a radius of 1221.1 kilometers.

Lasers and NMR lines

Overlapping lines can turn a nuclear magnetic resonance (NMR) spectrum into a forest. Warren *et al.* (p. 1683) show that visible laser light can induce differential line shifts on the order of 1 hertz in a

proton NMR experiment, an effect which could be used to separate closely spaced resonances. The line shifts arise from the magnetization produced by the polarized laser light through the inverse Faraday effect. A nonabsorbing laser frequency was chosen to minimize heating effects.

Vesicle fusion

The heterotrimeric guanosine triphosphate (GTP)-binding proteins (G proteins) are known to mediate signal transduction from cell surface receptors. Evidence is now accumulating that both small GTP-binding proteins and the heterotrimeric G proteins participate in intracellular transport pathways. Colombo *et al.* (p. 1695) used an in vitro assay to measure fusion of endocytic vesicles. Their results indicate that a G protein is required for endosome fusion. Agents that inhibit the function of G proteins antagonized the ability of a nonhydrolyzable analog of GTP to stimulate fusion of endocytic vesicles.

Land plant ancestors

Plant biologists have long debated which of the extant vascular plants represents the basal lineage of this group, which were among the first to inhabit land environments in the early Paleozoic. The similar morphology of psilopsids, the whisk ferns, which lack roots, gives them many similarities to some early fossil plants. However, the lycopsids, the club mosses, have fossil representatives throughout the past 400 million years, suggesting a primitive evolutionary position. Raubeson and Jansen (p. 1697) looked at structural elements in the chloroplast genome in representatives of all major extant lineages of vascular plants. Only lycopsids and one other early form, bryophytes, share a 30-kilobase pair inversion of the chloroplast gene order relative to all others, which supports the idea that lycopsids are the only modern descendants of the first evolutionary split of vascular land plants.

Direct measures

Charges are displaced when voltage-gated ion channels open in response to changes in membrane potential; Schoppa *et al.* (p. 1712) measured this charge displacement directly for wild-type and mutant *Shaker* potassium channels from *Drosophila*. The mutant channel, which contained a leucine to valine substitution in the S4 region, is less voltage-sensitive than the wild-type channel, even though the mutation involved only uncharged hydrophobic residues. However, the total charge displacement for both channels was about 12 charges. These results can be explained by a model in which the mutation shifts the equilibria of several voltage-dependent channel activation steps.

Echovirus receptor

The echoviruses can cause viral meningitis in adults and fatal generalized infections in newborn infants. Now Bergelson *et al.* (p. 1718) have identified a cell surface protein—the integrin VLA-2—as the receptor for echovirus 1. VLA-2 normally serves as an adhesion receptor for the extracellular matrix proteins collagen and laminin. Other picornaviruses bind to receptors that are members of the immunoglobulin superfamily of proteins. This is the first time that another superfamily—the integrin adhesion proteins—has been implicated (see news story by Eisner, p. 1647).

Meeting-goers alert

Eisner (p. 1645) highlights some of the topics to be presented at the FASEB meeting, 5 to 10 April in Anaheim, California. This issue also features the preliminary program (p. 1727) of the upcoming Science Innovation meeting, 21 to 25 July. The innovative format of this meeting includes overview lectures on techniques by leading researchers followed by workshops that will focus on the application of the techniques in biomedical research.



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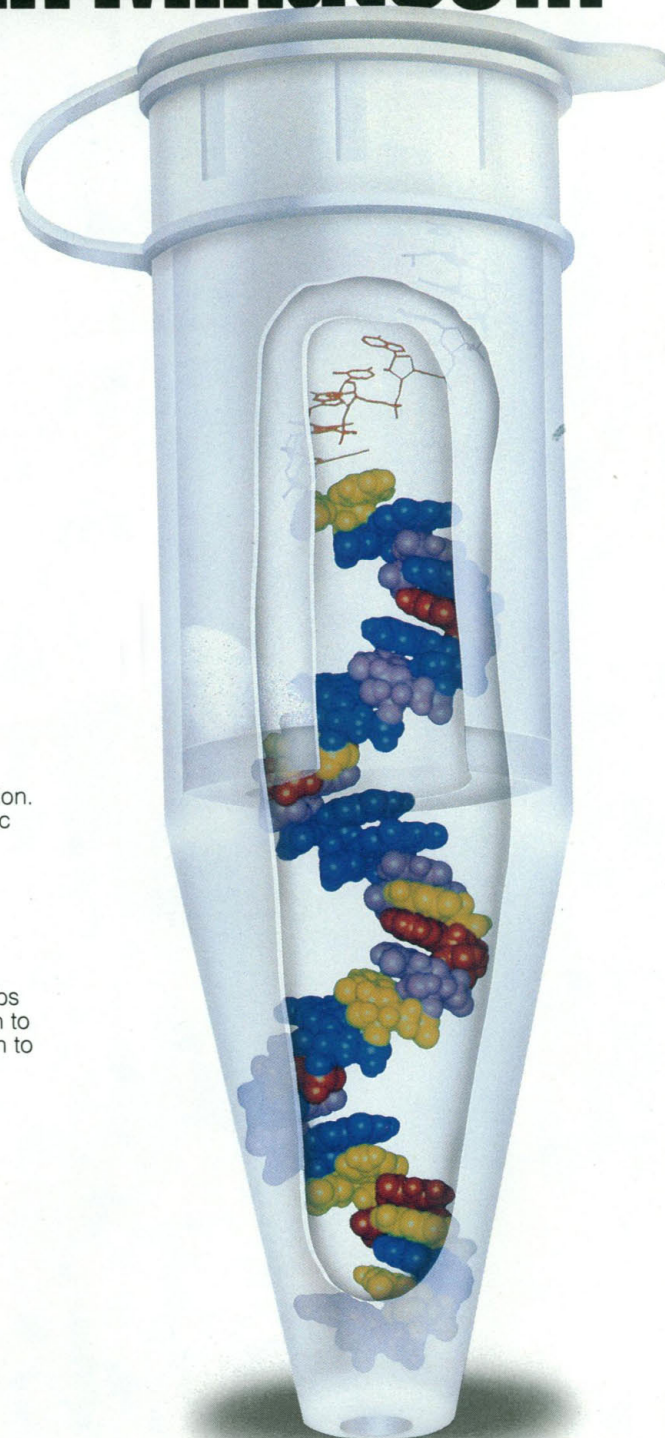


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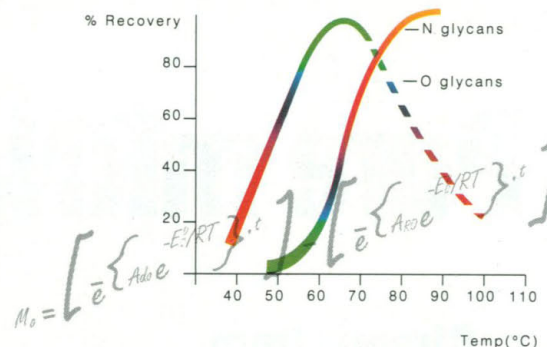
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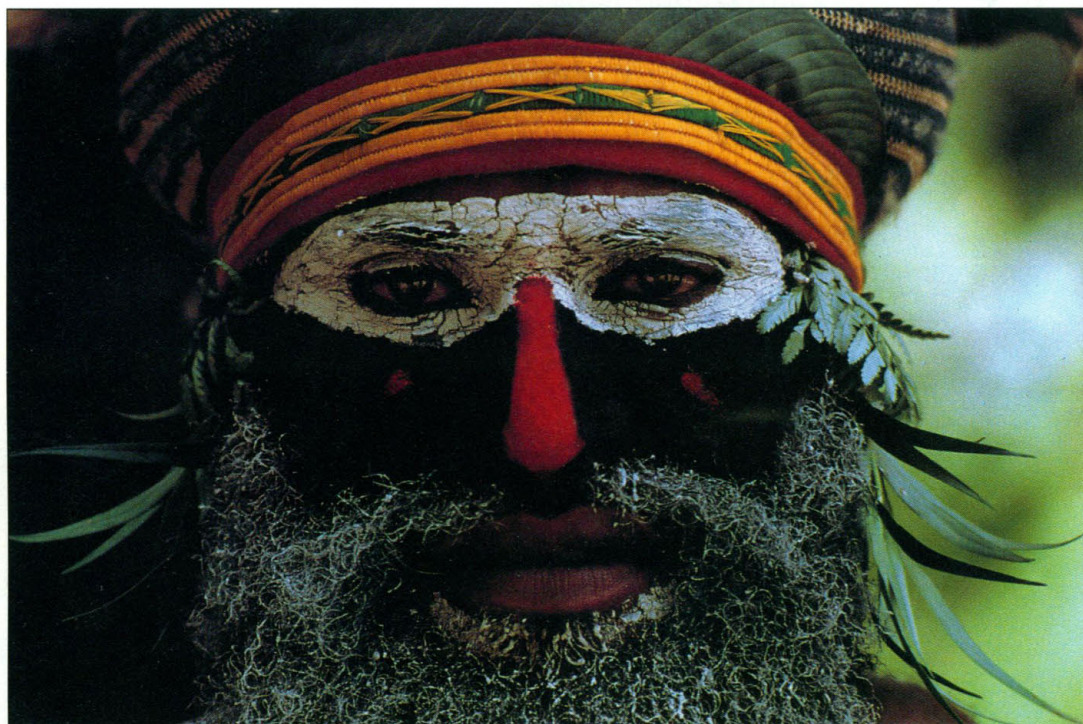
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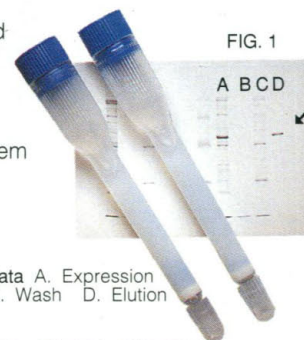


