

An abstract painting of a face, rendered in a style reminiscent of Vincent van Gogh's 'Olympionik' or similar expressionist portraits. The face is composed of thick, visible brushstrokes in a palette of reds, oranges, yellows, and blues. The background is a complex, textured mix of dark blues, purples, and reds, also created with expressive brushwork. The overall effect is one of intense emotion and dynamic energy.

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Minorities '93
**Trying to
Change the Face
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THE BIG BANDS

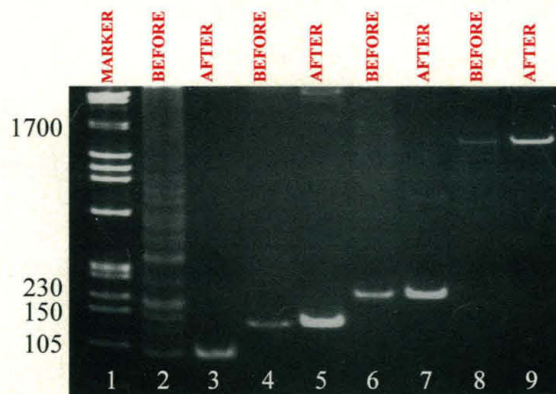
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PCR OPTIMIZATION



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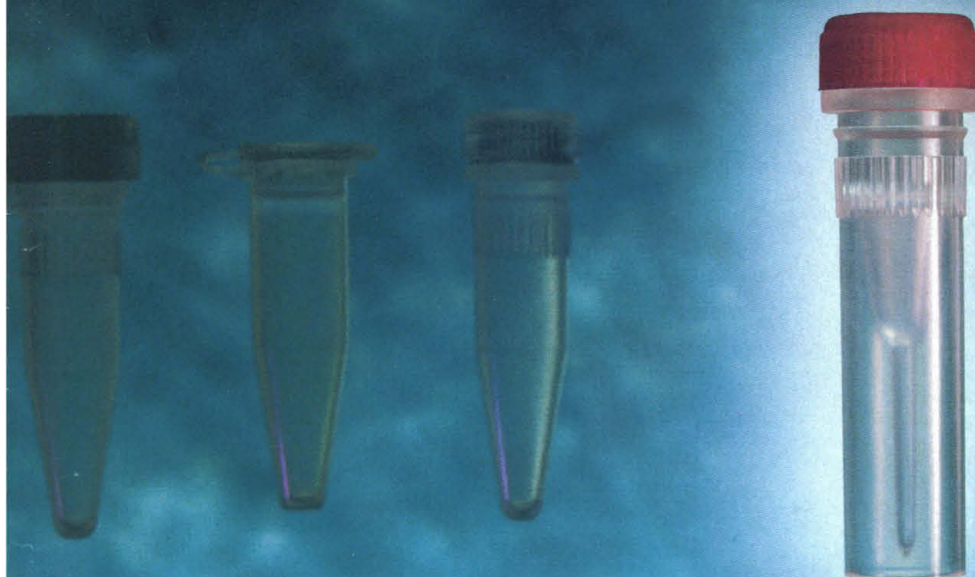
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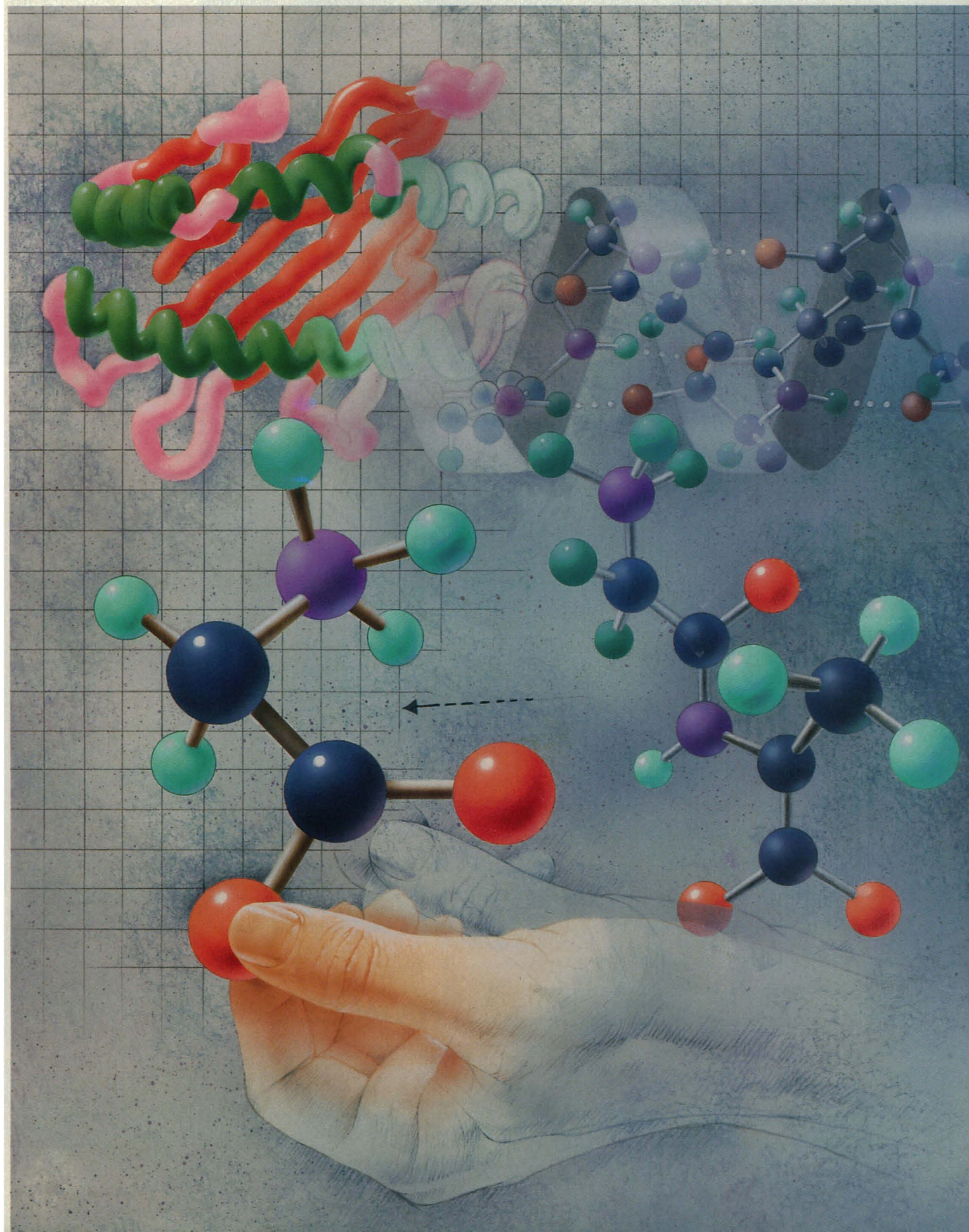
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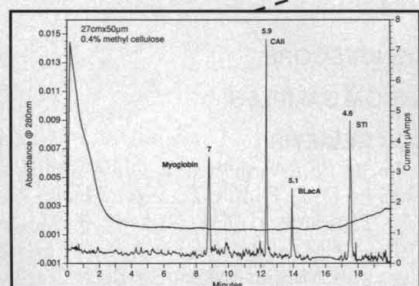
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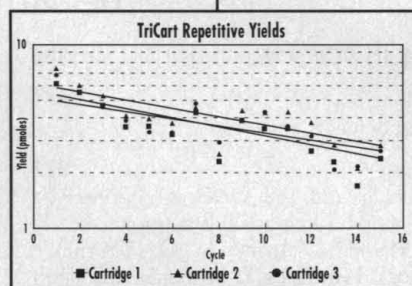
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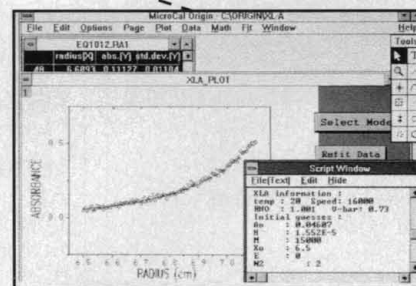
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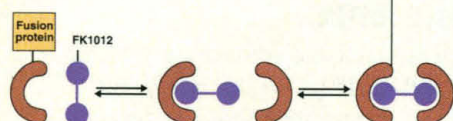
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COVER

Science presents a largely white face to the world. In this issue, a special news section beginning on page 1089 reviews attempts to add color to that face. By creating job opportunities in academia and industry, and by becoming scientific policy-makers, minority sci-

entists are making some inroads. But obstacles such as a lack of role models, economic hard times, and some cultural values held by both majority and minority groups are strewn across a far-from-finished canvas. [Painting: Camille Przewodek]

