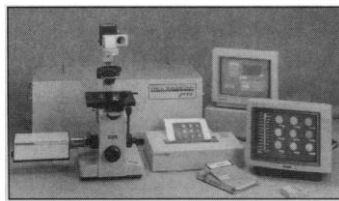


Workstation at PC Prices

The SPARCclassic is a fully loaded workstation that the manufacturer says is the world's least expensive color RISC system. It is based on the new 50-MHz microSPARC processor. The workstations deliver 59.1 MIPS at a cost of \$63 per MIPS. The manufacturer achieved price reductions through innovations such as the new processor, a new input/output subsystem that reduced seven controller chips to two advanced new ASICs, and a highly integrated system board. Sun Microsystems Computer Corp. **Circle 89.**



system of its kind sold and supported by one company, according to the manufacturer. The series offers more than a dozen configurations to choose from, including high-speed (millisecond) dual-channel excitation and emission photometry. Photon Technology International. **Circle 91.**

Scientific Software Family

A new set of software programs designed for scientific research includes graphics, biostatistics, and laboratory management. InPlot is a scientific graphics program that can analyze data, generate curves, and produce publication-quality graphics. Data can be entered onto a built-in spreadsheet or imported from ASCII files. The program requires DOS 3.0 or higher, 487K random access memory (RAM), 800K hard disk space, and a graphics adapter. InStat is a biostatistics program designed for scientists rather than statisticians. Help screens explain the usefulness of different tests and interpret results. The Macintosh version requires System 6 or later and 700K RAM. The DOS version requires version 3 or higher, 470K RAM, and a graphics adapter. InTend, a "laboratory bartender," helps the user locate and reorder chemicals, prepare buffers and solutions, review experimental protocols, identify hazardous chemicals, and comply with safety regulations. InTend requires DOS 3.0 or higher, 480K RAM, and 1.2 MB of hard disk space. GraphPad. **Circle 92.**

Fluorescence Imaging Systems

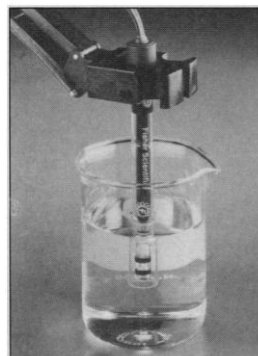
The ImageMaster series of quantitative ratio fluorescence imaging systems is for spatial resolution of intracellular ion concentrations. Built around a powerful personal computer-compatible hardware platform, the system combines the speed of a 486-based computer and the performance of a 640 image processing board with application-specific, proprietary software. Together with a camera and microscope of the user's choice, the result is the only

Graphing Software Upgrade

RPlot 2.1 is an upgrade of a DOS-based technical graphing package that is now also available in Windows and OS/2 versions. RPlot is designed for direct plotting of scientific and engineering results stored in ASCII files and can handle a variety of file formats. It offers data transformation and curve-fitting ability, production of publication-quality figures, and a basic drawing capability. RSoft Inc. **Circle 93.**

Small Conductivity Probe

A new immersion-type conductivity electrode fits into standard electrode holders, requires no more sample than for a pH read-



ing, and is available in rugged epoxy as well as glass. The electrode is 5 inches long and 12 mm in diameter and is available in a choice of three cell constants: 0.1, 1.0, and 10.0 cm⁻¹. Fisher Scientific. **Circle 94.**

Digoxigenin-Labeled DNA Probes

DNA probes are now available with a digoxigenin label, which allows the simultaneous use of two or more probes. Oncor's complete line of in situ probes is avail-

able labeled with digoxigenin, including α satellite, β satellite, classical satellite, midisatellite, COATASOME Total Chromosome Probes, microdeletion probes, and telomere probes. Oncor. **Circle 95.**

Literature

1992-93 *Catalogue: Biological Research Products* includes sections on enzymes, nucleic acids, reagent systems, protein translation and analysis, cellular regulation, eukaryotic transcription and reporter systems, and buffers. Promega Corp. **Circle 96.**

Cole-Parmer Balance Poster features a 2-year calendar with conversion tables for mass, temperature, area, and volume and a wide selection of balances. Cole-Parmer Instrument Corp. **Circle 97.**

The 1993-1994 *Fisher Catalog* has added about 12,000 new items to the tens of thousands in the previous edition. The 2266-page book with 6000 color photographs provides an encyclopedic overview of recent developments in instrumentation, apparatus, high-purity chemicals, and supplies. A 16-page technical section provides conversion tables and other information. Fisher Scientific. **Circle 98.**

The 1993-94 *Evergreen disposable labware catalog* includes new products such as spectrophotometer cuvettes, chromatography columns, breakaway enzyme-linked immunosorbent assay 8-well strips, 24-well tissue culture plates, and 500- μ l microcentrifuge tubes for polymerase chain reaction studies. Evergreen Scientific. **Circle 99.**

Automated Methods Development in HPLC is a technical note that describes the isocratic separation of nine caffeine metabolites with System Gold for Methods Development. Beckman Instruments. **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.

Overview of Science
Jobs, with an Emphasis
on Biotech

The Long, Strange Trip
of 1991-1992

Hot Fields of Many
Definitions

Biotech: The Shift from
Research to
Development

Science Careers for
Non-PhDs

Life Science Jobs in a Global Market

Careers in
Biotechnology and
Pharmaceuticals

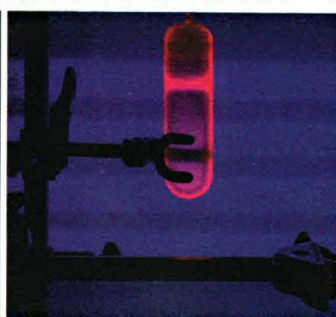
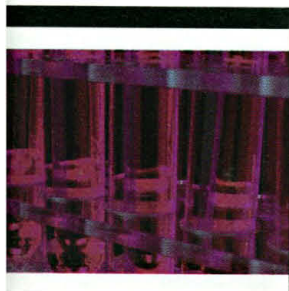
Rudiments
of Self-
Marketing

The Cover Letter
and Résumé

Tips on Giving
Effective Seminars

Opportunities and
Growing Pains in
Eurobiotech

Japan: Land of the
Rising Expectations





The Right Per the Success of

Research Scientists

Candidates for the following positions must possess a Ph.D. and at least one year of post-doctoral experience.

Experimental Pathology • Epithelial cell biologists to establish *in vivo* and *in vitro* models for the analysis of growth factor-target cell interactions.