Figure 1: Expression Data A. Expression B. Flow Through C. Wash D. Elution

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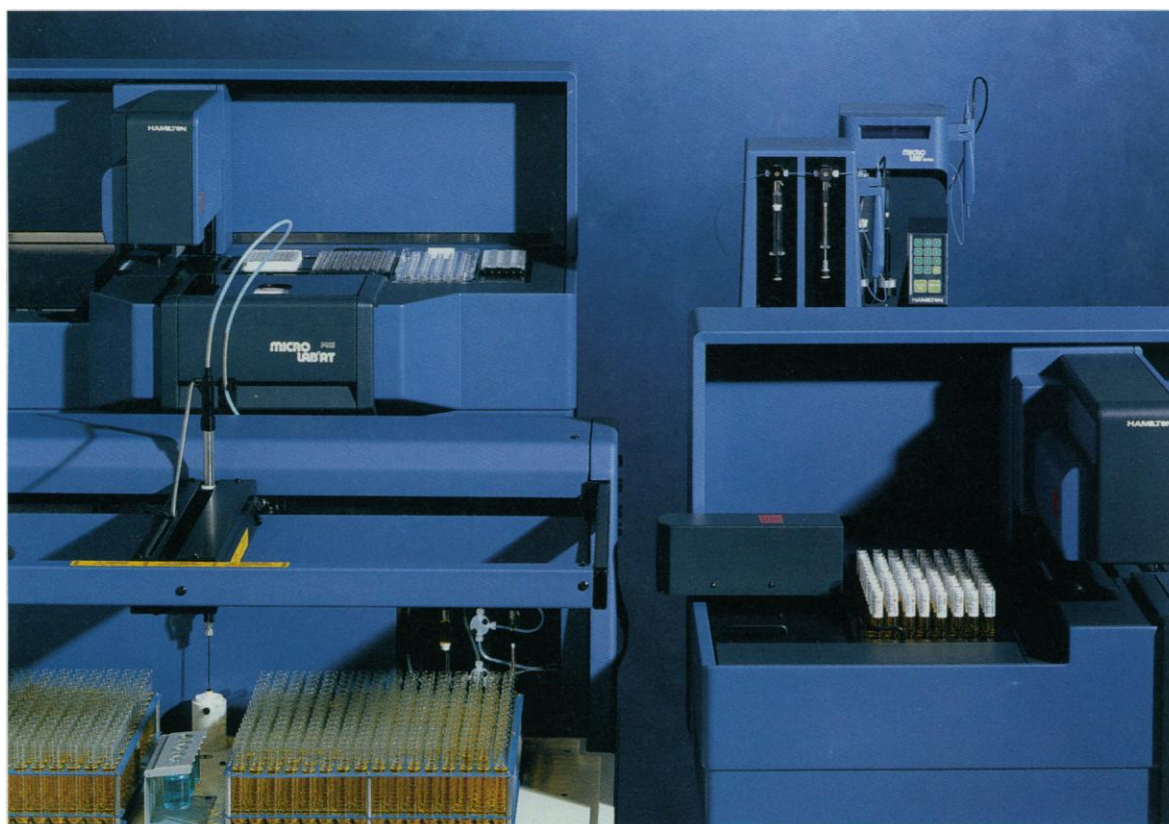
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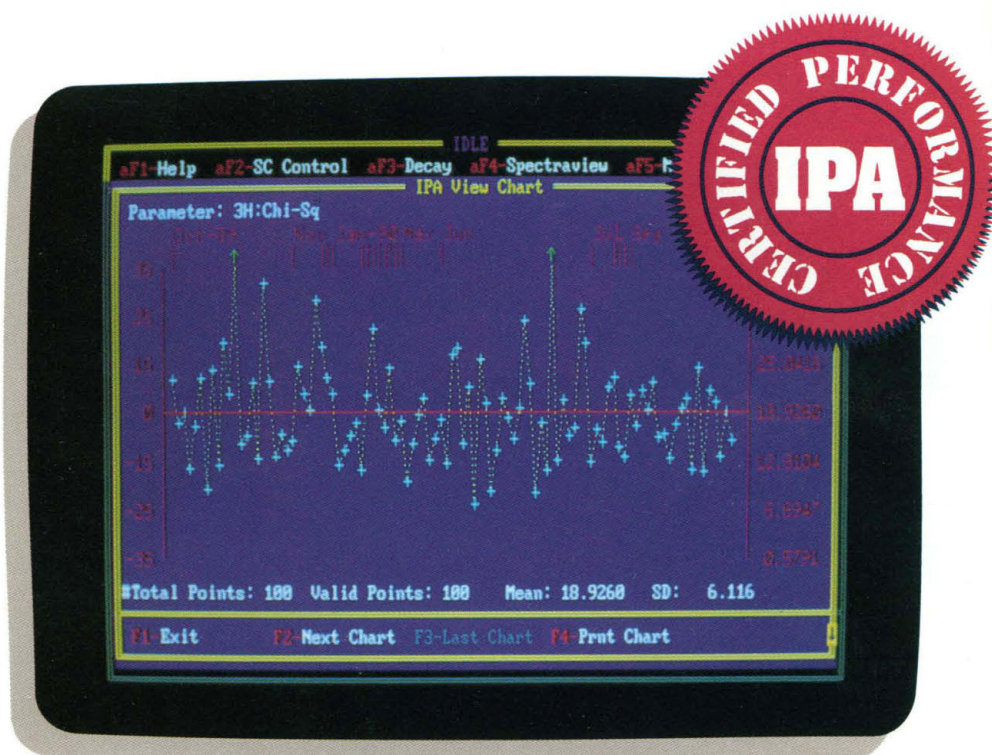


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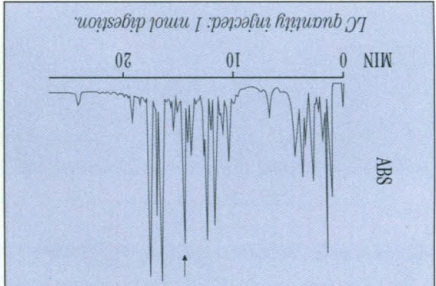


## Into a Source of Information.

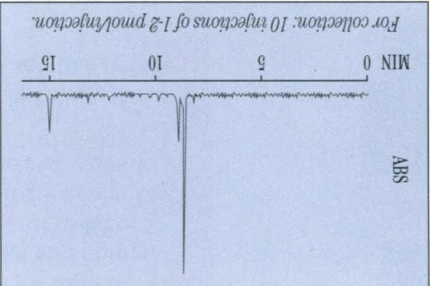
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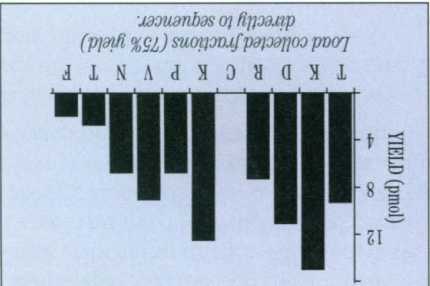
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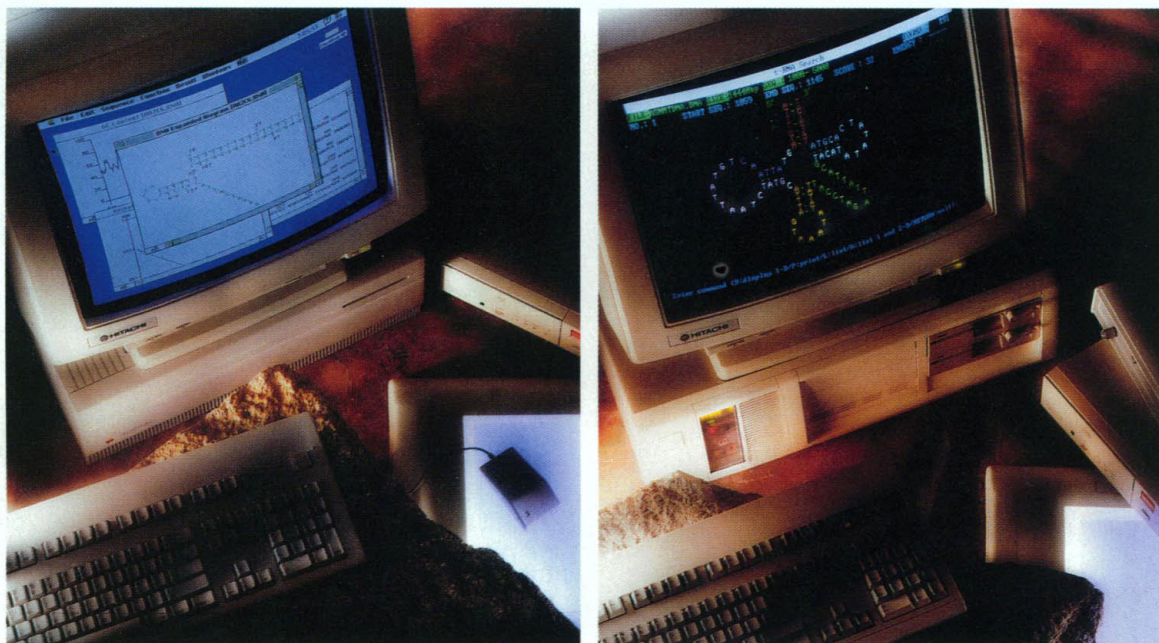
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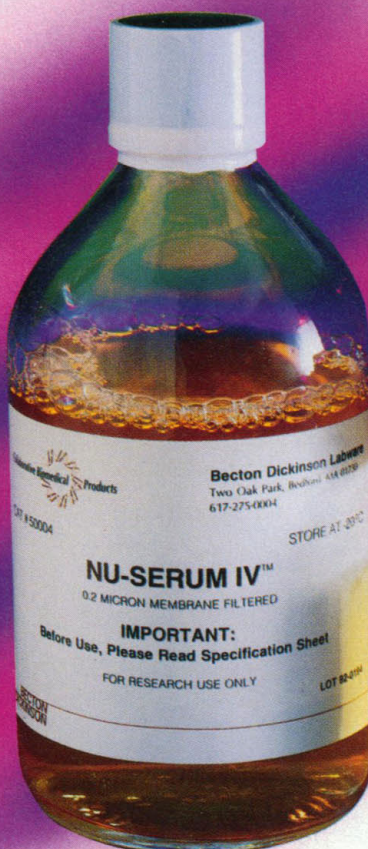
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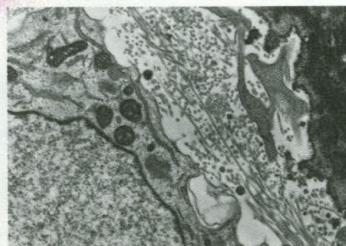
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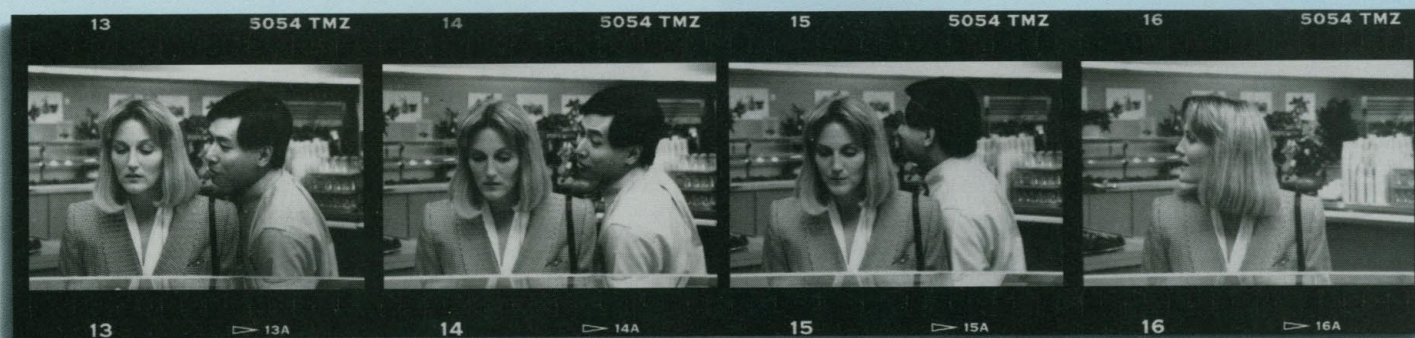
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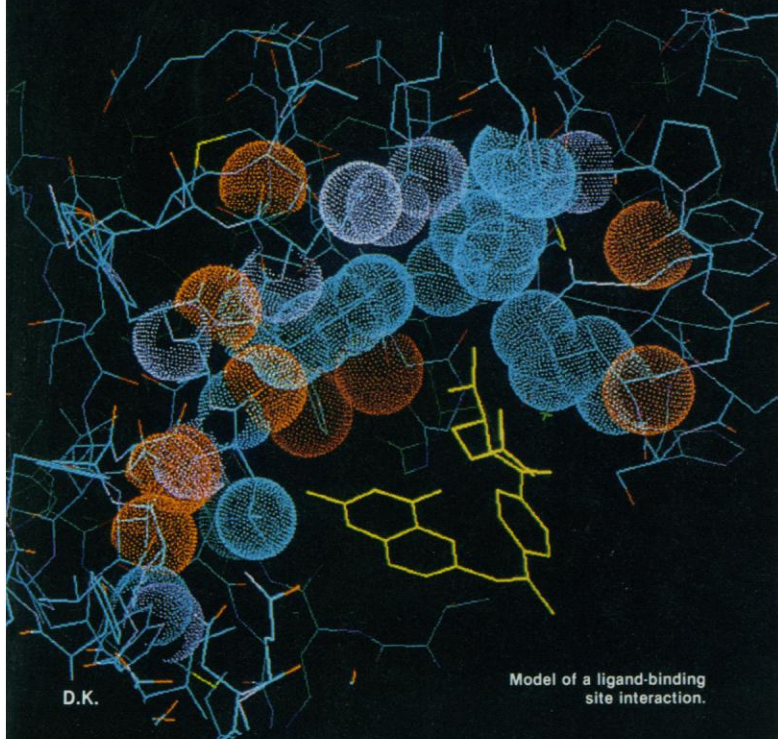
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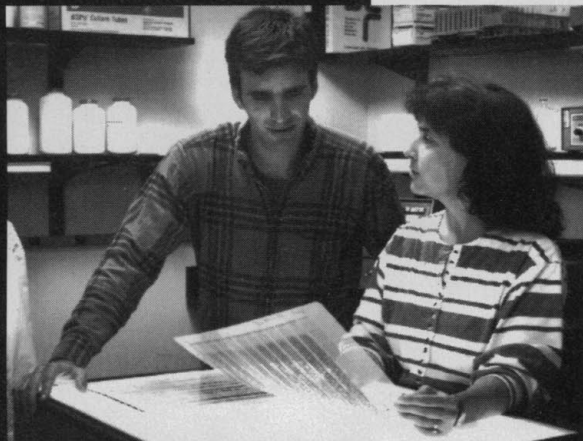
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### ▲ PLENARY SESSIONS