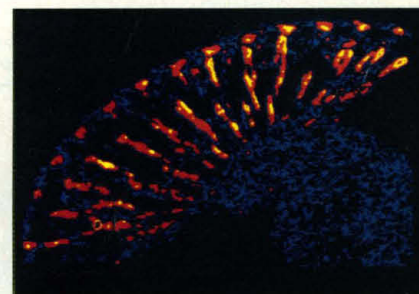


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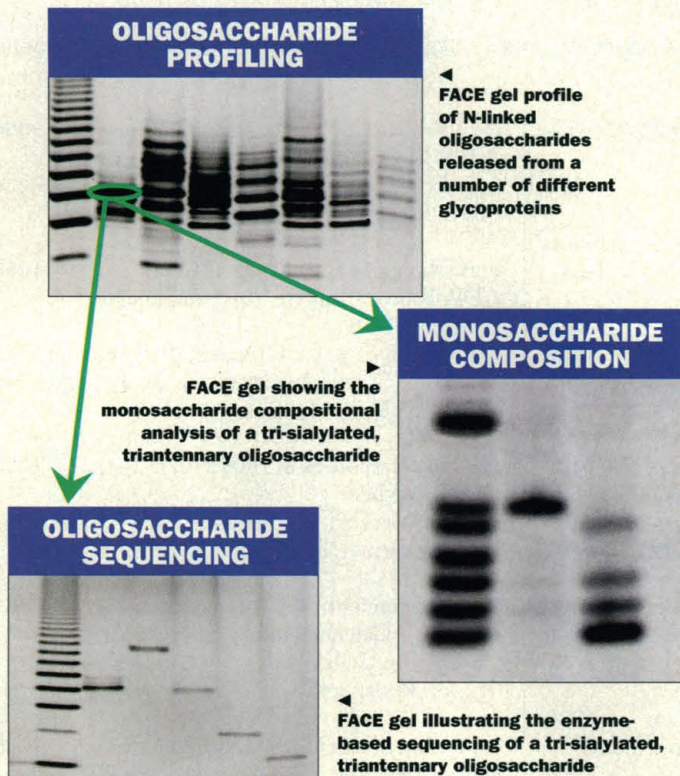
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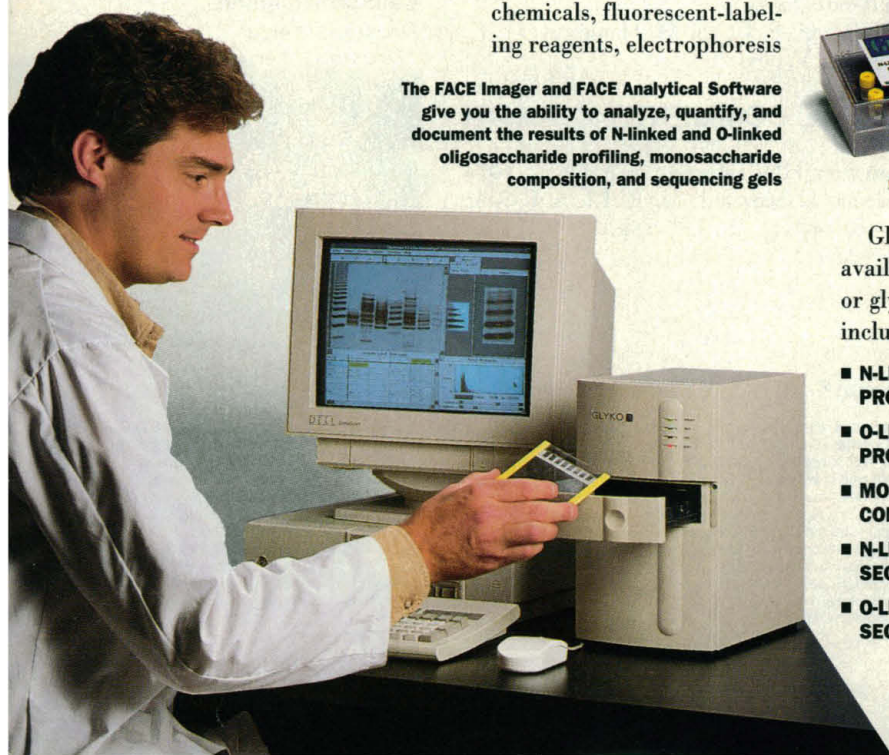
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Picosecond STM

High spatial resolution is the most familiar attribute of the scanning tunneling microscope. Picosecond time resolution can be achieved by taking advantage of the nonlinearity of the current-voltage response of the tip. Nunes and Freeman (p. 1029) converted optical pulses from a laser delay line into voltage pulses with photoconducting switches. When the pulses are coincident at the junction, the current is much greater than the simple sum of currents arising from each pulse. This excess current provides a time-dependent signal. Optically excited processes such as photoconductivity and reduction of superconducting gap voltages can be followed with this instrument.

Bacterial bushings

Flagellar bacteria have to anchor their rotating flagellum to a static outer membrane in such a way that the torque generated by the flagellum is dispersed effectively and thus does not rupture the membrane at the site of attachment. Engelhardt *et al.* (p. 1046) propose that an Archimedian spiral structure, the basal disk, serves these functions. Assembly of a spiral, compared to concentric rings, uses only a single point of growth and is less restricted by the size of the building blocks.

Electrical lighting on Jupiter

Radio-frequency emission from Jupiter's magnetosphere is correlated with the phase of Io, the innermost of the Galilean satellites. This phenomenon has been attributed to the generation of electric currents by Io's motion through the planet's

Unraveling trends in ultraviolet radiation

Although large decreases in stratospheric ozone levels in the Arctic and Antarctic springtime have been recognized for several years and lesser decreases have been reported elsewhere recently, the expected increase in the flux of ultraviolet-B (UV-B) light reaching the Earth's surface has been difficult to detect. One reason is that yearly variations in cloudiness and pollution can obscure local trends. Such interferences can be accounted for by monitoring the entire UV-B spectrum. Kerr and McElroy (p. 1032; see news story by Appenzeller, p. 991) report measurements from Toronto that show that UV-B levels increased up to 35 percent per year in winter and 7 percent per year in summer since 1989 in conjunction with observed decreases in column ozone levels over Toronto. No trends in intensity were seen at other wavelengths, as would be expected if a change in cloudiness, for example, was the cause.

magnetic field. Observations by Connerney *et al.* (p. 1035) of patches of infrared emission near Jupiter's poles lend weight to this suggestion; the emission is attributed to excited H_3^+ and arises at the points where magnetic flux tubes connected to Io complete a current loop through Jupiter's magnetosphere. Detailed modeling based on these observations should help to clarify the origin of Jupiter's decameter-wavelength radio emission, which is still poorly understood.

Turning on hormones

Plant development is controlled by phytohormones, but the activity of those hormones must be confined to the appropriate time and place. Inactive phytohormone conjugates are stored in the seed endosperm and transported to various parts of the seedling. Brzobohatý *et al.* (p. 1051) analyze the function of a β -glucosidase that is localized in the growing parts of the root tip and is able to cleave, and therefore activate, the phytohormone conjugates that are transported there from the endosperm. The enzyme does not,

however, cleave another type of phytohormone conjugate thought to be a permanently inactivated form of the hormone.

Calcium memories

Increased concentrations of intracellular calcium, $[Ca^{2+}]_i$, cause release of secretory vesicles docked at the cell surface. Von Rüden and Neher (p. 1061) present evidence that the $[Ca^{2+}]_i$ also controls conversion of secretory vesicles into a form that is docked or ready for release. Increased $[Ca^{2+}]_i$ enhanced recovery of a secretory response after release-ready vesicles had been depleted. Hormones that cause Ca^{2+} -dependent secretion often cause sustained increases in $[Ca^{2+}]_i$ of moderate magnitude that do not cause release. These sustained increases in $[Ca^{2+}]_i$ appear to enhance subsequent secretory responses by increasing the size of the pool of vesicles ready for release.

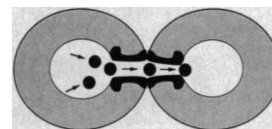
Intersecting paths

In many cell types, proliferation is inhibited by agents that increase the intracellular concen-

tration of adenosine 3',5'-monophosphate (cAMP) and consequently activate the cAMP-dependent protein kinase. Many growth factors activate a signal transduction pathway that includes the guanosine triphosphate binding protein Ras. Activation of Ras leads to activation of a series of protein kinases including Raf and mitogen-activated protein (MAP) kinases. Cook and McCormick (p. 1069) and Wu *et al.* (p. 1065) have localized a point at which these antagonistic pathways interact. They found that increased concentrations of cAMP inhibited activation of Raf and MAP kinases by Ras. Inappropriate activation of Ras appears to contribute to certain human cancers. These results reveal how hormones and other agents that increase concentrations of cAMP might counteract activation of Ras (see news story by Marx, p. 988).

Following directions

Gap junctions are structures that allow direct passage of small molecules between cells. More than a decade ago it was suggested that passage in both directions need not be equal. Robinson *et al.* (p. 1072), using intact retina, have performed



experiments that support this claim. Fluorescent dyes injected into astrocytes spread to either oligodendrocytes or Müller cells, yet dyes injected into either of the latter cell types rarely pass into astrocytes. This directional aspect of gap junction connections may provide another means of communication.

EVEN AS A YOUNG MAN, Tommy *knew* there must be *a w a y* *to* EXPRESS HIGHER LEVELS *of* RECOMBINANT PROTEIN.

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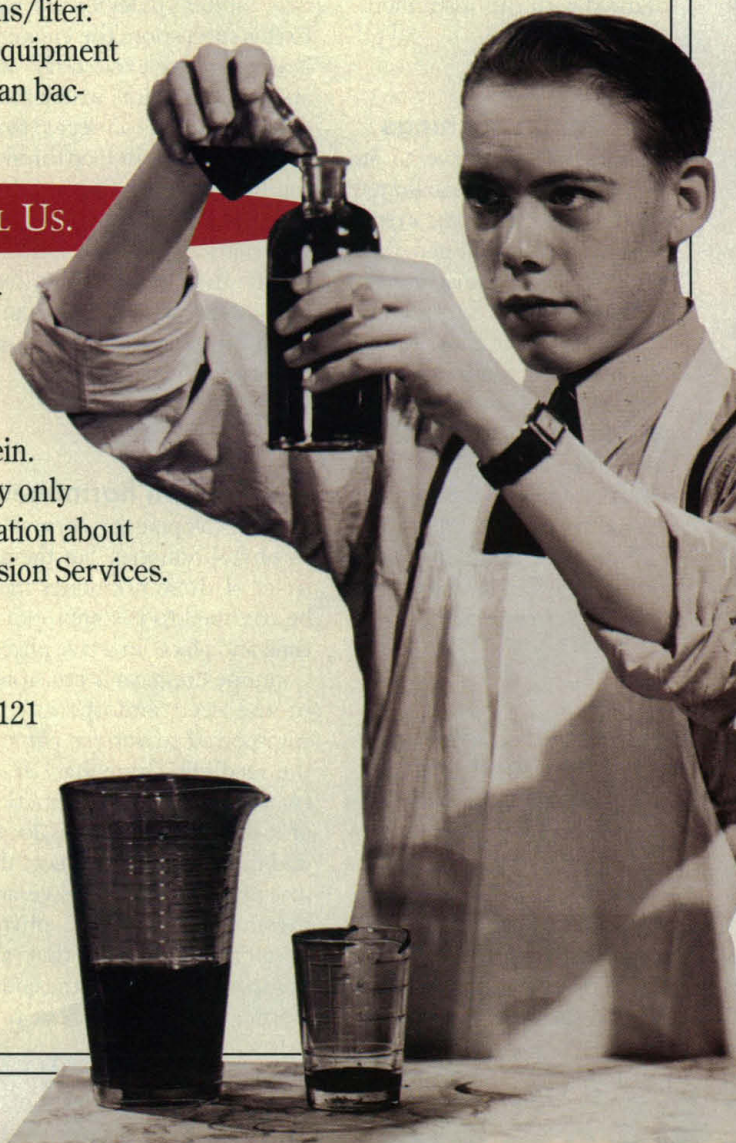