• Anatomic pathologists to develop innovative *in vivo* and *in vitro* models and analytical tools to study the influence of growth factors on target tissues and organs. (Job Code 200gp for both of these positions)

Inflammation • Cell biologists to develop and expand projects in the discovery and characterization of molecules involved in leukocyte trafficking and activation. Experience with cellular adhesion molecules, *in vitro* assays and monoclonal antibodies required.

• Molecular biologists experienced in cDNA cloning and expression of molecules involved in leukocyte trafficking. (Job Code 200mz for both of these positions)

Mammalian Cell Molecular Biology • Cell biologists involved in bioassay development for new growth/differentiation factors.

• Biochemists experienced in receptor/ligand interaction and functional analysis. (Job Code 200sh for both of these positions)

Molecular Genetics Molecular biologists experienced in the areas of bacterial expression of recombinant products and/or bacterial proteases. (Job Code 200fm)

Neurobiology Ph.D.s in cellular neurobiology and behavioral biology for exploratory research on the effects of neurotrophic factors on CNS. (Job Code 200jm)

Pharmacology Pharmacologists experienced in a variety of *in vivo* models. Knowledge of cardiovascular/inflammation desirable. (Job Code 200ac)

At Amgen, we understand that our future success as a company is inextricably linked to the accomplishments of each and every individual of our team. To that end, we have designed a stimulating research environment that actively encourages individualism and supports a diverse mix of ideas. We are pursuing an active research program, and offer strong support for interactions with peers in the academic community through collaborative relationships with universities and other companies. If this is the type of environment that would bring out your best, take a close look at the following opportunities. Now is the right time...and Amgen is the right place.

son in the Right Place is Essential to the Whole.

Protein Chemistry

Protein chemists experienced in purification

and characterization of natural and recombinant proteins. (Job Code 200bk)

Sequencing

Biochemists/molecular biologists experienced in cDNA cloning, subtractive hybridizations, normalization of cDNA libraries, DNA sequencing and computer analysis of DNA sequence. (Job Code 200ss)

Stem Cell Biology

Cellular/molecular biologists or biochemists experienced in receptor biology, hematopoiesis growth and differentiation. (Job Code 200je)

Toxicology

Toxicologists with 3-5 years' experience in toxicology with pharmaceutical industries. (Job Code 200lw)

Post-Doctoral Positions

Candidates for the following positions must possess a Ph.D.

Experimental Hematology

Molecular/cellular biologists with involvement in an interactive program studying the molecular regulation of hematopoietic stem cell migration, proliferation and differentiation. (Job Code 200em)

Inflammation

Molecular/cellular biologists to work on projects involved in leukocyte trafficking and activation. (Job Code 200hl)

Research Associates

Candidates for the following positions must possess a Bachelor's degree in a related discipline.

Developmental Biology

Experience in generation of transgenic mice and embryonic stem cell studies. (Job Code 200bb)

Informatics

Computational biologist to design and develop a database for analysis of DNA sequencing results. Five years' experience in developing software (C or C++) and course work in molecular biology. (Job Code 200hr)

Molecular/Cell Biology

Experience in tissue culture and/or DNA/RNA techniques. Must be familiar with cDNA library

construction and screening, DNA cloning, PCR, Southern, Northern, Western blot and gene expression. (Job Code 200hr)

Neurobiology

• Experience in neuropharmacology, *in situ* hybridization, behavioral biology and neurotrophic factor biology. (Job Code 200jm)

• Experience in animal models for neuronal degenerative diseases and general histology. (Job Code 200qy)

Pharmaceutics and Drug Delivery

• Experience in carbohydrate and protein chemistry. (Job Code 200jl)

• Experience with bioanalytical techniques (ELISA, SDS-PAGE), cell culture techniques, and handling of radio-labelled drugs desirable. (Job Code 200pr)

• Experience in biomolecule synthesis/modification/derivatization. Knowledge of spectroscopic and chromatographic methods desirable. (Job Code 200ok)

• Experience in biochemistry to work on *in vivo* and *in vitro* studies of uptake, processing and delivery. (Job Code 200dc)

Protein Chemistry

Experience in purification and characterization of natural and recombinant proteins. (Job Code 200bk)

Sequencing

Experience in the dideoxy chain termination method of DNA sequencing. Knowledge with ABI 373 automatic sequencer desirable. (Job Code 200ss)

Stem Cell Biology

Experience in receptor biology, hematopoiesis growth and differentiation. (Job Code 200jg)

At Amgen, we invest our employees with the freedom to manage their affairs, regulate the quality of work and make decisions within company goals. And, we back this freedom with meaningful challenge and responsibility, as well as a compensation and benefits package that reflects the level of our commitment. So, if it sounds like Amgen could be the right place for you, it's definitely the right time! Submit your resume, for confidential consideration, to: **Amgen Inc., Staffing, Job Code (See Above), Amgen Center, Thousand Oaks, CA 91320-1789.** Equal Opportunity Employer M/F/D/V.

AMGEN®

The flight of focused imagination.

From the very beginning, a brilliant concept radiates with the promise of future achievement. Bringing it to reality requires creativity, enterprise and a painstaking commitment to succeed. It is where the world's premier scientists have a global network of data at their disposal, empowering them to fly with their concepts.

This is the environment of SmithKline Beecham Pharmaceuticals Research and Development. Our history has been marked by pioneer discoveries including the phenothiazine tranquilizers, the H₂-receptor antagonists for gastrointestinal diseases, the identification of the 6-APA nucleus for beta-lactam antibiotics, the creation of the semi-synthetic penicillins, the first successful development of the

Silver gelatin prints. © Aaron Siskind Foundation, courtesy Robert Mann Gallery.



β-lactamase inhibitors to circumvent bacterial resistance and the development of the world's first commercially available, genetically-engineered human vaccine against hepatitis B. These accomplishments have been recognized by the award of a Nobel Prize and fourteen Queen's Awards in the U.K. since 1966.

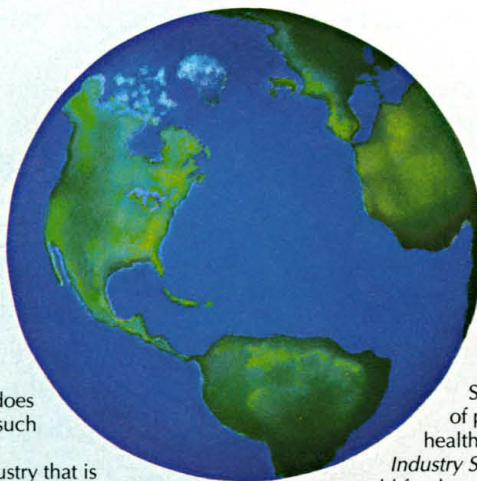
We look to the future with great optimism and the opportunity to explore the yet unrevealed panorama of challenges in our quest for superior therapeutics. If you feel strongly about pursuing your career in a progressive environment, please send your resume to: SmithKline Beecham Pharmaceuticals, Research & Development, Dept. S2/93, P.O. Box 401, Conshohocken, PA 19428. An Equal Opportunity Employer, M/F/D/V.