*The CF Gene: Perceptions,  
Puzzles & Promises*  
Francis S. Collins, M.D., Ph.D.

*The New Pharmacology:  
Tools to Arrest CF Lung Disease*  
Richard Boucher, M.D.

*Gene Therapy in CF:  
Progress & Prognosis*  
Ronald G. Crystal, M.D.  
& James Wilson, M.D., Ph.D.

- ▲ **SYMPOSIA:** Bacterial Adherence & Colonization • Immunotherapy  
• Pulmonary Complications • Late Breaking Science • Model Systems  
for the Study of CF • Advances in Clinical Therapies • Utilization of  
Genetic Information • Phagocytic Defenses • Virulence Factors  
• Monitoring & Evaluation of Pulmonary Physiology • Energy Expenditure  
• Electrolyte Transport & Structure – Function Studies of CFTR • Models  
of Care for Hospitalized Patients with CF • Respiratory Pathogens  
• Metabolism & Processing of CFTR • Clinical Questions in GI Management  
• Airway Clearance – Update on Therapies • Phenotypes from Genotypes  
• Current Topics in Nutrition • Transplantation • Structure/Function of  
Secretory Cells • Living with CF: Individual and Family Perspectives

- ▲ **SHORT COURSES:** Designing & Implementing Clinical Trials • Research  
Nurse/Study Coordinators Training • Human Subjects Research: Design &  
Grantsmanship • Modern-Day Molecular Genetics for the Clinician  
• Technological Advances in CF Home Care

Conference proceedings will be published as a supplement to  
*Pediatric Pulmonology*. **ABSTRACT DEADLINE: May 20, 1992.**

For abstract forms and registration information, contact:

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### CALL FOR ABSTRACTS

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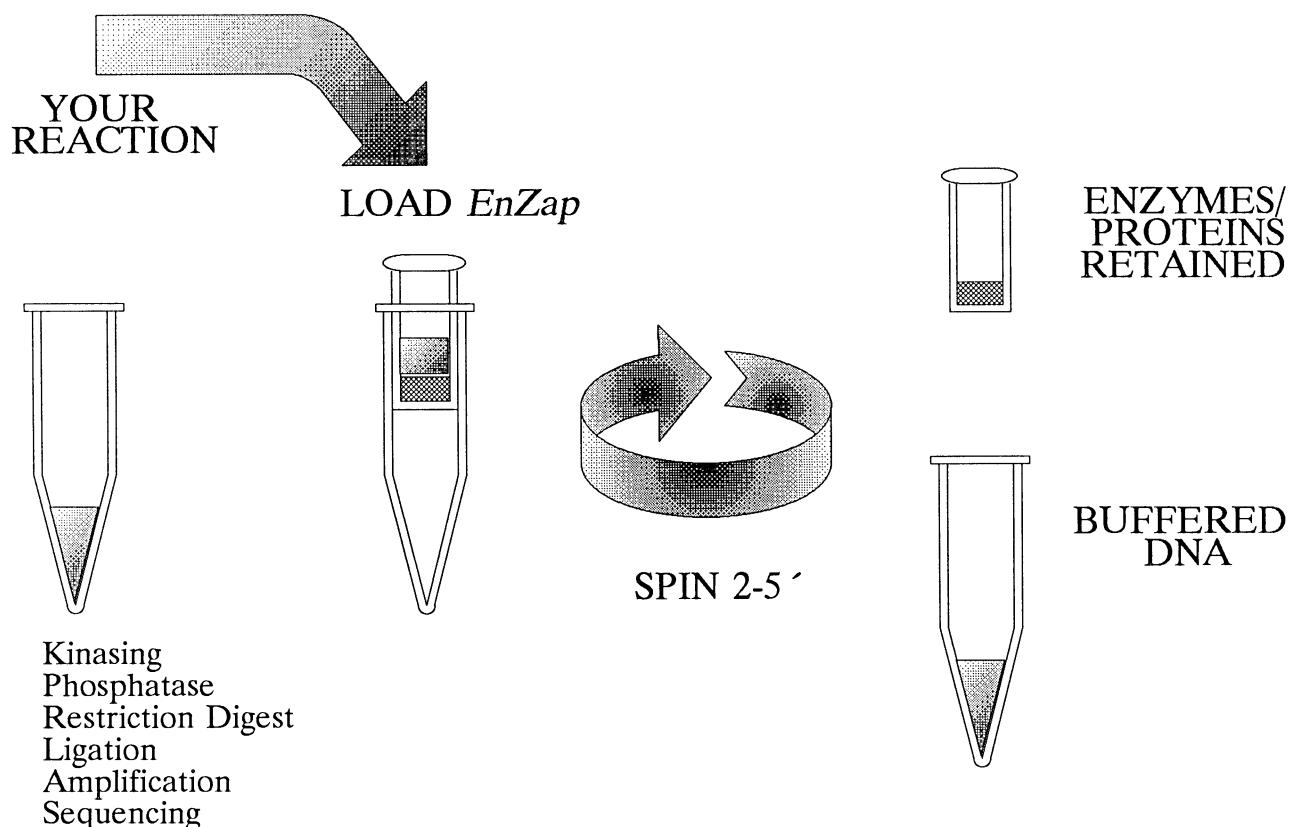
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1. *Nature* 344, 742-746 (1990). 2. *Nature* 349, 329-331 (1991). 3. *Science* 253, 199-202 (1991). 4. *Science* 253, 1417, 1420 (1991).  
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# Announcing a New Journal!

# Cell Transplantation

**Editor-in-Chief:** Paul R. Sanberg, Tampa, FL, USA

## Section Editors:

- Neuroscience - **Olle Lindvall**, Lund, Sweden
- Islets and Other Endocrines - **David W. Scharp**, St. Louis, MO, USA
- Tissue Engineering and Bioartificial Organs - **Patrick Aebischer**, Providence, RI, USA
- Hematopoietic System - **Robert Peter Gale**, Los Angeles, CA, USA
- Bone, Cartilage and Muscle - **A. Hari Reddi**, Bethesda, MD, USA
- Blood Vessels, Skin and Other Tissues - **Bruce E. Jarrell**, Tuscon, AZ, USA

This new interdisciplinary journal will publish original research and review articles on the subject of cell transplantation and its application to human diseases.

Reports will deal with a wide range of topics including physiological, medical, preclinical, tissue engineering and device-oriented aspects of transplantation of nervous system, endocrine, growth factor-secreting, bone marrow, epithelial, endothelial and genetically engineered cells, among others.

Reports of basic clinical studies, relevant technological advances, immunology research, patents, and ethical and regulatory considerations of cell transplants will all be welcome.

## Cell Transplantation will feature:

**Original Contributions:** Peer-reviewed, high-quality research investigations that represent new and significant contributions to science.

**Review Articles:** Reviews of major areas in cellular transplantation. These may be of any length and are peer-reviewed.

**Brief Communications:** Timely and brief, peer-reviewed studies.

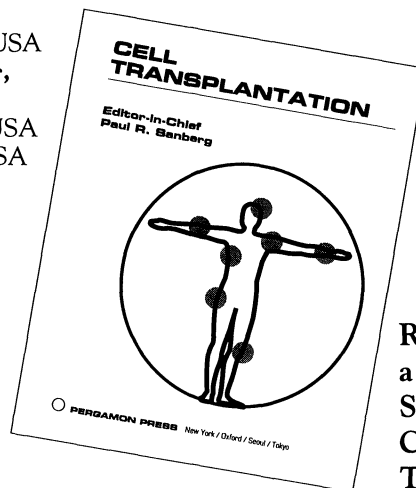
**Letters to the Editor:** Readers' comments on journal articles and other matters of interest to transplant researchers.