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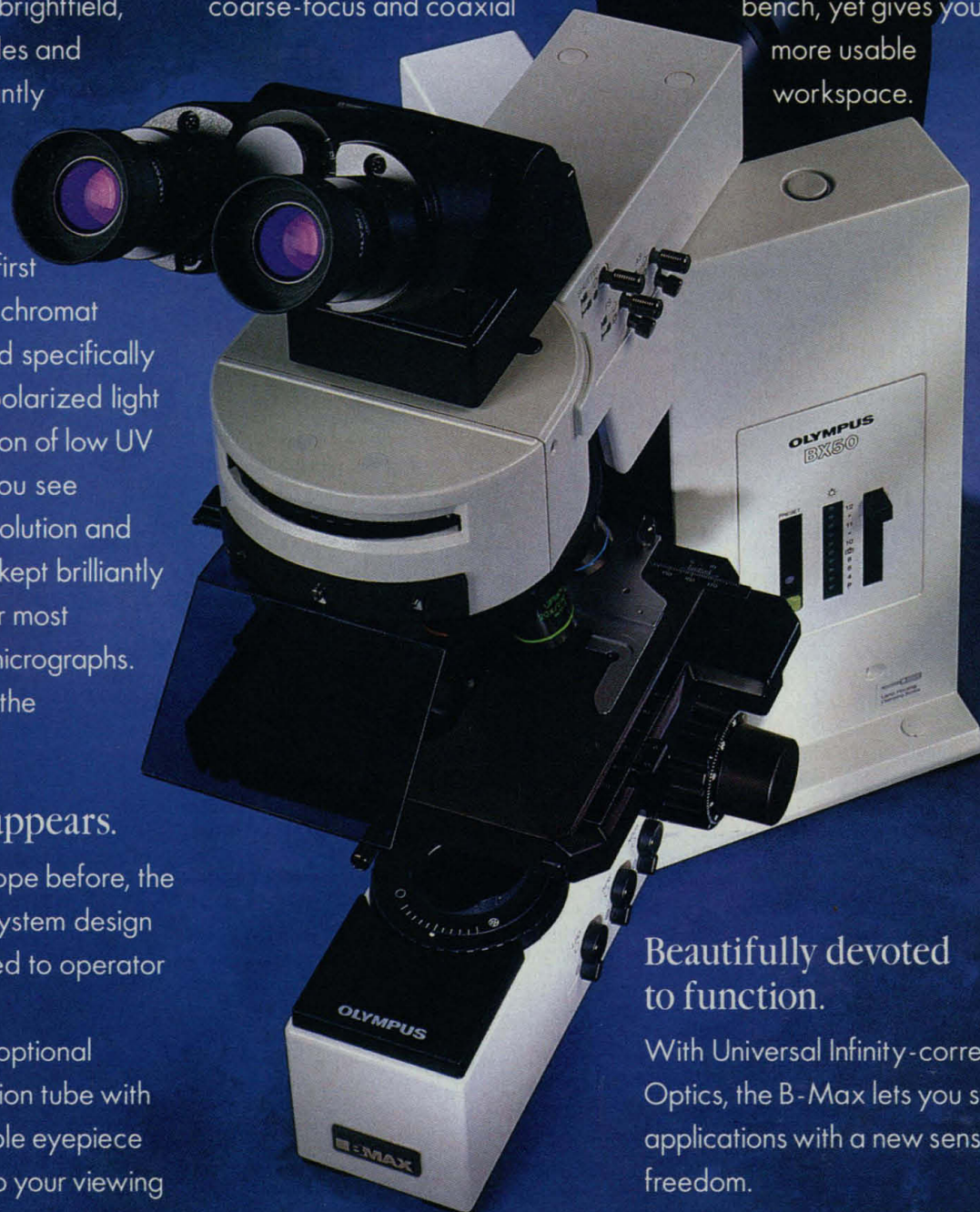
The effort disappears.

Unlike any microscope before, the Olympus B-Max system design is inherently devoted to operator comfort.

In seconds, the optional binocular observation tube with continuously variable eyepiece inclination adjusts to your viewing

angle. Your forearms and hands lie naturally on the tabletop as you turn the adjustable-torque coarse-focus and coaxial

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on fluorescence.



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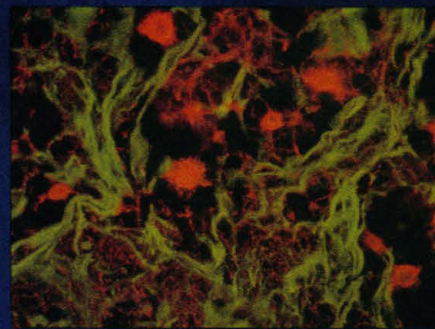
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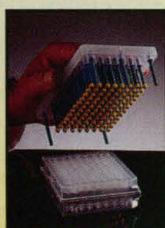
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This kit can be used to produce peptides for B-Cell epitope scanning or structure-activity relationship studies. The pin-bound peptides in this format can be regenerated and used multiple times.

MULTIPIN **DKP**

CLEAVABLE PEPTIDE KIT - DIKETOPYPERAZINE C-TERMINI



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MULTIPIN **GAP**

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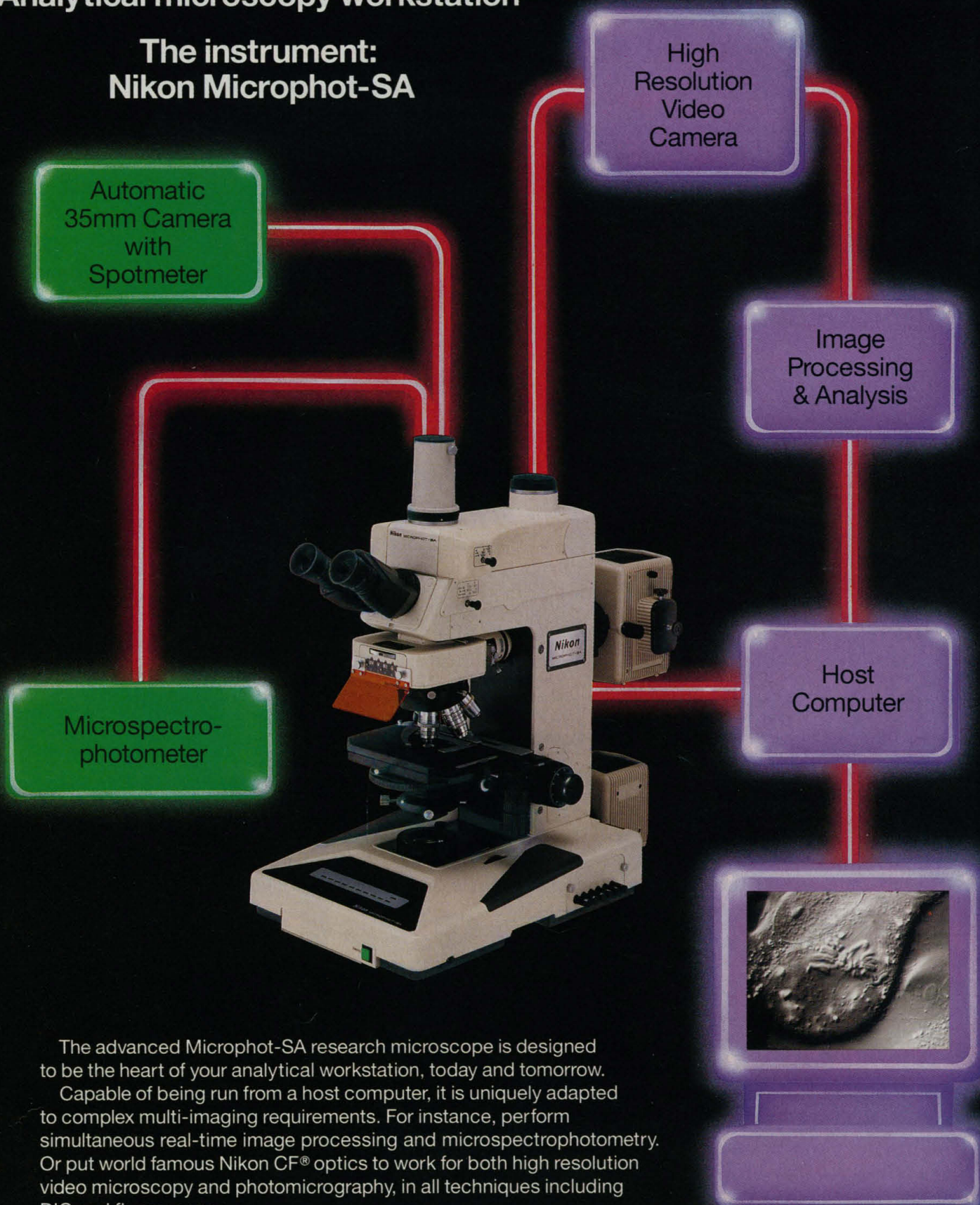
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- Significant reductions in amidite usage, 1.5 molar equivalents
- Fast detritylation, 2 min. at 200 μ mol scale
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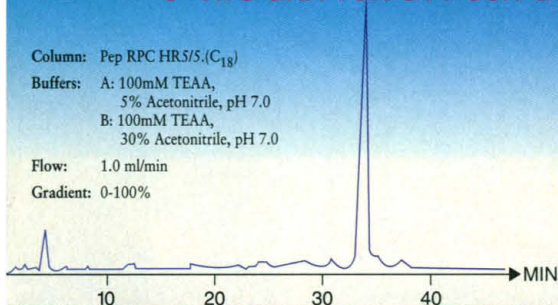
OligoPilot is fully programmable via an external computer. In addition, the computer tracks reagent usage and identifies the batch numbers for each reagent used for each oligo synthesis.

