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Women in Science '93
Gender & Culture

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*The Polymerase chain reaction (PCR) process is covered by U.S. patents owned by Hoffman-La Roche. Use of the PCR process requires a license.

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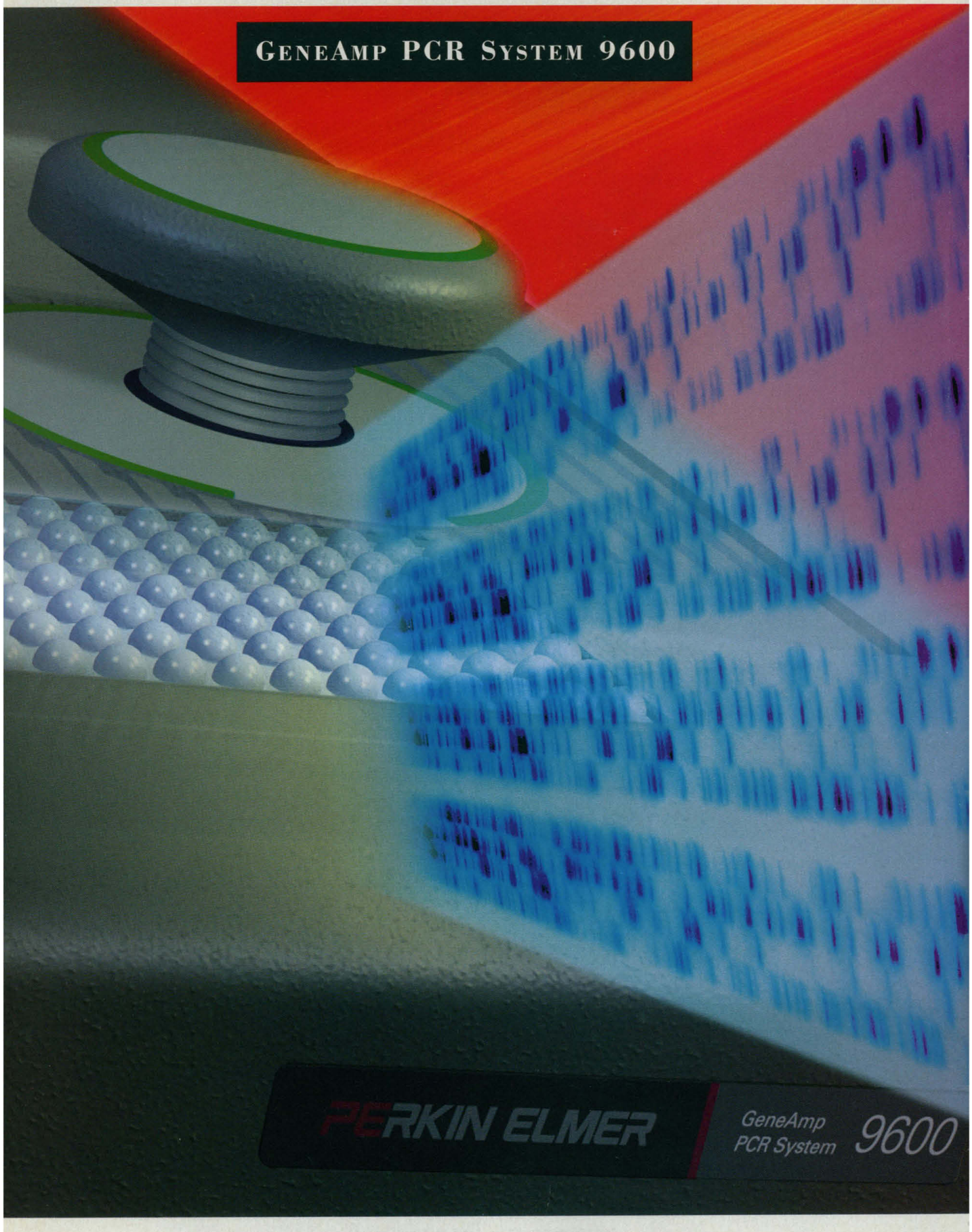

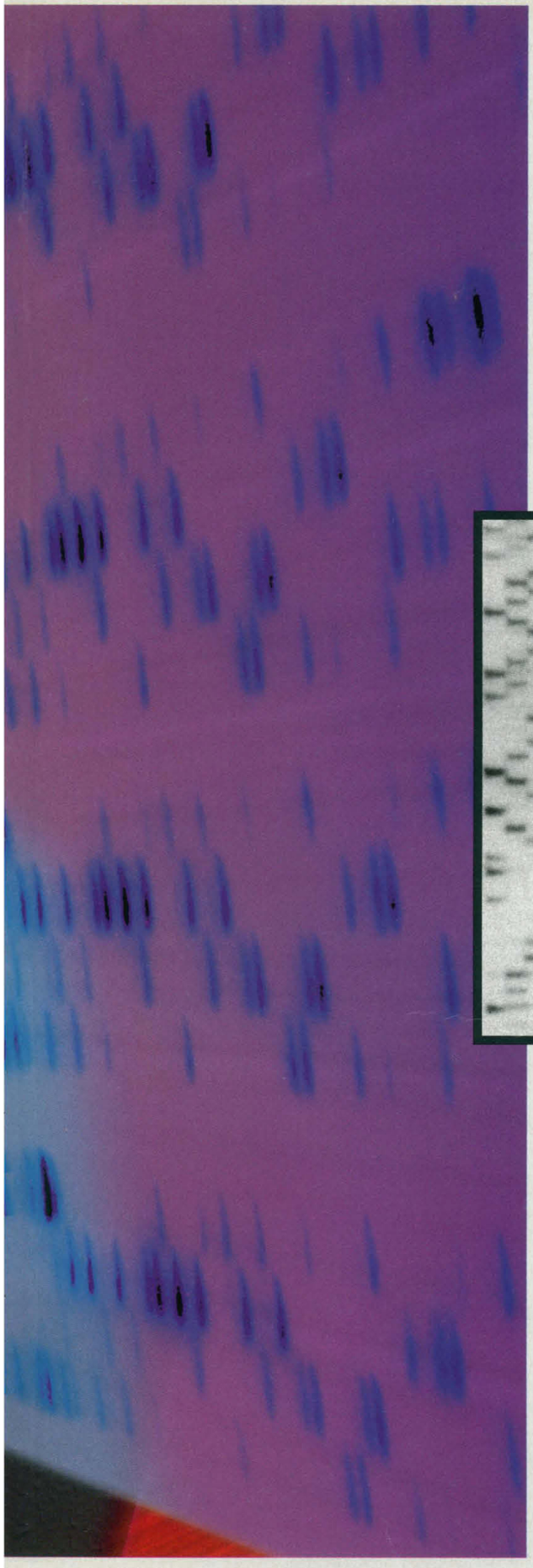

DNA SEQUENCING OF RETROVIRAL LTR USING PCR PRODUCTS AMPLIFIED FROM NIH 3T3 FIBROBLAST CELL LINE ON THE GENEAMP PCR SYSTEM 9600. COURTESY OF PIA MARIA CHALLITA, CHILDREN'S HOSPITAL, LOS ANGELES, CALIFORNIA.

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ISSN 0036-8075
16 APRIL 1993
VOLUME 260
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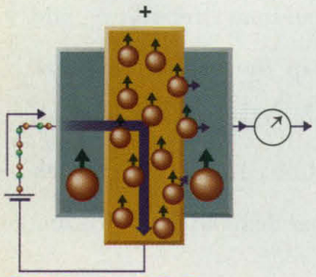
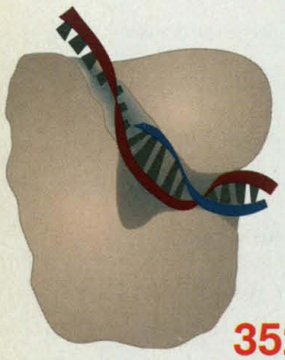
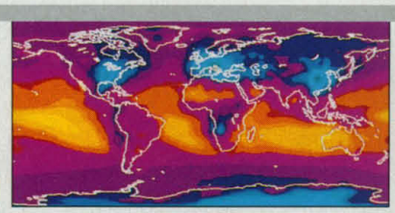


290 & 320
Spin switch



352
Hand holding a helix



311
Aerosols versus greenhouse gases

POLICY FORUM

NEWS

PERSPECTIVE

ARTICLE

RESEARCH ARTICLE

DEPARTMENTS

COVER

Members of the Auburndale Girls' Science Club with a robot they built for a robotics competition at the Massachusetts Institute of Technology. The suburban Boston club was started by the mother of one of the girls, who was afraid her daughter would lose interest in science as many girls do beginning around the eighth grade. Many of the programs that are successful in reversing this trend rely on an all-girl environment, a finding discussed in this year's special section on women in science beginning on page 383. [Photo: Sam Ogden]

REPORTS

WOMEN IN SCIENCE '93

WOMEN IN SCIENCE '93: GENDER AND THE CULTURE OF SCIENCE

383

Is There a 'Female Style' in Science? • The Male Box: Male Researchers Respond • Feminists Find Gender Everywhere in Science • Women Struggle to Crack the Code of Corporate Culture • Work and Family: Still a Two-Way Stretch • Entrepreneurs Say: 'It's Better to Be the Boss' • The Pipeline Is Leaking Women All the Way Along • Making Room for Women in the Culture of Science • Called 'Trimates,' Three Bold Women Shaped Their Field • Seeing Nature Through the Lens of Gender

◩ Indicates accompanying feature

■ **SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005**. Second-class postage (publication No. 484460) paid at Washington, DC, and additional mailing offices.

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Science is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

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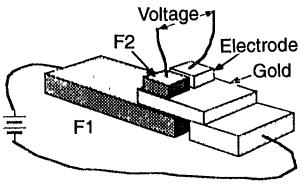
edited by PHIL SZUROMI

Switched spins

Semiconductor device performance suffers as the size of the device decreases. Johnson (p. 320; see news story by Flam, p. 291) proposes a device made only from metal films that works better as it gets smaller. Made



from a gold film sandwiched between two nickel-iron alloy ferromagnetic films (F1 and F2), the spin switch relies on the inherent quantum properties of electrons. The device controls the flow of electrical current according to the relative orientation of the magnetized alloy films.

■

Highly selective

A catalytic antibody has been generated that can differentiate between nearly identical reaction centers and can also generate products with high stereospecificity. Hsieh *et al.* (p. 337) show that monoclonal antibodies raised against an *N*-oxide hapten can reduce a diketone to a hydroxyketone with greater than 75:1 selectivity between two nearly equivalent carbonyl groups. A broad range of side chain groups can be tolerated.

■

Saturn's spot and hexagon

When the Voyager spacecraft passed by Saturn 12 years ago, close-up images revealed a bright hexagonal cloud structure encircling the giant planet's north pole at high latitude, accompanied by a single bright spot. New images of Saturn, taken with the Hubble Space Telescope (Caldwell *et al.*, p. 326) and at the Pic-du-Midi Observatory in the French Pyrenees (Sanchez-Lavega *et al.*, p. 329), show that the features have persisted. Their motion has been more or less in unison with the body of the planet even though the amount of solar heat received at the top of the atmosphere has varied dramatically over the past decade. These visible features must be structurally linked to stable dynamical phenomena deep in Saturn's dense atmosphere.

