AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SCIENCE

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MINORITIES IN SCIENCE

THE PIPELINE PROBLEM

Bio-Rad: The Evolution of Gene Transfer

Earlier methods of Gene Transfer

Particle Delivery

1991 *Bio-Rad introduces DuPont's Biolistic® PDS-1000/He particle delivery system to the world market for plant and animal applications.*

1993 *Particle delivery system expands to accommodate live animal work including gene therapy and genetic immunization.**

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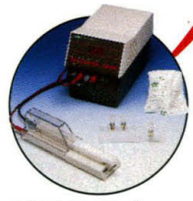
1989 *Bio-Rad guarantees high efficiencies with the introduction of convenient Electro-Competent® cells.*



1991 *Bio-Rad introduces the E. coli Pulser™ unit —the first dedicated pulser for efficient, economical library construction.*

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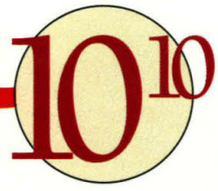
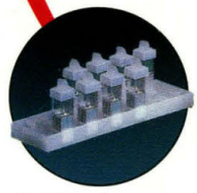
1987 *Bacterial electroporation efficiencies increased dramatically with the introduction of the Pulse Controller and 0.2 cm cuvettes.*



1988 *Bio-Rad pioneers 10^{10} transformants/µg: E. coli protocol optimized.*



1990 *Prokaryotic applications and efficiencies boosted by new 0.1 cm cuvettes.*

1986-2010 *The users club binder —yours free— continually keeps you up to date on the latest gene transfer protocols for plant and mammalian cells, bacteria, yeast and other fungi, etc.*

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* Tang, D., DeVit, M., and Johnston, S.A., *Nature*, **356**, 152-154 (1992). Biolistic is a registered trademark of the DuPont Company.

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PROTEINS

How innovative technologies solve today's problems.

Today's protein research environment is more exciting and demanding than ever before. With each breakthrough, researchers discover new challenges as they strive to do more in less time with smaller amounts of material. In many cases, they are solving these problems with the application of alternate technologies.

PROTEIN QUARTERNARY STRUCTURE: WHERE DO TRADITIONAL TECHNIQUES FALL SHORT?

Quantification of stoichiometry and binding affinities is critical, both in quality control of recombinant proteins and in anti-viral drug development. Yet direct measurement of these thermodynamic properties has been hampered by empirical methods that rely on molecular weight standards and unjustified assumptions or methods that interfere with equilibrium between associated and non-associated protein moieties. To avoid such problems, Beckman Instruments now offers a modern analytical ultracentrifuge described by Dr. Preston Hensley of SmithKline Beecham:

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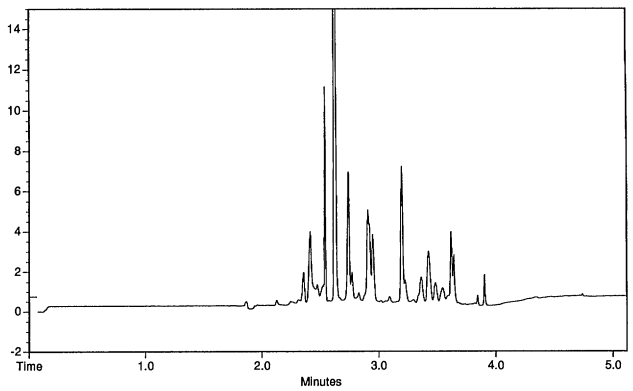

Tryptic digest of ß-lactoglobulin analyzed with CE. (700 attomoles injected.)

For more information about applications of the techniques discussed in this article, the Beckman Plus, or for information and dates on Beckman's worldwide Protein Discovery Tour, write to Beckman Instruments, Inc., Bioanalytical Systems Group, 2500 Harbor Boulevard, Fullerton, California 92634-3100. Or call, toll-free in the U.S.A. 1-800-742-2345.

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SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

NEWS

PERSPECTIVE

ARTICLES

RESEARCH ARTICLE

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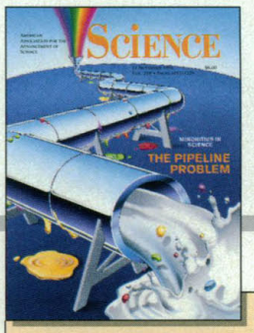
DEPARTMENTS

COVER

For two decades, U.S. scientists, educators, corporate executives, and government officials have struggled vainly to plug a pipeline: Minorities are leaking from our educational system at a rate that guarantees a predominantly white scientific workplace through the end of this century. Beginning on page 1175 and including an essay by NSF director Walter Massey (page 1177), a special section in this issue probes the causes of our past failures on this front and identifies solutions on the horizon. [Illustration: Stephen Bauer]



TECHNICAL COMMENTS

MINORITIES IN SCIENCE

◩ Indicates accompanying feature

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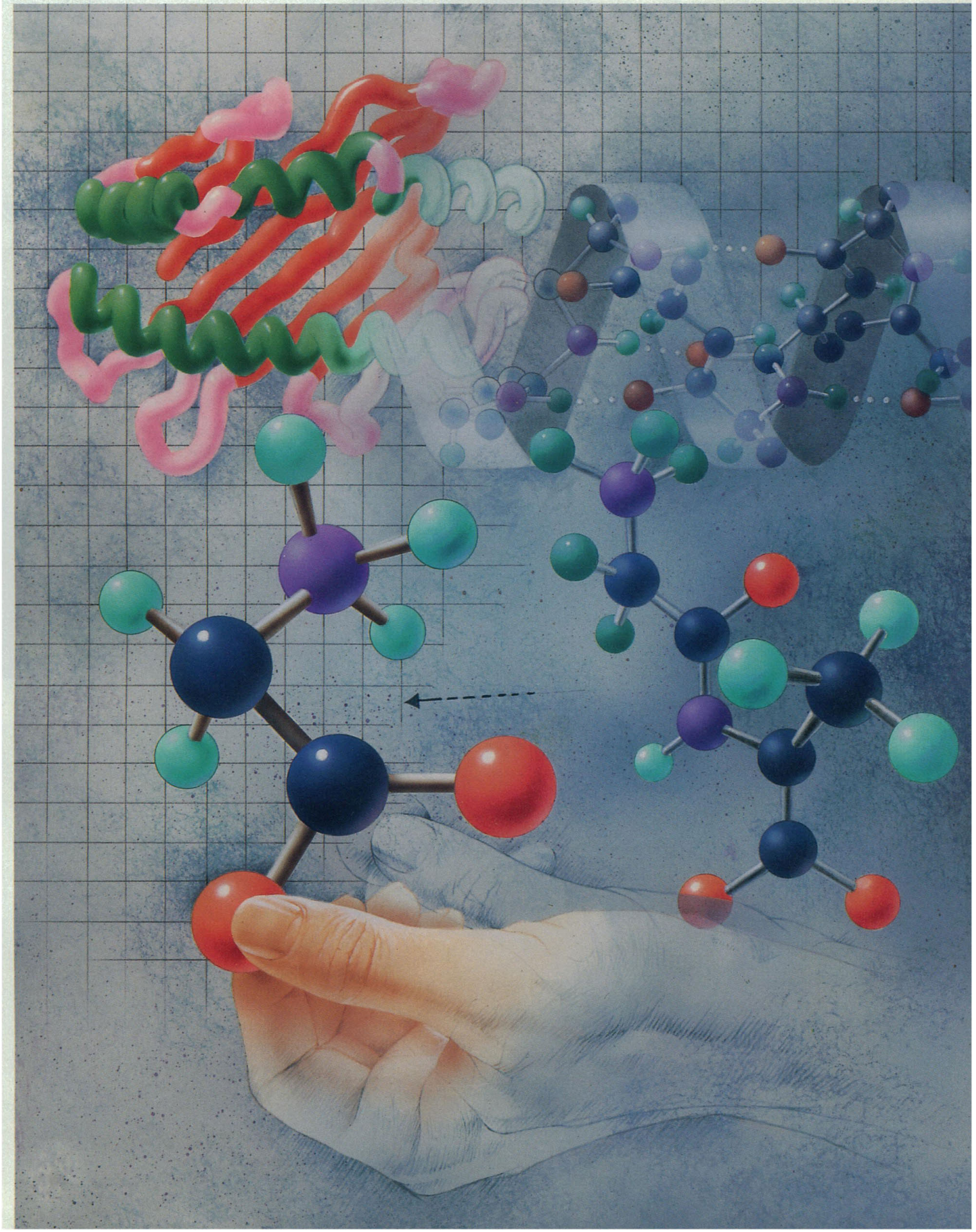

THIS WEEK IN SCIENCE

edited by PHIL SZUROMI

Condom quandary

Educational efforts to reduce the sexual transmission of the HIV virus apparently have not been very successful in the general population of the United States according to surveys by Catania *et al.* (p. 1101). About 15 to 30 percent of the heterosexual population engage in behaviors that put them at risk for HIV infection, but of that group, only 10 to 20 percent used condoms all of the time. The authors argue that new public health strategies need to be developed.

■

The atomic dance

Fabrication of small structures and devices requires knowledge of how atoms move on surfaces; phase transitions, diffusion, and epitaxial growth all involve the transport of atoms. In general, these motions are too fast to be imaged with the tools of choice, including the scanning tunneling microscope (STM). In studying the germanium (111) surface, Hwang and Golovchenko (p. 1119) found that, by adding a small number of lead atoms, the energy barrier for surface motions can be reduced so that metastable surface structures and shifts of atomic rows could be observed with an STM at room temperature.

■

Stretching exercises

Direct measurements of the stretching of individual DNA molecules have been made by Smith *et al.* (p. 1122). Magnetic beads were attached to one end of double-stranded DNA molecules (97 kilobase pairs); the other end was attached to a glass slide. Magnetic and hydrodynamic forces were used to stretch the DNA molecules, which were visualized by optical microscopy. The amount of force needed to produce a given extension of the molecules could be measured. Comparison of the results to the freely jointed chain model for DNA indicates that DNA has significant local curvature in solution

■

Completely wet

Dip a surface into a mixture of two fluids and one of them may coat it. This "wetting" can be either partial (a microscopic layer, perhaps) or complete (a thick, macroscopic layer). The circumstances under which one or the other occurs is clear for simple fluids but less so for mixtures of macromolecules. Steiner *et al.* (p. 1126) have now observed complete wetting of an interface from a mixture of olefinic copolymers. The authors spin-coated a silicon wafer to form a bilayer, then watched as one of the polymers diffused to the air-polymer interface. Such findings may help in learning how to vary surface interactions by altering the monomer properties.

Modeling strand transfer in reverse transcription

Viral reverse transcriptase (RT) enzymes can polymerize DNA from RNA or DNA templates and can also cleave RNA-DNA hybrids through their ribonuclease H (RNase H) activity. Peliska *et al.* (p. 1112) present mechanistic evidence that HIV-1 RT can perform all of the steps in the initial reverse transcription event, transfer of minus strand strong-stop DNA. In this process, DNA synthesis is initiated at the primer binding site near the 5' end of the viral RNA and continues to the strong-stop site at that end. The short strand is then transferred to the 3' end of the same or another viral RNA strand by aligning the repeat sequences at the two ends of the genome. By using short RNA template primers, the authors show that this strand transfer requires two distinct RNase H activities. In their model, after the DNA strand has been synthesized on the template RNA, the repeat sequence near the 3' end is removed. After the acceptor RNA binds to the DNA strand, the rest of the original RNA template is removed and DNA synthesis continues. Such synthesis can continue one base beyond the 5' end of the template RNA strand, resulting in a base misincorporation.

A warmer climate

About 3 million years ago, the Earth was significantly warmer than it is today. The warm climate could have been caused by elevated atmospheric CO_2 levels, which would have increased sea-surface temperatures globally, or enhanced ocean circulation, which would have increased temperatures principally in polar regions. Dowsett *et al.* (p. 1133) examine the distribution of Pliocene foraminifers, ostracods, plant fossils, and pollen in a transect from the equator to high latitudes in the Atlantic Ocean. Comparisons with the present-day distribution indicates that Pliocene sea-surface temperatures were greater than those today primarily at high latitudes, implicating increased ocean heat transport.

■

Perilous songs

Male field crickets attract more than their prospective mates with their songs. They also attract parasitic flies (genus *Ormia*) that deposit their maggots near the cricket, which in feeding upon it eventually kills it. Robert *et al.* (p. 1135) show that the hearing organ of these flies is more closely related to that of crickets, which tune in to far-field sounds, than to the ears of other flies, which tend to respond to short-range sounds.

■

Channel changing

Voltage-activated potassium channels contain an amino acid segment called S4 that is thought to be the sensor for changes in membrane potential. Oddly enough, this sequence is also found in the cyclic nucleotide–gated (CNG) ion channels, which are not voltage-activated but instead respond to intracellular ligands. Heginbotham *et al.* (p. 1152), in comparing the sequences of these two types of S4-containing channels, noted that the CNG channels lacked two amino acids in their pore-forming region. Mutant voltage-activated potassium channels from which these amino acids were deleted acquired the essential features of CNG channels; they did not discriminate between sodium and potassium, and they were blocked by divalent cations.

■

T cell meets B cell

Certain antigen-presenting cells such as dendritic cells can activate "memory" T cells (ones that have previously been activated by that antigen) as well as "virgin" T cells (which have never encountered the antigen). The response of T cells to surface antigens on B cells is more complex but may explain some puzzles in tolerance. Fuchs *et al.* (p. 1156) show that memory T cells are activated by B cells. Virgin T cells are not stimulated but in fact are rendered tolerant.

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Keeping up with the biomedical literature is a daunting task which has been greatly simplified by the advent of diskette-based current awareness services. The first and foremost product of this kind, **Reference Update®**, was released by Research Information Systems, Inc. in 1988. It was later imitated by *Current Contents on Diskette®*.