SB
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Life Science Jobs in a Global Market

Careers in
Biotechnology and
Pharmaceuticals

by John Timpane



Picture yourself on a desert island somewhere between Italy and Africa.

Your entire world is your father, a magician; Ariel, his spirit; and a savage creature, Caliban, wandering discontent on the isle. One day you see a group of handsome, rich, beautifully clad nobility assembled around your dad. They are brand-new to you, a little frightening, very attractive. You might well exclaim, as Miranda does in *The Tempest*, "O brave new world/ That has such people in't."

Picture yourself looking for a job in an industry that is very new, a world that requires innovation and courage, one that has many remarkable people in it and is looking for many more. For those with advanced degrees in science—not only PhDs but also MSs, BSs, and AA's—the world of biotech and pharmaceuticals is brave indeed, full of opportunities and challenges. In 1993 that world is closer than ever to the long-promised "boom" in products created by recombinant methods.

Below, we survey that world. First, we take an overview of pharmaceuticals and biotech, with emphasis on the peaks and valleys in the latter during 1991 and 1992. Charts and graphs will tell you about growth, leading products, and the so-called hot fields. Then we leave the charts and graphs to consider the brave part: how scientists actually get jobs in industry. How should BSs, MSs, and PhDs market themselves? What makes a good résumé, cover letter, interview, and presentation? What is a job interview like? A visit to an employer? And is there life after getting the job? We hear from different kinds of scientists who have gotten different kinds of jobs—and we hear from the human resource managers who are looking hungrily for more scientists.

Finally, we consider the rest of the world: Eurobiotech, bathed in the unsteady light of Maastricht and the EC; and Japan, smaller, diverse, throwing the net wide for products, partnerships, and talent.

Overview

The pharmaceuticals industry is about 150 years old, vast, and growing steadily. Biotech is still new, still small, yet already subject to booms and busts. Pharmaceuticals is also a far larger job world: the Pharmaceutical Manufacturers Association (PMA) estimates that

pharmaceutical companies employ about 300,000 to 400,000 people. An annual report by the accounting firm of Ernst & Young estimates that U.S. biotech companies employ about 79,000.

That's up from 70,000 a year ago, a hearty 13% growth rate. Biotech leads all other technology sectors in this category. The United States is still far and away the number one source of product innovation (according to Herman Saftlas, health care correspondent for *Standard and Poor's Industry Survey*), still the number one talent base in the world for the recombinant revolution (a total of 1,231 companies, according to Ernst & Young), and easily the number one market for biotech products (\$4 billion in 1991, as compared to about \$641 million in Europe). We are, however, hardly alone: there are about 500 companies in Western Europe and about 300 more in Japan doing excellent science and eager to compete.

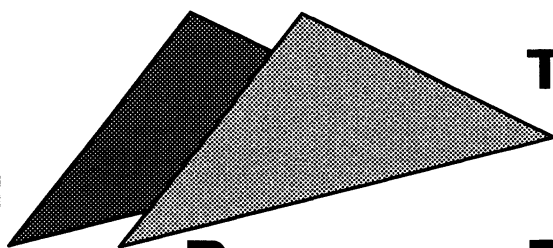
The breakthroughs we read about in the 1980s are now jostling for their debut. In various stages of readiness are important new products for the fight against disease, pestilence, and famine. There is much movement, much positioning, much hastening after good scientists. PhDs with the right skills are still prized, but now the opportunities for BSs and MSs are "simply tremendous," to quote Peter Lasky, manager of human resources for Genetics Institute. The key is to combine the degree with experience, skills, and the human touch.

Baker's Dozen and Friends

The past decade of effort has managed to get 13 biotech products onto the U.S. market—a dozen recombinant proteins and one monoclonal antibody product (see Table, next page). Eli Lilly's Humulin®, a synthetic human insulin, was the first, approved in 1982. The most recent, Proleukin® by Chiron, was approved in May 1992 and will soon be in play. No more than four biotech products have been approved in any one year. Compare this to the 30 traditionally created new biological entities approved in 1991.

But there is a long queue. Twenty-one biotech drugs awaited final FDA approval as of this writing, and hundreds more are in development.

John Timpane, PhD, writes frequently on the pharmaceutical and biotechnology industries.



TECHNOLOGICAL EXCELLENCE
PROVEN EXPERIENCE

PARNASSUS PHARMACEUTICALS, INC.

is a newly-founded, privately held company focused on implementation of biotechnology-driven drug discovery and development. Our research combines novel targets and progressive technological expertise in molecular and cell biology, biophysics, chemistry, biochemical pharmacology and automated screening. The Parnassus paradigm emphasizes a pioneering, highly integrated and fully-enabled approach to the discovery, design and improvement of therapeutic agents for unmet medical needs.

Our scientific co-founders include prestigious members of the San Francisco Bay Area biomedical academic community representing a wide range of technologies. The corporate scientific management includes two noted scientists with experience at both major pharmaceutical and biotechnology companies. The Scientific Advisory Board includes both Nobel Prize-winning scientists and renowned pharmaceutical industry veterans.

We invite Scientists with postdoctoral experience in either an academic or industrial biotechnology/pharmaceutical research environment, and a proven record of success evidenced by publications and patents, to fill important leadership roles at Parnassus in any of the following fields:

Synthetic Organic, Peptide and Medicinal Chemistry

Molecular and Cell Biology

Molecular/Biochemical Pharmacology

Protein Chemistry and Purification

Automation/Robotics Technology

Molecular Diversity Design

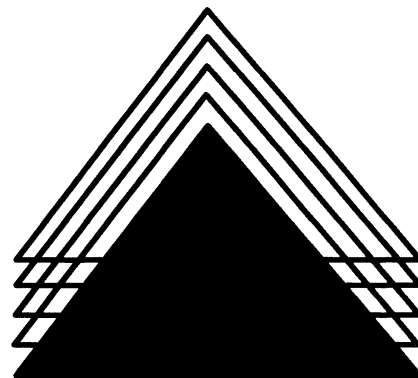
Site-directed Mutagenesis

Structural Biophysics

Computational Chemistry

Successful candidates will play a major role in the growth phase of the Company, and will share in the benefits of equity participation in this exciting venture. If you would like to join the team at Parnassus and make a significant contribution to new approaches in pharmaceutical discovery and development, we encourage you to submit your résumé in confidence to:

Michael C. Venuti, Ph.D.
Chief Scientific Officer
Parnassus Pharmaceuticals, Inc.
211 Belgrave Avenue
San Francisco, CA 94117



PARNASSUS
PHARMACEUTICALS, INC.