■

Chemical computing

Pattern recognition is often computationally implemented by some electronic analog of a neuron. Hjelmfelt *et al.* (p. 335; see news story by Flam, p. 291) propose a chemical pattern recognition system based on bistable reaction cells that are all coupled by mass transfer. Their numerical simulations of an array of iodate–arsenous acid reactions suggest that such a system could recognize previously programmed patterns of iodine concentrations. When presented with an unknown pattern, the system evolves either to a stochastic state if the pattern is not recognized, or to the programmed pattern if present.

■

Convergence of multiple signaling pathways

Binding of many growth factors, hormones, or neurotransmitters to their receptors on the cell surface activates signaling pathways that lead to activation of the mitogen-activated protein kinases (MAP kinases). Lange-Carter *et al.* (p. 315) present evidence that two distinct mechanisms exist to activate the cascade of protein kinases that control the activity of MAP kinase. MAP kinase is activated by another protein kinase (MAP kinase kinase or MAPKK) which, in turn, is activated by the proto-oncogene product Raf (also a protein kinase). The authors cloned and sequenced a protein kinase from mouse called MEK kinase that can also phosphorylate and activate MAPKK. MEK kinase is related to enzymes from yeast that participate in pheromone-induced signaling pathways and that lead to the activation of yeast homologs of MAP kinases. Although mammals have multiple pathways that converge to activate MAPKK, their signaling pathways are still remarkably similar to those in yeast.

■

Animal-fungi link

The origins of multicellular animals have been examined through a phylogenetic analysis of ribosomal RNA sequences by Wainright *et al.* (p. 340). They find that the animal lineage is monophyletic and includes the choanoflagellates. Animals and fungi share a more recent common ancestor than either group does with the plant lineage. Based on these phylogenetic data, the authors hypothesize that the last common ancestor of the animals and fungi was a flagellated protist.

■

Farm futures

Farmers today have a choice of ways to fertilize their lands and manage their production. Reganold *et al.* (p. 344) compare the results in New Zealand from two different styles of farm management. Conventional farms used synthetic chemical fertilizers and pesticides, whereas biodynamic farms used various organic mixtures to improve soil quality and diversify their crops and livestock. The biodynamic farms had better soil quality than the conventional farms and were just as viable financially.

■

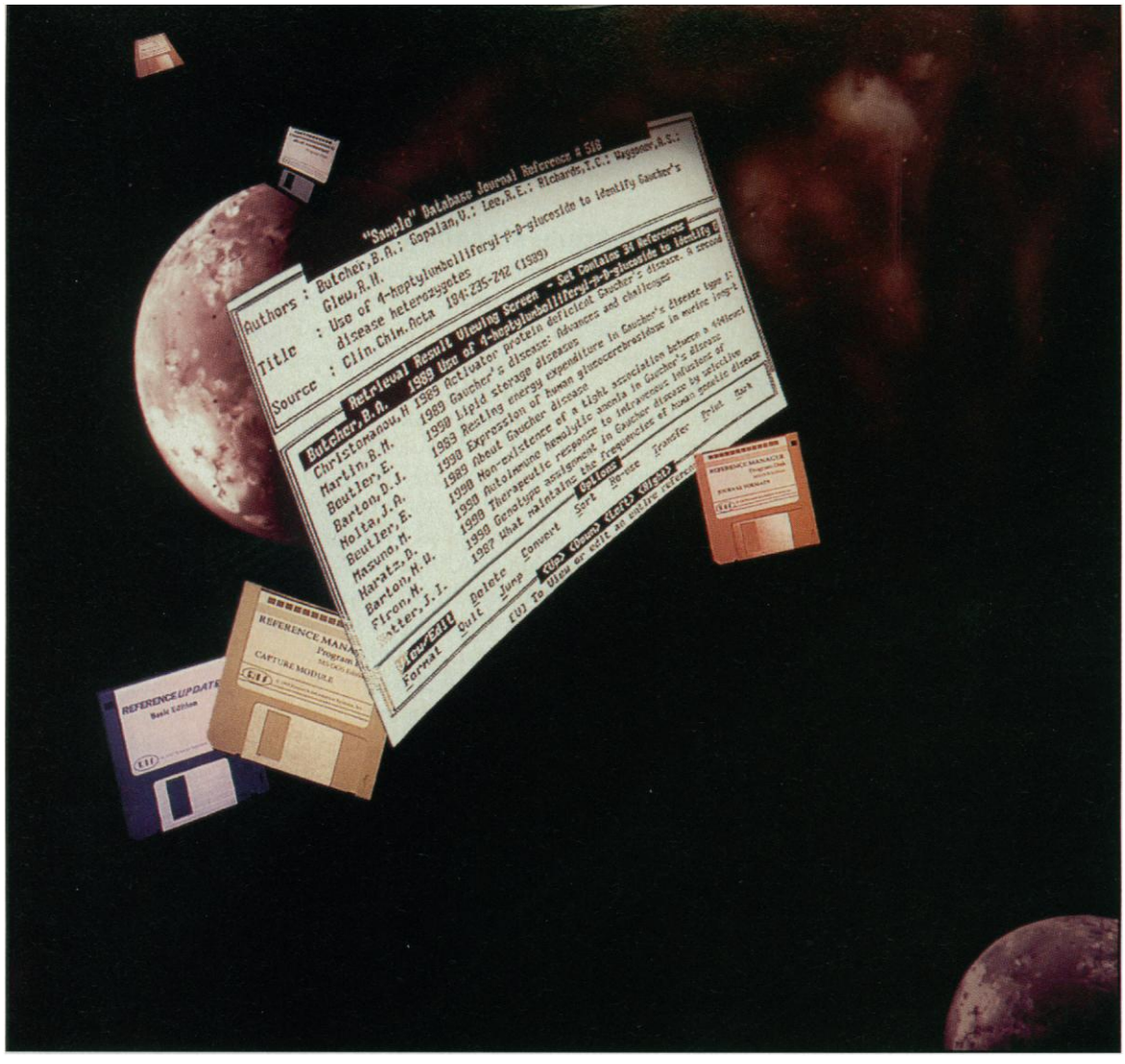
Peptide translocation without proteins

Peptides corresponding to the signal presequences of mitochondrial proteins can be imported into large, protein-free vesicles in response to membrane potentials. Maduke and Roise (p. 364) used a fluorescent marker to monitor the membrane association of a 25-residue signal peptide that had multiple charges and average hydrophobicity. The peptide became resistant to reaction with trypsin or dithionite added to the outside of the phospholipid vesicles and could be digested by trypsin contained inside the vesicles. These model studies suggest that protein import into mitochondria depends mainly on the potential-dependent translocation of the presequence.

■

Not acting alone

As they differentiate in the developing brain, postmitotic neurons migrate from the external germinal layer (EGL) to their final locations in the cerebellum. Mutations in the *weaver* gene in mice interrupt this migration. Gao and Hatten (p. 367) found that mutant *weaver* neurons can migrate and differentiate properly when implanted into a wild-type EGL. These experiments show that the *weaver* gene acts nonautonomously in vivo and suggest that cell-cell interactions are necessary for proper neuronal differentiation.



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Number 5

An Update on the State of the Art in Separations Technology

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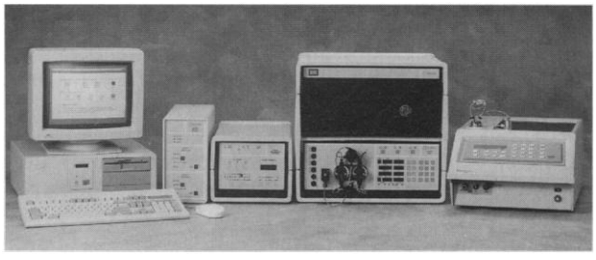

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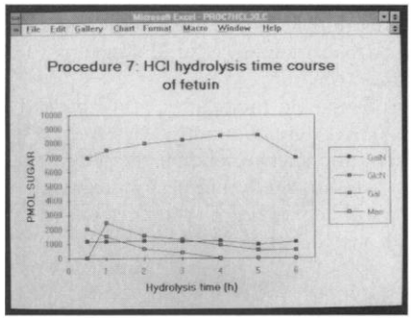

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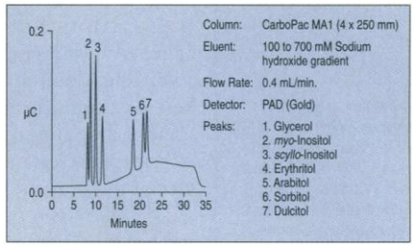

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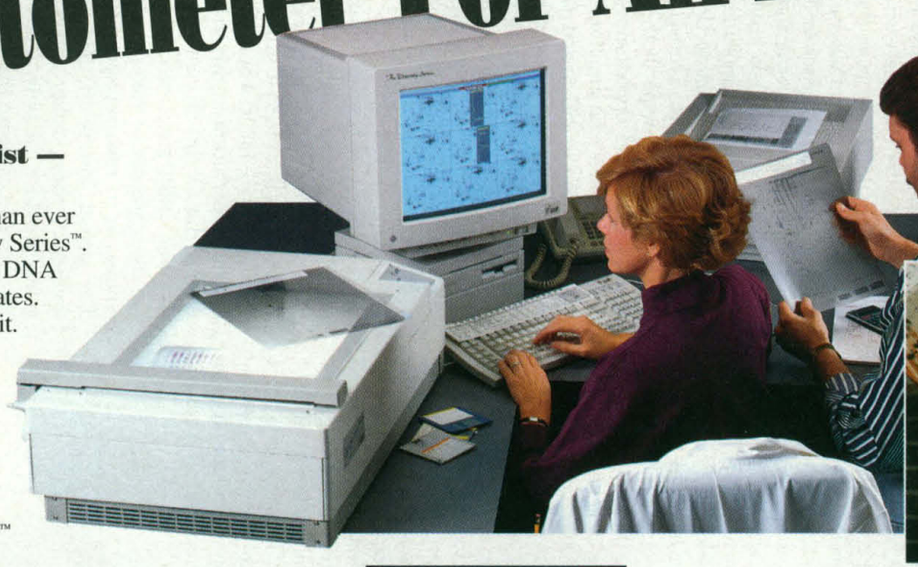