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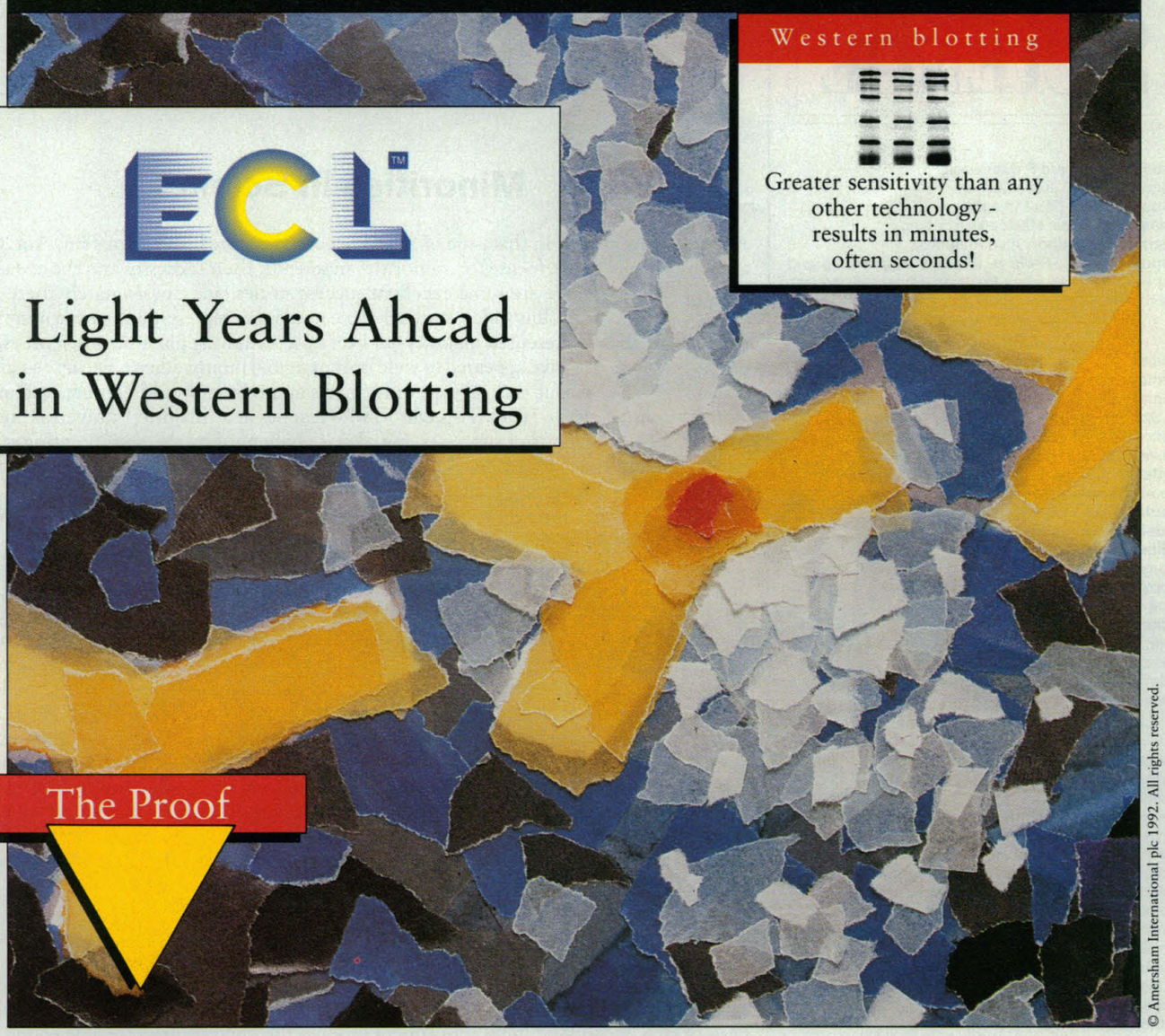

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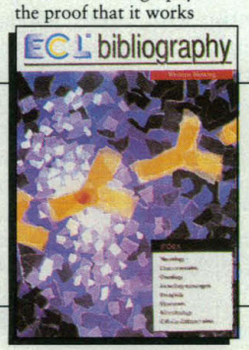

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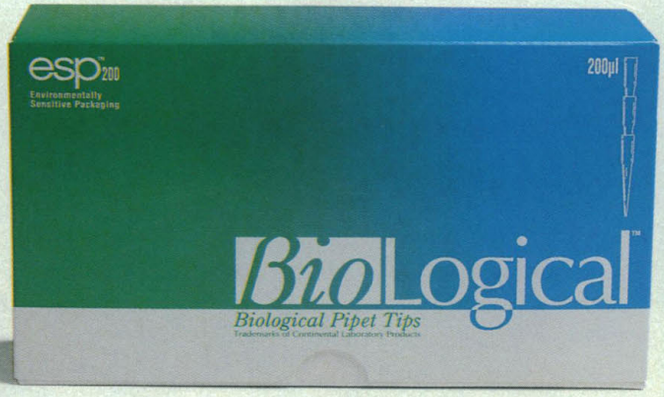

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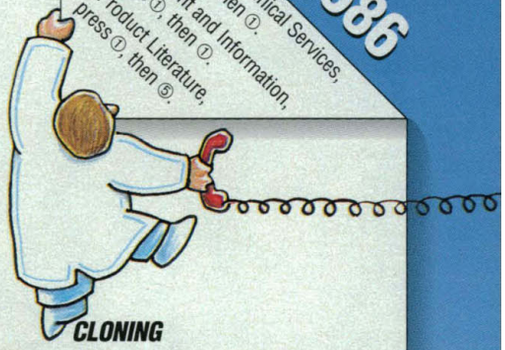

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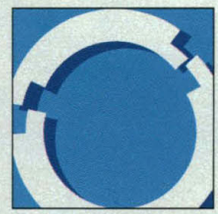

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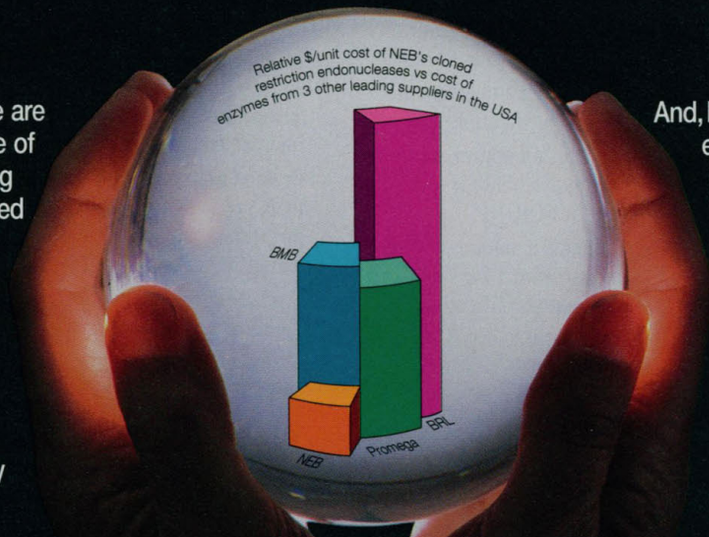

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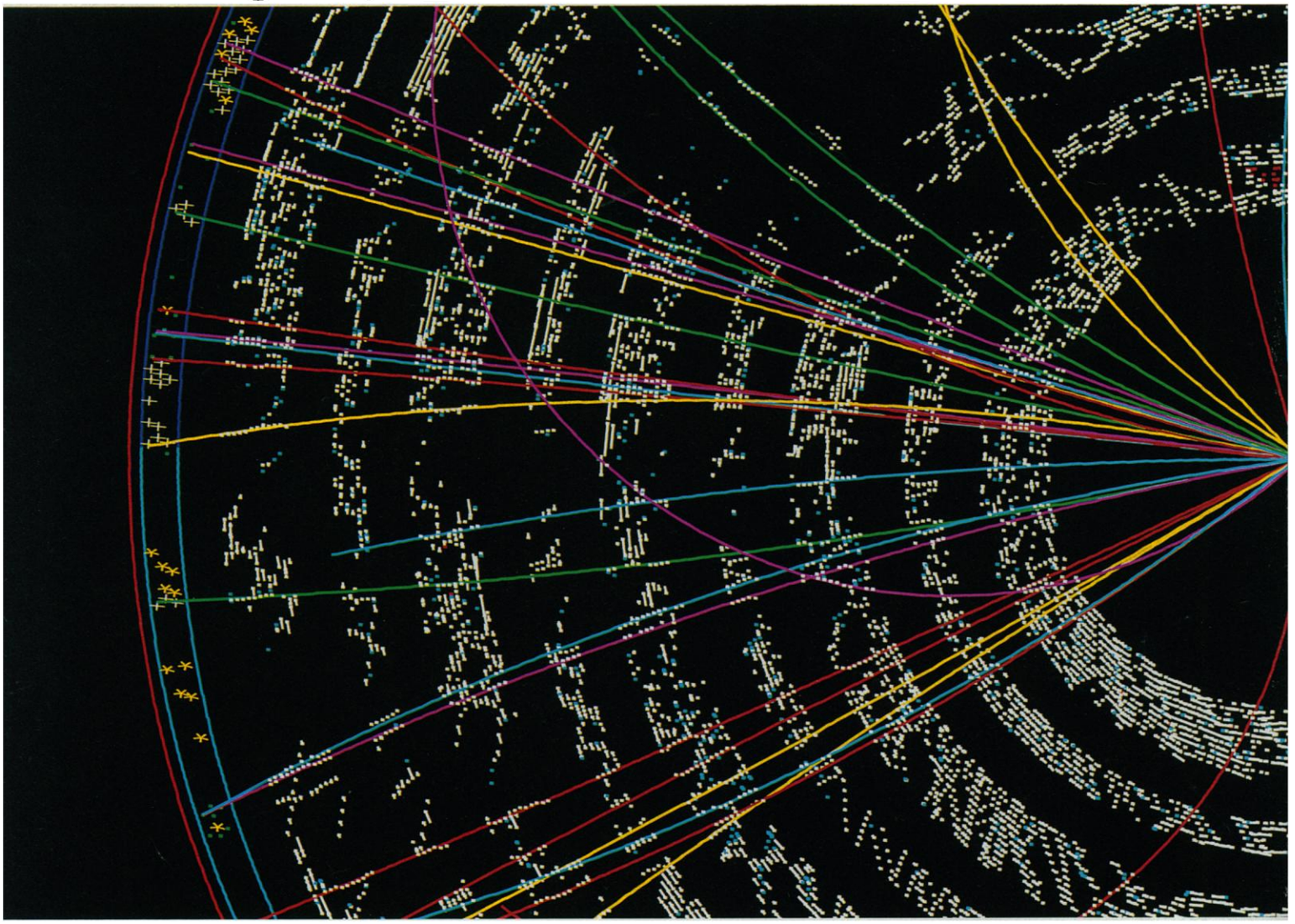


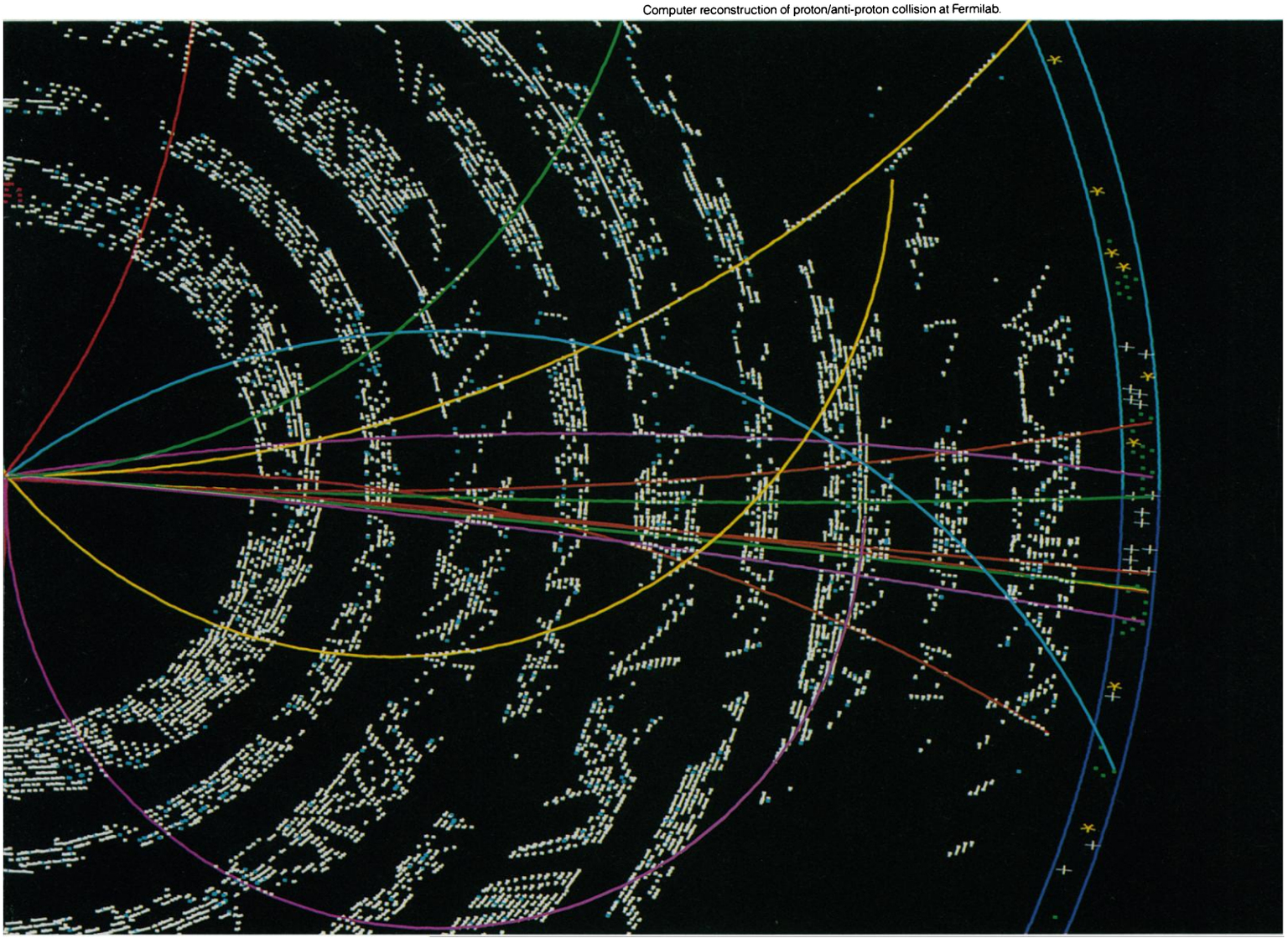
Fermilab is tapping a new

If there's one thing you can count on in science, it's that your data will increase exponentially but your funding won't.