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5'-ATC GAA TGA GTT CCA GTT-3'

Column: Pep RPC HR5/S.(C₁₈)
Buffers: A: 100mM TEAA,
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Gradient: 0-100%



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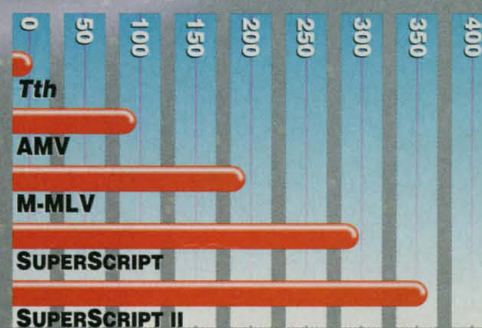


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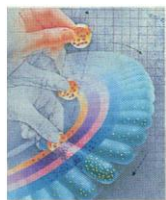
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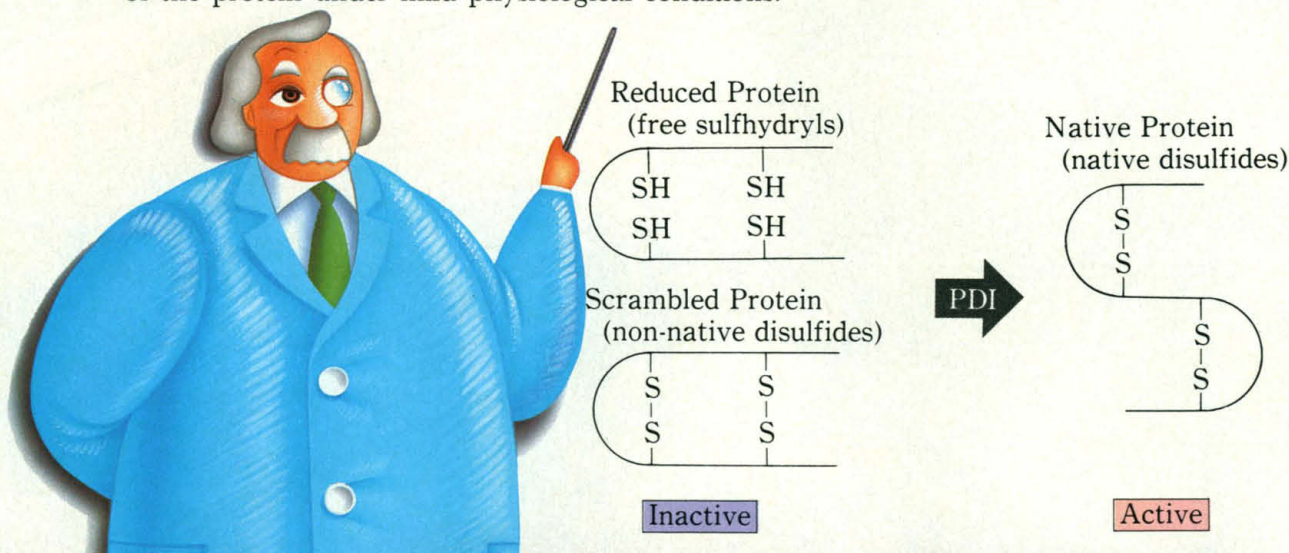
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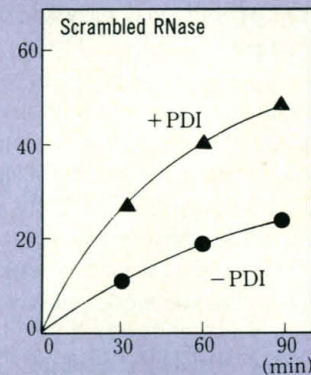
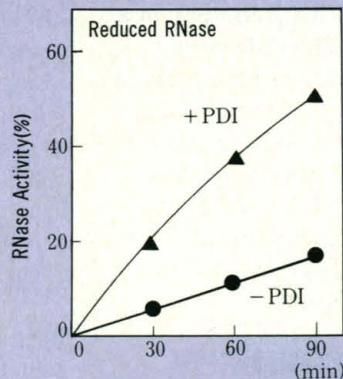
Application Example : Activation of Reduced-Denatured Ribonuclease A by PDI

Reduced-denatured RNase and Scrambled RNase (randomly formed disulfide bonds) are activated by Protein Disulfide-isomerase (PDI).

Refolding System

	Final conc.
Substrate protein	200 μ g/ml
Sodium phosphate buffer, pH 7.5	100mM
Glutathione	0.2mM
Reduced glutathione	2mM
PDI	20 μ g/ml

Results



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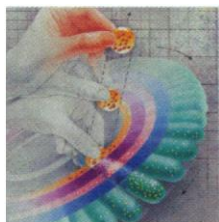
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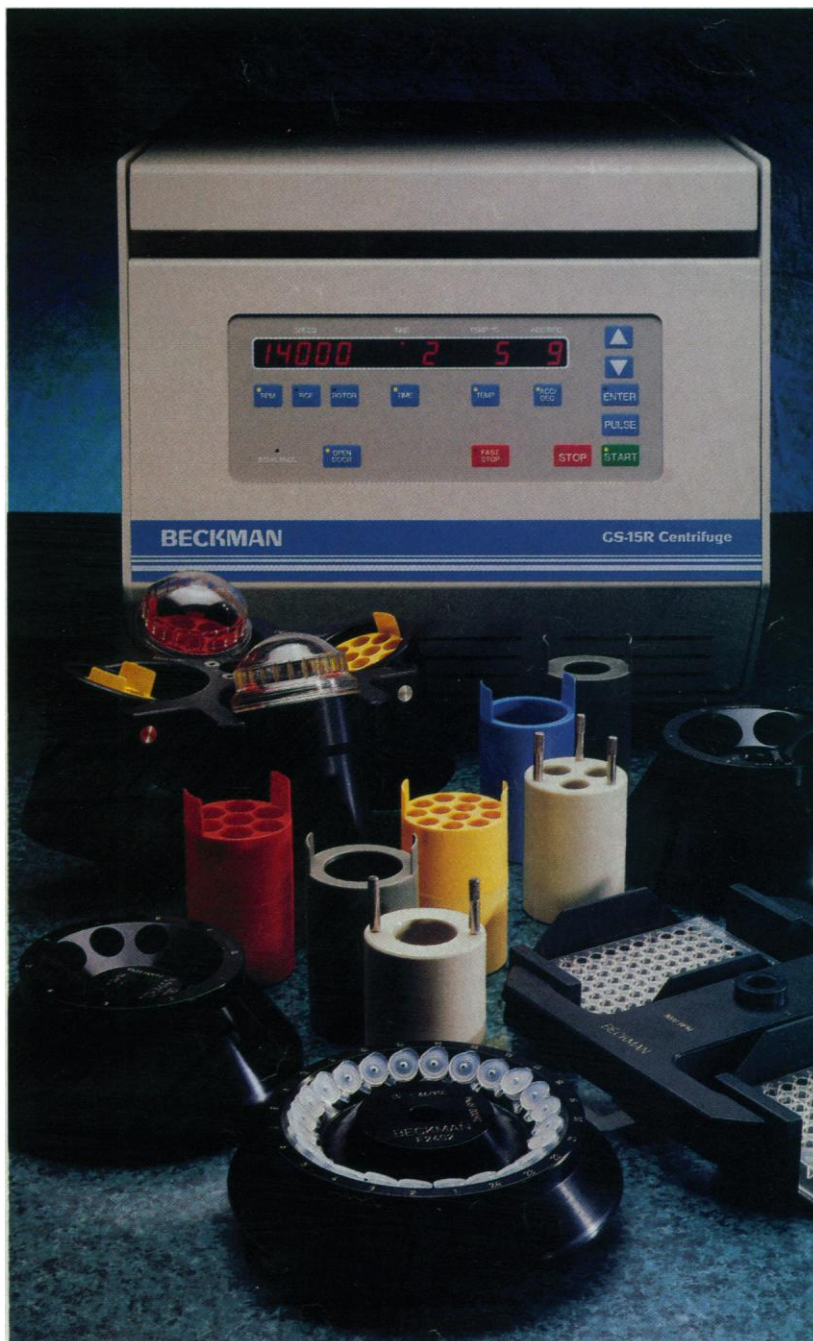
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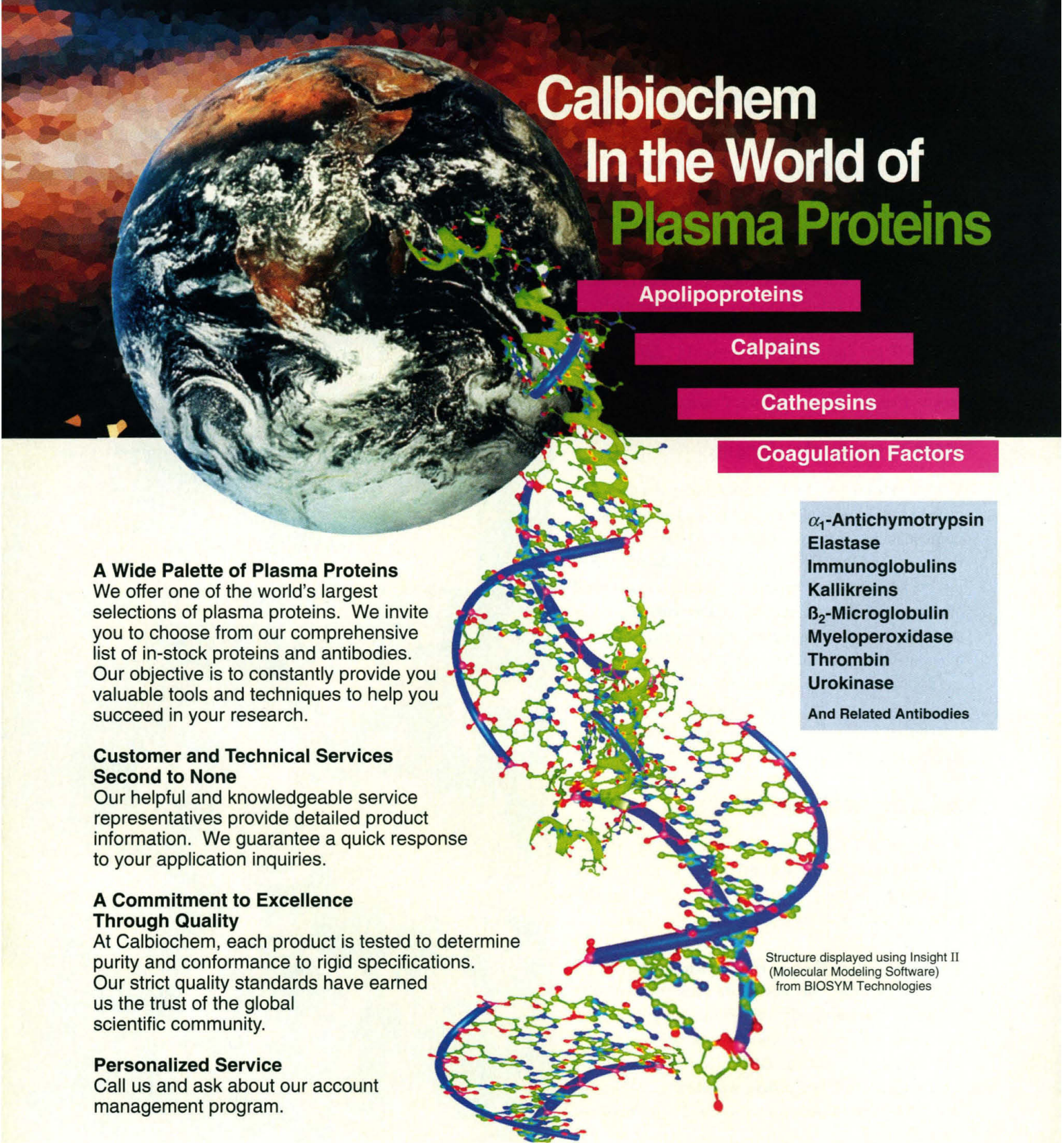