Scientific Co-Founders

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Founding Chairman of Parnassus and Professor of Biochemistry and Biophysics, and of Pharmaceutical Chemistry, UCSF

George H. Caughey, M.D.

Associate Professor of Medicine and Associate Member, Cardiovascular Research Institute, UCSF

Robert J. Fletterick, Ph.D.

Professor of Biochemistry and Biophysics, and of Pharmaceutical Chemistry, UCSF

Thomas L. James, Ph.D.

Professor of Chemistry, Pharmaceutical Chemistry and Radiology, UCSF

Jack F. Kirsch, Ph.D.

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Thomas S. Scanlan, Ph.D.

Assistant Professor of Chemistry and Pharmaceutical Chemistry, UCSF

Marc A. Shuman, M.D.

Professor of Medicine, Chief of Hematology and Interim Director, Cancer Research Institute, UCSF

Peter Walter, Ph.D.

Professor of Biochemistry and Biophysics, UCSF

Thomas B. Kornberg, Ph.D.

Professor of Biochemistry and Biophysics, UCSF

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Nobel Laureate in Physiology or Medicine
Professor of Microbiology and Immunology, and of Biochemistry and Biophysics, UCSF

Arthur Kornberg, M.D.

Nobel Laureate in Physiology or Medicine
Professor Emeritus (Active), Biochemistry Department, Stanford University

Howard J. Schaeffer, Ph.D.

President of the Burroughs-Wellcome Fund
Former Director, Burroughs-Wellcome Company

This is a partial listing of the Scientific Co-Founders and Advisory Board

In 1991, the PMA reported that its members were readying 132 such drugs; in March 1992, *Business Week* reported that biotech companies have more than 400 in some stage of testing. If anything is ever going to earn the hyperbole surrounding biotech—the talk of a Renaissance of discovery, of humankind gaining control, finally, over the forces of life—it will be the products biotech actually delivers. By any measure, the agents awaiting approval are a resounding answer. If only a few of them are only moderately successful, the brave new era so long predicted will be with us.

Jackie Syrop, senior editor for P&T, lists more categories of new drugs than there are products now on the market: colony stimulating factors, tumor necrosis factors, interferons, human growth hormones, human insulins, clotting factors, growth factors, interleukins, erythropoietins, thrombolytic agents, monoclonal antibody products (including imaging agents, diagnostics, and drugs to fight transplant rejection, cancer, sepsis, septic shock, and rheumatoid arthritis), immunotherapeutics, cardiovascular drugs, and vaccines. And that's only the American products, and only those related to health care at that. Biotech will soon be a world that has many products in it.

The Long, Strange Trip: 1991-1992

Nothing better illustrates the difference in biotech than its fortunes during 1991-1992, the first an astonishing boom year and the second a lesson in the fickleness of a hypercharged market. Depending on how you look at it, 1991 was either biotech's first great flowering or its first great shake-out. Between January 1991 and January 1992, according to *Business Week*, more than 50 privately held biotech companies went public and another 50 raised new equity. Within twelve months, the industry raised \$4.5 billion, more than that industry had raised in the previous decade. Biotechnology stocks as a group grew 100% in the same period, three times the 30% boom in the stock market. Amgen became the first biotech company to join the Fortune 500, and Centocor, which then had a value of \$1.3 billion, was listed among the *Busi-*

ness Week "Little Giants." Biotech became the darling of Wall Street. Government joined in, announcing in January 1991 a biotechnology research initiative to increase support for basic research by 7%, to \$4.03 billion annually.

These well-known figures masked a less publicized reality: the Darwinian forces of business competition were claiming many companies and forcing others to scramble for support. Despite all the headlines, the industry as a whole lost an estimated \$2.9 billion as of the end of fiscal year 1991. Mergers and joint ventures, ever a part of the biotech landscape, now seemed to be happening to everyone: Chiron

nology, would yield quick profits—but nothing is quick in biotech, at least not yet. G. Kirk Raab, CEO of Genentech, reminded investors that the research and development process takes an average of 7-12 years and costs more than \$300 million.

Some high-profile problems in the industry made investors uneasy. Stock in Immune Response dropped 25% after the FDA disappointed expectations of a quick approval for an AIDS vaccine. Perhaps the best-known cautionary tale was that of Centocor, whose stock lost 41% of its value one April day when the FDA decided not to approve the antiseptic drug Centoxin®. (As of this writing, Centocor has halted U.S. trials of Centoxin® because of disappointing results.) Mired in FDA wrangling, Centocor agreed to sell 5% of itself to Eli Lilly for \$100 million. Investors, not known for being either

peutics committees, who must now not only assess a new drug's efficacy and safety but also (o brave new world) decide which life-and-death cases receive this mortally expensive therapy and which do not. "When you get right down to it," says Lindquist, "the market makes its own decisions about rational drug use." The market has already spoken in some telling instances, including that of Activase TPA®, which has sold less well than anticipated because consumers (i.e., hospitals) largely have decided that its advantages over competitors do not outweigh its higher price.

In the third quarter of 1992, the skid appeared to halt. The *CooperScott Biotech Index* (CSBI), a quarterly report on biotech market fortunes, showed a 1% increase for biotech stocks. That's anemic, but then, so was everybody else: Standard & Poor's 500 grew only 3% in the same quarter. And it's certainly better than a loss of 35% from January to May. The CSBI shows several companies doing quite well.

Calgene (up 33% in the third quarter) and its investors were relieved to hear that the FDA would not impose stringent regulations on its Agbio sector; thus we should soon have the vaunted Flavr-Savr® tomato. Immunex stock grew 57% on news that it had reacquired exclusive rights from Hoechst-Roussel for Leukine®.

Why We Told You This Story

Investors and industry learned together that biotech, as part of the brave new world economy, is indeed subject to economic and social pressures. The roller-coaster ride of 1991-1992 confirms that biotechnology is a different world from that of pharmaceuticals.

Everyone we spoke to about science jobs said this at least once: *Scientists should become knowledgeable about industry.* They should learn how pharmaceuticals and biotech function as brave new worlds; they should learn the sociopolitical, legal, corporate, and market forces that make those worlds go round. "By all means learn these things from the scientist's perspective," says Tim Morrison, director of human resources at Repligen and chairman of the Massachusetts Biotechnology Human Resource Council, "but know that these are the forces shaping the industry you're going into, whether it be high-tech, biotechnology, or pharmaceuticals."