The scientists at Fermi National Accelerator Laboratory (Fermilab) have encountered this problem in a very big way. The data Fermilab processes for subnuclear event reconstruction and modeling has reached 40 terabytes a year. And they've developed an innovative solution to meet their needs.

Instead of relying on supercomputers, Fermilab has distributed a significant part of the workload to clustered IBM RISC System/6000™ workstations. They've combined 108 of them, at latest count, in a LAN-connected

Computer reconstruction of proton/anti-proton collision at Fermilab.



source of power.

processor farm. This farm gives Fermilab a full 3,000 MIPS that can be dedicated to a single parallel processing application.

"The result," as Thomas Nash, Head of Computing at Fermilab puts it, "is better science." At a fraction of the cost of using supercomputers.

Many users are discovering the affordable, scalable power of clustered RISC System/6000 workstations.

The National Center for Supercomputing Applications in Champaign, Illinois, for example, runs superscalar applications on a cluster of seven RISC System/6000s. High performance and reliability are why they selected the RISC System/6000.

BP Exploration (Alaska), Inc. is achieving supercomputer throughput for their reservoir simulation applications by doing batch load balancing on a cluster of five RISC System/6000s. For their computers, software, systems integration and training in the use of batch clusters, they worked in alliance with IBM. We can help you, too – with consulting services, open systems integration and Business Partner software.

If you'd like to make some discoveries of your own about the power and economy of RISC System/6000 parallel processing, call IBM Technical Computing Systems at 1 800 472-4966.

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* Eva Kvist, Scandinavian Gene Synthesis AB, Köping, Sweden.

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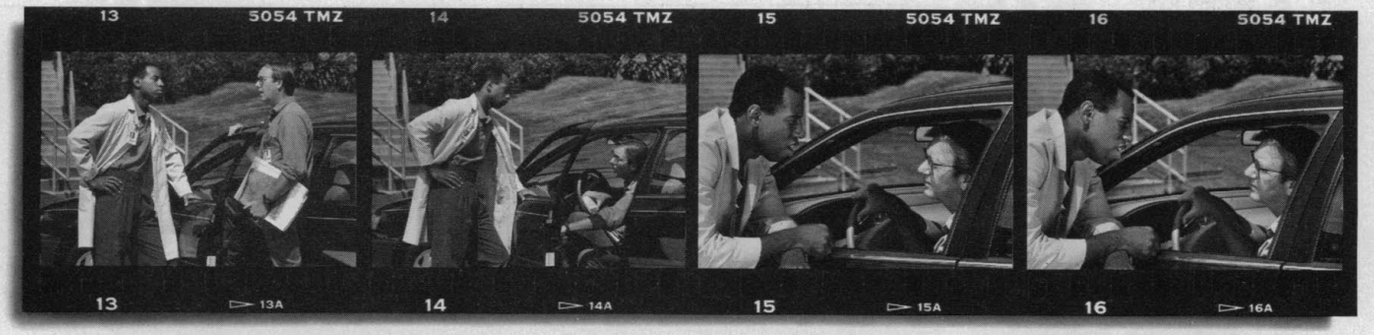
"We're making headway on those buckyballs." *"This could be a real coup for us."* "I wonder if anyone's hot on our tail."

"Doesn't look like it." "Not even the French lab?" *"No way. We're months ahead of them."*



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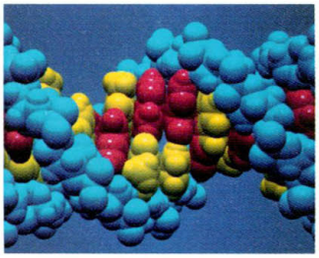
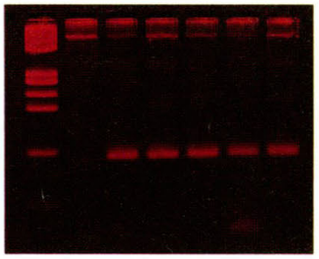
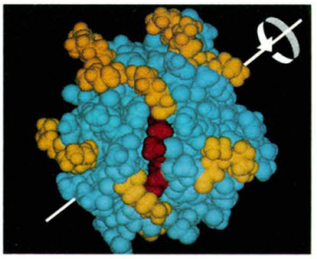


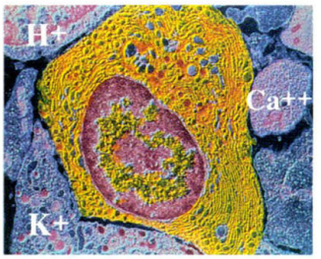
DNA Quantitation



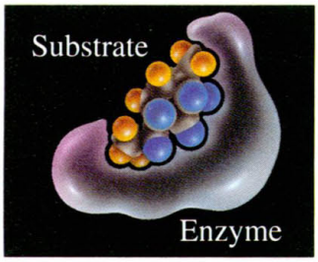
Gel Scanning



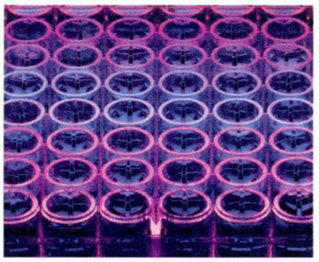
Macromolecular Anisotropy Measurements



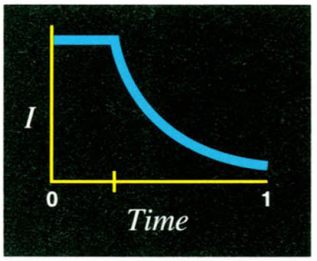
Intracellular Ion Determinations



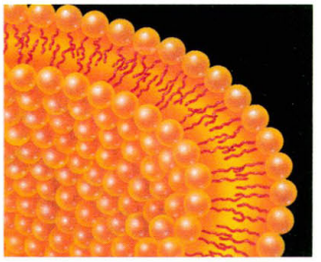
Enzyme Kinetic Analysis



Microplate Assays



Stopped-Flow Kinetic Analysis



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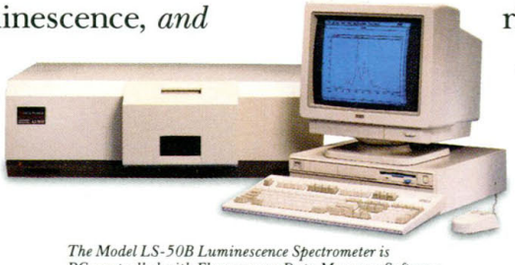

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1993-94
AAAS Fellowships for Scientists & Engineers

Congressional

AAAS Congressional Science & Engineering Fellows Program.

Fellows spend one year on Capitol Hill working with Members of Congress or congressional committees as special assistants in legislative and policy areas requiring scientific and technical input. Two fellowships will be offered, with annual stipends of $40,000.

Executive Branch

AAAS-Sloan Executive Branch Science & Engineering Fellows Program

Fellows work in the White House Office of Science and Technology Policy (OSTP) for one or two years, providing expertise in industrial research and development, technology transfer, international competitiveness, and related issues. One or two Fellows will be selected. Applications are invited from candidates with a minimum of five years industrial experience, through mid-level and senior executives. Stipends are negotiable, depending on qualifications and experience. Applicants must be U.S. citizens.

Diplomacy

AAAS Science, Engineering, & Diplomacy Fellows Program

Fellows work in international affairs on scientific and technical subjects for one year, either in foreign policy at the U.S. Department of State or in international development for the U.S. Agency for International Development. Approximately 12 Fellows will be selected. The annual stipend varies with experience, starting at approximately $40,000. Applicants must be U.S. citizens.

Environmental

AAAS Environmental Science & Engineering Fellows Program

Fellows work as special research consultants with the Office of Research and Development (ORD) of the U.S. Environmental Protection Agency for 10 weeks in the summer. The detailed, future-oriented research assists ORD in assessing the significance of long-range environmental problems. The stipend is $950 a week. Applicants must be residents of the United States. Ten Fellows will be selected.

Applicants should be postdoctoral to midcareer scientists and engineers, from any physical, biological, or social science or any field of engineering. The programs are designed to provide each Fellow with a unique public policy learning experience; to make practical contributions to the more effective use of scientific and technical knowledge in the U.S. government; and to demonstrate the value of science and technology in solving important societal problems. All Fellows participate in a rigorous orientation on the relevant congressional and executive branch operations and foreign affairs plus a year-long seminar series on issues involving science, technology, and public policy. The Congressional, Diplomacy, and Executive Branch programs begin in September 1993, and the Environmental program begins in June 1993. All application deadlines are January 15, 1993. For additional program information and application instructions, write:

Fellowship Programs/Directorate for Science and Policy Programs
American Association for the Advancement of Science
1333 H Street, NW, Washington, DC 20005 202/326-6600

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THE AAAS EMPLOYMENT EXCHANGE WILL BE HELD AT THREE AAAS-SPONSORED MEETINGS IN 1993:

AAAS★93 Annual Meeting
Hynes Convention Center, Boston, Massachusetts
February 11-16, 1993

AAAS Pacific Division Annual Meeting
University of Montana, Missoula
June 20-24, 1993

Science Innovation '93:
The Conference on New Research Techniques
Hynes Convention Center, Boston, Massachusetts
August 6-10, 1993

The Employment Exchange is an on-site job referral service for job candidates and employers, providing position posting, résumé referral, a message center, and interview facilities (including private interview booths) during the week of these AAAS-sponsored meetings.

We are inviting corporate, government, nonprofit, and academic recruiters representing a wide spectrum of scientific disciplines to review member and nonmember résumés and interview job candidates on-site.

EMPLOYER BENEFITS:

- Hundreds of top-notch candidates. Access to all résumés cross-referenced by discipline.
- Copy of the Pre-Meeting Candidate Bulletin (mailed to employers enrolled by January 29, 1993).
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- Unlimited position postings.
- **Special rates** for AAAS★93 Annual Meeting and Science Innovation '93 exhibitors, nonprofit organizations, and AAAS Corporate Members.

CANDIDATE BENEFITS:

- FREE enrollment for AAAS members who enroll by the advance enrollment dates: **January 29, 1993 for AAAS★93 Annual Meeting; June 4, 1993 for AAAS Pacific Division Annual Meeting; and July 16, 1993 for Science Innovation '93. Low $10 fee for nonmembers.**
- Hundreds of current position openings in a variety of disciplines and experience levels.
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If you are presently in the job market, a student anticipating graduation in 1993, or if you are an employer with positions to be filled, and wish to take advantage of our efforts on your behalf, complete the appropriate enrollment forms and forward them to: Jacquelyn Roberts, AAAS Employment Exchange, 1333 H Street, NW, Washington, DC 20005. Phone: 202-326-6737. Fax: 202-842-1065.

**Applies to candidates attending the meeting. Candidates who are unable to attend the meeting may obtain a copy of posted positions for an additional fee (Members: $15; Nonmembers: $25).*

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

1333 H Street, NW, Washington, DC 20005 (202)326-6737

EMPLOYMENT EXCHANGE

CANDIDATE

FILE NO._____

Name_____

Contact address_____

_____

City_____State_____ZIP_____

Phone Work (_____)_____Home (_____)_____

Citizenship_____Visa Type_____

(if non-US citizen)

Will you be available for an on-site interview at the:

AAAS★93 Annual Meeting	❒ Yes	❒ No
Pacific Division Annual Meeting	❒ Yes	❒ No
Science Innovation '93 Meeting	❒ Yes	❒ No

Discipline _____

Highest degree _____Year obtained _____

Position(s) sought:

- ❒ Postdoctoral
- ❒ Academic
- ❒ Government
- ❒ Nonprofit
- ❒ Industrial
- ❒ Other_____ (specify)
- ❒ Consultant
- ❒ Research
- ❒ Development
- ❒ Administrative
- ❒ Management

Salary desired _____

Date available _____

Geographic preference _____

POSITION SOUGHT AD:

Please prepare your Position Sought Ad in the box below. Your Position Sought Ad should include degree, discipline, degree date (month/year), skills and techniques, experience, salary desired, geographical preference, and date of availability. No personal information (names, addresses, phone numbers) will be published in the Position Sought ads. NOTE: All Position Sought ads postmarked by December 31, 1992 (for AAAS★93 Annual Meeting), and July 2, 1993 (for Science Innovation '93) will be published in the **Employment Exchange '93 Pre-Meeting Candidate Bulletin**. The bulletin will be mailed to all enrolled employers prior to the AAAS★93 Annual Meeting and Science Innovation '93.

FEES:

Enrollment with the Employment Exchange is a FREE service for AAAS members. Nonmembers are required to pay a $10 enrollment fee (US funds). Meeting attendance is not required in order to enroll with the Employment Exchange; however all candidates planning to be available on-site at the meeting(s) are required to be registered as a meeting attendee or as an "Employment Exchange/Exhibition Only" attendee (applicable for the AAAS★93 Annual Meeting and Science Innovation '93). "Employment Exchange/Exhibition Only" fees are $25 for AAAS members and $50 for nonmembers.

DEADLINES:

All Candidate Enrollment Forms must be received by the advance enrollment dates: January 29, 1993 for AAAS★93 Annual Meeting; June 4, 1993 for AAAS Pacific Division Annual Meeting; and July 16, 1993 for Science Innovation '93. On-site enrollment is available. NOTE: Candidates wishing to have their Position Sought Ad published in the **Pre-Meeting Candidate Bulletin** should submit their complete enrollment forms and information by **December 31, 1992** (for the AAAS★93 Annual Meeting), and **July 2, 1993** (for Science Innovation '93).

INSTRUCTIONS:

1) Complete the Candidate Enrollment Form by including your name, mailing address, and daytime telephone number where you may be reached. Prepare your Position Sought Ad as indicated above.