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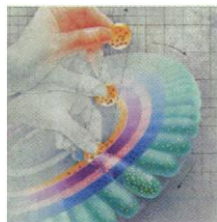
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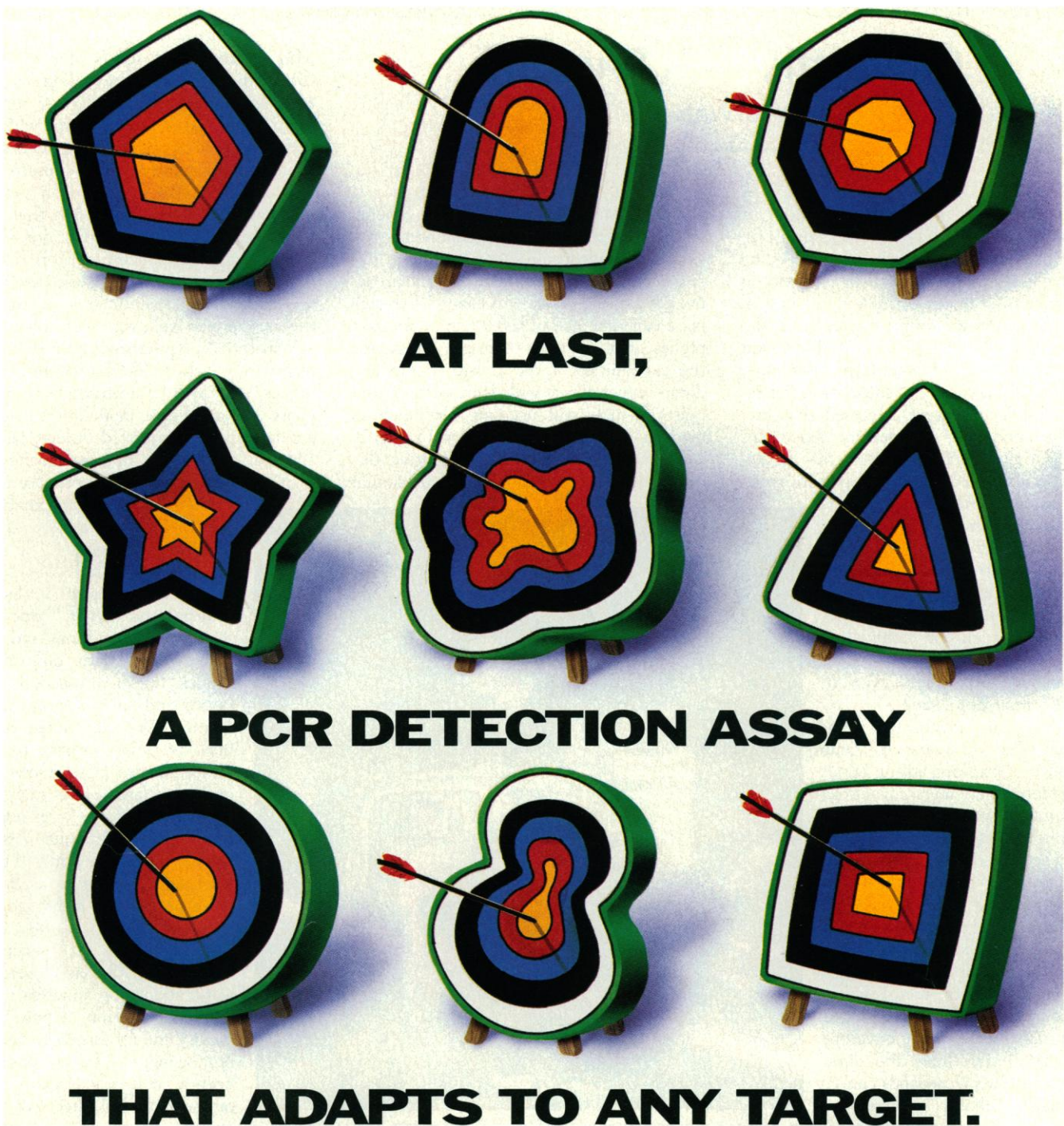
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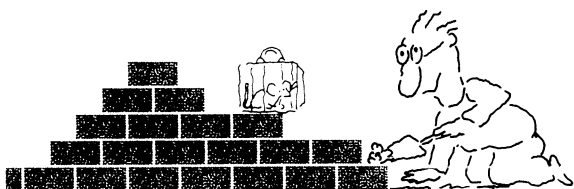