Baker's Dozen

Biotech Products Currently Marketed in the U.S.

Generic name (synonyms)
TRADE NAME (Manufacturer) • Year
Classification: Labeled Indications

Alteplase (rTPA)
ACTIVASE (Genentech) • 1987
recombinant protein: acute myocardial infarction; pulmonary embolism

Epoetin alfa (EPO)
PROCRIT (Amgen) • 1989
recombinant protein: anemia due to chronic renal failure; anemia due to zidovudine treatment in HIV-infected patients

Filgrastim (G-CSF)
NEUPOGEN (Amgen) • 1991
recombinant protein: neutropenia caused by chemotherapy

Hemophilus B (conjugate vaccine)
HIBITITER (Lederle/Praxis) • 1988
recombinant protein: prophylaxis against *Haemophilus influenzae*

Interferon alfa-2a
ROFERON A (Hoffman-La Roche) • 1986
recombinant protein: hairy cell leukemia; AIDS-related Kaposi's sarcoma

Interferon alfa-2b
INTRONA (Schering-Plough) • 1986
recombinant protein: hairy cell leukemia; AIDS-related Kaposi's sarcoma; hepatitis non-A, non-B/C; condylomata acuminata

Interferon gamma-1b
ACTIMUNE (Genentech) • 1990
recombinant protein: chronic granulomatous disease

Hepatitis B vaccine
RECOMBIVAX (MSD) • 1986
recombinant protein: prophylaxis against Hepatitis B infection

Human insulin
HUMULIN (Lilly) • 1982
recombinant protein: diabetes

Muromonab CD3 (OKT3)
ORTHOCLONE OKT3 (Ortho) • 1986
monoclonal antibody: graft rejection in renal transplant patients

Sargramostim (GM-CSF)
LEUKINE (Immunex) • 1991
recombinant protein: myeloid reconstitution after bone marrow transplantation

Somatropin
HUMATROPE (Lilly) • 1987
recombinant protein: human growth hormone deficiency in children

Somatrem
PROTROPIN (Genentech) • 1987
recombinant protein: human growth hormone deficiency in children

Source: P&T
September 1992

calm or patient, saw that no important drug filings were planned until 1994. Rather than diversifying, everybody in U.S. biotech is competing in a very few areas (septic shock, cancer, and cardiovascular, CNS, and autoimmune diseases). Some see this as a reason for concern, especially when they look at Japanese biotech, which, smaller, is trying to spread out into nondrug applications (see "BAI•O•TE•KU•NO•RO•JI•I" below). The risks, the long waits, and the seemingly arbitrary FDA approval process convinced some investors to cut down or step out.

And part of it was the great social and political movement to contain health care costs. Consider Centoxin® therapy, which would have cost \$24,000 a year. Already that is not a popular number for consumers and taxpayers alike. But more: imagine the brand-new economic, ethical, and moral problems facing hospital pharmacy and thera-

**Pursue quality research
in an esteemed scientific
environment.**

POSTDOCTORAL FELLOWSHIP PROGRAM

Genetics Institute, among the most highly respected research and development organizations, is at the forefront of the discovery and characterization of novel human regulatory proteins and their development into biopharmaceuticals. The largest biotechnology employer in Massachusetts, we are proud of our Postdoctoral Fellowship Program, which is designed for training in all areas of biopharmaceutical research and development. The outstanding postgraduate scientists in this program perform research in an academic atmosphere, backed by our exceptional human and scientific resources. In addition to working with noteworthy scientists and gaining exposure to a full spectrum of forefront technologies, Fellows participate in all aspects of scientific interchange. Publication is encouraged, as are presentations, and attendance at internal and national meetings and seminars.

As our research and discovery effort continues, both independently and through collaboration with respected universities, we are interested in individuals who are prepared to draw from our vast resources and make significant contributions in molecular and cell biology.

MOLECULAR AND CELLULAR GENETICS

Our studies, focusing on the expression, processing and secretion of recombinant human proteins in Chinese Hamster Ovary (CHO) cells, require a molecular biologist to set up homologous recombination in CHO cells for targeted gene disruption of secretion and growth control genes. The selected candidate will also have the opportunity to participate in transgenic research. Cell culture experience is desirable. (AD)

MICROBIOLOGY

Genetics Institute has developed new technologies for screening complex peptide libraries for sequences that can functionally mimic ligands for receptors and antibodies. Research opportunities involve utilizing this technology to probe protein-protein interactions and discover new therapeutics. Experience with microbial genetics, molecular biology and/or protein interactions is desirable. (JM)

HEMATOPOIESIS

Study the molecular and cellular biology of recently discovered and novel hematopoietic growth factors and receptors. The ideal candidate will have a PhD in a biological science and experience involving some of the following: PCR, cDNA cloning, receptor binding assays, cell culture, and FACS analysis. (SN)

STRUCTURAL BIOCHEMISTRY

The Structural Biochemistry Department has opportunities available for Postdoctoral Scientists interested in structural biochemistry and macromolecular structure/function relationships. Areas of emphasis include structural biochemistry, receptor/ligand interactions, biophysical analysis of glycoproteins, functional mapping of proteins, or development of MS-based protein and carbohydrate characterization strategies using two- and four-sector MS, ESI/MS and LD-TOF MS. (NS)

PROCESS BIOCHEMISTRY

The Process Biochemistry group is involved in developing scalable processes for purifying proteins of therapeutic importance. Research involves investigating new and emerging technologies for purifying proteins, using proteins that pose challenging separation problems as models. In addition, we are working to better understand the mechanism of action of existing separations, as well as investigating the effects of purification processes on the structure of proteins. (GA)

MICROBIAL FERMENTATION

This research effort involves the development of fermentation processes that maximize the cellular and volumetric productivity of bacteria capable of producing proteins of pharmaceutical interest. An opportunity exists for a microbial physiologist who will utilize knowledge of regulation of energy yielding pathways, protein chemistry and molecular genetics to enhance the production of recombinant proteins in *Escherichia coli*. Demonstrated proficiency with modern molecular biology techniques is essential. (HS)

SMALL MOLECULE DRUG DISCOVERY

Genetics Institute is a recognized leader in the biochemistry of cPLA₂, which mediates the production of inflammatory agents. Research opportunities will focus on advancing our understanding of the regulation, catalytic mechanism and cellular functions of cPLA₂. (SMDD)

PRE-CLINICAL BIOLOGY (2 positions)

Develop infectious disease models for the evaluation of novel cytokines as potential therapeutic agents. Responsibilities encompass performing in vitro and in vivo experiments involving cell assay systems, interactions with microorganisms, and protocol development. A PhD or PhD/MD in Immunology, Microbiology or related discipline is required. Experience with cell culture and in vivo models is desirable. (JS)

Our active pre-clinical hematopoiesis group uses multidisciplinary approaches to study the biology of novel cytokines. This research opportunity requires experience using general techniques of molecular biological analyses. Knowledge of in situ hybridization is desirable. (SG)

At Genetics Institute, you will be at the center of Massachusetts' well-established biotechnology community, which boasts four state centers supporting the sciences, and numerous undergraduate and graduate research institutions, including MIT and Harvard. Our Cambridge, Massachusetts location (across the Charles River from Boston) and Andover, Massachusetts location (just a 20-minute drive from Boston) provide convenient access to a host of widely recognized educational, cultural and recreational offerings throughout New England.