2) Enclose a current curriculum vitae (including at least three professional references), along with applicable fees, and mail to: Jacquelyn Roberts, Manager; AAAS Employment Exchange, 1333 H Street, NW, Washington, DC 20005.

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1333 H Street, NW, Washington, DC 20005 (202) 326-6737

EMPLOYMENT EXCHANGE — EMPLOYER

Complete and return enrollment form to the address above with prepared postings.

Name _____

Title _____

Organization _____

Department _____

Address _____

City _____ State _____ ZIP _____

Daytime Phone (___) _____ ext. _____

AAAS★93 ANNUAL MEETING

ENROLLMENT FEES:

❑ Nonprofit	$225.00
❑ Nonprofit/Meeting Exhibitor	$200.00
❑ Commercial	$375.00
❑ Commercial/Meeting Exhibitor	$350.00
❑ AAAS Corporate Member	$250.00
❑ Reserved Interview booth (optional)	$ 75.00

POSTING ONLY FEES (not conducting on-site interviews):

❑ Per Posting: *Science* Advertiser	$ 50.00
❑ Per Posting: Non-Advertiser	$ 60.00
TOTAL AMOUNT	**$ _____**

PAYMENT:

- ❑ Check enclosed
- ❑ Original purchase order attached
- ❑ Will pay on-site

NOTE: Enrollment fee includes unlimited postings and up to three recruiters. Reserved interview booth fee is optional. Employers enrolled by January 29, 1993 will receive the "Employment Exchange '93 Pre-Meeting Candidate Bulletin", which will be mailed on February 1, 1993.

RECRUITERS ATTENDING:

_____
Name Telephone

_____
Name Telephone

_____
Name Telephone

DAYS INTERVIEWING:

- ❑ Friday ❑ Saturday
- ❑ Sunday ❑ Monday

❑ Please send additional information for:

- ❑ AAAS★93 Annual Meeting
- ❑ AAAS Pacific Division Annual Meeting
- ❑ Science Innovation '93 Meeting

INSTRUCTIONS:

1) Complete enrollment form including the days you will be interviewing.
2) Prepare your position available description(s) on an 8 1/2" x 11" page. Description(s) should include: position title, educational and experience requirements, geographical location, field of work and duties, annual salary/range, position availability date, organization name, address, and representative.
3) Submit appropriate payment (check or original purchase order) with completed enrollment form and position description(s) to the address above.

NOTE: Payment of enrollment fees for the Employment Exchange does not include meeting registration. If you wish to attend lectures, workshops, or sessions, you must register for the meeting.

Nonmetallic Syringe for Micropipettes

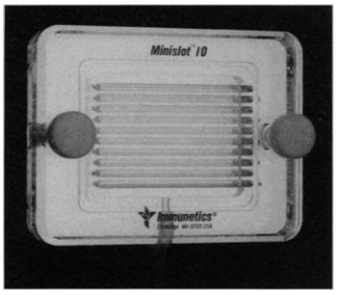
The MicroFil's long flexible tip allows the user to start filling micropipettes close to the pipette tip, eliminating both air bubble formation and clogging due to the washing down of dust particles. The MicroFil needle is constructed from a combination of polyimide and fused silica, with no metal components used. It can be stored with the filling solution inside for days without clogging. MicroFil eliminates the possibility of leaching metal ions from the wall material of the tip. It is more resistant to corrosion than a metal tip and more sturdy than a plastic tip. A luer fitting allows easy coupling to syringes and syringe filters. World Precision Instruments. Circle 87.

Organic Elemental Analyzers

The EA 1108 and the NA 100 Series 2 can determine the concentrations of nitrogen, carbon, hydrogen, and sulfur simultaneously and can be easily switched to direct oxygen measurement. These fully automated systems allow for the unattended analysis of up to 196 solid, liquid, and gas samples in organic or inorganic materials. Designed for versatility, they can determine concentrations from 100 parts per million to 100%. The instrument's operating principle of flash combustion followed by gas chromatography separation and detection not only ensures accurate, reproducible results but also allows the instrument to be coupled to other selective detectors, such as mass spectrometers. Fisons Instruments. Circle 88.

Blotting Instrument for DNA Hybridizations

The Minislot 10 is a vacuum manifold for use in checkerboard DNA hybridization or cross blot techniques. With this unit and an Immunetics Miniblotter, up to 280 separate hybridizations and antibody or other ligand-binding assays can be performed simultaneously on a single 7 by 10 cm membrane. Solutions of DNA or antigens are pipetted into each of the unit's ten slots and aspirated through a blotting membrane under vacuum, leaving horizontal stripes that span the width of the membrane. The membrane is then placed in a Miniblotter unit



containing parallel, vertically arranged incubation channels. Different antibodies, DNA probes, or other ligands introduced into each chamber are thus incubated with each of the ten horizontal stripes in a grid pattern. Enzymatic, chemiluminescent, or radioactive methods can be used to detect binding reactions, and results can be scanned for quantitation. Compared with enzyme-linked immunosorbent assay or dot blot techniques, this procedure requires smaller amounts of antigen, antibody, or DNA solutions and fewer pipetting manipulations. Immunetics. Circle 89.

DNA Sequence Reader

BaseScanner automates the task of reading DNA sequences from films produced by di-deoxy sequencing reactions, offering users greater speed and accuracy in DNA sequencing. Independent trials have shown that accuracy exceeding 98% can be expected from good quality films using the BaseScanner, according to the manufacturer. The system is based on a custom-designed scanner unit and DNA sequencing software interfaced through a Sun workstation. A sequence film is fed through the scanner in under 1.5 min, with the analog information converted to a digital signal by a charge-coupled device. Amersham International. Circle 90.

Variable Fluorescence Detector

The fluoroMonitor 4100 programmable fluorescence detector is for high-sensitivity high-performance liquid chromatography applications. Time programming of excitation and emission wavelengths and spectra scanning is provided through a computer-controlled stepper motor that drives both the Ex and Em monochromators. Additional features include programmable attenuation and gain settings, variable emission bandwidth, lamp life counter, self-diagnostics, and RS232 communications. The unit features a 150-watt xenon lamp for excitation wavelengths of 200 to 700 nm and emission wavelengths of 220 to 700 nm. LDC Analytical. Circle 91.

Gel Drying Frames

The beveled-edge design of this gel drying frame makes assembly easy because the clamps slide easily over the rounded edges of the frame. Mini-gel and standard sizes are available to produce gels that are flat and that can be used for scanning, densitometry, fluorography, and overhead projection. Integrated Separation Systems. Circle 92.

Literature

Lab Acrylics is a brochure featuring many durable items, including biohazard shields and waste containers. Isolab. Circle 93.

Nycomed Density Gradient Media is a catalog that offers a selection of separation media for obtaining pure, unaltered suspensions of cells, subcellular organelles, and macromolecules. An applications booklet is also available. GIBCO BRL. Circle 94.

QC Expert Software: Automatic Quality Control for ICP-AES and ICP-MS details a software system that performs extensive quality control of atomic emission and mass spectrometry data. Perkin-Elmer Corp. Circle 95.

The ABC's of Lab Safety: A Beginner's Guide to Occupational Exposure to Hazardous Chemicals in Laboratories—29 CFR 1910.1450 outlines the scope and application of new regulations. Savant Audiovisuals. Circle 96.

The HP Supercritical Fluid Chromatograph is a six-page brochure that describes this instrument's abilities. Hewlett-Packard. Circle 97.

1993 Physiology Research Instruments is an 80-page catalog that includes many instruments for the whole animal research laboratory. New products include an electronic animal identification system, infusion/withdrawal syringe pumps, a system for the automated transfer of selected cells, and the MacLab Data Acquisition System. Stoelting. Circle 98.

Adaptable Laboratory Thermoregulator (ATR-4) describes an instrument with four independent control loops to thermoregulate complex or multiple systems. The bipolar output channels can be used to drive both heating and cooling devices, and the built-in thermistor calibration routines allow the use of virtually any thermistor in each of the eight input channels. Fine Science Tools Inc. Circle 99.

Custom Biological Storage Freezers, Classic Ultra-Low Temperature Freezers, and *Custom Deluxe Ultra-Low Temperature Freezers* are three brochures on these devices. Harris Manufacturing Co. Circle 100.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card and placing it in a mailbox. Postage is free.

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Bert Adler, photography 1989

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Minorities in Science: The Pipeline Problem

1ST ANNUAL REPORT

SPECIAL SECTION

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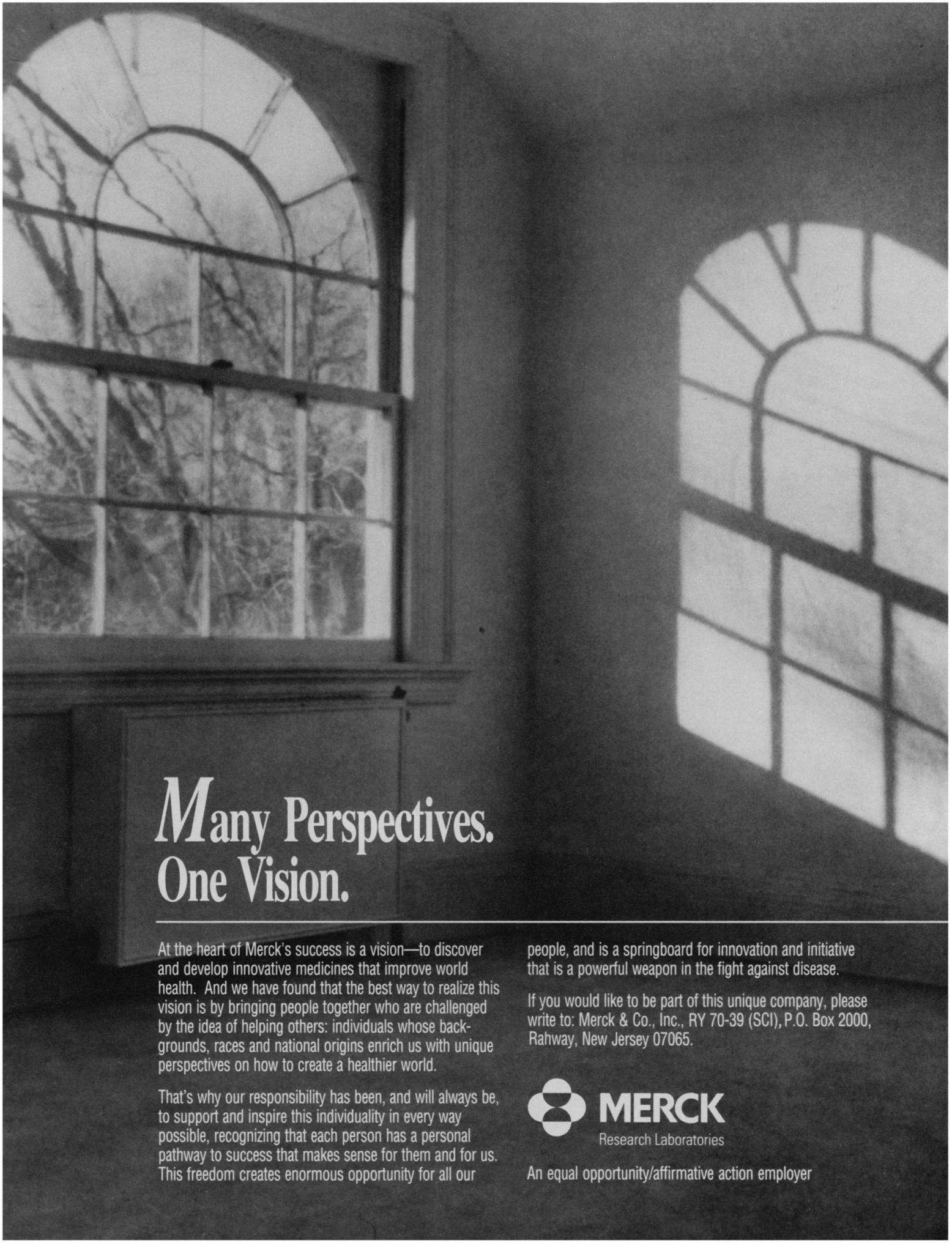
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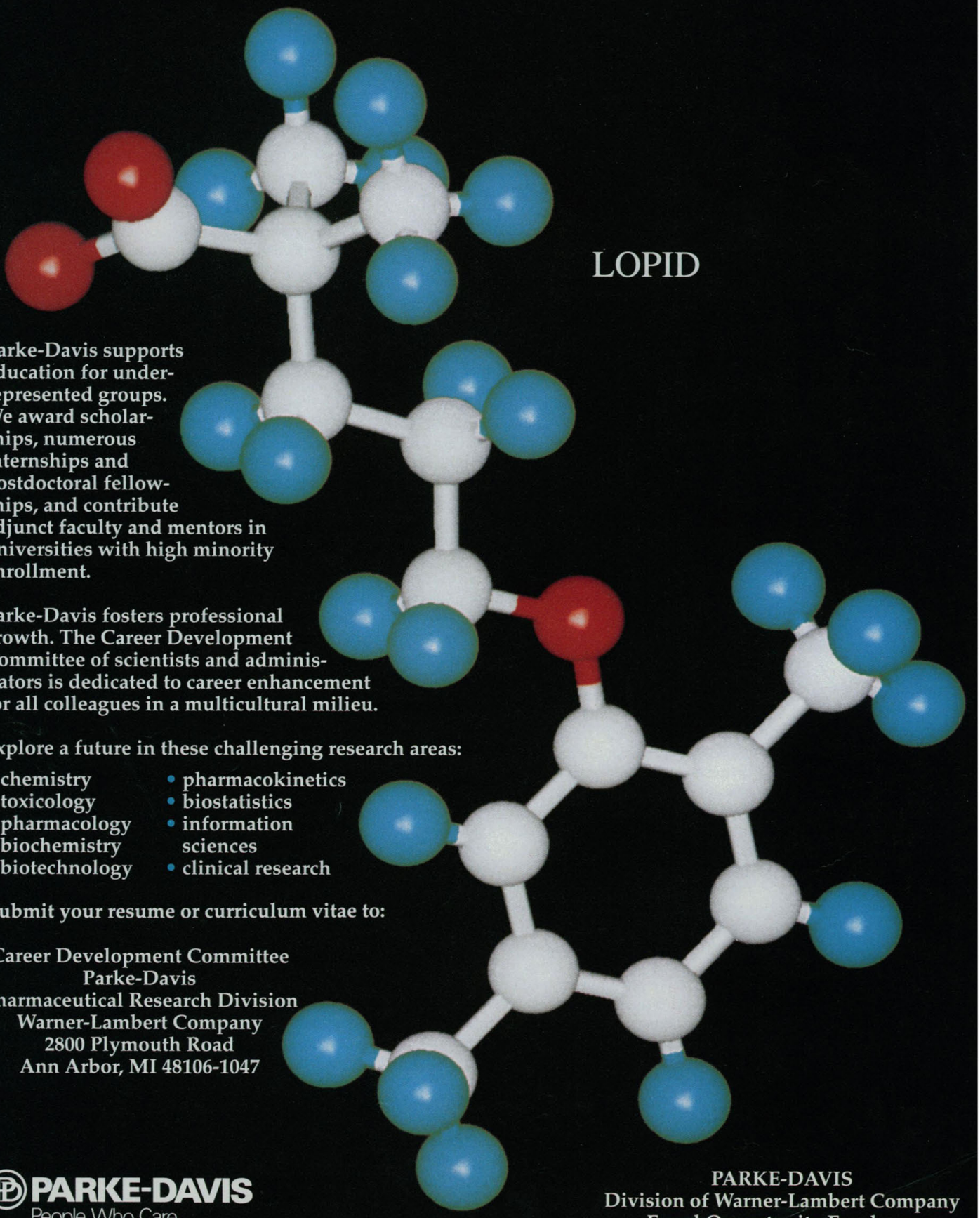

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The following descriptions are provided to introduce the various educational opportunities available at the National Institutes of Health.