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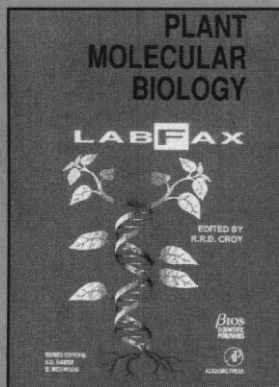
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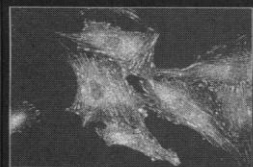
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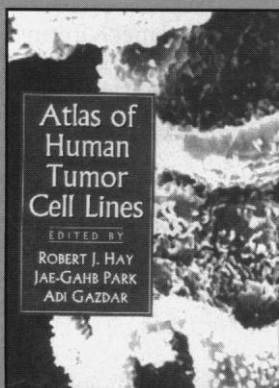
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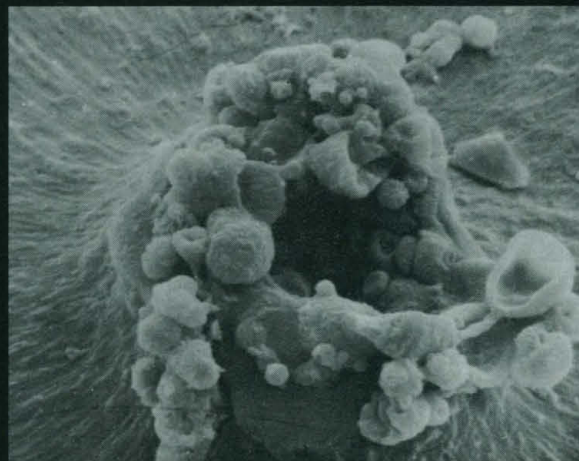
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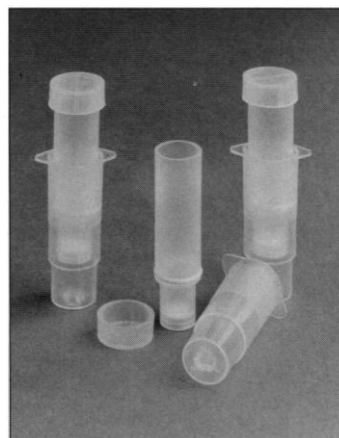
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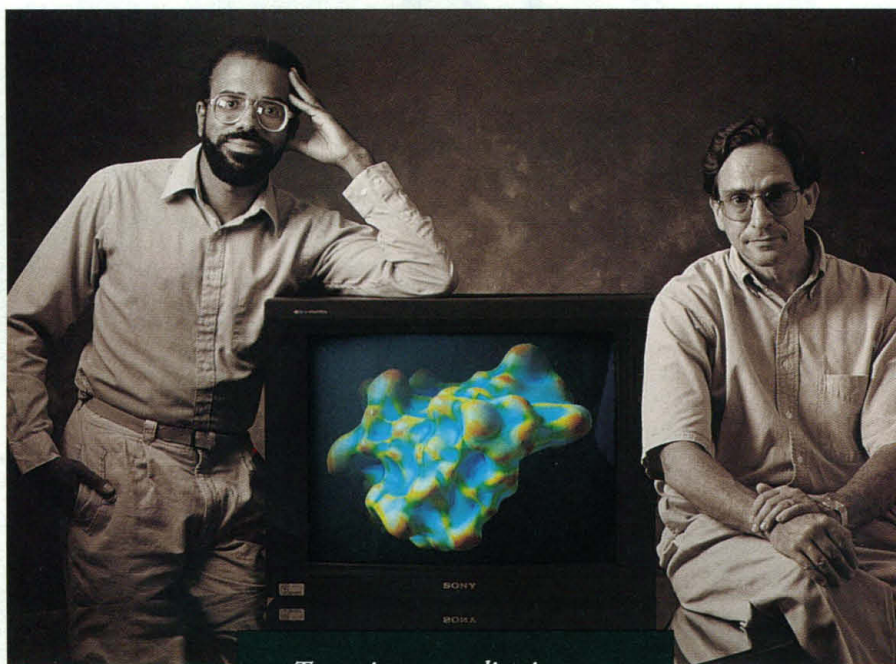
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*Bruce S. Duncan, Ph.D.,
Research Associate,
Department of
Molecular Biology (left),
is pictured with
Arthur J. Olson, Ph.D.,
Professor, Department of
Molecular Biology, and
Director, Molecular
Graphics Laboratory.*

In the Department of Molecular Biology at The Scripps Research Institute (TSRI), postdoctoral fellow Bruce S. Duncan, Ph.D., is developing new computational methods to represent molecular structures and model their interactions. This research is important for gaining new insights into biological processes and for the development of medical applications such as computer-aided drug design.

For more than three decades, TSRI has maintained its position at the forefront of science and focuses its efforts in molecular biology, cell biology, chemistry, immunology, molecular and experimental medicine, neuropharmacology and neurobiology.

"Because of its extensive resources and scientific talent, TSRI is an ideal place for people with ability and motivation," Duncan believes. These include a staff of more than 2000, with 200 principal scientific investigators and 500

*To receive an application or to
request additional information,
please contact:*

*The Scripps Research Institute
10666 North Torrey Pines Road
La Jolla, CA 92037
(619) 554-2832*

postdoctoral fellows; a collaborative intellectual environment; and superior experimental and computational facilities. The Institute's proximity to the San Diego Supercomputer Center, University of California at San Diego, the Salk Institute and a biotechnology

community that ranks as the fourth largest in the nation provides even more research opportunities for its scientists.

For postdoctoral fellows looking for a unique and stimulating environment, The Scripps Research Institute announces:

A Postdoctoral Fellowship Program for Minorities.

Two fellowships are available for research in molecular biology and related fields. They are open to those with training in biology, chemistry, immunology, biochemistry, neurobiology, mathematics, physics, and computer science. Qualified underrepresented minority candidates are encouraged to apply.



THE SCRIPPS RESEARCH INSTITUTE

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Devise methods for the large scale production, preparation, and purification of recombinant adenovirus for use in human gene therapy. Candidates must have a Ph.D. in Virology, Cell Biology or related field or 5-10 years of direct experience in large scale animal virus production. A comprehensive understanding of GMPs is essential. Candidates with GMP experience preferred. Code SG

Research Scientist

Electrophysiology - Ussing Chamber

Your primary focus will be to establish and oversee the Ussing chamber functional assay in order to support our adenovirus and lipid gene therapy programs. You will contribute as a member of our Cystic Fibrosis gene therapy group with specific responsibility for establishing the equipment and protocols to evaluate the functionality of CFTR following transduction of the CFTR cDNA into airway cells. You will also oversee all aspects of functional analysis of CFTR using both Ussing chambers and fluorescent digital imaging microscopy/SPQ. Requires a Ph.D. with at least 2-3 years of postdoctoral training and experience in the use of electrophysiological approaches to study and characterize ion channels or transporters. Experience with Ussing chambers in the assay of membrane currents would be an advantage. Code SG-2

Protein Purification Supervisors

Oversee a multi-shift chromatography operation that utilizes state-of-the-art automated chromatography systems. Requires a BS/MS (Chemistry/Biochemistry strongly preferred), 3-5 years of supervisory experience in large scale protein purification and thorough knowledge of cGMP compliance in the biotech/pharmaceutical industry. Experience in automated chromatography and process validation is desired. Code MG

Cell Culture, Bioreactor Operations Supervisors

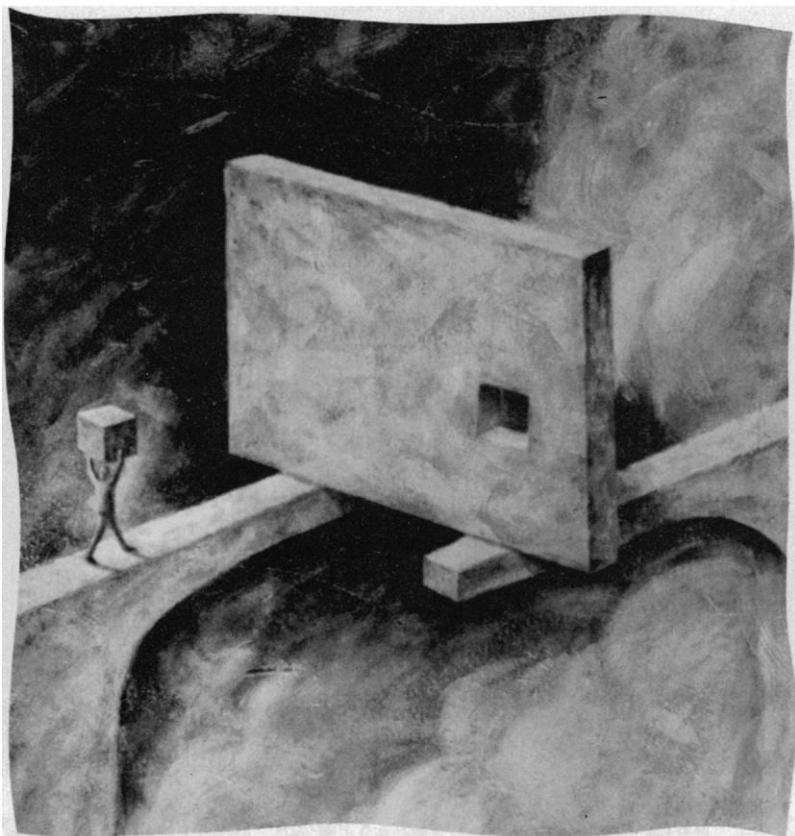
Supervise and schedule a multi-shift cell culture operation utilizing state-of-the-art bioreactor systems. Requires a BS/MS in Biology or Biochemistry, 3-5 years' supervisory experience in continuous and batch fed cell culture conditions, a significant bioreactor controls background, and thorough knowledge of cGMP compliance. Proficiency in large scale mammalian microcarrier-based cell culture is required, while an understanding of DCS and PLC controls with start-up experience is strongly preferred. Code PK

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Our drug discovery programs in Inflammation Research and Chemistry are looking for dedicated BS/MS/Ph.D-level scientific staff with expertise in biochemical and cell-based assay techniques. Qualified candidates will join a highly motivated, interdisciplinary team involved in the research and development of high throughput assays, quantitation of receptor-ligand interactions and screening of natural and synthetic

libraries for the identification of potential therapeutic agents. Scientists will closely interact with researchers working in the areas of inflammation, autoimmunity, chemistry and structure-based design in the search for new drugs. We currently have opportunities for the following professionals in our **Drug Discovery and Assay Development** group:

Molecular Biologists

Qualified candidates should have a working knowledge of cDNA cloning techniques, PCR and directed mutagenesis. Cell culture experience is a plus. (Job Code OA-SC-RN-001)

Cell Biologists

Qualified candidates must be able to isolate cells and platelets from human blood. Experience with cell activation, endothelial-leukocyte biology, cell adhesion or receptor biology is desired. (Job Code OA-SC-RN-002)

Biochemists

Qualified candidates must be experienced in protein purification and characterization. A working knowledge of enzymology, receptor biochemistry or carbohydrate analysis is desired. Experience with ELISA and/or radioimmunoassays is a plus. (Job Code OA-SC-RN-003)

Biophysical Chemists

Qualified candidates should have a good working knowledge of analytical biophysical techniques used for characterization of glycoproteins and enzymes (i.e., analytical ultracentrifugation, fluorescence spectroscopy, microcalorimetry, BIAcore, TIRF and CD spectroscopy). Experience with computer data analysis is desired. (Job Code OA-SC-RN-004)

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Argonne makes available some of the finest world class research tools in operation today. This includes a powerful source of pulsed neutrons for materials research; the first superconducting, heavy-ion accelerator.

Argonne is building on more than 40 years of expertise in nuclear energy research. Our most recent work involving breeder reactor technology has resulted in the develop-

ment of an Integral Fast Reactor that promises to become the world's safest, cleanest and most economical power source.