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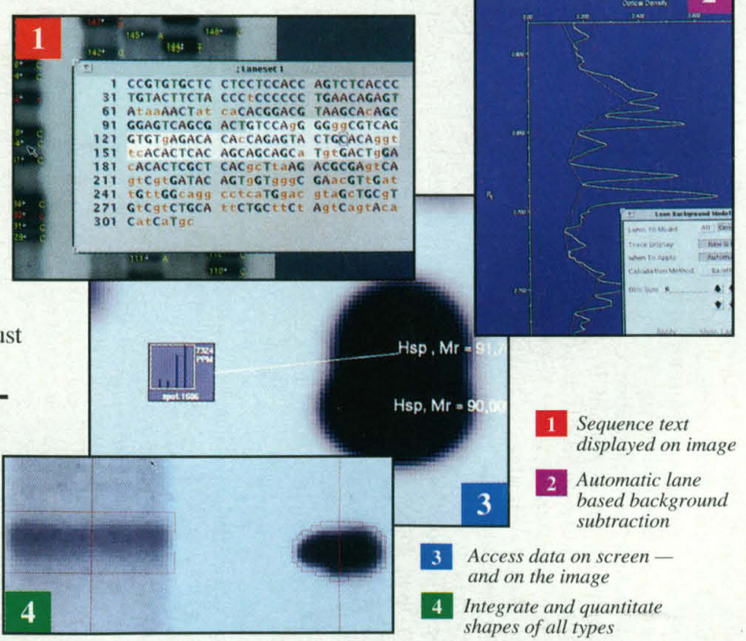

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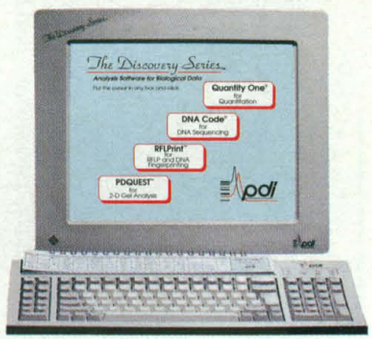

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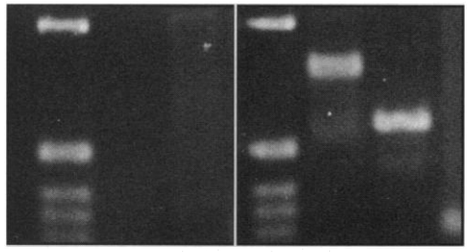

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* PCR is covered by U.S. Patent No. 4,683,202 issued to Cetus Corporation.

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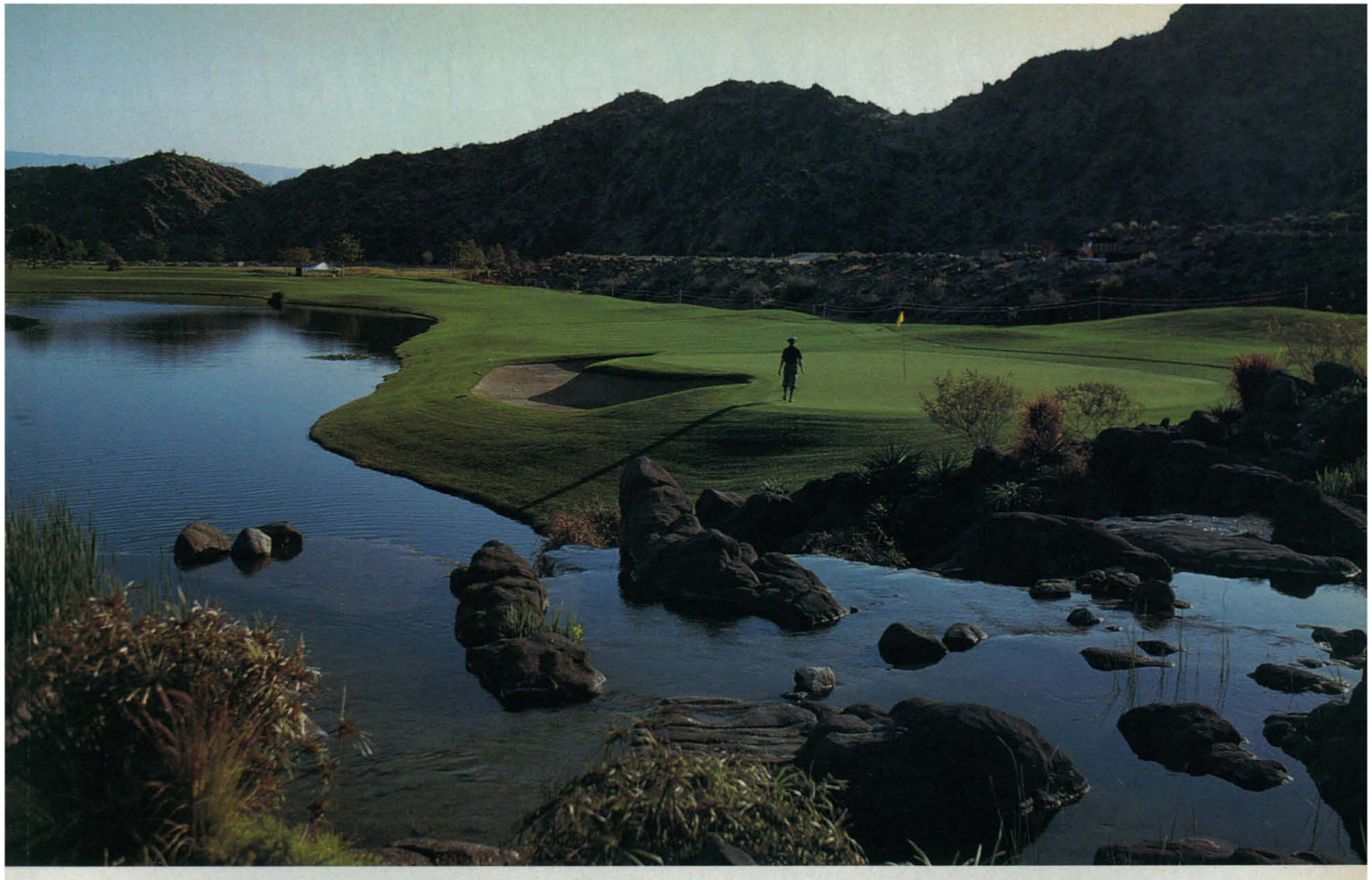
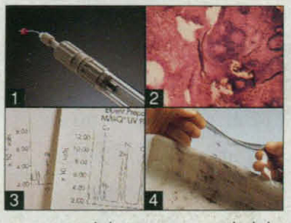


There Are Places You Expect To Find Water Hazards. Your Lab Shouldn't Be One Of Them.

Water hazards on a golf course can cost you a couple of strokes. In a lab, however, water hazards in the form of ions, pyrogens and organics can cost you months of research work.

That's why it's critical for you to have a water purification system that removes contamination instead of one that contributes to it. If you don't, you could end up like one of these facilities:



1. A lab doing protein purification with HPLC found that endotoxins in its water system contaminated proteins.

2. Organics in another facility's water system kept mammalian cells from growing in defined medium.

3. A semiconductor plant testing for copper had its chromatographic results ruined by contamination in their water system.

4. In yet another lab, phosphates being used to clean the water system got into the water used for polyacrylamide gels, rendering them useless.

In each of these cases, when the lab switched to a Milli-Q® Plus Water Purification System, all their problems disappeared.

That's because the Milli-Q Plus system delivers the highest quality water available: 1.5 liters per minute at 18 megohm and < 10ppb TOC (with RO pretreatment).

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Also, because we don't use separate bowls, the system has virtually no hold-up volume. This results in faster flush-ups, along with reduced extractables and bacterial growth.

To further prevent water degradation, the system even recirculates water automatically every hour for approximately five minutes.

So beware of less expensive water purification systems that claim to do as good a job as the Milli-Q Plus system: They may prove hazardous to your work.

For additional information about the Milli-Q Plus system, including a brochure, technical bulletins and data sheet, call 1-800-225-1380.

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Infrared DNA Sequencing...

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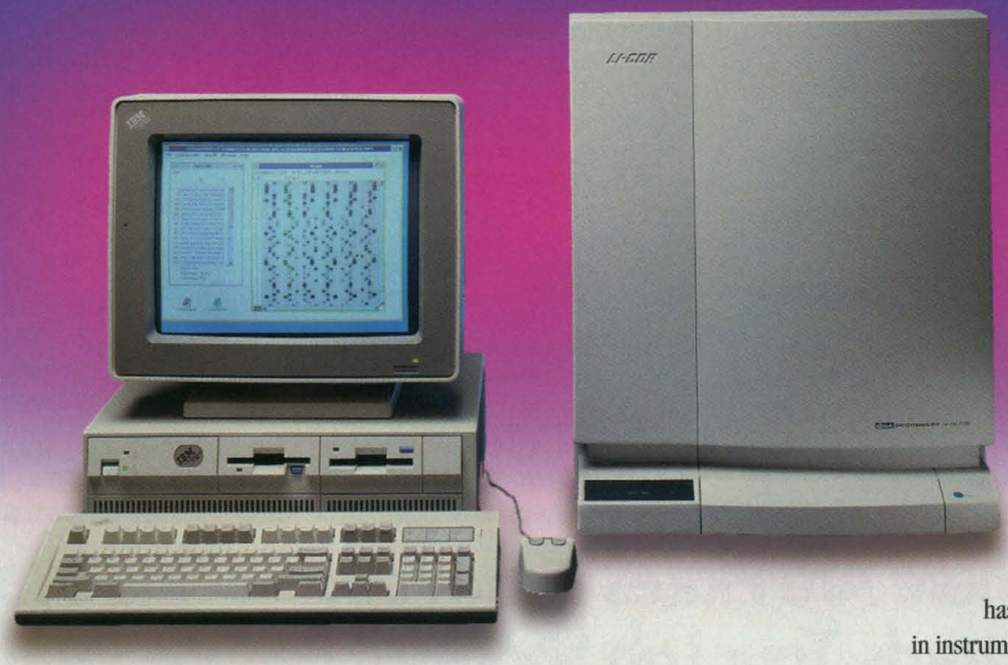

If you've been considering an automated system, only the new Model 4000 DNA Sequencer from LI-COR can give you the accuracy, flexibility and affordability that characterize automated *infrared* DNA sequencing.