Laboratory Research Postdoctoral Training

Postdoctoral opportunities are available in a variety of disciplines in the basic biomedical sciences at the NIH. Candidates should have 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.

A catalog featuring descriptions of NIH research laboratories and other postdoctoral opportunities is available through the NIH Office of Education. Current postdoctoral openings may be accessed through 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.

In addition, individuals interested in pursuing research training through the Clinical Investigator Pathway of the American Board of Internal Medicine may contact the NIH Office of Education for additional information.

Subspecialty and Clinical Research Training

Subspecialty training at the NIH allows physicians to become board-certified specialists who are also prepared for careers in academic medicine. In-depth training in clinical and or basic research complements the fellow's clinical training and all 18 programs are accredited by the Accreditation Council on Graduate Medical Education or by boards in their respective disciplines. Programs include: Allergy and Immunology, Anatomic Pathology, Critical Care Medicine, Dermatology (third year), Endocrinology and Metabolism, Gastroenterology, Hematology, Infectious Diseases, Medical Genetics, Medical Oncology, Nuclear Medicine, Oral Medicine, Pediatric Endocrinology, Psychiatry (fourth year), Radiation Oncology, Reproductive Endocrinology, Rheumatology, and Transfusion Medicine. Programs in Pulmonary Diseases, Pediatric Hematology/Oncology, Clinical Chemistry, and Clinical Microbiology offer credit toward board certification on an individual basis.

Re-Entry Postdoctoral Training

A new program is being developed at the NIH to assist individuals with terminal degrees (e.g., MD, PhD, MD/PhD, DDS, DMD, etc.) who have had to delay or postpone their research career because of family responsibilities. Research training, workshops, for-

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To Training on Of Scientists And esearchers.

mal course work, and mentoring will be provided to assist participants in their retraining and eventual re-entry into a research career. Plans are to appoint the initial class in the fall of 1993 or 1994, and inquiries concerning this program are welcome.

Graduate Program in Genetics

Students interested in doctoral training in genetics are encouraged to consider the NIH-George Washington University (GWU) Graduate Genetics Program. NIH and GWU faculty will provide didactic instruction at GWU, and dissertation research will be conducted in NIH laboratories. Full tuition and stipend support is provided.

Medical and Dental Student Programs

The Summer Research Fellowship Program provides 8 to 10 weeks of basic research training for students in the summer following their first or second year. In addition, nineteen different Clinical Electives are available for third and fourth year students, providing clinical and clinical research experiences unduplicated elsewhere.

Undergraduate Student Programs

Students can participate in state-of-the-art biomedical research through either the Summer Internship Program or the fall Research Semester for Undergraduate Students in the Biomedical Sciences. In addition, juniors or seniors who are preparing for careers as secondary science teachers may participate in the Pre-Service Teacher Program to gain experience in biomedical research, the use of new technologies, and the teaching of bioethical issues.

College and University Faculty Programs

To help improve the opportunities available to groups underrepresented in the biomedical sciences, plans for a summer institute are under development for faculty from women's colleges and two- and four-year institutions with a significant minority enrollment. Faculty will be able to enhance their personal scientific development as well as gain assistance in updating their courses in molecular and cellular biology.

Secondary School Teacher Programs

Several summer programs provide opportunities for teachers to participate in laboratory research, including an In-Service Program which offers an in-depth course in molecular biology before the research experience begins and training in the teaching of bioethics and use of electronic databases.

To find out how the NIH can play a role in your research training, please contact the NIH Office of Education for information on any of these programs.

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Now, we're looking for individuals who know that doing good for others can be good for the bottom line. As a Fortune 100 leader in the development and manufacture of pharmaceuticals, diagnostics, chemical and agricultural products, hospital products, and medical and infant nutritionals, we can offer you virtually unlimited opportunity for professional growth.

So if you can show us a strong record of achievement, and would like to use your experience to make a difference in the way people live, we should be talking.

Write to: Manager—Corporate Staffing, Dept. 393, Ad SCI/MIN, Abbott Laboratories, One Abbott Park Rd., Abbott Park, IL 60064.

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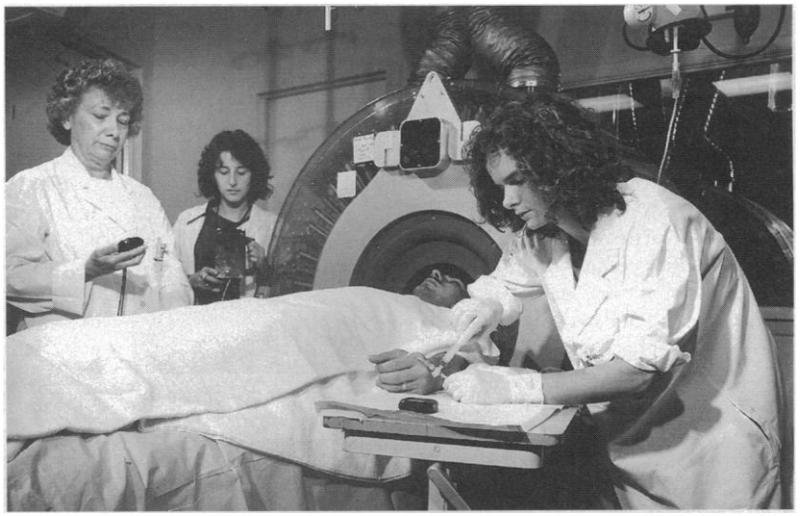
BROOKHAVEN NATIONAL LABORATORY: WORLD-CLASS SCIENTISTS. WORLD-CLASS SCIENCE.

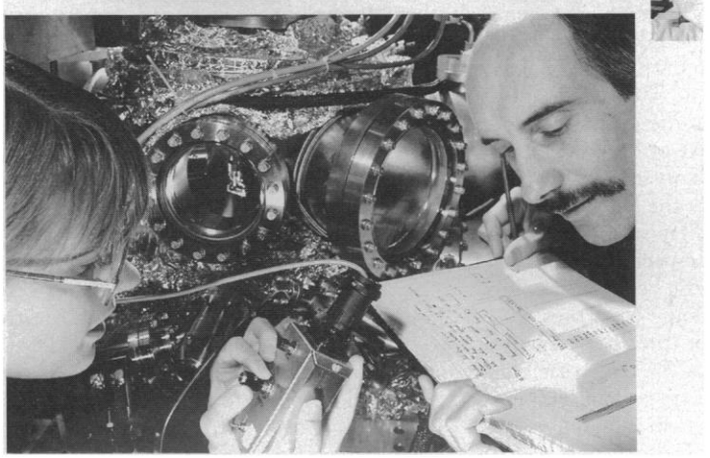
At Brookhaven National Laboratory, you will have the opportunity to conduct research with many of the world's leading scientists. You will have the benefit of leading-edge research facilities. And you will find yourself in an exciting multidisciplinary environment where the excitement of science is nurtured and recognized.

Among our advanced research facilities are the National Synchrotron Light Source, the world's best source of synchrotron light; the Alternating Gradient Synchrotron, a leading and versatile accelerator; the Scanning Transmission Electron Microscope, one of only three high-resolution microscopes in the world capable of imaging single heavy atoms; and the Relativistic Heavy Ion Collider, a soon-to-be-completed world-class particle accelerator.

For dedicated individuals with a PhD, MS or BS in Physics, Chemistry, Biology, Materials Science, Environmental Science or Computer Science, Brookhaven offers a truly collaborative atmosphere, filled with challenge and excitement. Our salaries and benefits are competitive and ancillary amenities include a state-of-the-art child development center, and numerous recreation facilities. Brookhaven is set on 5200 wooded acres, 75 miles from New York City. The State University of New York at Stony Brook is in the vicinity, creating the opportunity for professional and cultural interactions.

If you're ready to give your best, working with the best, please call our JOBLINE at (516) 282-7744 or send your resume to: Brookhaven National Laboratory, Associated Universities, Inc., Personnel Division, Bldg. 185, Upton, Long Island, NY 11973. Equal Opportunity Employer M/F/D/V.





BROOKHAVEN
NATIONAL LABORATORY
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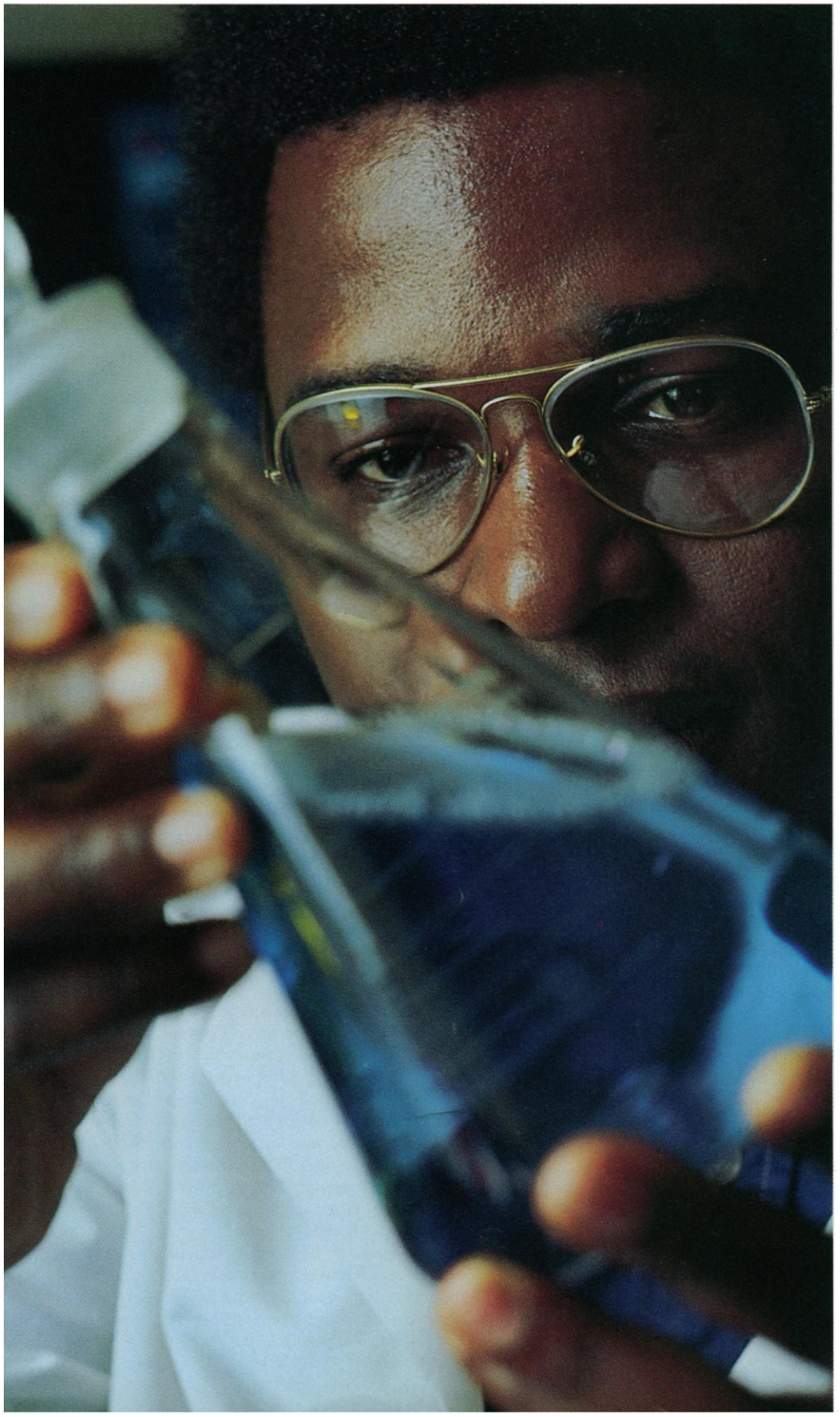
Our interdisciplinary team environment attracts the finest talent to Hoffmann-La Roche.



Hoffmann-La Roche has been a respected worldwide pharmaceutical leader for nearly a century. Our renowned accomplishments in basic and applied research have produced results that have improved the quality of life globally.

Our current pursuit of innovative therapeutic approaches keeps us focused on tomorrow's solutions to cancer, metabolic, bronchopulmonary, autoimmune and inflammatory diseases.

We attribute much of what we have already achieved to our staff of talented professionals who thrive in a stimulating and intellectual interdisciplinary environment. The freedom of inquiry, the diversity of backgrounds, and the vast resources available at Hoffmann-La Roche will continue to attract highly skilled individuals.