Genetics Institute offers competitive salaries and benefits, including comprehensive healthcare, three weeks' paid vacation, 401(k), stock purchase plan, on-site exercise facility, and child care resource and referral. For more information about postdoctoral fellowships, please send curriculum vitae and letter of interest specifying job code to: **Human Resources Department, Genetics Institute, Inc., 87 CambridgePark Drive, Cambridge, MA 02140, Attn: Postdoc Fellows.**

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

GENETICS INSTITUTE



Harnessing The Body's Power To Heal™

Genetics Institute, one of the most highly respected research and development organizations in the world, is also the largest biotechnology employer in Massachusetts. We are at the forefront of the discovery and characterization of novel human regulatory proteins and their development into biopharmaceuticals, as evidenced by our enviable performance in new drug discoveries. In active development are three promising product candidates, to which we have kept key U.S. marketing rights: a bone growth factor; a platelet stimulator; and a white blood cell factor. Our most recent licensed product to reach the market is a recombinant anti-hemophilic factor. Fueling the pipeline are R&D programs addressing blood cell growth and repair, immune modulation, and small molecule drug discovery, among others.

SMALL MOLECULE DRUG DISCOVERY **Medicinal Chemistry (3 positions)**

We are strengthening our drug discovery efforts with the addition of a Medicinal Chemistry group. We have opportunities for candidates with experience in synthetic organic chemistry and/or medicinal chemistry to join this team in the search for novel anti-inflammatory compounds. We are seeking individuals who thrive on interactions with a multidisciplinary team of Cell/Molecular Biologists, Biochemists, and High Throughput Robotized Screening, Protein Structure and Molecular Modeling groups. Our state-of-the-art facilities include a 600MHz NMR spectrometer and molecular modeling capabilities comprising computer hardware and a full range of software for computational chemistry. The following positions for active experimentalists are available:

PhD in Organic/medicinal Chemistry with 3-5 years' experience in a drug discovery program or experience in natural product synthesis. Experience in the design and synthesis of peptide mimetics would be desirable. A good publication record is a must. (JMS3)

PhD in Synthetic Organic Chemistry with a minimum of 2 years' postdoctoral experience. (JMS4)

BS/MS with 1-3 years' research experience in synthetic organic chemistry. (JMS5)

PRE-CLINICAL BIOLOGY

Toxicology

We seek an experienced individual to plan, initiate and monitor safety studies of key product candidates with outside contract facilities. Responsibilities involve developing an internal laboratory group to provide special toxicology evaluations of drug candidates. Candidates must have 3-5 years' industrial/academic experience evaluating toxicology profiles of drug products. Background with GLP procedures is required. Board Certification in Toxicology (DBAT) and experience with cellular toxicology preferred. (JMS7)

Clinical Pharmacokinetics (3 positions)

Develop a group to support clinical programs for new drug candidates in collaboration with Clinical Research, Regulatory and Pre-Clinical Biology. Responsibilities include designing, monitoring and reporting of clinical pharmacokinetic trials, and providing PK packages for drug submissions. Requirements include a PhD in Pharmacology/Pharmaceutics/ Pharmacokinetics and 3+ years' experience in clinical pharmacokinetics. (JMS1)

In these two newly created positions, candidates will analyze pharmacokinetic/pharmacodynamic data from clinical studies. Responsibilities encompass the development of pharmacokinetic/pharmacodynamic models for drug candidates, presentation of data to management, and preparation of technical reports. A BS/MS in the life sciences and 1+ years' relevant experience are required. (JMS2)

Data Analysis (2 positions)

Develop a small group responsible for the development and application of pharmacokinetic/pharmacodynamic models for new drug candidates. A PhD in Biostatistics/Pharmacokinetics/Pharmacology, and 2 or more years' experience with PK/PD modeling are required. (JMS8)

Perform population pharmacokinetic and pharmacodynamic analysis from non-clinical and clinical data, and support the preparation of technical reports and registration dossiers. A BS/MS and 2+ years' experience in pharmacokinetics/pharmacodynamics are essential. (JMS9)

Assay Support/Development

Develop and conduct routine qualitative/quantitative assays (ELISA, bioassay, HPLC, SEC) on recombinant protein candidates in biological matrices. Activities include coordination of methods performed at outside research facilities. In addition to a BS/MS in the life sciences, you must have 2+ years' experience in immunology and assay development. (JMS10)

DISCOVERY RESEARCH

Protein Purification

Working in our molecular Biology Laboratory, the selected candidate will assume responsibility for the analysis and purification of growth factors from conditioned media and tissue. Requirements include a PhD and 3-5 years' experience in protein purification/biochemistry. (MMS1)

Liver Biology

Contribute to our Molecular Biology Laboratory by assuming responsibility for the cell biology aspects of the liver biology program. To qualify, you must possess a PhD with 3-4 years' postdoctoral experience. Your background must include liver biology experience. The ideal candidate will have experience with primary liver cells, and the biology of fibrosis and cirrhosis. (MMS2)

DNA Synthesis

As a member of our Organic Chemistry Laboratory group, which is responsible for providing DNA synthesis expertise to a variety of Discovery Research laboratories, you will perform automated DNA chemistry. A BS/MS in Chemistry/Biochemistry and 1-3 years' related technical experience are necessary; background with DNA synthesizers preferred. (MMS3)

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Peptide Synthesis

Explore peptide synthesis technology as a method for generating large collections of molecules suitable for screening in our Drug Discovery program. A BS/MS in Chemistry and 1-3 years' experience in organic synthesis are highly desirable. (MMS4)

Protein Chemistry

Within our Protein Chemistry Laboratory, your primary responsibilities will encompass protein purification and characterization of novel proteins. The successful candidate will possess a BS/MS and 1-3 years' relevant experience; background with SDS-PAGE, HPLC and column chromatography preferred. (MMS5)