- **500 Bases per Sample**
- **Typical Accuracy of 99%**
- **Solid-State Reliability**
- **Application Flexibility**
- **Affordable Expansion**
- **Reduced Operation Costs**

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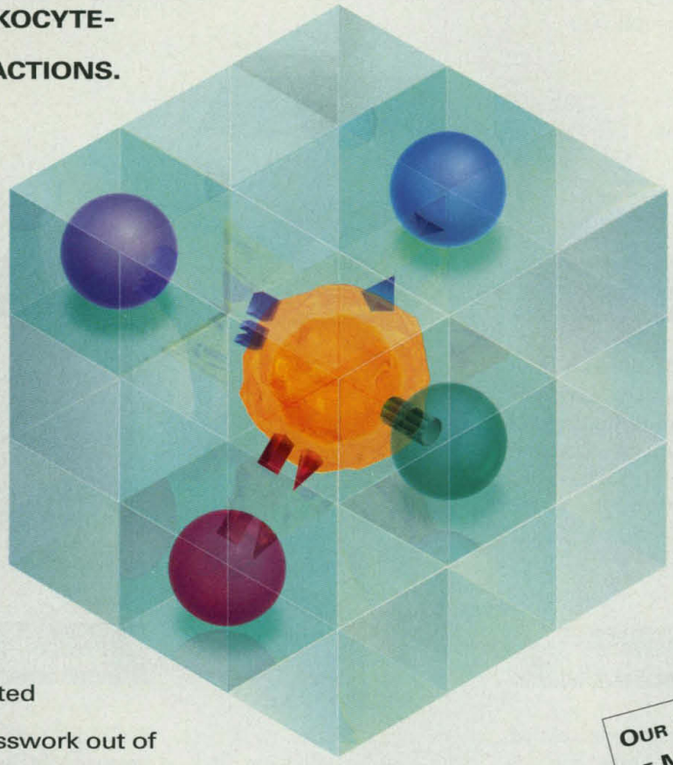

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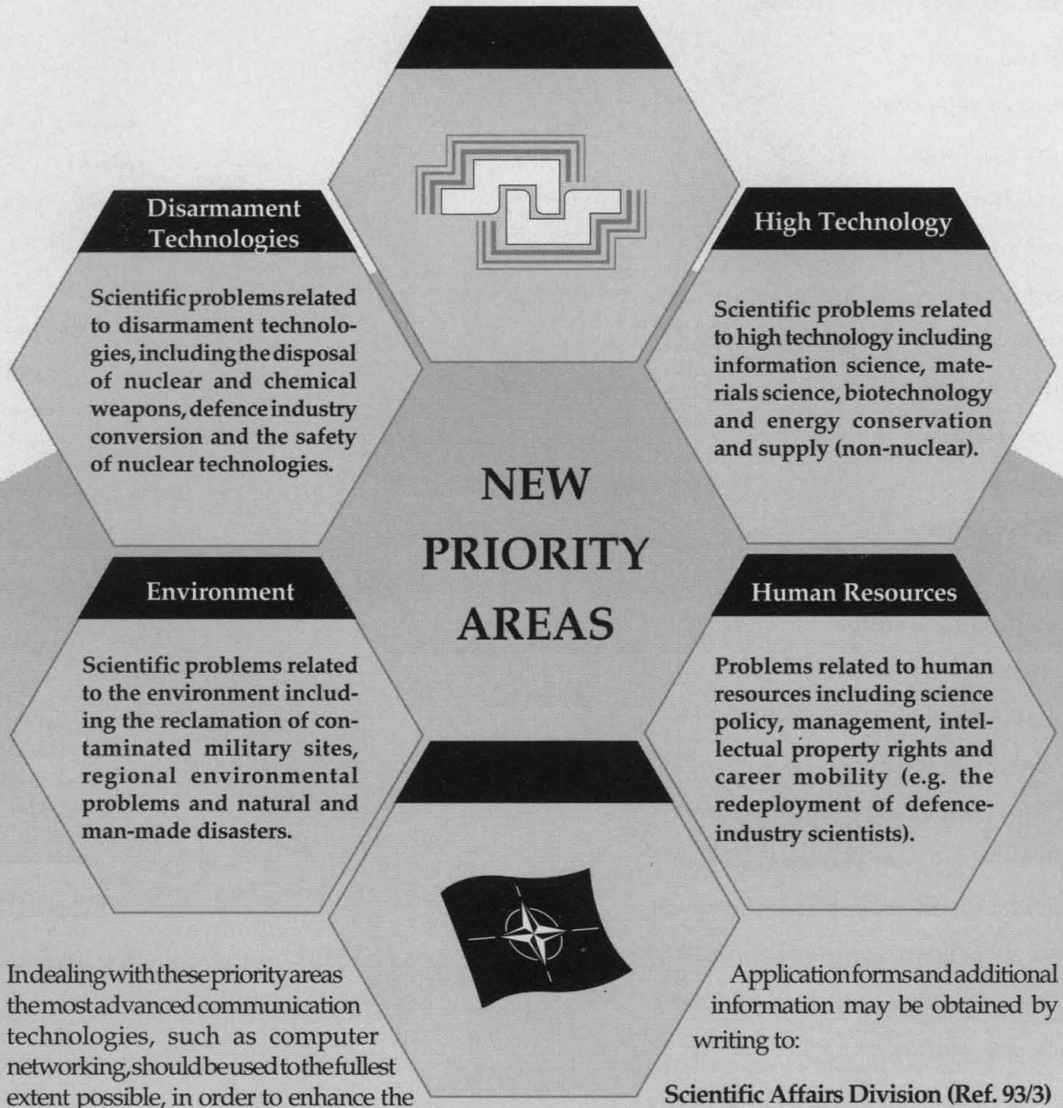
Applications may be submitted for support to organize and direct Advanced Study Institutes or Advanced Research Workshops, or to participate in Collaborative Research Grants, Linkage Grants or Expert Visits. The Priority Areas are as follows:



In dealing with these priority areas the most advanced communication technologies, such as computer networking, should be used to the fullest extent possible, in order to enhance the scientific dialogue between NATO countries and Cooperation Partner countries.

Application forms and additional information may be obtained by writing to:

Scientific Affairs Division (Ref. 93/3)
NATO
B-1110 Brussels, Belgium

NATO countries: *Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Turkey, United Kingdom, United States.*

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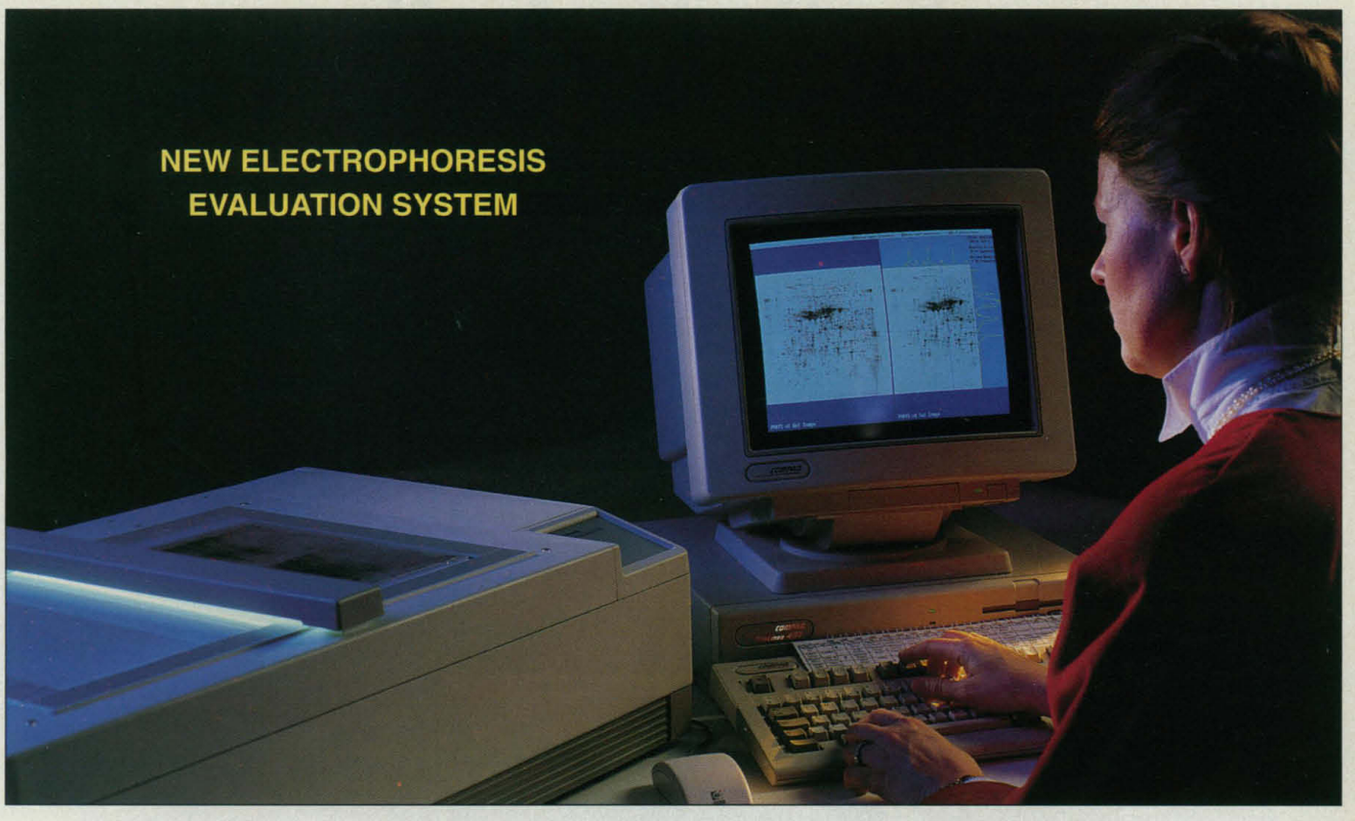

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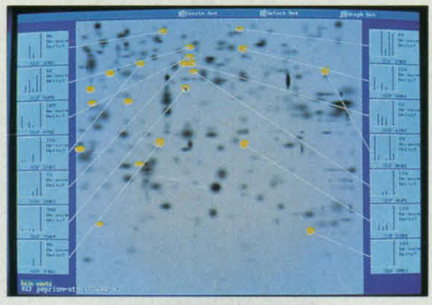

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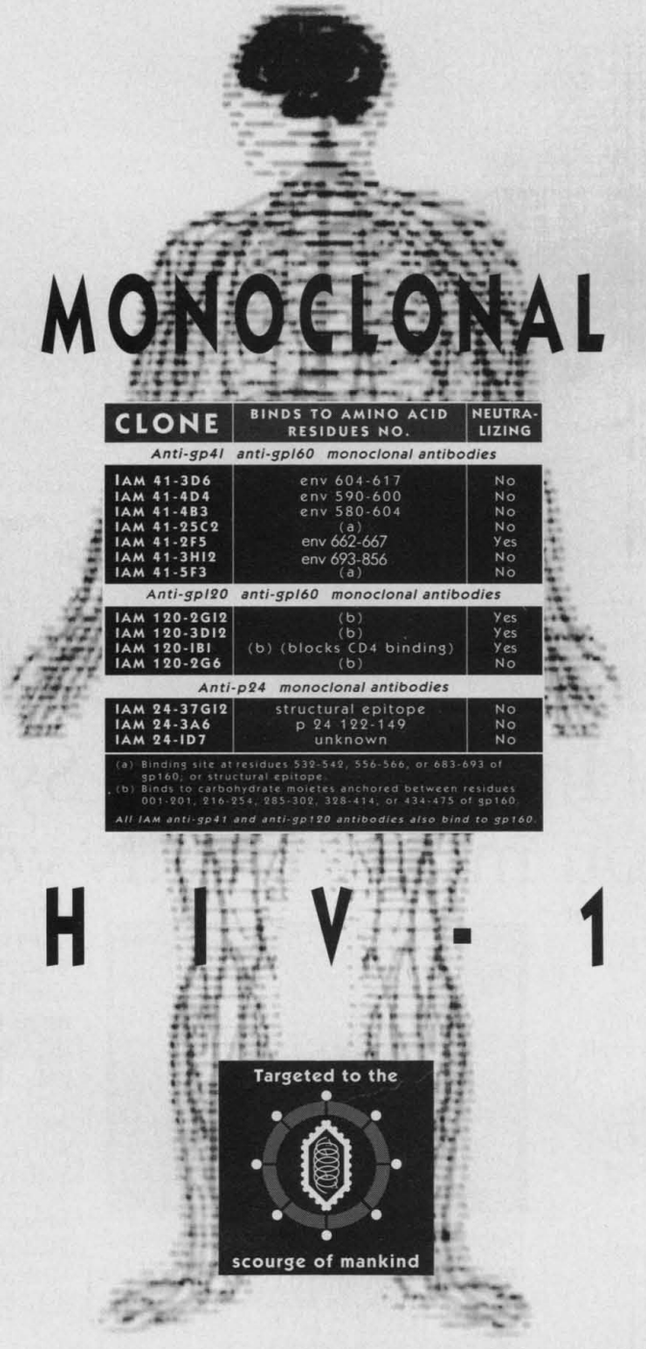