If you have a BS, MS or Ph.D, we invite you to explore the possibilities open to you in:

- **Analytical Chemistry**
- **Biochemistry**
- **Cell Biology**
- **Chemical/Biochemical Engineering**
- **Microbiology**
- **Molecular Biology**
- **Organic Chemistry**
- **Pharmaceutics**
- **Pharmacokinetics**
- **Pharmacy**
- **Protein Chemistry**

Send a letter stating scientific interest with a detailed resume to: Staffing Department SMC, Hoffmann-La Roche Inc., Nutley, New Jersey 07110-1199. We are an equal opportunity employer.

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At first glance, Groton, Connecticut seems like most New England coastal towns—picturesque, tree-lined streets and quiet residential neighborhoods. But this peaceful community is also home to one of the world's most powerful forces in healthcare, Pfizer Inc, Central Research Division.

In our unique campus-like setting, scientists gather from a wide range of fields and interests. All linked by one shared goal: to discover therapies that will extend and improve the quality of life for millions of people worldwide. The quality of their response—as measured by the vitality of Pfizer's drug pipeline and the solid successes of new products such as Zoloft and Zithromax—has made us one of the largest and most respected pharmaceutical companies on the globe.

For professionals with a BS, MS or PhD in Chemistry, Biology, Computer Science, Pharmacy, Animal Science or other health-related discipline, there is no better foundation for your future achievement...no greater support structure and resource. This is where you can engage today's most critical healthcare challenges with unmatched personal and professional satisfaction.

Pfizer offers outstanding compensation and benefits including a progressive daycare center, 401k plan and much more. For prompt consideration please send your resume to: **Dr. Ken R. Harewood, Manager, Pfizer Inc, Central Research Division, Groton, CT 06340.** An equal opportunity employer.

Pfizer

Central Research
Bringing science to life.

MEMORIAL SLOAN-KETTERING CANCER CENTER

The Memorial Sloan-Kettering Cancer Center offers postdoctoral training fellowships in basic laboratory and clinical research. Stipends provided are based upon level of postdoctoral experience. For additional information write to program directors listed below.

CLINICAL SCHOLARS TRAINING PROGRAM IN BIOMEDICAL RESEARCH

Richard A. Rifkind, MD - Director

This two-year postdoctoral fellowship program provides training for a select group of physicians who have completed their clinical training and demonstrate a commitment to careers in biomedical research. Training opportunities are available in the research programs of: molecular biology, cell biology and genetics, cellular biochemistry and biophysics, immunology and molecular pharmacology and therapeutics.

SURGICAL ONCOLOGY RESEARCH TRAINING PROGRAM

Murray F. Brennan, MD - Director

The program seeks to strengthen academic surgical oncology research by training surgical fellows in laboratory research related to biology of human cancer. Research opportunities include areas such as metabolism, neurophysiology, molecular biology, cell biology, immunology, immunopathology and genetics.

PSYCHIATRIC AND PSYCHOLOGICAL RESEARCH TRAINING IN AIDS

Jimmie Holland, MD - Director

This training program seeks to address the urgent need to recruit and train more investigators to conduct research on the mental health aspects of the AIDS epidemic. The program draws upon a faculty involved in investigations of psychiatric, neuropsychological, and behavioral aspects of AIDS/HIV infection in diverse populations (gay men, women, intravenous drug users and minority group members). The methods used to train new investigators include didactic seminars, apprenticeship with experienced investigators, and supervised conduct of independent research.

PSYCHIATRIC AND PAIN RESEARCH TRAINING IN CANCER

Jimmie Holland, MD - Director

This training program seeks to address the urgent need for a cadre of investigators with expertise in the supportive care areas of pain, psychological distress, supportive/palliative care, psychoneuro-immunology and behavioral medicine. The training program is open to psychologists and physicians with training in psychiatry, neurology, medicine and oncology. Its world reknown faculty is involved in research of the psychiatric, neuropsychological, behavioral, neuroimmunological and pain related (clinical and laboratory) aspects of patients with cancer. The curriculum to train these clinical investigators includes didactic seminars, apprenticeship with experienced clinical investigators in pain, psychiatry, psychology and neurology and closely supervised conduct of independent research.

GASTROINTESTINAL ONCOLOGY RESEARCH

Sidney J. Winawer, MD - Director

The program offers opportunities for basic and applied research in Gastrointestinal Cancer. A number of interrelated groups are working on collaborative efforts and jointly participate. This affords the trainees an excellent opportunity to study a wide spectrum of biological, cytogenetic, immunological and pharmacological approaches to gastrointestinal cancer in its etiology.

CANCER CHEMOTHERAPY TRAINING PROGRAM

John Mendelsohn, MD and George Bosl, MD - Co-Directors

The Oncology/Hematology Fellowship Program provides qualified physicians with comprehensive clinical training necessary for certification in Internal Medical subspecialties of Oncology and Hematology and research training designed to prepare the trainee for an academic research career. Through the Cancer Chemotherapy Training Program, clinical and laboratory scientists from Memorial Hospital and the Sloan-Kettering Institute provide opportunities in and supervision of basic and applied research training in gene expression, growth factor modulation, differentiation, drug resistance, gene transfer, and clinical trials methodology after the completion of clinical training.

IMMUNOLOGY RESEARCH TRAINING PROGRAM

Kenneth O. Lloyd, PhD - Director

The program offers training in areas of modern immunology. These include human and mouse immunogenetics, function and mechanism of action of T lymphocytes, biology of B lymphocytes, and molecular control of HLA antigen genes. Two labs are interested in T cell development and selection in the thymus and in the peripheral circulation. The Program also has strong efforts in tumor immunology. The emphasis in these labs is on an analysis of the immune response in tumor cancer antigens, the production of human and mouse monoclonal antibodies to tumor antigens and the clinical application of these antibodies.

HEAD AND NECK TRAINING PROGRAM - SURGICAL ONCOLOGY

Stimson P. Schantz, MD - Director

This is a two year program with dedicated clinical and research training opportunities in head and neck oncology. A specific focus will be placed on cancer prevention and detection strategy for tobacco-induced cancer.

ENDOCRINE AND METABOLIC RESEARCH TRAINING PROGRAM

Martin Sonenberg, MD, PhD - Director

The objective of the Endocrine Research Training Program is to develop research physicians and scientists who will contribute to an understanding and management of endocrine and metabolic diseases. We are integrating the training programs of 17 faculty members of 4 neighboring institutions, Memorial Sloan-Kettering Cancer Center, The Rockefeller University, the New York Hospital-Cornell Medical Center and The Population Council. Areas of research include: mechanism of hormone action, hormonal control of growth and differentiation, regulation of testicular function, neuroendocrine control of neural gene expression, control of membrane channel function, biochemical genetics and metabolism of atherosclerosis, hormonal control of bone metabolism, anti-receptor antibodies in cancer treatment.

MSKCC is committed to equal opportunity through affirmative action and therefore, members of minority groups are encouraged to apply.

Memorial Sloan-Kettering Cancer Center
1275 York Avenue
New York, NY 10021

Outstanding science is our culture.

At Genentech, we believe that providing an environment where outstanding science leads to solving problems and discovering new, often unexpected, opportunities is the most important element of the Genentech culture.

We're proud of the reputation we have built for the quality, commitment and diversity of our research efforts as well as for our business success. Our commitment to science starts with finding the top talent in many fields of biological science, and continues with an R&D expenditure of more than 50% of our annual revenues. Under the company's liberal publication policy, scientists are encouraged to publish their work. Our scientists publish over 220 papers per year, significantly more than any other biotechnology company.

We are interested in hiring outstanding people who share our commitment to science. If this describes you, please forward your resume to Human Resources Dept. LT, 460 Point San Bruno Blvd., South San Francisco, CA 94080. We promote and actively support affirmative action and equal opportunity employment.

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SCIENCE

AT THE

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MUSEUMS AND RESEARCH ORGANIZATIONS

In Washington, D.C.:
National Air and Space Museum
National Museum of American History
National Museum of Natural History
National Zoological Park
In Edgewater, Maryland:
Smithsonian Environmental Research Center
In Suitland, Maryland:
Conservation Analytical Laboratory
In Cambridge, Massachusetts:
Smithsonian Astrophysical Observatory
In the Republic of Panama:
Smithsonian Tropical Research Institute

FIELDS OF RESEARCH

ANTHROPOLOGY - physical anthropology, and archaeology
ASTROPHYSICS AND ASTRONOMY
BIOLOGICAL SCIENCES - animal behavior, ecology, evolutionary and systematic biology, marine biology, natural history, population biology, veterinary research, including an emphasis on the tropics
EARTH SCIENCES - meteoritics, mineralogy, paleobiology, petrology, planetary geology, sedimentology, and volcanology
HISTORY OF SCIENCE AND TECHNOLOGY
MATERIALS ANALYSIS - conservation science, and archaeometry

OFFICE OF FELLOWSHIPS AND GRANTS
SMITHSONIAN FELLOWSHIPS IN-RESIDENCE

The Smithsonian Institution encourages access to its collections, staff specialties, and reference resources by visiting scholars, scientists, and students. The Institution offers in-residence appointments for research and study using its facilities, with the advice and guidance of its staff members.

Senior Postdoctoral Fellowships are available to scholars who have held the degree for more than seven years. The term is 3 to 12 months. The deadline is January 15, annually.

Postdoctoral Fellowships are available to scholars who have held the degree for less than seven years. The term is 6 to 12 months. The deadline is January 15, annually.

Predoctoral Fellowships are available to doctoral candidates who have completed preliminary course work and examinations and are engaged in dissertation research. The term is 6 to 12 months. The deadline is January 15, annually.

Graduate Student Fellowships are available to students actively engaged in graduate study at the Masters or Ph.D. level. The term is 10 weeks. The deadline is January 15, annually.

Faculty Fellowships are available to U.S. minority faculty members. The term is 2 to 4 months. The deadline is February 15, annually.

OFG Internships are available for U.S. minority undergraduate and graduate students to participate in ongoing research or museum-related activities for periods of 9 to 12 weeks. The deadlines are Feb. 15 (summer term), June 15 (fall term), and Oct. 15 (spring term), annually.

For more information about these and other programs and/or application materials please contact:

Office of Fellowships and Grants
Desk R
Smithsonian Institution
Washington, D.C. 20560
(202) 287-3271

Senior Environmental Scientists - Applied Ecosystems Research

The South Florida Water Management District is a 16-county regional agency responsible for the management of water resources in the most urbanized area of Florida. The agency has direct responsibility for environmental research and management for the Kissimmee River, Lake Okeechobee and over 1 million acres of Everglades. With a staff of more than 1,500 and a budget exceeding $200 million, our agency addresses issues involving environmental protection/enhancement, water supply, flood control and water quality protection. At the District, applied ecosystems research is the foundation for sound resource management decision making. We are seeking experienced individuals with solid scientific credentials for the following positions:

Senior Environmental Scientist - Water Modeler

The Everglades Systems Research Division of the District has recently embarked on a program for developing an interdisciplinary system of models which is capable of simulating the movement of water, fate and transport of chemical constituents and the ecological response to changes in the management of the extensive system of canals, fresh water wetlands, and other water bodies. To participate in this effort, we seek a highly skilled and highly motivated professional whose experience and research interests are in the areas of hydrodynamics and linked water quantity-quality modeling in riverine and fresh water wetland systems. The ideal candidate will have experience in modeling water and constituent transport in the aquatic systems and an understanding of the biogeochemical processes and their relationship to the environmental response resulting from changes in the water management. Minimum requirements for this position are a M.S. degree and four years of related professional experience, but a Ph.D. with at least 4 years of experience is preferred. Qualified individuals with advanced degrees in civil or environmental engineering, wetlands ecology, environmental chemistry are encouraged to apply. Experience in developing water quantity/quality models in Unix workstation or any other environment is highly desirable.

For this position only, please contact Dr. Jayantha Obeysekera, Supervising Professional Civil Engineer, Everglades Systems Research Division, at 407-687-6551 or send resume to address below.

Senior Environmental Scientist - Applied Marine Ecologist

Prefer Ph.D. in marine biology, ecology or related field and at least four years of laboratory and field experience or M.S. and seven years of experience. Candidate must have an outstanding research publications record. The successful candidate will conduct laboratory and field studies to characterize, understand, and predict the responses of the Florida Bay ecosystem to various natural and anthropogenic stresses, including freshwater intrusion and eutrophication. Particular emphasis will be placed on sea grass ecophysiology, nutrient biogeochemical dynamics, and definition of conditions that preserve natural system dynamics. Teamwork with other senior scientists from diverse disciplines is required. Supervision of research technicians and management of research contracts may be required. Advanced knowledge of aquatic chemistry and statistics and strong oral and written technical communications skills are required. Knowledge of systems ecology and simulation modeling is highly desirable. Skill with standard word processing, spreadsheet, data base, and statistical analysis software packages is assumed.

Senior Environmental Scientist- Applied Microbial Ecologist/Phycologist

Prefer Ph.D. in microbiology, limnology, ecology or related field and at least four years of laboratory and field experience or M.S. and seven years of experience. Candidate must have an outstanding research publications record. Will conduct laboratory and field studies to characterize the responses of microbial/algal communities to natural and anthropogenic nutrient and hydroperiod stresses in natural and constructed wetlands. Particular emphasis will be placed on microbially-mediated nutrient biogeochemical dynamics and the responses of algal communities to various nutrient and hydroperiod stresses. Teamwork with other senior scientists from diverse disciplines is required. Supervision of research technicians and management of research contracts may be required. Advanced knowledge of aquatic chemistry and statistics and strong oral and written technical communications skills are required. A knowledge of systems ecology and simulation modeling is highly desirable. Skill with standard word processing, spreadsheet, data base, and statistical analysis software packages is assumed.

For two positions described above, contact Larry Fink, Supervising Professional-Environmental Scientist, Everglades Systems Research Division, 407-687-6749 or send resume to address below.