**Announcements and News:** Notices of upcoming meetings, conferences, seminars, and other events of interest to those in the field.

## An Invitation to Contribute

The Editor-in-Chief welcomes the submission of original articles. Copies of instructions for the preparation of manuscripts are featured in each issue of the journal or can be obtained from the Editorial Office. All manuscripts (one original and three copies) should be sent to : Prof. Paul Sanberg, Editor-in-Chief, Cell Transplantation, Div of Neurosurgery, Dept of Surgery, U. of South Fla., College of Med. MDC16, Tampa, FL 33612

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Volume 1, 1992

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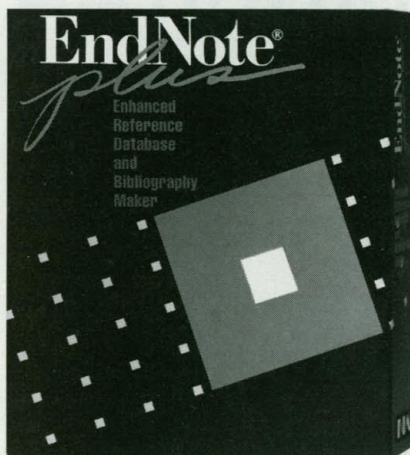
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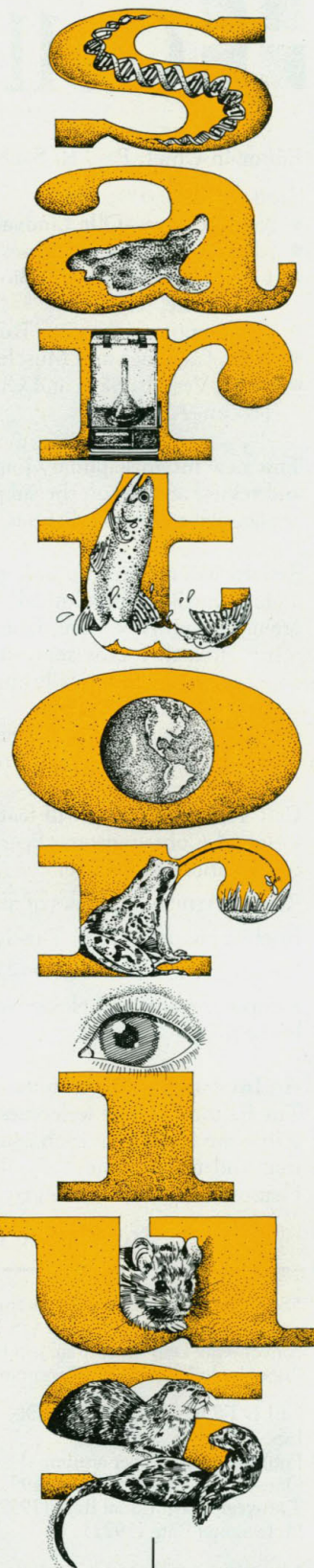
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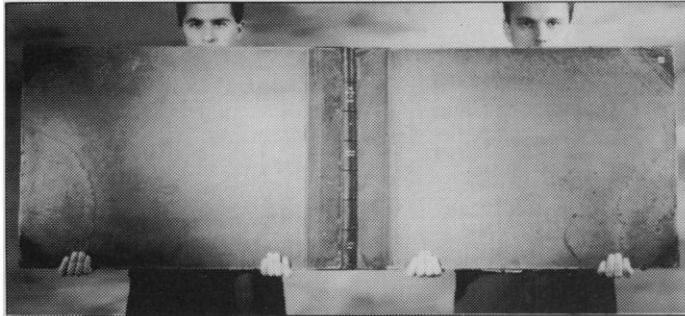
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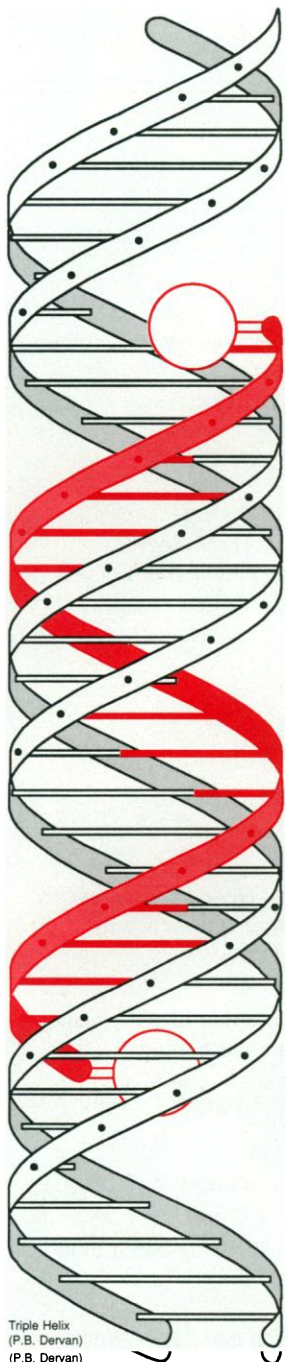
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*Check out the program on the following pages and make plans to be there.*

## **Advanced Technology Workshops**

*(See the program on the following pages for details.)*

Basic/Clinical Immunology Techniques  
Biomedical Imaging  
Brain Research Techniques  
Chemical and Structural NMR  
DNA Amplification  
DNA Forensics  
DNA Sequencing Technology  
Drug Targeting, Delivery, and Tracing  
Electrical Measurements of  
Mammalian Cells in Culture

Gene Expression  
Gene Therapy  
High-Speed Liquid Chromatography  
Information Analysis  
Gene Transfer  
Field Flow Fractionation  
Fluorescent In-situ Hybridization (FISH)  
Innovations in Crop Production  
Mass Spectrometry  
Microscopy

Nonisotopic Detection  
Oncogenes and Suppressor Techniques  
Gene Mapping  
Optical Trapping Instrumentation and  
Applications (Laser Tweezers)  
Preparative & Analytical  
Electrophoresis  
Protein Structure Determination  
Supercomputers in Research



Preconvention Program

TUESDAY, 21 JULY

Noon–7:00pm      Registration

5:00pm–7:00pm      Grand Opening Reception in Exhibit Hall

WEDNESDAY, 22 JULY

8:00am–12:30pm      Plenary Session

**Paul Berg\***, *Stanford Univ.*  
Keynote Address

**C. Thomas Caskey**, *HHMI/Baylor College of Med.*  
“DNA-based diagnostics: The molecular era is reality”

**Mario R. Capecchi**, *HHMI/Univ. of Utah*  
“Gene transfer techniques”

**Robert B. Goldberg**, *UCLA*  
“From test tube to farm: New plant technologies”

**Richard N. Zare**, *Stanford Univ.*  
“Laser-based chemical analysis”

**Stephen Fodor**, *Affymax*  
“Photolithic synthesis”

9:00am–5:00pm      Exhibits and Employment Exchange

Noon–2:30pm      Lunch in Exhibit Hall

2:30pm–5:00pm      Advanced Technology Workshops  
(Concurrent sessions A through K)

**[A] Gene Transfer**  
ERWIN WAGNER, *Research Inst. of Molecular Pathology*

**[B] Nonisotopic Detection**  
IRENA BRONSTEIN, *Tropix, Inc.*  
“Ultrasensitive detection of biomolecules with chemiluminescence”  
LARRY KRICKA, *Univ. of Pennsylvania*

**[C] Mass Spectrometry**  
BRIAN CHAIT, *Rockefeller Univ.*  
DONALD F. HUNT, *California Inst. of Technology*  
“Chemical communication between cells trying to overcome viral infection: Deciphering coded messages by tandem mass spectrometry”

**[D] DNA Sequencing Technology**  
ELLSON CHEN, *Applied Biosystems, Inc.*  
“Overview”  
RICHARD GIBBS, *Baylor College of Med.*

**[E] Innovations in Crop Production**  
ATHANASIOS THEOLOGIS, *USDA Plant Gene Expression Ctr.*  
“Reversible inhibition of tomato fruit senescence by antisense RNA”  
STEPHEN DELLAPORTA, *Yale Univ.*  
“Identification and isolation of genes that regulate plant morphogenesis and their utility in biotechnology”  
BRIAN LARKINS, *Univ. of Arizona*  
“The quest for high-lysine corn”  
ROGER N. BEACHY, *Washington Univ.*  
“Developing virus disease-resistant transgenic plants”  
BARBARA MAZUR, *DuPont Co.*  
“Molecular biology and molecular breeding-based improvements in crop quality traits”

**[F] Optical Trapping Instrumentation and Applications (Laser Tweezers)**  
TUDOR N. BUICAN, *Cell Robotics*  
MICHAEL BERNS, *Beckman Laser Inst., UC-Irvine*  
KARL OTTO GREULICH, *Physical Chemistry Inst., Hamburg*  
G.J. BRAKENHOFF, *Univ. of Amsterdam*

\*Invited, not confirmed

Who should attend Science Innovation '92?

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| ◆ Forensic specialists     | ◆ Senior scientist-managers   | ◆ Research managers    | ◆ Professors               |
| ◆ R&D directors            | ◆ Postdoctoral fellows        | ◆ Staff scientists     | ◆ Other biomed researchers |



## [G] Microscopy

MICHAEL ISAACSON, *Cornell Univ.*

JEAN PAUL REVEL, *California Inst. of Technology*

STEPHEN SMITH, *Stanford Univ.*

## [H] Fluorescent In-situ Hybridization (FISH)

BARBARA J. TRASK, *Lawrence Livermore Natl. Lab*  
"DNA sequence mapping by FISH to metaphase and interphase chromosomes"

THOMAS CREMER\*, *Univ. of Heidelberg*  
"Nuclear organization studies/improved cytogenetic analyses in interphase and metaphase"

JEANNE LAWRENCE, *Univ. of Massachusetts*  
"RNA processing"

MARTIN FERGUSON, *Yale Univ.*  
"Kinetoplast organization and replication analyzed by fluorescence in-situ hybridization"

NIGEL CARTER, *Cambridge Univ.*  
"Reverse chromosome painting (flow sorting and PCR) for chromosome aberration analysis"

## [I] Brain Research Techniques

ROGER TSIEH\*, *UC-San Diego*

## [J] Preparative and Analytical Electrophoresis

LLOYD SMITH, *Univ. of Wisconsin, Madison*

## [K] DNA Forensics

DEBBIE NICKERSON, *California Inst. of Technology*

KENNETH KIDD, *Yale Univ.*

5:00pm–7:00pm Poster Session and Reception

7:00pm–9:00pm Industry Workshops

## THURSDAY, 23 JULY

8:00am–12:30pm Plenary Session

**Irving Weissman**, *Stanford Univ.*

"Immunology technology: The scid mouse, et al."