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Anti-gp41 anti-gp160 monoclonal antibodies		
IAM 41-3D6	env 604-617	No
IAM 41-4D4	env 590-600	No
IAM 41-4B3	env 580-604	No
IAM 41-25C2	(a)	No
IAM 41-2F5	env 662-667	Yes
IAM 41-3HI2	env 693-856	No
IAM 41-5F3	(a)	No
Anti-gp120 anti-gp160 monoclonal antibodies		
IAM 120-2GI2	(b)	Yes
IAM 120-3DI2	(b)	Yes
IAM 120-IBI	(b) (blocks CD4 binding)	Yes
IAM 120-2G6	(b)	No
Anti-p24 monoclonal antibodies		
IAM 24-37GI2	structural epitope	No
IAM 24-3A6	p 24 122-149	No
IAM 24-ID7	unknown	No

(a) Binding site at residues 532-542, 556-566, or 683-693 of gp160, or structural epitope.
(b) Binds to carbohydrate moietes anchored between residues 001-201, 216-254, 285-302, 328-414, or 434-475 of gp160.
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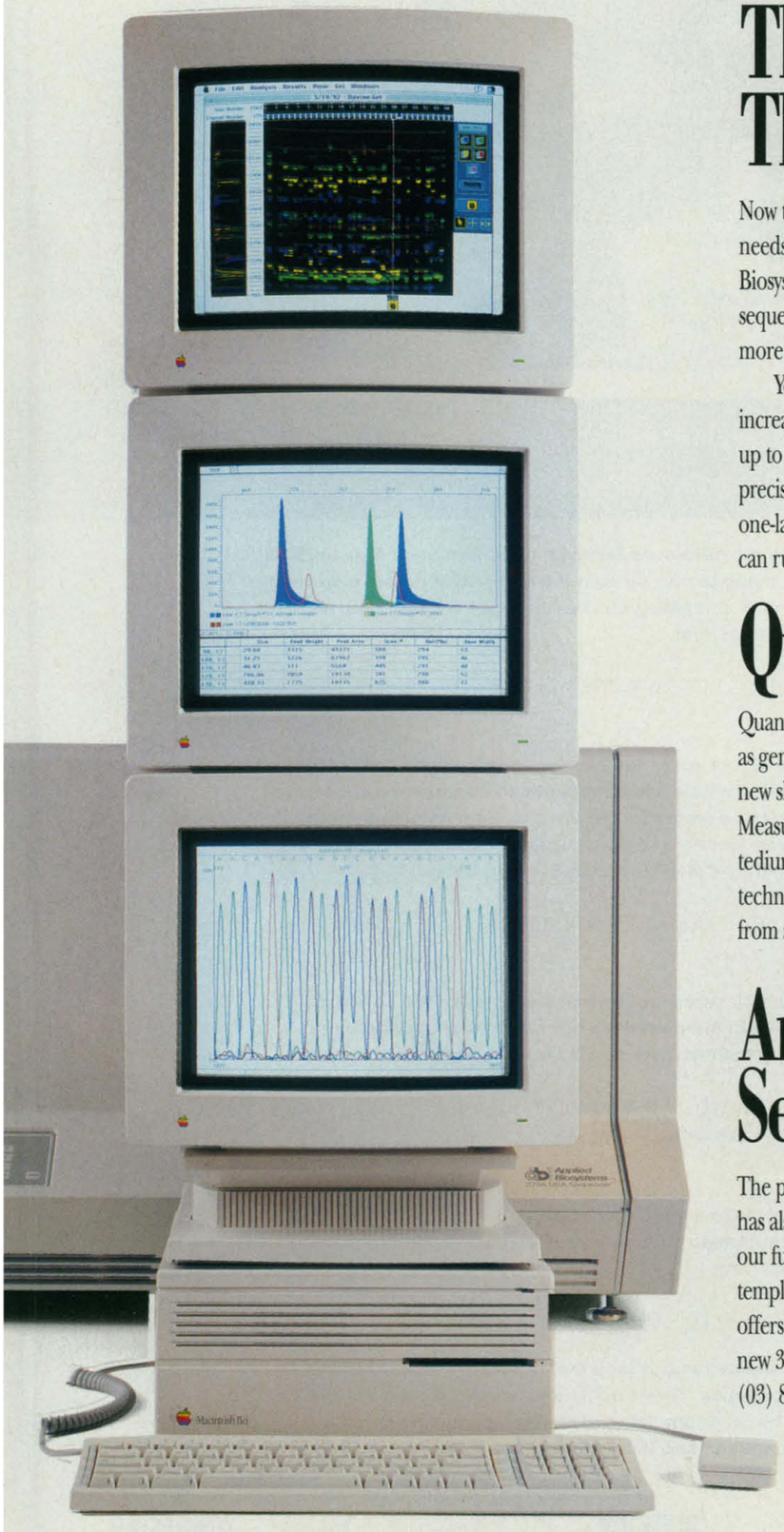

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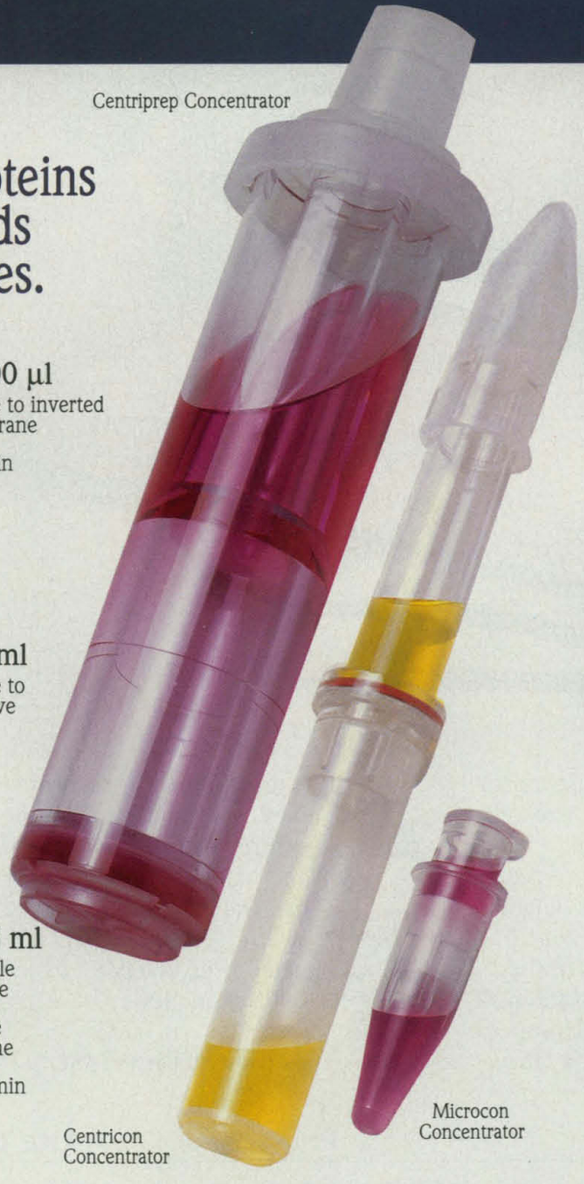
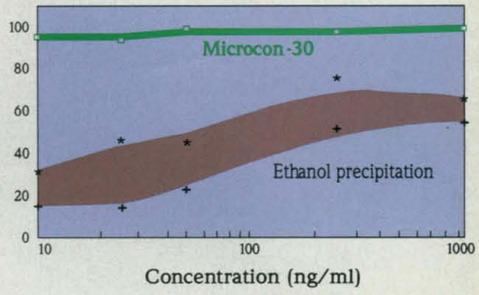


Ultra Recovery: % Recovery (DNA)



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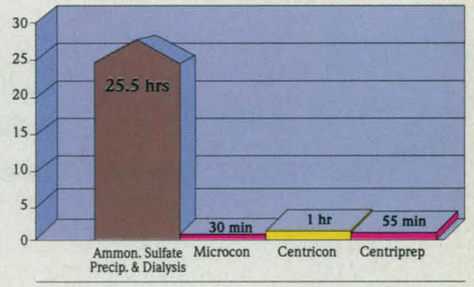