The Integral Fast Reactor will alleviate nuclear waste disposal problems by burning its own long-lived radioactive waste.

During 1992/93, teams of scientists and engineers will continue to oversee construction of the nation's brightest x-ray source, The Advanced Photon Source. The facility will eventually accommodate more than 300 scientists performing up to 100 experiments simultaneously.

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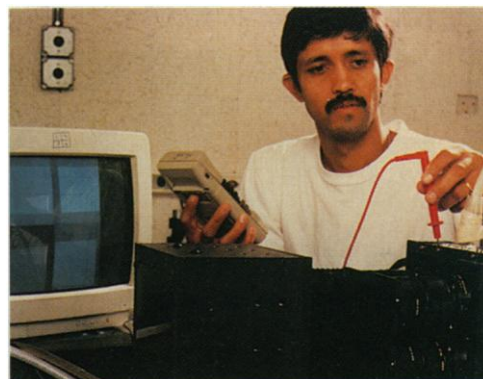
Argonne National Laboratory

Operated by the University of Chicago, this

DNA, research at this multi-program laboratory spans the breadth and width of scientific inquiry. Current projects include physical, biomedical and environmental sciences, as well as selected energy technologies.

Lawrence Berkeley Laboratory

This laboratory was initially established as a particle physics accelerator facility engaged in traditional research areas of physics, accelerators and nuclear science. Today, Lawrence Berkeley has diversified into advanced materials, chemical sciences, energy,



and university partners, includes energy and environmental technologies, advanced materials, biotechnology, precision manufacturing, high-performance computing and more!

Pacific Northwest Laboratory

This national center for science and engineering solves problems involving

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laboratory is one of the world's leading centers for research in parallel computing, environmental research, biological research, materials research, nuclear research and more. Argonne is also home to the Advanced Photon

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Brookhaven National Laboratory

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Oak Ridge National Laboratory

ORNL brings science to bear on issues of national importance: energy, environment, and economic competitiveness. Pioneering research, with industrial

energy, the environment and national security. Through a contractual agreement with Battelle Memorial Institute, this laboratory also offers an extensive capability for the transfer of technology to industry.

Want to learn more? Then learn more about the opportunities that are waiting for you at the Energy Research Laboratories. Resumes can be sent to the laboratories listed below.



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Argonne National Laboratory
Employment and Placement, Bldg. 201, ERL
9700 S. Cass Avenue
Argonne, IL 60439

Battelle-Pacific Northwest Laboratory
Staffing, Dept. 5139-DAF
P.O. Box 999, ERL
Richland, WA 99352

Brookhaven National Laboratory
Personnel Division, Bldg. 185, ERL
Upton, NY 11973-5000
JOBLINE: (516) 282-7744

Lawrence Berkeley Laboratory
Employment/Staffing Office
One Cyclotron Road, MS938A, ERL
Berkeley, CA 94720

Oak Ridge National Laboratory
Staffing Department
P.O. Box 2008, ERL
Oak Ridge, TN 37831-6217

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MINORITY STUDENTS

AT&T can help you earn your PhD.

AT&T's Cooperative Research Fellowship Program (CRFP) was initiated twenty years ago to provide financial support for high-potential African Americans, Hispanics, and Native Americans, who are underrepresented in science and engineering. The program helps these individuals pursue doctoral studies in mathematics, computer science, engineering, and the physical sciences. Once you are accepted, the program pays for your tuition, fees, and books. In addition, it grants you an annual stipend (\$13,200 for the 1993-1994 academic year) and makes it possible for you to attend conferences. It provides you with a summer job at AT&T Bell Laboratories in a field related to your program. And it supplies you with a Bell Labs mentor on whom you can depend during the early years of your career.

Today, the program's graduates are part of the fabric of American science and engineering, and they are found throughout industry, academia, and government. Of the sixty-seven Fellows awarded PhDs, twenty-nine (43%)

are working in industry and twenty (30%) in academia. The remaining eighteen (27%) are either working in government or pursuing post-doctoral degrees.

A study by the National Action Council for Minorities in Engineering (NACME) concluded that AT&T's CRFP significantly affects the graduate experience and subsequent career paths of the Fellows. As Willetta Greene-Johnson, a 1987 graduate of the University of Chicago and current Professor of Chemistry at Chicago's Loyola University said, "CRFP was a definite, positive experience. The program helped me make my decision to pursue science as a career. My summer job at the Labs gave me an opportunity to see how 'real science' was done."

To obtain an AT&T CRFP application and brochure, call the Program Administrator at 908 949-2943 or mail or fax the coupon below. All applications and supporting materials must be received by January 15, 1994.

Mail or fax this coupon for your AT&T CRFP application and brochure

Mail to: CRFP Program Administrator, AT&T Bell Laboratories,

101 Crawfords Corner Road, Room 1E-230,

Holmdel NJ 07733-3030

FAX : (908) 949-1534

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Committed To Train Of Scientists And

The National Institutes of Health is the world's largest institution committed to biomedical research. The NIH intramural research program, which brings together more than 4,000 doctoral level scientists and a clinical center that is home to half of all research beds in the country, has traditionally provided exceptional postdoctoral training opportunities in both the basic and clinical biomedical sciences. In addition, the NIH is fully committed to helping prepare the upcoming generation of scientists by providing programs for graduate, medical, and college students. Programs for college faculty and secondary school teachers are also available to help the nation's professors and teachers better prepare the next generation of scientists.

The National Institutes of Health also seeks to ensure that the upcoming generation of scientists reflects the rich cultural diversity of this Nation's citizenry. The NIH and the Minority Officers Liaison Council of the United States Public Health Service are committed to achieving this goal and enhancing the training experience and career development of all postdoctoral fellows at the NIH.

The following descriptions introduce the various postdoctoral and other educational opportunities available at the National Institutes of Health. Minorities are especially encouraged to explore the various training opportunities which are available and to contact

the Office of Education for additional information.

Postdoctoral Training Programs

Laboratory Research Training

Postdoctoral fellowships are available to conduct fundamental biomedical research in a wide variety of disciplines at the NIH. Initial appointments are usually for two to three years. 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. Current postdoctoral openings at the NIH are posted on the NIH EDNET Bulletin Board's POSTDOC conference which is available via modem. In addition, the NIH welcomes applications for anticipated openings nine months to a year in advance. A catalog featuring research descriptions of NIH scientists has been developed to assist prospective fellows in this process and the catalog is available from the NIH Office of Education. Research descriptions may also be accessed on the NIH Gopher server on Internet. 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.

Clinical Research and Subspecialty 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 in the following programs which are accredited by the Accreditation Council on Graduate Medical Education or by boards in their respective disciplines: Allergy and Immunology, Anatomic Pathology, Critical Care Medicine, Dermatology (third year), Diagnostic Immunology, Endocrinology and Metabolism, Gastroenterology, Hematology, Infectious Diseases, Medical Genetics, Medical Oncology, Nuclear Medicine, Oral Medicine, Pediatric Endocrinology, Pediatric Hematology/Oncology, Psychiatry (fourth year), Radiation Oncology, Reproductive Endocrinology, Rheumatology, and Transfusion Medicine. Programs in Clinical Chemistry and Clinical Microbiology offer credit toward board certification on an individual basis.

Re-Entry Postdoctoral Training

A new program has been developed at the NIH to assist individuals with terminal degrees (e.g., MDs, PhDs, MD/PhDs, etc.) who have had to delay or postpone their research careers because of family responsibilities. Research training, supported by

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ing The Next Generation Clinical Researchers.

courses and workshops, is provided to assist participants in their retraining and eventual re-entry into research careers.

Accessing Information on Postdoctoral Training Electronically

The NIH EDNET Bulletin Board's POSTDOC conference may be accessed by Internet (cu.nih.gov) or via modem (1,3014022221 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.

An electronic version of the Postdoctoral Research Fellowship Opportunities catalog may be accessed via the network-based (Internet) Gopher Information System. To access the NIH Gopher server, Gopher client software (available via anonymous ftp "boombox.micro.umn.edu") must be running on your computer and configured to point to "gopher.nih.gov" and port "70". Select *Grants and Research Information* to reveal the *NIH Office of Education* directory.

Graduate Student Programs

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

Medical and Dental Student Programs

The **Summer Research Fellowship Program** provides eight to ten 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 the **Summer Internship Program**. The summer program also provides

workshops on career pathways and strategies for a successful scientific career, as well as a weekly seminar series. 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.

Secondary School Teacher Programs

Several summer programs provide opportunities for teachers to participate in laboratory research, including an **In-Service Teacher Program**. It offers teachers from schools with predominantly minority enrollments an in-depth course in molecular biology before the research experience begins. Training in the teaching of bioethics and use of electronic databases is also provided.

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.



National Institutes Of Health

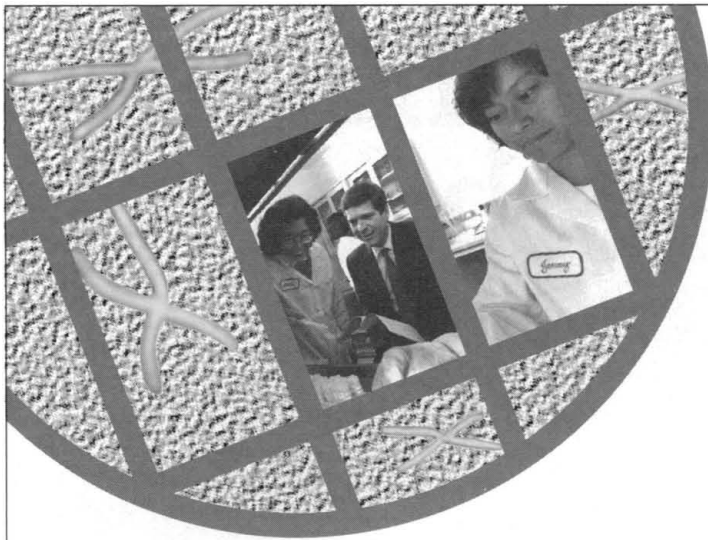
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To provide students with maximal choice and flexibility in selecting a research specialization, the basic science departments at UCLA offer a combined recruitment, admission and first-year program. This initiative, known as UCLA ACCESS to Programs in the Molecular and Cellular Life Sciences, represents a simple, flexible mechanism for maximizing research choices throughout the first year of graduate study. As part of this program, students are able to select research projects from 150 faculty mentors according to changing perceptions, interests and goals without regard to traditional departmental boundaries. Ethnic, gender and cultural diversity are both a strength and a priority at UCLA and we solicit and encourage applicants who will increase and strengthen our diversity.