**Glen Evans\***, *Salk Inst.*

"Gene mapping techniques"

**Leroy Hood**, *California Inst. of Technology*

"Large-scale genetic mapping and sequencing for the Human Genome Project"

**Curtis Harris**, *NIH*

"Tumor suppressors, oncogenes, and human cancer"

**Wayne Hendrickson\***, *Columbia Univ.*

"X-ray crystallography"

**Paul Hansma**, *UC-Santa Barbara*

"Scanning probe microscopy"

9:00am–5:00pm Exhibits and Employment Exchange

Noon–2:30pm Lunch in Exhibit Hall

2:30pm–5:00pm Advanced Technology Workshops  
(Concurrent sessions L through S)

## [L] Basic and Clinical Immunology Techniques

ELLEN V. ROTHENBERG, *California Inst. of Technology*  
"Analysis of cellular responses"

JONATHAN UHR\*, *Univ. of Texas Southwestern Med. School*

## Program Committee

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**Ronald E. Cape**, *Director, Chiron Corp.*

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**Larry L. Smarr**, *Director, National Ctr. for Supercomputing Applications, and Professor of Astronomy and Physics, Univ. of Illinois, Champaign*

**Savio L.C. Woo**, *Professor of Cell Biology and Molecular Genetics, Baylor College of Med.*



**[M] Oncogenes and Suppressor Techniques**

B. ROBERT FRANZA, JR., *Cold Spring Harbor Lab*  
 "Quantitative regulatory biology: Understanding the molecular mechanisms of cancer"

**[N] Gene Mapping**

HELEN DONIS-KELLER\*, *Washington Univ.*  
 RON DAVIS\*, *Stanford Univ.*

**[O] DNA Amplification**

KARI B. MULLIS, *Consultant*  
 "PCR"  
 JULIAN GORDON, *Abbott Labs*  
 "QPCR"  
 THOMAS G. LAFFLER, *Abbott Labs*  
 "LCR"  
 DAVID LANE\*, *Gene Track*  
 "QB"

THOMAS R. GINGERAS, *Baxter Diagnostics*  
 "3SR"

TERRANCE WALKER, *Becton Dickinson Research Ctr.*  
 "SDA"

**[P] Protein Structure Determination**

RAYMOND SALEMME\*, *Sterling Winthrop, Inc.*  
 EATON LATTMAN\*, *Johns Hopkins Univ.*

**[Q] Field Flow Fractionation**

CALVIN GIDDINGS, *Univ. of Utah*  
 MARCIA HANSON, *FFFractionation, Inc.*

**[R] Supercomputers in Research**

LARRY L. SMARR\*, *Univ. of Illinois, Champaign*

**[S] Biomedical Imaging — Part 1**

DAVID ISAACSON, *Rensselaer Polytechnic Inst.*  
 "Electrical conductivity and permittivity: Imaging below 100KHz"

CHRISTOPHER C. GALLER, *Scripps Clinic & Research Fdn.*  
 "Magnetic source imaging (MSI) of human cortical function and dysfunction"

MATTHEW O'DONNELL, *Univ. of Michigan*  
 "Ultrasound imaging and therapy"

HERBERT KRESSEL\*, *Univ. of Pennsylvania*  
 "NMR imaging"

5:00pm–7:00pm Poster Session and Reception

7:00pm–9:00pm Industry Workshops

---

**FRIDAY, 24 JULY**

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8:00am–12:30pm Plenary Session

**Eric Kandel\***, *Columbia College of Physicians & Surgeons*  
 "Brain research"

**Arthur M. Brown**, *Baylor College of Med.*  
 "Patch clamp and the molecular biology of ion channels"

**Fred W. McLafferty**, *Cornell Univ.*  
 "Tandem mass spectrometry of large biomolecules"

**Joseph L. Goldstein**, *Univ. of Texas Southwestern Med. School*  
 "Treating receptor diseases by activating genes: Lessons from cholesterol"

**Richard R. Ernst**, *ETH-Zentrum, Zurich*  
 "Nuclear magnetic resonance (NMR): An innovative field par excellence"

**Harden McConnell**, *Stanford Univ.*  
 "The cytosensor-microphysiometer: A tool for discovery"

9:00am–2:30pm Exhibits and Employment Exchange

10:00am–12:30pm Special Symposium

**R&D Funding in Fiscal Year 1993 — Part 1**

ALBERT H. TEICH, *AAAS*  
 "Overview of federal funding for R&D"

STEPHEN D. NELSON, *AAAS*  
 "R&D in the FY 1993 budget"

SPEAKER TBA  
 "What's new in R&D for FY 1993: Innovations and initiatives"

SPEAKER TBA  
 "Congressional outlook for R&D funding"

Noon–2:30pm Lunch in Exhibit Hall

**Invitation to Exhibit**

By exhibiting at *Science Innovation'92*, your organization can reach bench scientists from all the disciplines that contribute to the field of biomedical research.

The exhibition is the place where attendees can examine technologies cited by the plenary lecturers and workshop leaders and arrange for the implementation of those technologies in their labs. Through industry workshops and exhibits, you can forge relationships with scientists who are potential users of your products and services as well as future research partners.

For an exhibit prospectus and complete details, contact Scott Pierce in the AAAS Meetings Office at 202-326-6462 (Fax: 202-289-4021).



1:30pm–3:30pm Special Symposium

**R&D Funding in Fiscal Year 1993 — Part 2**

SPEAKER TBA

“Support for research: A scientist’s view”

SPEAKER TBA

“The NIH budget for FY 1993”

SPEAKER TBA

“The NSF budget for FY 1993”

SPEAKER TBA

“The DOE budget for FY 1993”

2:30pm–5:00pm Advanced Technology Workshops  
(Concurrent sessions S through Z)

**[S] Biomedical Imaging — Part 2**

HARVEY CLINE, *General Electric R&D Ctr.*

“3-D display and automated analysis of volume CT and NMR imaging data”

PAUL A. BOTTOMLEY, *General Electric R&D Ctr.*

“Human in vivo NMR spectroscopy: Clinical tool or research probe?”

ENRICO GRATTON, *Univ. of Illinois, Urbana-Champaign*

“Near-infrared optical tomography”

ROBERT R. ALFANO, *City College of City Univ. of New York*

“0.4-1.5 THz: Imaging with photons”

HENRY WAGNER, *Johns Hopkins Med. Inst.*

“Imaging intercellular communication in living human beings”

**[T] Gene Therapy**

HELEN BLAU\*, *Stanford Univ. School of Med.*

INDER M. VERMA, *Salk Inst.*

“Fibroblasts as tissues for gene therapy”

**[U] Gene Expression**

RANDAL J. KAUFMAN, *Genetics Inst.*

“Factors limiting expression of foreign genes in mammalian cells”

MARTIN ROSENBERG, *SmithKline Beecham Corp.*

**[V] Chemical and Structural NMR**

RUSSELL JACOBS, *California Inst. of Technology*

ERWIN L. HAHN\*, *UC-Berkeley*

**[W] Drug Targeting, Delivery, and Tracing**

JOHN BALDESCHWIELER\*, *California Inst. of Technology*

**[X] High-Speed Liquid Chromatography**

FRED REGNIER, *Purdue Univ.*

NOUBAR AFEYAN, *PerSeptive BioSystems*

**[Y] Information Analysis**

TIM HUNKAPILLAR, *California Inst. of Technology*

ELBERT BRANSCOMB, *Lawrence Livermore Labs*

**[Z] Electrical Measurements of Mammalian Cells in Culture**

IVAR GIAEVER, *Rensselaer Polytechnic Inst.*

CHARLES R. KEESE, *Rensselaer Polytechnic Inst.*

J. WALLACE PARCE, *Molecular Devices Corp.*

R. MARK WIGHTMAN\*, *Univ. of North Carolina*

5:00pm–7:00pm Poster Session and Reception

7:00pm–11:00pm Banquet (separate fee required, see registration form)

**Daniel E. Koshland, Jr.**, *UC-Berkeley/Science*

“Introduction to the Thomas Alva Edison Lectureship”

**Harry Gray\***, *California Inst. of Technology*

Banquet Address

Music and Dancing

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SATURDAY, 25 JULY

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8:00am–12:30pm Emerging Technologies

**Savio L.C. Woo**, *HHMI/Baylor College of Med.*

“Gene therapy for metabolic disorders”

**George P. Smith**, *Univ. of Missouri*

“Phage display and irrational drug discovery”

**Carver Mead**, *California Inst. of Technology*

“Very large-scale integration (VLSI) models of neural systems”

**Richard Lerner\***, *Scripps Clinic & Research Fdn.*

“Catalytic antibodies”

**Peter Dervan**, *California Inst. of Technology*

“Sequence-specific recognition of double helical DNA by triple helix formation”

**Steven Chu**, *Stanford Univ.*

“Laser manipulation of neutral particles”

**Steven M. Block**, *Rowland Inst./Harvard Univ.*

“Biological uses of optical tweezers”

**Richard F. Voss**, *IBM Research*

“Fractal geometry: Quantifying nature’s shapes”

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Due to the nature of the meeting, the program is continuously being developed and refined. Proposals for presentations of emerging technologies are always welcome (fax to Dr. Robin Yeaton Woo at 202-289-4021).



San Francisco Area Tours

While in San Francisco, your family and guests can take advantage of these AAAS-organized tours! Make reservations now — space is limited. Transportation is included. Pick up tickets on site at the Tour Registration desk.

San Francisco City Highlights

Wednesday, 22 July, 1:30pm–5:00pm  
Thursday, 23 July, 1:30pm–5:00pm

This tour includes such San Francisco highlights as the Golden Gate Bridge, Chinatown, North Beach, Fisherman’s Wharf, Nob Hill, Cliff House, Seal Rocks, and facades of Victorian homes.

Golden Gate Park

Thursday, 23 July, 1:00pm–5:00pm

Golden Gate Park was built in the late 1800s. This tour visits the Academy of Sciences with its Planetarium, Aquarium, and Natural Science Halls; Tulip Garden; Buffalo Paddock; and Spreckel’s Lake.

Lawrence Berkeley Laboratory

Saturday, 25 July, 1:00pm–5:00pm

This tour will feature a number of research projects being conducted at LBL. The lab is one of three DOE Human Genome Centers; the tour will examine the computing and engineering aspects of this project. In addition, the tour will feature LBL’s synchrotron light source — the Advanced Light Source — and its many applications to the physical and life sciences, as well as several labs conducting important research in materials science.