Senior Environmental Scientist - Ecological/Landscape Modeler

Position requires demonstrated experience in the development and application of regional and unit ecological simulation models. Preferred qualification is a Ph.D. with at least four years of experience in ecological/landscape modeling. Experience with STELLA-based ecological models is highly desirable. Candidate will develop state-of-the-art ecological and landscape models to simulate physical, chemical and biological processes in freshwater wetlands ecosystems. Knowledge of wetlands hydrology, nutrient biogeochemical dynamics, macrophyte growth, peat accumulation and oxidation, fire propagation and effects is required. Teamwork with other senior scientists from diverse disciplines is required.

For this position only, please contact Dr. Fred Sklar, Supervising Professional Environmental Scientist, Everglades Systems Research Division at 407-687-6604 or send resume to address below.

Technical support positions are also available.

The District offers a highly progressive professional environment with a team approach to solving complex environmental problems. In addition to competitive compensation, excellent benefits and the opportunity for continuing professional development, our employees enjoy the many benefits of South Florida living with a sub-tropical climate, exceptional year round recreational opportunities and favorable tax advantages. If unable to contact the individuals named above, please send resume, including social security number and desired position to: Ms. Linda Starr, Human Resources Division, Re: S/1192/SES, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, Florida 33416-4680. We are an equal opportunity employer M/F/D/V and a drug-free, smoke-free workplace.

South Florida Water Management District

When we talk about the environment, we mean business.

We Have The Chance To Make A Real Difference.

"As a Senior Scientist, I am able to present myself as a successful individual who can serve as a mentor to young minorities in deciding to enter the scientific area. Through Johnson & Johnson's support of Project 2000, we're encouraged to work with inner-city children to help instill a positive attitude towards school and academic achievement. By providing support on every level, RWJPRI has made my job very rewarding."

Kwasi Ohemeng
Senior Scientist
Medicinal Chemistry

"I was attracted to RWJPRI because of its reputation for reaching out to women and minorities, and its commitment to diversity in the workforce. The company supports my participation in Math Options, a special program at Penn State to interest minority students in careers in Math and Science, provides financial support of future minority candidates, and backs my efforts to recruit top minority students. Here, the contributions that cultural differences produce are recognized and valued. This supportive environment and feeling of mutual respect and appreciation make RWJPRI a great company to be a part of."

Ceile Hedberg
Director of
Laboratory Animal Medicine

Both Dr. Ohemeng and Dr. Hedberg continue to make a real difference through their efforts both personally and professionally.

The R.W. Johnson Pharmaceutical Research Institute (RWJPRI) is a worldwide research and development organization within Johnson & Johnson. RWJPRI performs R&D activities for the Johnson & Johnson pharmaceutical companies ... Cilag, McNeil Pharmaceutical, Ortho Pharmaceutical and Ortho Biotech. We're continually seeking candidates who can make a real difference in the following fields: pharmacy, biology, biochemistry, toxicology, immunology, chemistry, microbiology, biochemical engineering, pharmacology, pathology, statistics, nursing and medicine. Please send your resume to: HR Dept. SC 1192, R.W. Johnson Pharmaceutical Research Institute, P.O. Box 300, Raritan, NJ 08869-0602. An Equal Opportunity Employer, M/F/D/V

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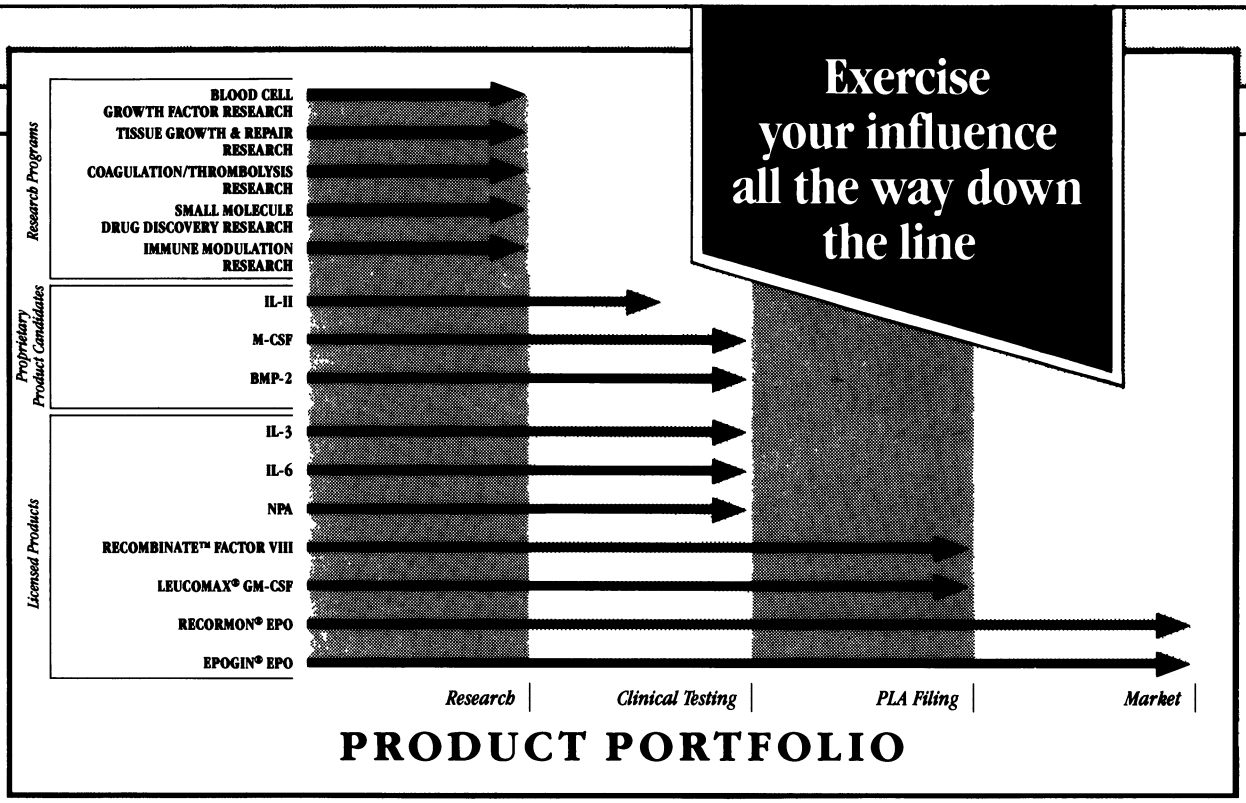


At Genetics Institute, the largest biotechnology employer in Massachusetts, each member of our team contributes to our progress, and has an opportunity to participate in our growth and success. Our commitment to discovering, developing and commercializing innovative pharmaceutical products to meet important medical needs drives our business, and creates a dynamic and progressive work environment.

Currently, we are interested in relocating individuals who are prepared to influence our products from inception through commercial development. An established and growing biopharmaceutical company with an outstanding reputation and excellent resources, Genetics Institute has an enviable track record in new drug discoveries. Three promising product candidates, to which we have kept key U.S. marketing rights, are now in active development. These include: a bone-growth factor now being evaluated for orthopedic healing; a platelet stimulator in evaluation as an adjunctive therapy in cancer treatment; and a white blood cell factor with a broad range of potential applications. Our earliest products are now on or approaching the market via licensees. These include EPO, GM-CSF, Factor VIII, IL-3, IL-6 and NPA. Fueling the pipeline are R&D programs addressing blood cell growth and differentiation, coagulation, tissue growth and repair, immune modulation, and small molecule drug discovery, among others.

At Genetics Institute, you will be at the forefront of Massachusetts' well-established biotechnology community, which boasts more than 100 companies, four state centers supporting the sciences, numerous undergraduate and graduate research institutions, including MIT and Harvard, and one of the world's leading medical research centers. You'll have the opportunity to enjoy the lifestyle and numerous resources of New England while participating in one of the most highly respected research and development organizations in the world.

The Genetics Institute team has grown to over 700 people in four facilities: a corporate headquarters and main discovery research facility in Cambridge, Massachusetts; a small molecule discovery research center, also in Cambridge; a product development and manufacturing facility in Andover, Massachusetts; and an office in Tokyo, Japan. Current opportunities exist in Andover, just a 30-minute drive from Boston, and in Cambridge, across the Charles River from Boston.

Due to our expansion, we seek to fill over 100 positions. Individuals with BS, MS or PhD degrees are invited to explore opportunities in the following areas.

■ Pre-Clinical Biology/ Clinical Development

Opportunities in our Pre-Clinical group include: Hematology/ Immunology, Pharmacology, Cellular/In-vivo Models, Pharmacokinetics/ Toxicology, Pre-Clinical Monitoring and Biostatistics.

■ Discovery Research & Development

Positions in Discovery Research include: Protein Chemistry, Hematopoiesis, Hard & Soft Tissue Repair, Cellular Immunology, Mammalian Cell Culture, Mass Spectrometry, Immunochemistry, Cellular Adhesion, Protein Chemistry/Immunology and Protein Biochemistry/Micro-sequencing.

■ Pharmaceutical Sciences

Work within our Pharmaceutical Sciences group in Drug Delivery Development, Pharmaceutical Analysis, Fill & Finish Product Development, or Protein Formulation Development.

■ Chemistry

Apply your chemistry experience in one of the following groups: Chemical Engineering, Analytical Chemistry or Carbohydrate Chemistry.

■ Postdoctoral Fellowships

Applicants are being accepted for postdoctoral fellowships in all of the preceding areas.

In addition to a stimulating and collaborative work environment with opportunities for career advancement, Genetics Institute provides competitive salaries and extensive benefits. These include a comprehensive and flexible relocation package, your choice of healthcare plans, three weeks' paid vacation, 401(k) match, stock purchase and equity participation programs, on-site exercise facilities, and child care resource and referral.

■

Please forward your resume, specifying area of interest, to Genetics Institute, Inc., Human Resources, Dept. SCI, 87 CambridgePark Drive, Cambridge, MA 02140; fax, (617) 876-8847.

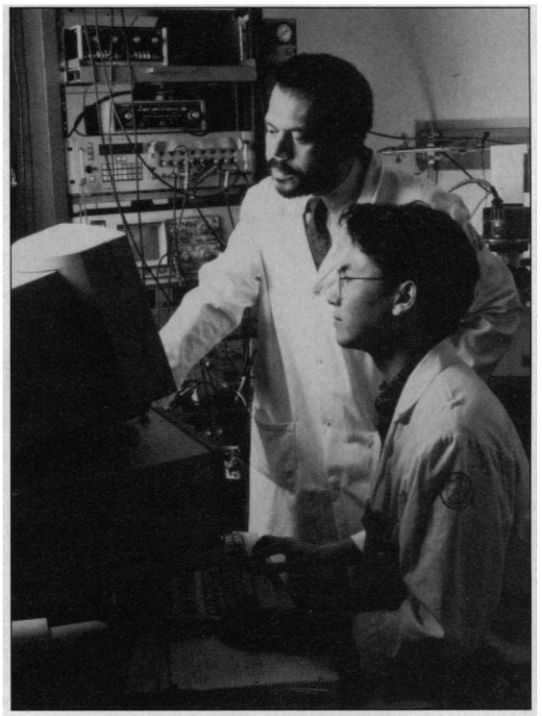
■

Genetics Institute is dedicated to building strength through diversity. We are an Affirmative Action Employer.

GENETICS INSTITUTE

Harnessing the body's power to heal™

The Tri-Institutional Program trains physician-scientists to investigate, as well as treat disease.



The Tri-Institutional MD-PhD program enables a select group of highly qualified students to combine medical training at Cornell University Medical College with the extraordinary biomedical research and educational opportunities available at the ***Cornell University Graduate School of Medical Sciences, The Rockefeller University,*** and the ***Sloan-Kettering Institute.***

Designed to address the growing need for individuals with the expertise to carry advances from the basic research laboratory to the clinic, The Tri-Institutional Program trains physician-scientists to investigate, as well as treat disease. The 6-7 year MD-PhD program prepares students for leadership roles in clinically oriented research and teaching. Research training is offered in the following areas: biochemistry, biophysics, cell biology, genetics, immunology, molecular biology, neurosciences, pharmacology, and physiology.

Because of the increasing diversity of the United States population, the national need for physician-investigators who are members of under-represented minority groups is acute. The Tri-Institutional MD-PhD Program is actively seeking to increase applications from under-represented minority students.

For further information, please contact:
Tri-Institutional MD-PhD Program
Cornell University Medical College
1300 York Avenue
New York, NY 10021

Telephone: (212) 746-6023

Note: Since this issue of *Science* appears after the deadline for application to the Medical College through AMCAS, if you wish to apply this year, please call immediately for special application arrangements.

WYETH-AYERST RESEARCH

Leading the way for a healthier world

Wyeth-Ayerst Laboratories is a division of Fortune 100 American Home Products Corporation, a leading manufacturer and marketer of health care products with multi-billion dollar annual sales and an impressive record of growth and profitability.

As a research-based pharmaceutical company, we are committed to helping people lead healthier lives through innovative pharmaceutical and nutritional products. It is from this commitment and position of strength that we move forward with a major expansion of our research and development activities.

At Wyeth-Ayerst, our commitment to tomorrow is evidenced in the products we develop, the research we pursue, the excellence we achieve.

Our continued success depends upon the talent of multi-disciplinary research teams made up of scientists like you...bringing to market pharmaceutical products that improve health and enhance the quality of life.

Join Wyeth-Ayerst Laboratories for an unparalleled opportunity for professional growth. We seek both entry-level and experienced candidates to staff key positions in drug discovery and development research at our three primary U.S. Research and Development facilities.

WYETH AYERST™

We're building on our success

We offer competitive salaries and professional opportunities as well as a full range of benefits.

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RADNOR, PENNSYLVANIA

Candidates with M.D., R.N., B.S./M.S. or Ph.D. degrees in appropriate disciplines are sought to staff key positions at our suburban Philadelphia location in Clinical Research, Clinical Development. Research Quality Assurance, Biostatistics and Clinical Data Management, Regulatory Affairs, Biotechnology/ Microbiology and Nutrition areas. Respond to Wyeth-Ayerst Research Personnel, P.O. Box 8299, Philadelphia, PA 19101.