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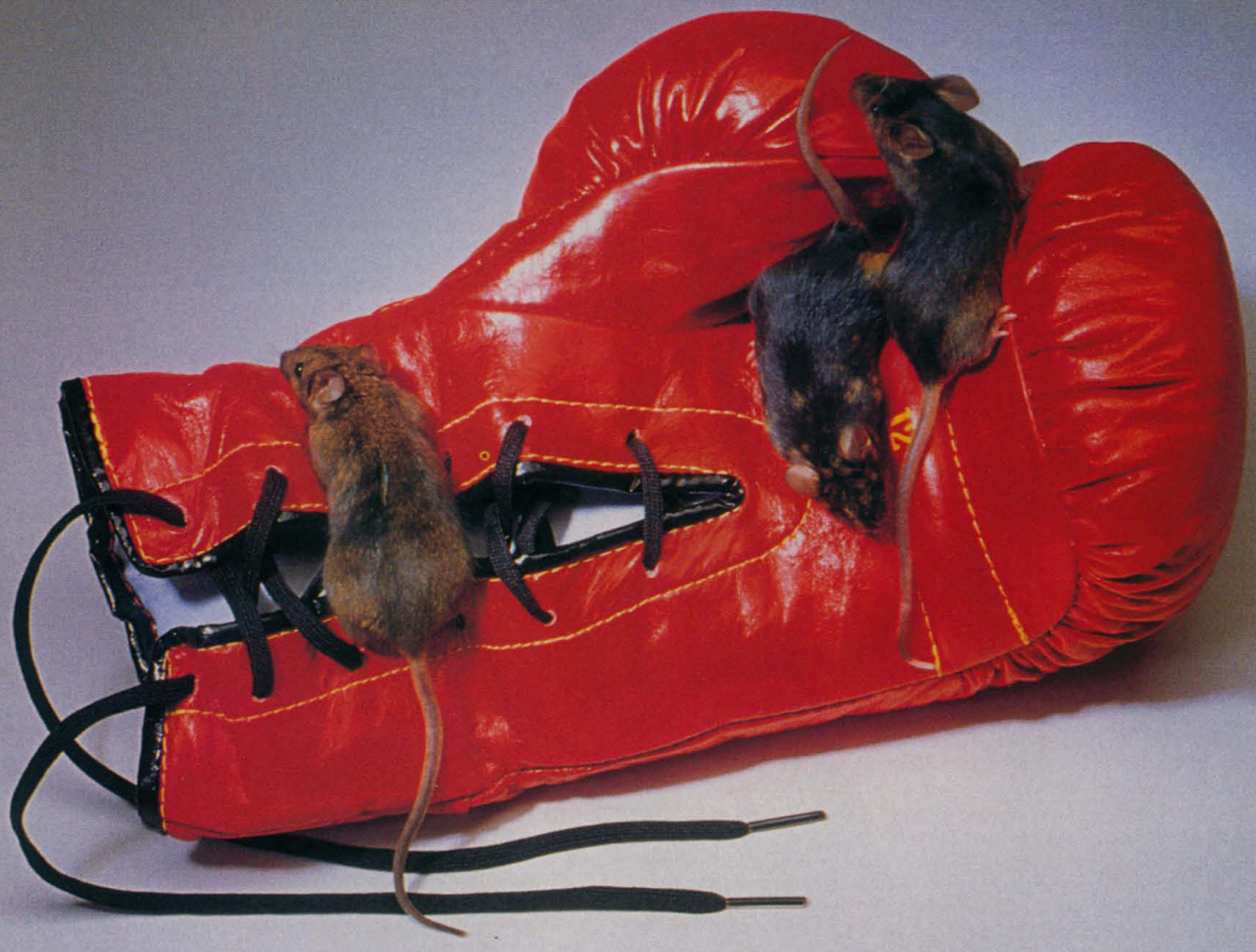

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Acceptance: Applicants will be notified by July 1, 1993 regarding the status of their abstracts. If your abstract is accepted, you will be assigned to a poster session and provided with a 4' x 4' bulletin board on which to display graphics and text. Posters will be displayed in the Exhibit Hall during the entire meeting, and presenters will be assigned two hours at their posters. Accepted abstracts will be published in the program book, which will be distributed to all registrants. Abstracts received after June 15, 1993 will not be published in the program book but may be accepted for display.

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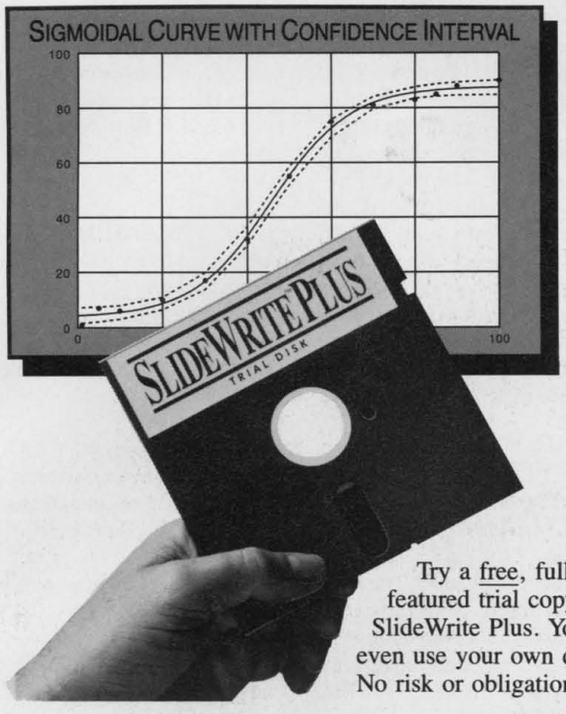

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UltraFit, curve-fitting software for the Apple Macintosh, fits experimental data by nonlinear regression, using either the Marquardt or Deming algorithm, to any of 26 equations supplied with the program or to the user's own equations, which can be entered and stored from the keyboard. The fitting process can be monitored in real time, and a "log book" automatically records each fit and its statistics, either in summary or with full detail. Graphing facilities enable variable-length axes, user control over tick marks, the use of log axes, and variable fonts and sizes for titles and axis labels. The program runs on any Macintosh with 1 megabyte of random access memory and is fully compatible with systems 6 and 7. **Biosoft. Circle 94.**

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Literature

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Harnessing the Antibody: The fundamentals of enzyme immunoassay is a primer that describes the principles of immunoassay as applied to environmental analysis. For decades, this technique has been applied in the realm of clinical biology; this text explains for environmental analysts the technique and how it has been adapted for measuring pesticides and industrial contaminants. **Millipore. Circle 98.**

Step Motor Controllers is a 32-page catalog on a line of step motor drivers, controllers, and control software. **SEMIX. Circle 99.**

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Gender and the Culture of Science

WOMEN IN SCIENCE '93

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Industrial R&D

Science Education

A Case Study: Primatology

Art: Anne Alvarez, *photo research*; Debra Naylor, *design*; Terry Smith, *illustrations*; Linda C. Owens, *production*
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SAM OGDEN

Welcome to *Science*'s second annual "Women in Science" section: Gender and the Culture of Science. This section is considerably different from the one *Science* published last year—in large measure because we listened to you. Among the more than 500 readers who wrote or faxed *Science* last year in response to the first "Women in Science" section, several themes were heard repeatedly. One was that last year's section put the onus on women to succeed in science against all odds—rather than focusing on the obstacles that are raised against them. That criticism led directly to the theme of this year's issue: the culture of science. In distinctly different ways, all the articles in this issue raise the controversial question of whether women do science differently from the way men do it and whether, as a result, women are excluded from the inner circles of the largely male culture of science. Since there are few controlled studies on the subject, the question can't be answered scientifically. But it can be raised. And raise it we do. Marcia Barinaga writes about whether there is a "female style" of performing nitty-gritty scientific tasks such as running a lab and organizing a collaboration. Virginia Morell examines primatology, a case study in how gender can influence an entire discipline's research framework. Elizabeth Culotta tackles the culture of industrial research, along the way offering women key tips on avoiding female-unfriendly environments (there are still plenty of them out there). Joe Alper looks at why science education turns off huge numbers of young women—and looks at a handful of programs that reverse the process. Finally, we profile some women we think of as "Pathbreakers," who have found novel ways through the maze of gender and culture in science. Let us know what you think of our efforts by using the Reader Response Form on page 432. You know we're listening.

–John Benditt, Features Editor

Research Training The National Ins

The National Institutes of Health is an institution dedicated to basic and clinical biomedical research. Sixteen research institutes, more than 4,000 scientists with doctoral degrees, and a clinical center that is home to half of all research beds in the country, combine to make the NIH the only facility of its kind in the world. Over two thousand research projects are available and postdoctoral fellows will find that NIH laboratories are able to provide research training in virtually every area of biomedical research. Over the years more than 50,000 scientists and physicians, including eleven Nobel prize winners, have trained at the NIH's main campus in Bethesda, Maryland, a suburb of Washington, DC, and in NIH laboratories located in Baltimore, North Carolina, Montana, and Arizona.

Postdoctoral opportunities in basic biomedical science are available to individuals with either a graduate doctoral degree (e.g., PhD, MD/PhD) or a professional degree (e.g., MD, DO, DDS, DMD, or DVM) accompanied by previous laboratory research experience. Postdoctoral fellows generally receive an initial appointment of two years with salary support available through a number of funding mechanisms. In addition, individuals interested in pursuing research training through the Clinical Investigator Pathway of the American Board of Internal Medicine (ABIM) may contact the Office of Education for details.

Listed below are a few of the many postdoctoral training opportunities available in the basic sciences. To apply, please send a cover letter, *curriculum vitae*, bibliography, and statement of research interests to the address listed with each position. In addition, please arrange to have letters of recommendation sent from three scientists who can provide an evaluation of your qualifications.

Alcohol Research
Susan Shoaf, PhD

The scientific bases and medical aspects of alcoholism are being studied and current investigations focus on genetics, imaging, neurotransmission, neurohormones, liver function, pharmacology, and cognition. Candidates must be board certified or eligible internists, psychiatrists, neurologists or pediatricians and a US citizen or permanent resident. Laboratory of Clinical Studies (OE-31), NIAAA, Building 10, Room 3B19.

Ca^{2+} Signalling
Indu S. Ambudkar, PhD

Ca^{2+} fluxes in salivary gland cells are being studied with emphasis on the regulation of the Ca^{2+} influx mechanism and the plasma membrane Ca^{2+} pump. Experience with techniques of ion flux and protein purification, and less than two years of postdoctoral experience, are required. Clinical Investigations and Patient Care Branch (OE-31), NIDR, Building 10, Room 1N113.

Endothelial Cell-Tumor Cell Interactions
Unnur P. Thorgeirsson, MD

The interactions of endothelial cells with tumor and stromal cells in breast cancer are under investigation. Novel genes involved in suppressing endothelial proliferation are being sought. experience in cellular and/or molecular biology and less than five years of postdoctoral experience are required. Office of the Director, DCE (OE-31), NCI, Building 37, Room 2D02.

Environmental Epidemiology of Cancer
Louise A. Brinton, PhD

The environmental etiology of a variety of cancers, especially female cancers, are being identified using a variety of epidemiologic, multidisciplinary approaches. Applicants must have less than five years postdoctoral experience. Environmental Epidemiology Branch (OE-31), NCI, 6130 Executive Boulevard, Executive Plaza North, Room 443, Bethesda, MD 20892.

HIV Therapeutics
Julianna Lisziewicz, PhD

Novel therapeutic approaches to the inhibition of HIV-1 replication are currently being developed. Experience in cellular and molecular biology and an interest in gene therapy are required. Laboratory of Tumor Cell Biology (OE-31), NCI, Building 37, Room 6D02.

Molecular and Cell Biology
Constance Tom Noguchi, PhD

The regulation of the developmental and tissue-specific expression of erythroid genes, including cell surface receptors, and the identification of elements important for differential expression and processing of gene products are being studied. Experience in molecular biology and less than five years of postdoctoral experience are required. Laboratory of Chemical Biology (OE-31), NIDDK, Building 10, Room 9N307.

Molecular Endocrinology
Sheue-yann Cheng, PhD

The effects of thyroid hormones on the growth and development of tumors are being studied with particular emphasis on the role of thyroid hormone nuclear receptors in the carcinogenesis of breast cancer. A strong background in cell biology, biochemistry and/or molecular biology is preferred. Laboratory of Molecular Biology (OE-31), NCI, Building 37, Room 4B09.

Molecular Immunology
B.J. Fowlkes, PhD

T cell development is being studied, with particular emphasis on early T cell differentiation, thymic selection, and the mechanisms involved in lineage commitment. Laboratory of Cellular and Molecular Immunology (OE-31), NIAID, Building 4, Room 111.