Giant Redwoods and Sausalito

Friday, 24 July, 2:00pm–5:00pm

This tour crosses the Golden Gate Bridge to visit Muir Woods, home of the giant coastal redwoods. After walking among the trees, some more than 1,000 years old, the tour group heads to Sausalito, a Mediterranean-style art colony.

Marin Headlands and Marine Mammal Center

Friday, 24 July, 1:00pm–6:00pm

This outing begins with a tour of the Marine Mammal Center at Marin Headlands to learn about the local marine mammals and the ways in which the center rescues and cares for them. The tour then heads to the beach for views of Point Bonita Lighthouse and ocean-going fishing boats.

Napa Valley Wine Tour

Saturday, 25 July, 9:00am–4:00pm

An excursion into the Napa Valley visits two wineries for a glimpse of the winemaking process and a taste of the wines. The tour includes lunch at a charming local restaurant and time for browsing in the shops in a restored brick winery.

Bay Cruise

Saturday, 25 July, 1:30pm–4:00pm

This tour begins with a cruise on San Francisco Bay for a close-up view of such sights as Alcatraz Island, Angel Island (once the Ellis Island of the West), and man-made Treasure Island. The boat crosses beneath the Golden Gate Bridge for views of the villages of Sausalito and Tiburon, as well as the city’s dramatic skyline.

Tour Registration Form: Science Innovation '92

| Tour                                            | Cost | # of Tickets | Amount Enclosed |
|-------------------------------------------------|------|--------------|-----------------|
| San Francisco Highlights (Wednesday, 7/22) .... | \$19 | _____        | _____           |
| San Francisco Highlights (Thursday, 7/23) ..... | \$19 | _____        | _____           |
| Golden Gate Park (Thursday, 7/23) .....         | \$25 | _____        | _____           |
| Lawrence Berkeley Lab (Saturday, 7/25) .....    | \$18 | _____        | _____           |
| Giant Redwoods & Sausalito (Friday, 7/24) ..... | \$22 | _____        | _____           |
| Marin Headlands (Friday, 7/24) .....            | \$22 | _____        | _____           |
| Napa Valley (Saturday, 7/25) .....              | \$56 | _____        | _____           |
| Bay Cruise (Saturday, 7/25) .....               | \$24 | _____        | _____           |

Total Amount Enclosed .....

Name \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

City/state/zip \_\_\_\_\_

**Mail this form with payment to:**

Cable Car Seminars and Tours  
1111 Hamilton Avenue  
Palo Alto, CA 94301  
415-328-5898

Please make check payable to  
Cable Car Seminars and Tours.

**Note:** No refunds after 1 July  
1992. No children under 7 years  
of age. Tour may be canceled if  
minimum is not met.



## Exhibition

The following is a partial list of *Science Innovation '92* exhibitors:

Abacus Concepts, Inc.  
Advanced ChemTech  
Alza Corporation  
Applied Biosystems, Inc.  
Applied Imaging Corporation  
Autodesk, Inc.  
Beckman Instruments, Inc.  
BioSymb Technologies  
*BioTechniques* / Eaton Publishing  
Brinkman Instruments, Inc.  
Cambridge Scientific Abstracts  
Cell Robotics, Inc.

Clontech Laboratories, Inc.  
Coherent Laser Group  
CPG, Inc.  
Cruachem, Inc.  
David Kopf Instruments  
Digital Equipment Corporation\*  
Element Analysis Corporation  
Epicentre Technologies Corp.  
Forma Scientific, Inc.  
Fotodyne, Inc.\*  
*Genetic Engineering News*  
Hamamatsu Photonic Systems Corporation  
Hamilton Company  
IntelliGenetics / Betagen  
Isco, Inc.

Komp-Spin, Inc.  
LI-COR, Inc.\*  
MJ Research, Inc.  
Molecular Devices Corporation  
Molecular Dynamics\*  
National Biosciences, Inc.  
National Instruments Corp.  
Niles and Associates, Inc.  
Olympus Corporation  
Oxford Glycosystems, Inc.\*  
Panlabs, Inc.  
Radnoti Glass Technology, Inc.  
Rainin Instrument Company, Inc.  
*Science Magazine*  
Stovall Life Science, Inc.  
Sutter Instrument Company

Technical Products International  
Ted Pella, Inc.  
Tropix, Inc.  
VG / Fisons Instruments  
Vital Images, Inc.  
Wolfram Research, Inc.  
Xenopore Corporation

## Exhibit Hours

Tues., 21 July, 5:00pm–7:00pm  
(Grand Opening Reception)  
Wed., 22 July, 9:00am–5:00pm  
Thurs., 23 July, 9:00am–5:00pm  
Fri., 24 July, 9:00am–2:30pm

\*Organizations conducting industry workshops at *Science Innovation '92*

## Call for Poster Papers

The poster sessions at *Science Innovation '92* provide an informal way for you to discuss your latest technique one on one with interested colleagues. Appropriate topics include technical developments relating to any of the 26 advanced technology workshops.

**Requirements for submission:** The presenter listed on the abstract must be registered for *Science Innovation '92* (use registration form on page 1735). Each presenter may submit only one abstract for consideration.

**Format of abstracts:** Abstracts not conforming to the following format will be returned unprocessed. Type the text of the abstract to fit within a 5" square in the center of an 8.5" × 11" sheet of white paper. Use a typewriter or letter-quality (not dot matrix) printer. Use black ink for all hand lettering. Indent, space, underline, and capitalize as in the example on the right. Do not double-space the body of the text. Do not draw a box around the abstract, nor cut out the abstract. Above the 5" square, type the name of the advanced technology workshop to which the abstract relates. Below and to the left of the square, type the name, address, and phone number of the poster presenter.

**Mailing instructions:** Mail the abstract flat (do not fold or bend). Send original plus two photocopies to: *Science Innovation '92*, Contributed Papers, AAAS Meetings, 1333 H Street, NW, Washington, DC 20005.

**Deadline:** Abstracts postmarked after 1 May 1992 will not be accepted.

**Acceptance:** AAAS will evaluate abstracts and notify presenters of a decision by the first week in June. Accepted abstracts will be assigned to a 2-hour poster session; poster displays should be designed to fit a 4' × 8' bulletin board. Accepted abstracts will be published in the program book distributed to all meeting registrants.

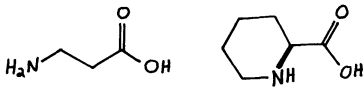
Name of advanced technology workshop to  
which abstract relates

(Skip at least 3 lines before beginning abstract.)

5"

Indent 7 Spaces and Type Title in Upper and Lower Case Letters and Underline. PRESENTER'S NAME IN UPPER CASE (Institution Name in Upper and Lower Case Within Parentheses), ADDITIONAL AUTHOR (Institution), etc.

Skip one line and type abstract. The full width of the column of typed material should be 5 inches (12.7 cm) and must not extend beyond that. The total length of the material, from top of title to bottom of footnotes, must not exceed 5 inches (12.7 cm). Abstracts that exceed these parameters will be returned. Any special symbols or signs that must be hand lettered should be rendered in black ink as clearly and carefully as possible. The entire submission should be of camera-ready quality so that it can be photographed and printed. The printed abstract will be about 2/3 the size of the typed version. Avoid paragraphing, as this wastes space. However, you may use your allotted space to neatly letter equations and diagrams as you deem necessary, as in this example:



You may also use your allotted space for footnotes.\*

\*Skip one line and type footnotes, if any.

Name of Presenter  
Presenter's Street Address  
Presenter's City/State/Zip  
Presenter's Country  
Presenter's Phone Number



# Hotel Reservation Form

Science **Innovation** '92 ✧ San Francisco ✧ 21–25 July 1992

Send confirmation to:

Name \_\_\_\_\_  
(first name) (last name)

Institution/company \_\_\_\_\_  
(if part of address)

Address \_\_\_\_\_

City/state/zip/country \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

Other occupant(s) of room \_\_\_\_\_  
(name)

\_\_\_\_\_/\_\_\_\_\_  
(name) (name)

| Hotel Choice | Hotel Name |
|--------------|------------|
| 1st          |            |
| 2nd          |            |
| 3rd          |            |
| 4th          |            |

**Type of room desired** (check one):

- ☐ Single (1 person, 1 bed)      ☐ Triple (3 people, 2 beds)      ☐ 1-bedroom suite  
☐ Double (2 people, 1 bed)      ☐ Quadruple (4 people, 2 beds)      ☐ 2-bedroom suite  
☐ Double/Double (2 people, 2 beds)

**Arrival date** \_\_\_\_\_ **Departure date** \_\_\_\_\_

**Special housing needs:** ☐ Wheelchair-accessible room      ☐ Nonsmoking room

Other \_\_\_\_\_

All reservations must be guaranteed with a deposit of U.S. \$125 per room, either by VISA, MasterCard, or check (payable to San Francisco Convention and Visitors Bureau). Suite deposits are \$250 for a 1-bedroom suite, \$375 for a 2-bedroom suite. **Your credit card account will be charged upon receipt by the San Francisco Convention and Visitors Bureau.**

☐ Check enclosed    ☐ VISA    ☐ MasterCard    (No other cards can be accepted.)

Credit card # \_\_\_\_\_

Exp. date \_\_\_\_\_ Signature \_\_\_\_\_

## Hotel Room Rates

Room rates quoted are \$ per night and are subject to city taxes (currently 11%).

| Map # | Hotel Name                          | Single | Double <sup>1</sup> | Triple | Quad | Suite   |
|-------|-------------------------------------|--------|---------------------|--------|------|---------|
| 1     | San Francisco Marriott <sup>2</sup> | 125    | 145                 | 175    | 205  | 230 +up |
| 2     | ANA Hotel San Francisco             | 125    | 135                 | 160    | 185  | 350 +up |
| 3     | Hotel Diva                          | 109    | 109                 | 119    | 129  | 125 +up |
| 4     | Handlery Hotel Union Square         | 100    | 100                 | 110    | 120  |         |
| 5     | Holiday Inn Civic Center            | 85     | 95                  | 110    | 125  |         |
| 6     | Kensington Park                     | 105    | 105                 | 115    | 125  |         |
| 7     | King George Hotel                   | 92     | 92 <sup>3</sup>     | N/A    | N/A  | 185     |
| 9     | Ramada Hotel San Francisco          | 90     | 90                  | 102    | 114  | 200–280 |
| 10    | San Francisco Hilton                | 115    | 115                 | 140    | 165  |         |
| 11    | Sheraton Palace                     | 125    | 145                 | 165    | 185  | 350 +up |
| 12    | Hotel Union Square                  | 95     | 95                  | 105    | 115  |         |
| 13    | U.N. Plaza                          | 65     | 65                  | 75     | 85   |         |

FOOTNOTES: [1] Double rate applies to both Double and Double/Double rooms. [2] The San Francisco Marriott is the AAAS headquarters hotel. [3] At King George Hotel, 2-bed rooms have two *twin* beds.