Molecular and Cellular Genetics/Transgenics (3 positions)

Responsibilities include genomic cloning; immortalizing primary cells; and expressing recombinant proteins and performing gene knockout experiments in mammalian cells. Successful candidates will have BS/MS degrees in the biological sciences and 2-4 years' experience, ideally involving mammalian tissue culture and standard techniques of molecular biology. Experience with embryonic stem cells desirable. (MMS6)

Conduct structure-function studies on coagulation proteins. A minimum of a BS/BA in the life sciences is required, along with 1-2 years' experience in molecular biology, cloning and cell culture. Experience in site-directed mutagenesis desirable. (MMS7)

Cellular Immunology (3 positions)

We are seeking intelligent, creative and hardworking scientists trained in the primary culturing and assay of lymphocytes, as well as epithelial and tumor cells, to study immunoregulatory mechanisms. Two positions are available: one for a PhD with 3-4 years' postdoctoral training including experience with protein purification; and a second for an individual with a BA/BS and no less than 3 years' experience including FACS and molecular biology. (MMS8)

Utilize your excellent tissue culture and molecular biology experience in our Cellular Immunology Lab. The selected candidate will have a minimum of a BS in the life sciences and 5 years experience; immunology/cell biology background desirable. (MMS9)

PHARMACEUTICAL SCIENCES

Particle Analysis

Perform pharmaceutical particle analysis, with responsibility for lab set up and quantification/identification of particles in parenteral products. In addition to a PhD and 0-5 years' experience, you must possess knowledge of the operation of HIAC, Coulter, Malvern, SEM and optical microscopy.(DMS1)

Drug Delivery

Develop targeted and controlled released delivery systems for our proprietary protein-based biopharmaceuticals. Responsibilities involve preparing samples, screening new biomaterials, and working with pre-clinical investigators. A PhD in Chemistry/Pharmaceuticals/ Pharmacokinetics/ Pharmacodynamics or equivalent is essential, along with 0-2 years' experience. (DMS2)

Principal Scientist

Develop processes for BEP manufacture, including preparation, filling, drying and sterilization. The selected candidate will have PhD in Chemistry/Chemical Engineering/Pharmaceuticals/ Materials Engineering or related discipline, plus 10 years' experience in the pharmaceutical/device industry and involving erodible medical devices or drug delivery system process development. (DMS3)

PRE-CLINICAL SCIENCE/ DRUG DELIVERY

Supervise a staff of pre-clinical scientists involved in developing drug delivery systems for biopharmaceuticals. Activities will include representing the department on multidisciplinary project teams, and supporting pre-clinical investigations. A PhD in Chemistry/Pharmacy/Biomaterials Engineering, 5-10 years' experience involving erodible delivery systems and devices, and superior communications skills are necessary. (DMS4)

MICROBIAL FERMENTATION

Microbiologist/Biochemical Engineer

Primary responsibilities involve developing fermentation processes that optimize production of biopharmaceuticals by recombinant bacteria. Applicants must have BS degrees with 2-4 years' experience or MS degrees with 0-2 years' experience in microbiology, biochemical engineering or a related field. Working knowledge of current fermentation technology is vital. An understanding of bacterial physiology and/or molecular biology desirable.(DMS5)

Biochemical/Chemical Engineer

Assume responsibility for the initial scale-up of fermentation processes designed to produce biopharmaceuticals from recombinant bacteria. You will participate in the transfer of these processes from small bench- to intermediate-scale bioreactors, with some process optimization involvement at the intermediate scale. To qualify, you must have a working knowledge of current fermentation technology, plus a BS with 4-6 years' experience or an MS with 2-4 years' experience in microbiology, biochemical engineering or a related field. Knowledge of bacterial physiology and/or molecular biology desirable.(DMS6)

Genetics Institute offers competitive salaries and benefits, including comprehensive healthcare, three weeks' paid vacation, 401(k), stock purchase plan and equity participation programs, on-site exercise facility, and child care resource and referral.



See us at The Career Connection Job Fair
Friday, February 26th, 9am-1pm & 3-6pm
Saturday, February 27th, 9am-2pm
Guest Quarters Suites Hotel
640 West Germantown Pike,
Plymouth Meeting, PA

If you are unable to attend the job fair, please forward your resume to Human Resources Department, Genetics Institute, Inc., 87 CambridgePark Drive, Cambridge, MA 02140, specifying the job code for position of interest.

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

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Scientists

Synergen, located in Boulder, Colorado, is a research-based biopharmaceutical company engaged in the discovery, development and production of protein-based human pharmaceuticals. Synergen's recombinant technology focuses on naturally occurring human proteins that regulate body processes associated with disease.

Synergen is working to further scientific understanding of how the human body responds to inflammation, injury and disease, in order to produce pharmaceuticals that reduce mortality and help people who have illnesses that currently have no satisfactory treatment. Currently, we are conducting Clinical Trials, Phases I through III, for several promising compounds and are now ready to manufacture in our new commercial scale manufacturing plant.

This is difficult, challenging and exciting work. Highly qualified people are drawn to Synergen, attracted by the science, energy, values and informal collegial work environment.

Openings for scientists exist in the following areas:

PHARMACOKINETICS

This position requires a scientist with a Ph.D. in pharmacokinetics, pharmacology, or physiology and a well-established expertise in pharmacokinetics and protein analysis. Demonstrated experience in animal and human pharmacokinetics of therapeutic proteins is desired.

FORMULATIONS

This scientist will work in the laboratory developing formulations for new protein therapeutics for clinical testing and/or work on advanced delivery systems. Requirements include experience in protein chemistry, formulation development, lyophilization or advanced delivery systems applicable to protein therapeutics.

TOXICOLOGY

This scientist will use *in vivo* models to test preclinical safety of anti-inflammatory agents, cytokines, binding proteins and neurotrophic factors. Demonstrated experience in toxicology and physiology and *in vivo/in vitro* model experimentation is essential. Ph.D. or DVM/Ph.D. with a minimum of 2 years Post Doctoral experience is required.

Synergen offers competitive salaries, generous benefits including relocation and 401(K), and corporate financial stability. Synergen is nestled at the base of the Rocky Mountains in Boulder, Colorado, a university community just 30 minutes north of Denver. The area's mild, sunny climate fosters an active, casual lifestyle in a community that respects education and technology.

For consideration please send your resume/C.V. to: **Employment Manager, Box SCF, Synergen, Inc., 1885 33rd Street, Boulder, CO 80301.** We are an Equal Opportunity Employer.