All Ph.D. students are fully supported through a variety of sources including the following federally sponsored pre-doctoral training programs:

Cellular and Molecular Biology, Genetics, Atherosclerosis, Tumor Cell Biology, Biotechnology, Tumor Immunology, Microbial Pathogenesis, Chemistry/Biology Interface Training

For information and application materials:

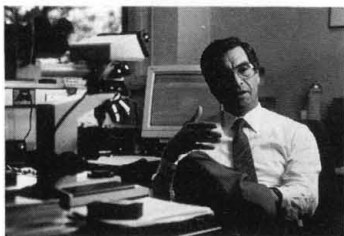
UCLA ACCESS
Molecular Biology Institute, University of California, Los Angeles
Los Angeles, CA 90024-1570
(800) ATG-UCLA or (310) 206-5280

R & D Scientists at Pfizer Central Research

Pfizer's Central Research Division is a global medical and scientific community with headquarters in Groton, Connecticut. Our expanding facility offers an unparalleled environment for professionals who want to discover innovative treatments for disease as well as expand their own potentials.

DR. RICARDO OCHOA, DIRECTOR

As Director of Pathology in the Drug Safety Evaluation Department, I lead a team of veterinarians trained in toxicologic pathology. Our major responsibilities are to evaluate the safety of new drug candidates in all therapeutic areas.



This is challenging work and I would certainly like to encourage members of minority groups to seriously consider this field. After work I am a dedicated long distance runner and find southeastern Connecticut ideal for this activity.

DR. EDNA GARCIA, RESEARCH SCIENTIST

Pfizer liked my years of team experience as an engineer and medical technologist, coupled with my mass spectrometry research. But, as a native Texan with over 300 years of family ties there,



I had to look closely at the company and the community before I committed to Pfizer. I've found that working with structurally unique molecules is very satisfying. It's been a pleasure living here, too. People are quite friendly, and the rural atmosphere has been really good for me and for my family.

MS. JANET GREEN, BIOMETRICIAN

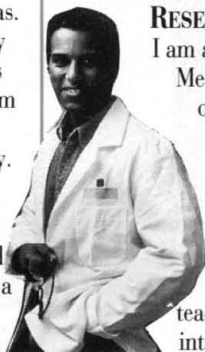
As a clinical research biometrician, I work closely with new agents that are potential candidates for regulatory approval. It's very interesting working here – no one is looking over your shoulder; you can use your own initiative. Outside of Pfizer, I'm president of the local



YWCA Board, and I participate in programs that acquaint young women with science and math careers and prepare them for entering the workforce.

DR. DANIEL YOHANNES, RESEARCH SCIENTIST

I am a synthetic organic chemist in Medicinal Chemistry. The focus of our research is to design small molecules to improve cognition in the treatment of Alzheimer's disease, and I also work closely with my colleagues in biology, to define the activity profile of new drug candidates. Good teachers along the way nurtured my interest in science...and Pfizer offers me another such opportunity.



MS. GWENDOLYN ROBINSON, ASSOCIATE SCIENTIST

I study behavioral effects of new compounds for anxiety, Alzheimer's disease, and psychosis and support other disease studies as well. It's a challenging field and I feel I have the freedom necessary to select the studies appropriate to the project. As a student, my favorite subject was zoology, so it is not surprising that my career at Pfizer has been focused on studying behavior. I've raised three children here, too and like the

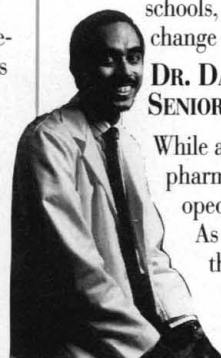


schools, the coast and the change of seasons.

DR. DAVID BLACKWELL, SENIOR RESEARCH SCIENTIST

While an intern in the summers for a pharmaceutical company, I developed a strong interest in toxicology.

As a veterinarian, I now work in the General Toxicology Group within the Drug Safety Evaluation Department. My technical responsibilities



include evaluating the safety profile of compounds designed to treat human diseases. I feel a strong sense of responsibility in this role – people's lives depend on it.

DR. JOHN VINCENT, ASSOCIATE DIRECTOR

I have a varied background in clinical medicine, with a PhD degree in Clinical Pharmacology. As a member of

the Early Clinical Research Group, I am responsible for designing and carrying out studies to determine the safety, toleration and pharmacokinetics of new drug candidates. I've found Pfizer to be a fascinating place; its quality and its openness are remarkable. And that holds true for the communities here as well. I have children involved in scouting for example, and they clearly have found a home.



As a research-based, global health care company, Pfizer's mission is to create innovative products that improve the quality of life around the world. If you are interested in joining our dynamic scientific team, please send your resume to: Manager, Employee Resources Department, Pfizer Inc, Central Research Division, Eastern Point Road, Groton, CT 06340. We are an equal opportunity employer.



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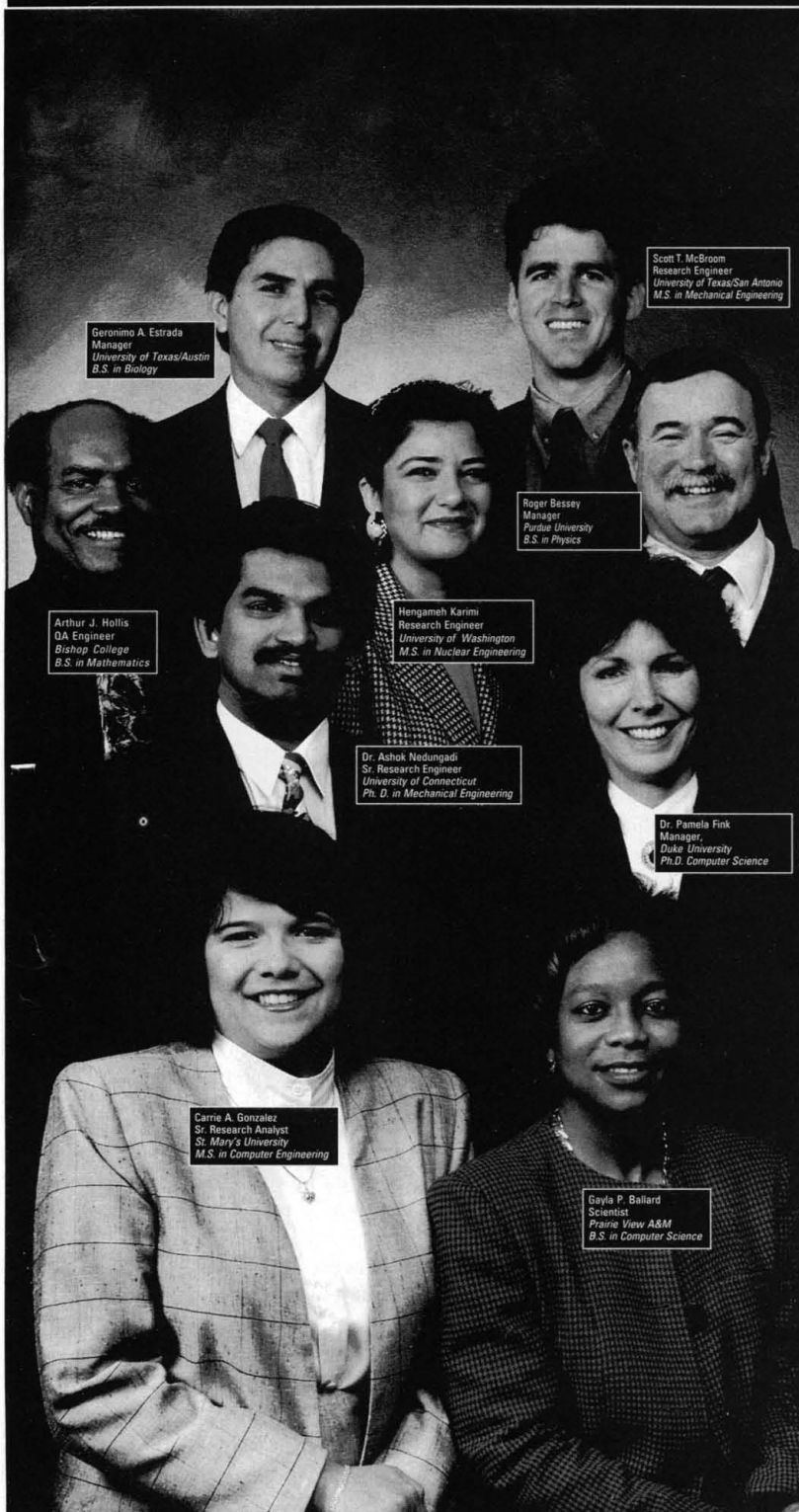
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Inquiries and/or resumes should be addressed to: Southwest Research Institute, Personnel Department #723, 6220 Culebra Road, P.O. Drawer 28510, San Antonio, Texas 78228-0510.



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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 renowned 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, molecular genetic, immunological and pharmacological approaches to gastrointestinal cancer and its etiology. There is special emphasis on cancer prevention, nutrition and inheritance.

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. Another interest is in T cell development and selection in the thymus and in the peripheral circulation. The Program also has strong efforts in tumor immunology, with an emphasis 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.



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