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Molecular Neurobiology
M.A. Ruda, PhD

The mechanisms of nerve injury and nociception at the level of the dorsal root ganglion and spinal cord are being studied using molecular biological techniques and immunocytochemistry. Neurobiology and Anesthesiology Branch (OE-31), NIDR, Building 30, Room B20.

Oral Epidemiology
Helen C. Gift, PhD

Methods for the control and prevention of orofacial diseases and conditions, especially in high risk populations and among special care groups, are being developed and analyzed in order to promote oral health. PhD in biostatistics or a related discipline is preferred. Disease Prevention and Health Promotion Branch (OE-31), NIDR, 5333 Westbard Avenue, Room 538, Bethesda, MD 20892.

Oral Epidemiology
Deborah M. Winn, PhD

Epidemiologic research examining the etiology and natural history of oral conditions, oral manifestations of systemic diseases, and clinical dentistry is being conducted. A background in epidemiology or biostatistics is preferred. Analytical Studies and Decision Systems Branch (OE-31), NIDR, 5333 Westbard Avenue, Room 537, Bethesda, MD 20892.

Oropharyngeal Physiology and Imaging
Barbara C. Sonies, PhD

The development of normal and abnormal speech and swallowing are being tracked using 3D modeling of the oral muscles and multimodality imaging systems. Applicants must have PhD, MD or DMD and less than five years postdoctoral experience. Department of Rehabilitation Medicine, Clinical Center and NICHD (OE-31), Building 10, Room 6S235.

Papillomavirus Replication and Gene Regulation
Alison A. McBride, PhD

In order to better understand virus-associated transformation and carcinogenesis, the mechanisms by which the papillomavirus E1 and E2 proteins regulate viral transcription and DNA replication are being studied. Candidates should have experience in molecular biology, biochemistry or cell biology and less than five years of postdoctoral experience. Laboratory of Tumor Virus Biology (OE-31), NCI, Building 41, Room D704.

Platinum Drug-DNA Interactions
Miriam C. Poirier, PhD

The mechanisms underlying the correlation of tumor remission with covalent binding of high levels of platinum chemotherapeutic drugs to cancer patient blood cell DNA are being investigated. Applicants must be US citizens or permanent residents with either an MD or a PhD received within the past three years. Laboratory of Cellular Carcinogenesis and Tumor Promotion (OE-31), NCI, Building 37, Room 3B25.

Retinoids, Cancer and Differentiation
Carol J. Thiele, PhD

The molecular mechanisms mediating retinoic acid induced neuronal differentiation in neuroblastoma cell lines, including regulation of trk receptor and neurotrophin gene expression, are being investigated as a basis for studying neuronal development, tumor biology, and the developmental mechanisms mediating HIV-1 neuropathogenesis. Applicants should have less than five years postdoctoral experience. Pediatric Branch (OE-31), NCI, Building 10, Room 13N240.

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For an on-line listing of additional postdoctoral openings you may access the NIH EDNET Bulletin Board's POSTDOC conference via modem (1,3014922221 or 1,8003582221). The settings for modem access are "7,Even, 1". When connected to NIH, type in ",vt100" at the connect message, "F5E" at initial, and "AJL1" at account.

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Scientific Leaders at Pfizer Central Research

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Dr. Jean Beebe, Research Scientist
My lab studies differentiation of tumor cells and seeks to develop novel anti-cancer agents. I was particularly attracted by Pfizer's target-based approach to drug discovery. I find that Pfizer supports women not only in philosophy but in practice.

Dr. Debra Williams, Sr. Associate Director/ Group Leader
I have a background in teaching, research and clinical medicine; and fortunately, I have had many choices. As part of clinical research at Pfizer, I am responsible for drug trials for opportunistic infections in AIDS and for clinical studies on a major new antibiotic drug. My work enables me to continue a limited clinical practice as well, and I'm convinced that I made the right decision for me and for my family.

Dr. Linda Chatman, Sr. Pathologist
I always wanted to be a veterinarian, and as I became more specialized, I chose toxicological pathology. Here at Pfizer, I look for adverse effects of compounds and study the mechanism of drug action. I find that the quality of your work is what counts. My experience has been extremely positive. Pfizer provides the career path—then it's up to you.

Dr. Anabella Villalobos, Sr. Research Scientist
I always planned to go into drug discovery, and Pfizer was on the top of my list. In my area, Alzheimer's disease, there is an immediate need for innovative new drugs, and I want to be a part of that drug discovery process. My fascination with science began in high school when a single teacher who truly loved chemistry inspired me.

Dr. Yuhpyng Chen, Principal Research Investigator
As a medicinal chemist, I am currently involved in the synthesis of compounds to treat Alzheimer's, anxiety and depression. Developing research proposals that ultimately become projects is exciting—and working with great biologists is doubly rewarding. When I came to Pfizer ten years ago, there were few women chemists. Today, the number is steadily increasing, and that's the way it should be.

Dr. Melissa Tassinari, Manager
My teratology work is an essential part of new drug discovery. Our primary concern is to ensure that drug candidates have no adverse effects on the reproductive system. At Pfizer, I've had many terrific opportunities; and setting up a lab to conduct a full range of reproductive studies, including neurobehavioral research, is definitely one of them. I find the team approach here to be consistent with my way of operating. That's what I like about my group—we all work toward a common goal.

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Dr. Karen L. Fitzgerald, Ph.D.
Sector Quality Assurance Manager
Hospital Lab Instrumentation

" One really nice feature at Abbott is the ability to advance either on the scientific ladder or the management ladder. If scientists want to continue doing basic research, they have the ability to advance by being nominated into The Volwiler Society. Alternatively, scientists who have chosen to go into more of a management track have the opportunity to learn leadership and program management skills...and advance their careers that way."*

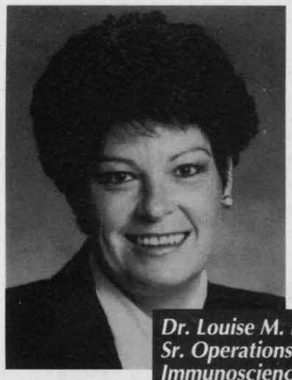
Dr. Fitzgerald earned her Ph.D. in Microbiology/ Immunology at Northwestern University Medical School. After joining Abbott in 1984 as an entry level scientist in our Cancer Technical Product Development Group, she was part of the team that developed the IMx instrument and the assays used on this system.This immunoassay instrument system has a menu of assays which includes 46 tests in areas such as fertility, hepatitis, cancer, and pregnancy. Dr. Fitzgerald was also program manager for the IMx Select product before being promoted into quality assurance in 1992.

"The greatest challenge at Abbott has been balancing my career and personal life. Developing products for Abbott is very demanding...and very satisfying. The excitement of completing a project and meeting goals drives the commitment of time (and overtime) and the energy needed to complete the tasks. This must be balanced with my personal life and raising a family. I have had to learn to better manage my time and personnel to accomplish this."

After obtaining her Ph.D. at New York Medical College, Dr. Shih worked in the fields of enzymology and assay development for 5 years before joining Abbott in 1985. She was lead scientist in the development of the first recombinant HIV blood screening assay and has played a key role in the development of several other products for the detection of HIV and HTLV viruses.

Dr. Jessie Shih, Ph.D.
Laboratory Manager
Diagnostic Biology Research

**The Volwiler Society was created by Abbott to recognize consistent and exceptional scientific achievement.*



Dr. Louise M. Dube, Ph.D.
Sr. Operations Manager
Immunoscience Venture

"The 'Venture' system, established in our Pharmaceutical Products Division R&D is a very unique and creative system for the development of new drugs. It has offered me a rare opportunity to broaden my skills...not only as a manager but in many different fields of science including chemistry, toxicology, and formulation."

After earning her Ph.D. in Pharmacokinetics at Purdue University, Dr. Dube joined Abbott as a Sr. Research Scientist in Drug Metabolism. One year later, she was promoted to Operations Manager, Immunoscience Venture. In this capacity, Dr. Dube was responsible for coordinating all research activities related to the global development of a new class of compounds (5-Lipoxygenase inhibitors)—from the pre-clinical phase to Phase IV.

"The career environment for women scientists at Abbott has improved tremendously in the last twelve years. When I joined Abbott in 1976, I was the first woman organic chemist Ph.D. in the department of medicinal chemistry. It was awkward. Today, we have many women scientists among our scientific staff...and I believe all of them are treated equally and fairly."

Dr. Fortuna Haviv, Ph.D.
Research Fellow/Senior Group Leader
Pharmaceutical Products Division

After obtaining her Ph.D. at the Weizmann Institute (Rehovot) and Indiana University, Dr. Haviv completed her postdoctorate work at the Woodward Research Institute. Dr. Haviv's seventeen-year career at Abbott includes the discovery of new anti-inflammatory and antibiotic drugs. She presently directs medicinal chemistry research in the luteinizing hormone-release hormone (LHRH) area. This work led to the discovery of A-75998, an LHRH antagonist, which is currently in phase I/II clinical studies. This drug will be used for the treatment of hormone dependent diseases such as prostate cancer, endometriosis, uterine fibroids, and breast cancer.

Dr. Susan Tomazic-Allen, Ph.D.
Research Investigator
Diagnostics Division

"Many of the projects I have participated in utilize technologies new to the industry—for example, DNA amplification. In addition, scientists at Abbott are encouraged to develop technical collaborations with and actively seek the opinions of highly respected scientists around the world. As a result, there are ample opportunities to develop products which are relevant, novel, and which will truly add value to health care."

Since joining Abbott in 1987, Dr. Tomazic-Allen has contributed to the development of the enzyme DNA ligase which is critical to Abbott's DNA amplification technology, Ligase Chain Reaction. Currently, she manages the DNA Probe Reagent Development group responsible for the development and manufacture of all DNA amplification reagents. Dr. Tomazic-Allen obtained her Ph.D. from M.I.T.

"Career advancement at Abbott is based, as it should be, on the quality of scientific work. The contributions of each individual towards a specific project goal are evaluated on the basis of scientific merit. In this environment, the gender of the contributor is far less important than the quality of their scientific contribution."

Dr. Kennan Marsh, Ph.D.
Associate Research Fellow &
Section Head/Drug Analysis,
Pharmaceutical Products Division

After earning her Ph.D. at the University of Kansas, Dr. Marsh joined Abbott as a member of our Preformulations Group. In 1986, she transferred to our Drug Metabolism Department, where she formed a group to provide bioanalytical support to discovery project teams. In this capacity, Dr. Marsh provides an early pharmacokinetic evaluation of new discovery compounds in a variety of animal species and applies analytical methodologies to other questions surrounding the evaluation of new discovery compounds *in vivo*.