ROUSES POINT, NEW YORK

This location on beautiful Lake Champlain invites candidates with B.S./M.S., or Ph.D. degrees in the appropriate scientific disciplines to inquire about our openings in Analytical Chemistry, Chemical Development, Pharmaceutical Sciences, Toxicology and Drug Safety. Respond to Wyeth-Ayerst Research Personnel, 64 Maple St., Rouses Point, NY 12979.

PRINCETON, NEW JERSEY

Candidates with B.S./M.S. or Ph.D.'s in the appropriate scientific discipline (Molecular Biology, Biology, Immunology, Pharmacology, Biochemistry, Organic Chemistry and Chemistry) are sought to staff positions in Analytical Chemistry, Cardiovascular-Metabolic Disorders, Central Nervous System Pharmacology, Drug Metabolism, Female Health/Bone Metabolism, Organic Chemistry and Inflammation/Allergy/Immunology. Respond to Employment Supervisor, Wyeth-Ayerst Research, CN 8000, Princeton, NJ 08543-8000.

At each of these sites, you will find the most advanced resources and the convenience of outstanding cultural, educational and leisure activities just minutes away.

We are proud to offer an excellent quality of work life.

Wyeth-Ayerst offers the ideal environment to spark your enthusiasm and challenge your ingenuity. In support of your research efforts, you will find responsible management and innovative colleagues, as well as state-of-the-art resources and equipment. The free-flow of scientific and technical knowledge is encouraged by frequent in-house seminars and Company-sponsored participation in conferences and worldwide symposia. Our research scientists are encouraged to establish their reputations by developing a strong record of publications.

Outstanding professional opportunities.

Company policies that support your professional growth include a job posting program, training activities and a benefits package that offers tuition reimbursement. Our Research & Development Career Ladders provide the structure to recognize education, skills and experience from the level of a recent college graduate to that of an experienced Ph.D. or M.D. research scientist who is a recognized authority in a particular field.

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INNOVATIVITY

...the word we use to describe the leading edge work going on at Battelle's Pacific Northwest Laboratories. Combining innovation and creativity, our Innovativity transforms unique ideas into useful technologies.

Our staff includes more than 4,000 scientists, engineers and support specialists who are solving problems of national importance. We value each of these staff members, whose unique talents and perspectives enrich our integrated work force at Battelle. Together, we are meeting tomorrow's technology needs and improving the quality of life in our communities and around the world.

Find out why Innovativity is your password to a future at Battelle's Pacific Northwest Laboratories. You may become a member of the diverse Battelle team by sending your resume to Battelle, Pacific Northwest Laboratories, Staffing Center, P.O. Box 999, Dept. 5017, Richland, WA 99352.

Battelle
Pacific Northwest Laboratories

MEHARRY MEDICAL COLLEGE

School of Graduate Studies and Research

Opens the Door to a Career of Research and Discovery

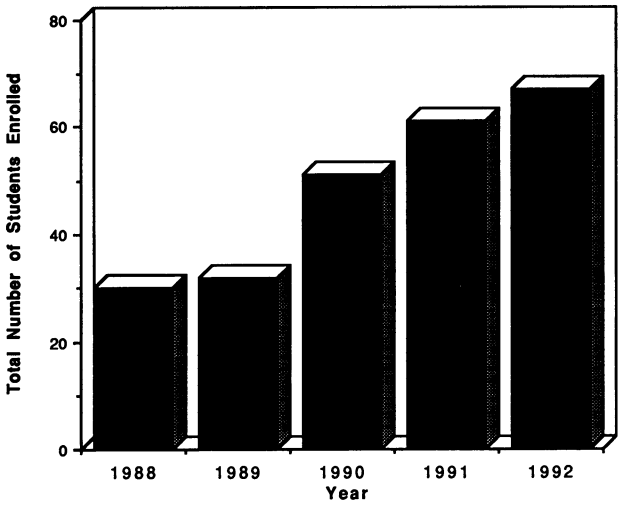
Graduate Program: Offers the Doctor of Philosophy Degree in biomedical sciences, molecular biology, biochemistry, microbiology, pharmacology or physiology. Postdoctoral training available in several areas.

Important facts about Meharry's Graduate School

- Since 1976 over 10% of all Biomedical Sciences Ph.D.'s awarded to African Americans in the U.S.A. were earned at Meharry
- Combined MD/Ph.D. Degree programs
- Active state of the art research laboratories
- Excellent student/teacher ratio allows for daily interaction
- Strong interdisciplinary research programs in tropical disease, sickle cell, neuroscience and membrane biology
- External research funding in excess of $12 million dollars
- Accredited by the Southern Association of Colleges and Schools
- Graduate fellowships available ($10,000–$15,000)
- Masters of Science in Public Health programs available
- Graduate students from more than 20 undergraduate institutions
- Graduates obtain postdoctoral positions in leading research institutions, (e.g., Harvard, Yale, NIH, Vanderbilt, Baylor)

For information contact:
George C. Hill, Ph.D.
Interim Dean, School of Graduate Studies and Research
1005 D. B. Todd Blvd.
Nashville, TN 37208
(615) 327-6193•1-800-835-2391
Fax (615) 321-4694

Total Enrollment in Meharry's Ph.D. Program



Research and Research-Related Funding
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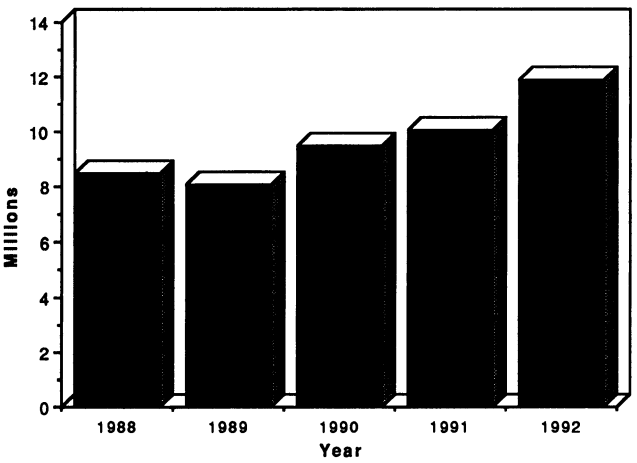

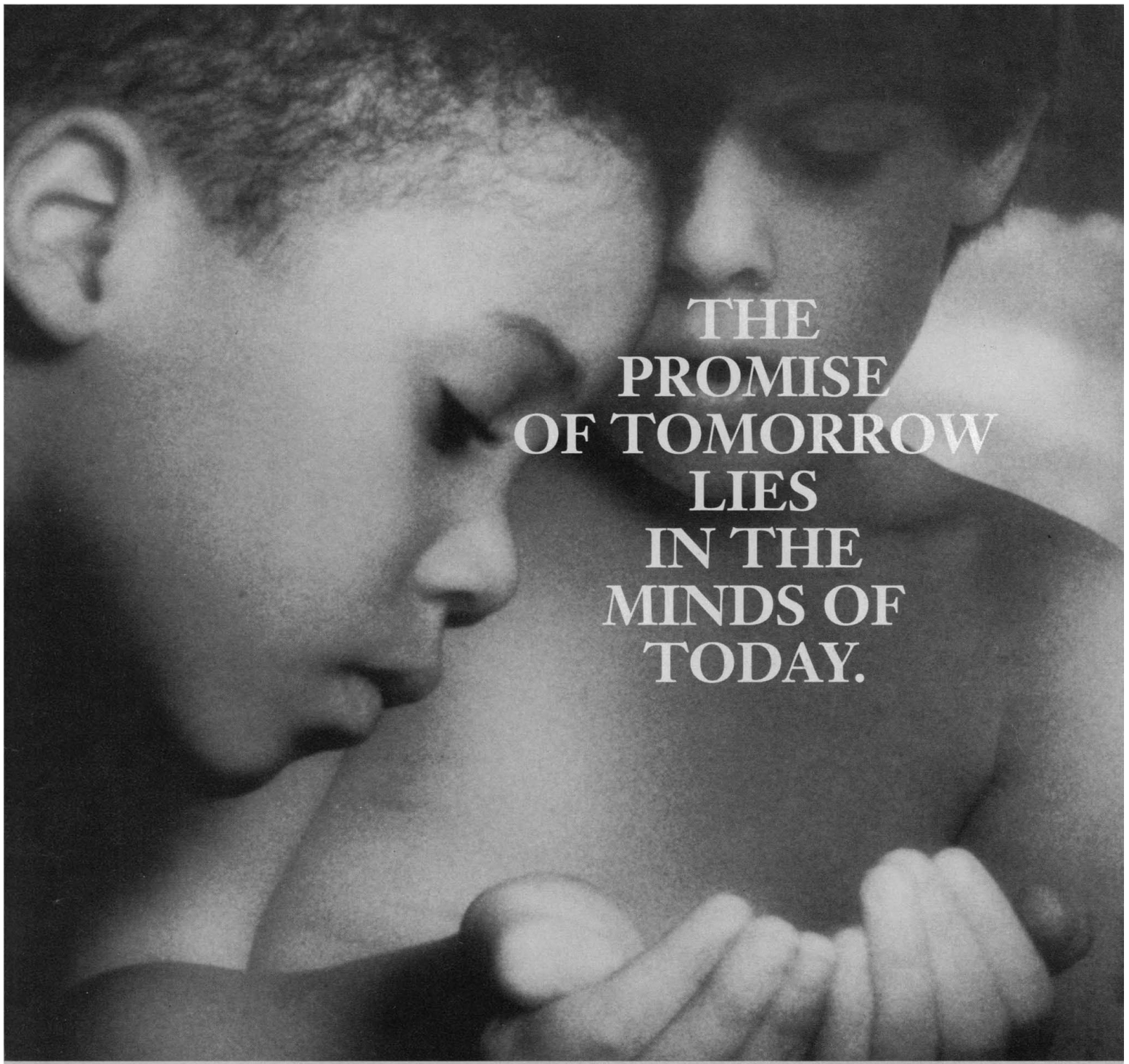

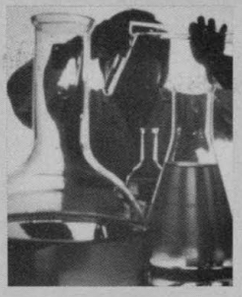

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Qualifications: Candidates for the Staff Fellowship Program must have completed all requirements for a doctoral degree (M.D., Ph.D., or equivalent degrees). Graduates of foreign medical schools must submit a copy of their permanent Educational Commission for Foreign Medical Graduates (ECFMG) certification. Candidates must be either U.S. citizens or resident aliens eligible for citizenship within four years.

Duration: Appointments are for an initial two-year period and may be extended up to a total of seven years.

Location: Laboratories are strategically located on the campus of the National Institutes of Health in Bethesda, Maryland, or in close proximity to the campus.

Salary: For the Staff Fellowship Program, the salary range for candidates with a doctoral degree (other than M.D.) is from $28,000 to $60,070. Salary range for candidates with a medical degree is from $28,000 to $70,850. Salary, research support, and level of responsibility are commensurate with education and experience.

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How To Apply: Candidates should send a current Curriculum Vitae, bibliography, and statement of research interest to:

FDA/Center for Biologics Evaluation and Research
Equal Employment Opportunity Office
8800 Rockville Pike, HFB-14
Bethesda, Maryland 20892
Attention: Ms. Theresa Phillips-SM

Applications are accepted throughout the year, and candidates should indicate when they will be available for employment. For further information, call (301) 295-8714.

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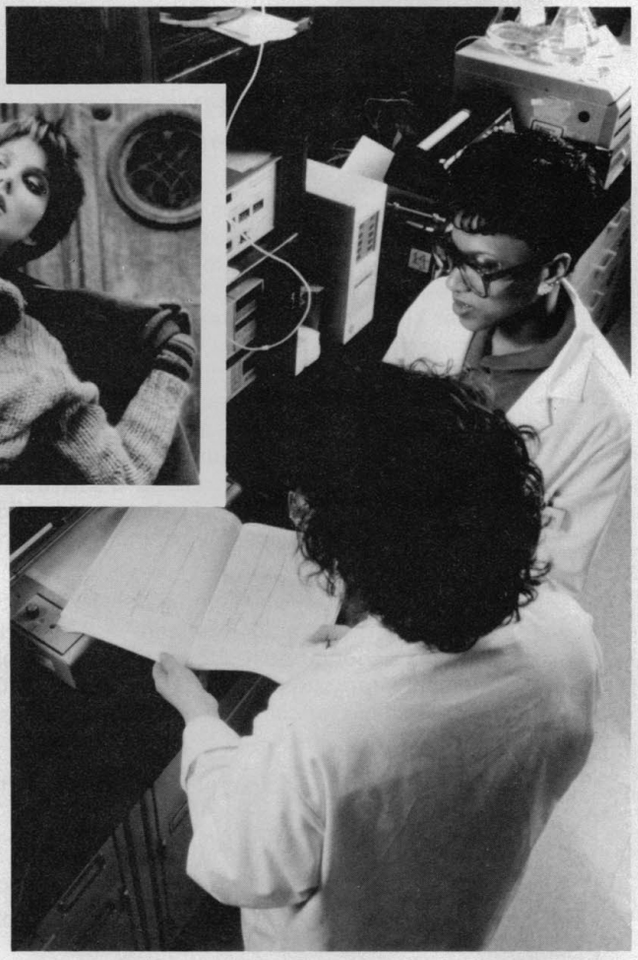

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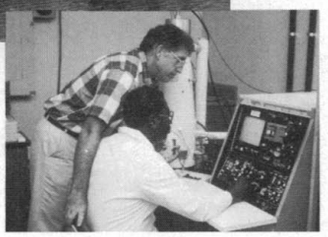

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NIEHS Personnel Office (HNV57)
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How important have minority-related issues been to your scientific career? _____
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What formal or informal organizations for minorities have been helpful to you?

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What experiences have you had that are relevant to minorities in science? (attach other sheets if necessary) _____
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Mail responses to: Ann Gibbons, *Science*, 1333 H St., N.W. Washington, D.C. 20005 or FAX to (202) 408-8015. (All responses will be kept confidential, with the possible exception of being included—without names—in surveys presented to the Board of the AAAS or to advertisers.)

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