**Reservations:** The San Francisco Convention and Visitors Bureau Housing Bureau will make hotel reservations on a first-come, first-served basis upon receipt of a properly completed *Science Innovation* '92 housing form. Reservations will be processed in order of receipt, based on choice and availability. Confirmations will be sent directly to the occupant by the Housing Bureau. **Telephone reservations cannot be accepted.**

**To complete this form:** [1] Use a separate reservation form for each room requested, not for each individual. Send only *one* form if sharing with a colleague; duplicate forms cause delays in processing and may result in double charges. [2] List at least four hotels, in order of preference, where you'd like to stay. [3] Check the type of room you would like. [4] Complete the remainder of the form, being sure to include your arrival and departure dates, credit card number and expiration date (if using credit card for your deposit), and any special requests you might have (nonsmoking room, wheelchair accessibility, etc.). [5] Please be thorough; failure to include all pertinent information may delay processing of your reservation.

**Children in rooms:** There is usually no charge for children under a particular age; check with the Housing Bureau.

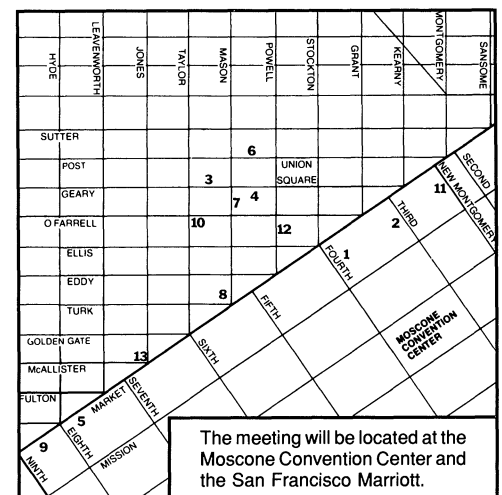
**Cancellations/changes:** To cancel or make changes to reservations, contact the SFCVB Housing Bureau up to 2 weeks prior to your arrival date. After that, please contact the hotel directly. No refunds will be given for cancellations made less than 72 hours prior to the opening of the conference.

**Mailing instructions:** Mail your completed form and deposit to:

*Science Innovation* '92 Housing  
San Francisco Housing Bureau  
PO Box 424279  
San Francisco, CA 94142-4279

Reservation forms must be postmarked by 12 June 1992. Housing requests *received* after 19 June 1992 are conditional on room availability. Do *not* mail this form to AAAS; see the mailing address above.

**It is recommended that you keep a photocopy of this form for your records.**





# Science *Innovation* '92

21–25 July 1992 ✧ San Francisco

## Advance Registration Form

Register by 1 May and save up to \$120

### REGISTRANT INFORMATION (Please type or print)

|                                                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                          |  |  |  |  |          |  |  |  |  |  |  |  |  |  |
|---------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------------------------------------------------------|--|--|--|--|----------|--|--|--|--|--|--|--|--|--|
| First name (as you would like it to appear on your badge)           |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Last name (as you would like it to appear on your badge) |  |  |  |  |          |  |  |  |  |  |  |  |  |  |
| Institution/company (will appear on badge, subject to abbreviation) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                          |  |  |  |  |          |  |  |  |  |  |  |  |  |  |
| Mailing address                                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                          |  |  |  |  |          |  |  |  |  |  |  |  |  |  |
| City                                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  | State                                                    |  |  |  |  | Zip code |  |  |  |  |  |  |  |  |  |
| Country                                                             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Daytime phone number                                     |  |  |  |  |          |  |  |  |  |  |  |  |  |  |

AAAS membership number (if member) \_\_\_\_\_  
(appears on AAAS membership card and above your name on *Science* subscription label)

If registering at student rate, check here ☐ and attach a copy of your student ID card.

☐ Check here if you need special services due to a disability (we'll call you before the meeting).

**Advanced Technology Workshops:** Please indicate the workshops you wish to attend (check up to three):

- |                                                                |                                                               |                                                                 |
|----------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|
| <input type="checkbox"/> Biomedical Imaging                    | <input type="checkbox"/> Fluorescent In-situ Hybridization    | <input type="checkbox"/> Mass Spectrometry                      |
| <input type="checkbox"/> Brain Research Techniques             | <input type="checkbox"/> Gene Expression                      | <input type="checkbox"/> Microscopy                             |
| <input type="checkbox"/> Chemical and Structural NMR           | <input type="checkbox"/> Gene Mapping                         | <input type="checkbox"/> Nonisotopic Detection                  |
| <input type="checkbox"/> DNA Amplification                     | <input type="checkbox"/> Gene Therapy                         | <input type="checkbox"/> Oncogene and Suppressor Techniques     |
| <input type="checkbox"/> DNA Forensics                         | <input type="checkbox"/> Gene Transfer                        | <input type="checkbox"/> Optical Trapping (Laser Tweezers)      |
| <input type="checkbox"/> DNA Sequencing Technology             | <input type="checkbox"/> High Speed Liquid Chromatography     | <input type="checkbox"/> Preparative/Analytical Electrophoresis |
| <input type="checkbox"/> Drug Targeting, Delivery, & Tracing   | <input type="checkbox"/> Basic/Clinical Immunology Techniques | <input type="checkbox"/> Protein Structure Determination        |
| <input type="checkbox"/> Electrical Measure of Mammalian Cells | <input type="checkbox"/> Information Analysis                 | <input type="checkbox"/> Supercomputers in Research             |
| <input type="checkbox"/> Field Flow Fractionation              | <input type="checkbox"/> Innovations in Crop Production       |                                                                 |

### IMPORTANT FOOTNOTES

[1] **Deadline** for early registration discount is 1 May. Final deadline for advance registration is 10 July. On-site registration begins at noon on 21 July at the Moscone Center.

[2] **Banquet**, with music and dancing, will be held on Friday night, 7:00–11:00 pm, at the San Francisco Marriott.

[3] **To qualify for student rate**, you must be a graduate or undergraduate student and must attach a copy of your student ID card. *Registrations received without appropriate verification will be charged at the Regular rates.*

[4] **Membership:** \$47 of dues plus international postage fees are allocated to *Science*. California dues include all applicable state and local taxes. Canadian dues include GST. Please allow 6–8 weeks for receipt of first issue of *Science*.

[5] **Cancellations** must be received in writing by 12 June 1992. *No refunds will be made for cancellations received after this date.* Refunds are subject to a \$50 cancellation charge and will be processed after the meeting.

[6] **Checks** must be in United States currency and must be payable on a U.S. bank.

L M

### MEETING REGISTRATION FEES<sup>1</sup> (Check one box only)

| Category<br>(Select either with or without banquet <sup>2</sup> )                      | On or before<br>1 May '92 | After<br>1 May '92 |
|----------------------------------------------------------------------------------------|---------------------------|--------------------|
| <input type="checkbox"/> Regular AAAS member <i>with</i> banquet .....                 | \$300 .....               | \$420              |
| <input type="checkbox"/> Regular AAAS member <i>without</i> banquet .....              | \$250 .....               | \$370              |
| <input type="checkbox"/> Regular nonmember <i>with</i> banquet .....                   | \$400 .....               | \$520              |
| <input type="checkbox"/> Regular nonmember <i>without</i> banquet .....                | \$350 .....               | \$470              |
| <input type="checkbox"/> Student <sup>3</sup> AAAS member <i>with</i> banquet .....    | \$200 .....               | \$270              |
| <input type="checkbox"/> Student <sup>3</sup> AAAS member <i>without</i> banquet ..... | \$150 .....               | \$220              |
| <input type="checkbox"/> Student <sup>3</sup> nonmember <i>with</i> banquet .....      | \$260 .....               | \$330              |
| <input type="checkbox"/> Student <sup>3</sup> nonmember <i>without</i> banquet .....   | \$210 .....               | \$280              |

### MEMBERSHIP DUES<sup>4</sup> (Optional)

If you're not a AAAS member, you can join now by checking the appropriate box below — and take advantage of the discounted *member* registration fees above. You'll also get a year's subscription (51 issues) to the journal *Science*<sup>4</sup>.

|              | USA (except CA)                  | California                       | Canada                            | International                     |
|--------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
| Regular      | <input type="checkbox"/> \$87.00 | <input type="checkbox"/> \$95.08 | <input type="checkbox"/> \$146.59 | <input type="checkbox"/> \$182.00 |
| Student      | <input type="checkbox"/> \$47.00 | <input type="checkbox"/> \$51.37 | <input type="checkbox"/> \$103.79 | <input type="checkbox"/> \$142.00 |
| Postdoctoral | <input type="checkbox"/> \$62.00 | <input type="checkbox"/> \$67.76 | <input type="checkbox"/> \$119.84 | <input type="checkbox"/> \$157.00 |
| Retired      | <input type="checkbox"/> \$47.00 | <input type="checkbox"/> \$51.37 | <input type="checkbox"/> \$103.79 | <input type="checkbox"/> \$142.00 |

### PAYMENT

Meeting registration fee<sup>5</sup> ..... \$

Membership dues (if joining now) ..... \$

Total amount ..... \$

☐ Check enclosed<sup>6</sup>    ☐ VISA    ☐ MasterCard  
(no other cards accepted)

☐ Original institutional purchase order attached

\_\_\_\_\_  
Credit card number

Exp. date \_\_\_\_\_ Signature \_\_\_\_\_

### MAILING INSTRUCTIONS (10 July deadline<sup>1</sup>)

**Mail to:** Science Innovation '92, P.O. Box 630285, Baltimore, MD 21263.  
**Or fax** (credit card payments only) to 202-289-4021.

## General Meeting Information

**Location:** Sessions and exhibits will be in the Moscone Center, 747 Howard Street; and the San Francisco Marriott, 55 Fourth Street.

**Housing:** Reduced-rate guest rooms are available at a number of San Francisco hotels if you make your reservations using the AAAS housing form on page 1734. Reservations must be made through the housing bureau and must be postmarked by 12 June 1992.

**Transportation:** Bay Area Rapid Transit (BART) provides convenient transportation around the city; a modern subway and bus system links many areas within and around the city. SFO Airporter provides bus service from the airport to area hotels every 20 minutes between 5:00am and 11:30pm. Buses depart from the lower level baggage claim areas. Fares are \$8 one-way, \$12 round trip. Taxis are also located on the lower level baggage claim area. Fares to downtown are approximately \$25–\$30. Allow 30–45 minutes between the airport and hotels.

**On-site registration hours:** Tuesday, 21 July, noon–7:00pm; Wednesday–Friday, 22–24 July, 7:00am–5:00pm. (Located in the South Lobby of Moscone Center.)

## Discount Air Fares

Fly United Airlines to *Science Innovation '92* and you can save with these low, discount air fares available for travel between 18 and 29 July 1992:

**40% off regular coach fares** published at time of ticket purchase. (In Canada, discounts up to 35%.) No minimum stay needed; 7 days advance purchase required. No one-way discounts.