If you are interested in pursuing opportunities with Abbott Laboratories, please write to: ***Corporate Staffing, Dept. WS, Abbott Laboratories, One Abbott Park Road, Abbott Park, IL 60064.*** *Abbott is an Affirmative Action Employer/ Smoke Free Environment.*

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Regeneron Pharmaceuticals

Regeneron Pharmaceuticals, Inc. is a biotechnology company dedicated to the research and development of treatments and therapies for neurological degenerative diseases. Opportunities are now available for Research Assistants with a B.S./M.S. in Biology or Chemistry coupled with 1-5 years' of experience in one or more of the following areas: **Molecular Biology, Neurobiology, Protein Purification, Fermentation, Protein Biochemistry.** Regeneron is located in Westchester County, 25 miles north of New York City. The highly collaborative and supportive Regeneron community offers considerable scientific and professional growth potential and a competitive compensation package. Interested candidates, send resumes to: Human Resources Department, Regeneron Pharmaceuticals, Inc., 777 Old Saw Mill River Road, Tarrytown, N.Y. 10591 - BIN ES.

Oncogene Sciences, Inc.

To capitalize on the latest developments in oncogenes, antioncogenes and gene transcription, Oncogene Science is expanding its research into the discovery and development of novel human therapeutics. Opportunities are now available for professionals experienced in the areas of molecular and cellular biology, assay development, laboratory automation, screening and natural products chemistry. Qualified applicants will include Ph.D.'s in **Molecular Biology, Medicinal Chemistry, and Pharmacology.** Experience in the pharmaceutical or health industries is desirable but not essential.

Interested candidates may send resumes and references to: Human Resources, Oncogene Sciences, Inc., 106 Charles Lindbergh Blvd., Uniondale, N.Y. 11553. Attention: STNY.

ImClone Systems, Inc.

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Human Resources,
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10014.

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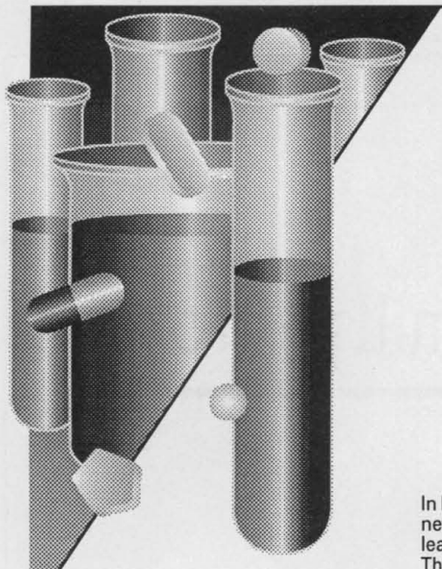

A DYNAMIC MISSION

At the Glaxo Inc. Research Institute, Our Priority is Progress.

In Research Triangle Park, NC, the inspirational Sir Paul Girolami Research Center houses the new Glaxo Inc. Research Institute. Here, professional excellence teams with scientific leadership in a unified mission: to advance the progress of drug discovery and development. The result is an environment of exceptional challenge...and unsurpassed reward.

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• Apoptosis, Cell Cycle Control, and DNA Repair

Individual will explore an aspect of p53 in carcinogenesis, cell cycle check point control, apoptosis and DNA repair. The successful candidate will create mouse models utilizing transgenic and ES cell technologies to express normal and mutant forms of p53 and will collaborate with Glaxo and academic scientists working on the biochemistry of cell cycle control and DNA repair. Experience in molecular genetics and a keen interest in cell cycle control and apoptosis are required. **Please refer to Job # ASC911701 on all resumes.**

• Intracellular Trafficking and Secretion

Individual will study mechanisms of intracellular trafficking, processing and secretion of cytokines important in the regulation of the inflammatory response. Strong background in intracellular protein trafficking, processing or secretion is required. An interest in immunoregulation and inflammation is desirable. **Please refer to Job # ASC911702 on all resumes.**

• Signal Transduction Pathways

Individual will join a multi-disciplinary team studying the role of SH2, SH3, and catalytic domains of src-tyrosine kinase in oncogenesis. Protein chemistry and biophysical techniques will be used to define the nature and interactions of the catalytic and ligand binding properties of src-tyrosine kinase. Experience in enzymology, protein chemistry and biophysical techniques is required. Experience in signal transduction is beneficial. **Please refer to Job # ASC911703 on all resumes.**

• Structural Studies of DNA-Binding Proteins

Individual will investigate the regulation of gene expression through studies aimed at solving the tertiary structure of transcription factor – DNA complexes. Experience in protein purification and protein crystallography is required. **Please refer to Job # ASC911704 on all resumes.**

• Structure/Function Studies of G-Protein Coupled Receptors

Individual will join a multi-disciplinary research team investigating the structure/function relationships of seven transmembrane cell surface receptors. Candidate must have a background in molecular biology and protein structure with experience in one or more of the following areas: in vitro mutagenesis, gene expression, DNA sequencing, receptor-ligand interactions, molecular modeling or X-ray crystallography. **Please refer to Job # ASC911705 on all resumes.**

All candidates will have distinguished themselves by academic scholarship and excellence in research leading to the award of a Ph.D. in a relevant life science area within the past three years. Appointments will be made for two years with possible extension to third and final year upon favorable internal review and recommendation.

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If you would like to know more about the scientific opportunities at Burroughs Wellcome Co., call our Job Information Line at **(919) 830-2997** for jobs in Greenville, NC; or **(919) 248-8347** for jobs in Research Triangle Park, NC. Please reference this ad in your cover letter. Resumes will not be considered which do not reference an active Job Number as indicated on the Job Information Line.

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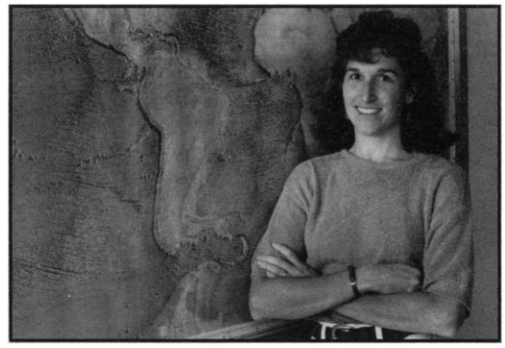
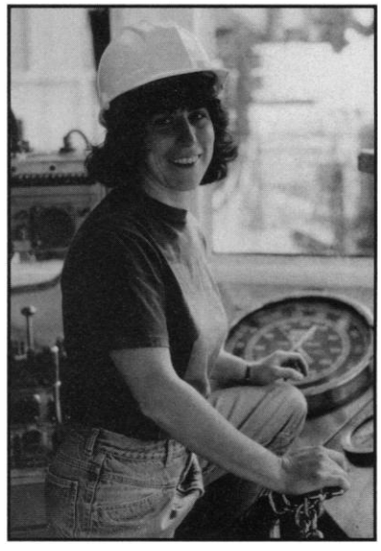
Sallie "Penny" Chisholm
Professor of Civil and Environmental Engineering, Massachusetts Institute of Technology



Susan Lozier
Assistant Professor of Ocean Sciences, Duke University

Deborah Penry
Assistant Professor, Department of Integrative Biology, University of California at Berkeley



Ellen Kappel
Associate Program Manager, Ocean Drilling Program

WOMEN IN OCEANOGRAPHY

Advancing our general knowledge of all aspects of the oceans and their importance to earth as a habitat, and translating that knowledge into useful information for policy and management, presents many opportunities for women in science and engineering. International in culture, interdisciplinary in scope, oceanography offers opportunities few other sciences can rival—the excitement of work at sea, the challenge of understanding the global commons. Women play a major role in research and education in oceanography. Just ask Susan Lozier, a physical oceanographer, who uses mathematical models to study ocean circulation dynamics. Or ask Ellen Kappel. She provides technical oversight of contracts and helps translate available funds into working science for the Ocean Drilling Program. Or speak with Penny Chisholm. Specializing in phytoplankton ecology, Penny studies phytoplankton population variances in coastal and open-ocean communities, and the regulation of phytoplankton productivity. Research is also Deborah Penry's forté; she was recently honored with NSF's Alan T. Waterman Award as the most promising junior scientist in the US for pursuing research toward understanding the cycling of materials in the sea.

The educational opportunities at the graduate level are not limited to Ph.D.s, for many M.S. students find the broad interdisciplinary aspects of oceanography excellent training. Better understanding the oceans and wise use of ocean resources requires dedicated professionals with interests in:

- ▼ Chemical Oceanography/Marine Geochemistry
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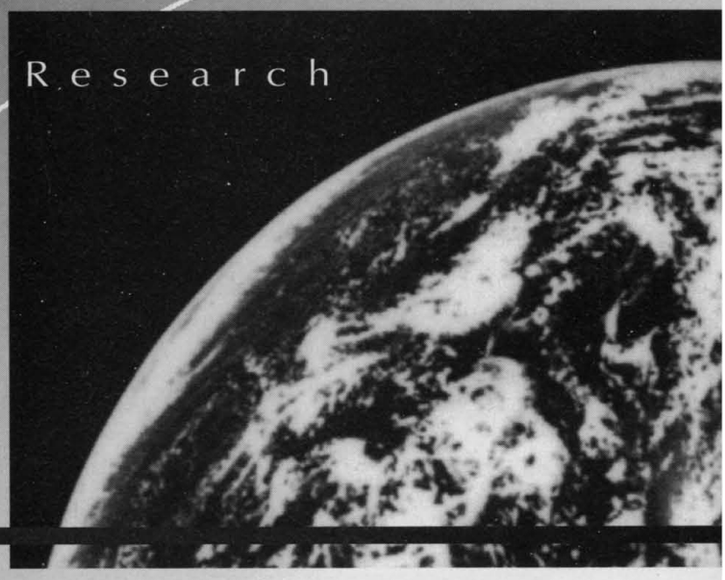
- ▼ Ocean Engineering
- ▼ Marine Geology & Geophysics
- ▼ Physical Oceanography, and
- ▼ Marine Policy.

If you would like to know more about B.S., M.S., and Ph.D. opportunities, contact the President's Office of the Joint Oceanographic Institutions/Suite 800/1755 Massachusetts Ave., NW/Washington, DC, 20036-2102; phone 202-232-3900; fax 202-232-8203; telemail JOI.INC/Omnet.

Wyeth-Ayerst Research



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FOOD AND DRUG ADMINISTRATION

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QUALIFICATIONS: These positions require specific course work in the field of study and professional experience or directly related postgraduate education. Experience in the development, manufacture or testing of drugs and/or antibiotics is desired.

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SALARY: Civil Service salary range for GS-12 through GS-13 is $40,298 - $62,293. Salary, benefits, and level of responsibility are commensurate with education and experience. Positions may also be filled by appointment in the U.S. Public Health Service, Commissioned Corps with commensurate salary and benefits.

HOW TO APPLY: If you are interested in either position, submit detailed Curriculum Vitae or Application for Federal Employment (SF-171) and a copy of college transcripts to:

DHHS/PHS/Food and Drug Administration

Center for Drug
Evaluation and Research
5600 Fishers Lane
Room 6B-05; HFD-20
Rockville, MD 20857
Attn: Rhonda S. Alderman

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