**5% off lowest promotional round-trip fares**, subject to availability. (Includes travel originating in Canada.)

These special fares are available only through the Gil Travel convention reservation desk. Certain restrictions may apply and seats are limited.

To take advantage of this offer, call the toll-free number below and tell the travel specialist you are attending *Science Innovation '92*. Or you can fax your information to the fax number listed below.

**Toll-free number:** 800-888-5127 ♦ **Fax number:** 215-742-4050

## Employment Exchange

The Employment Exchange at *Science Innovation '92* provides a forum in which employers and job candidates can meet for one-on-one interviews.

AAAS is inviting corporate, government, and academic recruiters representing a wide spectrum of scientific disciplines to participate by reviewing resumes and interviewing qualified candidates on site.

If you have positions to be filled or are currently seeking employment, you should take advantage of this program.

### Benefits to employers:

- ♦ Hundreds of top-notch candidates.
- ♦ Access to all resumes cross-referenced by discipline.
- ♦ On-site interview facilities and scheduling services.
- ♦ Unlimited position postings.
- ♦ Special rates for nonprofit organizations and for *Science Innovation '92* exhibitors.

### Benefits to candidates:

- ♦ Hundreds of current position openings in a variety of disciplines and experience levels.
- ♦ On-the-spot interviews.
- ♦ Access to full descriptions of all available positions.
- ♦ Free enrollment for AAAS members who apply on or before 5 June 1992. (Low \$10.00 fee for nonmembers and on-site applicants.)

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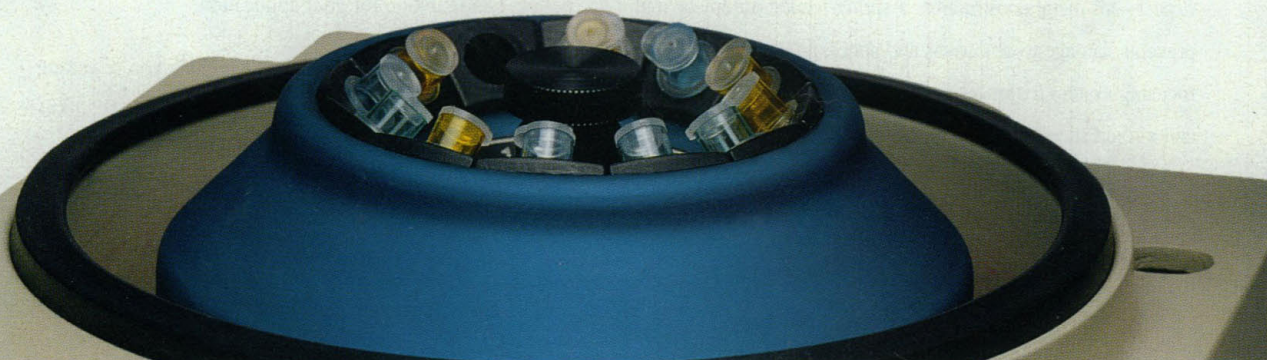




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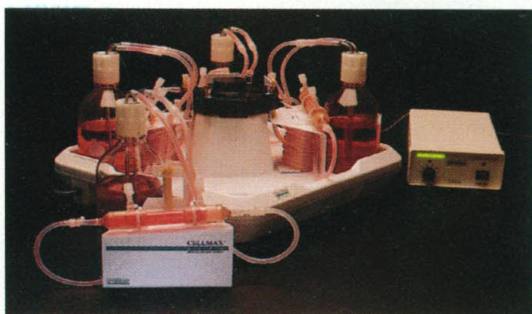
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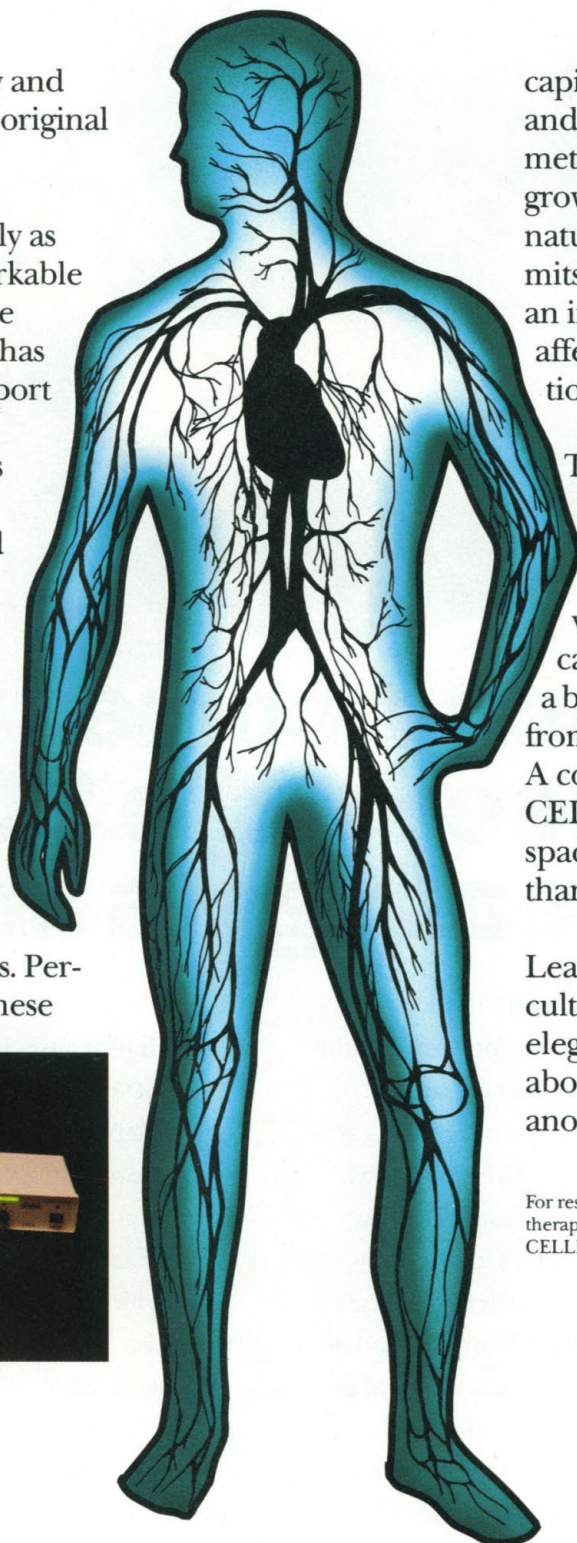
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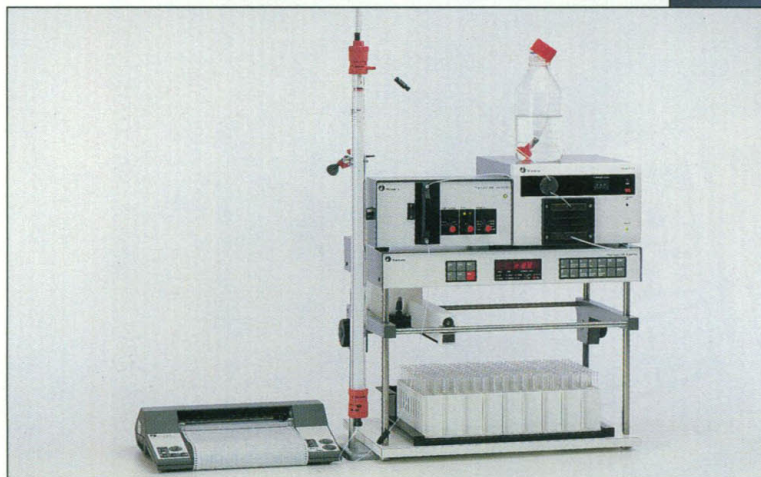




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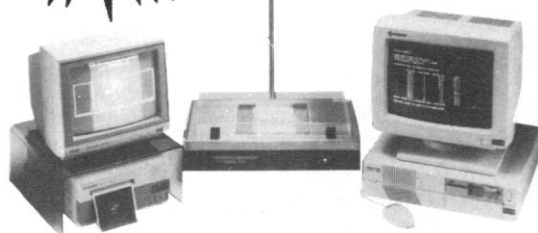
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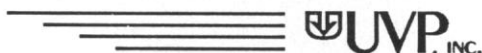


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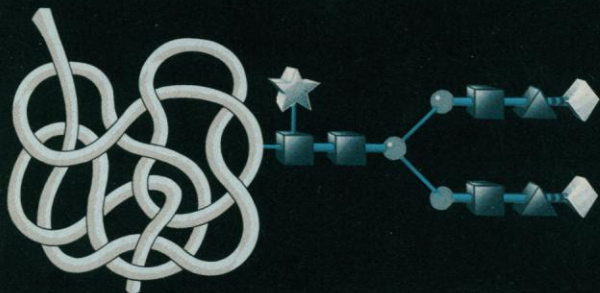
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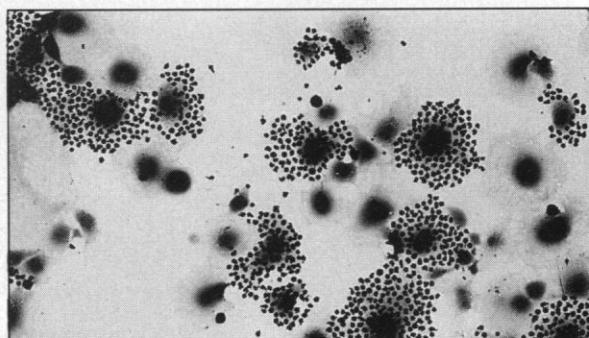
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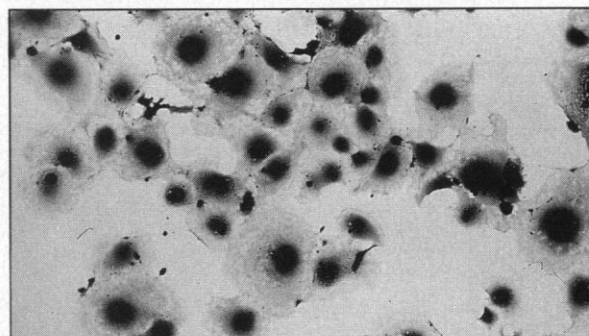
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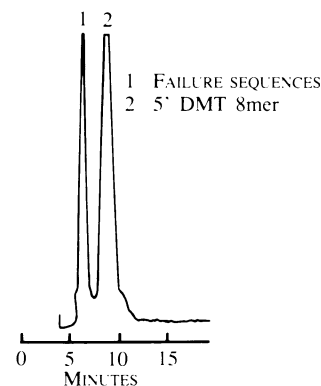
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