The Most Logical Company of Gail K. Naughton

Gail K. Naughton, executive vice president, chief operating officer, and co-founder of Advanced Tissue Sciences in La Jolla, California, says that when you have a good idea, a good way to make it happen, and a desire to do cutting-edge work that will benefit people, starting a biotech company is sometimes simply "the most logical thing to do."

After receiving her BS in biology from St. Francis College in Brooklyn, Naughton joined the basic medical sciences program at the New York University Medical Center. Her research at that time was in hematology, dealing with both blood and bone marrow

tissues. After completing her PhD, she stayed on for a postdoc in the dermatology department.

Her project involved vitiligo (a disease in which the skin loses all its pigmentation) and its relationship to melanoma. Animals with melanomas sometimes develop vitiligo, which saves their lives. "We were trying to mimic the same mechanisms in humans," Naughton says. "My project forced me to learn how to culture a variety of human skin cells. I tried the traditional methods, but after a while it became apparent there must be a better way. My husband, a hematologist, was working with bone marrow tissues, and he suggested that three-dimensionality would help."

"What we did was very basic: we took traditional ways of growing cells and matched them with a technology known for many years—that if you add a feeder layer of cells that make growth factors, the cells will grow better. We basically adapted those techniques to a three-dimensional system, knowing that most closely represents human skin tissue. We saw we had a powerful idea, and we started looking around for funding. It was as simple as that."

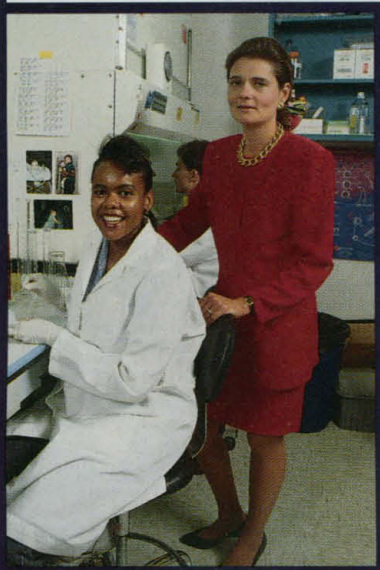
As simple as being in the right place at the right time. "The NYU Medical Center is well known for helping motivate scientists into business," she says. "And the mid-80s was an exciting time for new research being funded by industry." Academic grants were dwindling, and investors were very excited about the promise of biotech. "Plus a couple of people I'd known had started companies. So it was worth a shot."

Advanced Tissue Sciences is a tissue engineering company. Its premier product was Skin²—living tissue for research testing. Why start with a nontherapeutic product? "Because we were among the first to grow tissue and ship it worldwide for further use. We wanted to learn what the whole process would be like: QC, QA, getting through customs and still emerging with a living tissue at the end of it. There was no cookbook. We had to do it first ourselves. Then we could leverage that expertise into our transplant products." A living dermal replacement, for use in severe burns, chronic skin ulcers, and deep wounds, has been in clinical testing since January 1991. Other tissues, including cartilage, bone, and liver, are in preclinical studies.

Naughton's career is a study in the new symbiosis between industry and science. She enjoys her working relationship with Art Benvenuto, the company's CEO, who "has brought us extensive business experience and a much-needed emphasis on delivering more than we promise." In September 1992, Advanced Tissue Sciences acquired Neomorphics, a small company in Massachusetts. It was one of those universally beneficial alliances that one hears more and more about in biotech. Advanced Tissue Sciences continues to fund the laboratories and the 35 scientists at Neomorphics. "They continue to do their excellent work, and we benefit from their expertise," she says. "But this acquisition has also been a means of funding the transplant lab of Joseph Vacanti, director of transplantation at Children's Hospital in Boston, as well as the laboratory of Robert Langer of MIT, probably the best-known polymer scientist in the world."

"Thus we have an exciting liaison with two top centers where new research is continuously being done by bright minds in touch with the latest discoveries. Their doctoral and postdoctoral scientists are working on research that we can then transfer to clinical testing in a very short time. We do the upscale development of the product, the clinical trials, and the marketing. This really is a testimony to the new relationship between biotech and academicians, really a new attitude toward the relation between research and product development."

Energy levels are high at Advanced Tissue Sciences. "The excitement is always there. The talent never goes away. We hire people with a sense of humor because you need that in this business. They have to want to do cutting-edge work in the newest of technologies—and they have to believe in doing something that is going to benefit people. That's the true excitement and challenge of it."



Advanced Tissue Sciences COO Gail K. Naughton (right), with research associates Inger Kidd (left) and Lee Landeen (background).

HOT FIELDS

Q: What are the "hot fields" in biotech and pharmaceuticals today?

A: It all depends.

Always there are the traditional areas of advancement. A report prepared for the PMA identifies seven: the cause of cancer and its relationship with aging; the link between the environment and genetic factors in coronary heart disease; pain; arthritis and connective tissue diseases; mental illness, including depression and schizophrenia; memory improvement for patients with Alzheimer's disease and other dementia; and advanced drug delivery systems. One could add the treatment of HIV/AIDS patients (11 agents now on the market and 77 in testing) or septic shock. And there are other worlds to be conquered, including ag biotech, mining (designer microorganisms that leach minerals), bioremediation, detergents, and cosmetics.

Heat is unequally distributed. What's hot at a particular company depends on its needs and its state of maturity. Although molecular biology appears under "Pure Heat" below, many smaller and mid-size companies need staff in other areas. Mark Iorio, human resource manager at Serono Laboratories, says, "For us, there's a large number of qualified PhDs looking for pure research positions, when we're looking for good people in clinical research, manufacturing, and regulatory affairs."

On the other hand, Melanie Graper, director of worldwide R&D employment for SmithKline Beecham, says, "Molecular genetics is a hot field now." Debbie Calabrese, area human resource manager for research at Amgen, says, "We're looking to expand. That means people with molecular and cell biology backgrounds, protein chemistry, inflammation, and neurobiology." So the pure researcher is still very much in demand—and in ever more specialized niches. "A trend we're seeing, especially among pure researchers now, is that the more

We're pioneering new frontiers in oligonucleotide therapeutics.

Gen-Probe Incorporated is the acknowledged leader in DNA probe diagnostics. The foundation of our Company's success has been innovative approaches to solving challenging technical problems as well as the ability to apply our technology to important medical problems. These same strengths coupled with our experience in nucleic acid diagnostics make Gen-Probe uniquely suited to assume a leadership position in the emerging area of oligonucleotide therapeutics.

We are seeking Scientists with varied backgrounds and experience to join us in developing agents to treat infectious diseases and develop core technologies. We seek those with a pioneering spirit who wish to explore new approaches in an environment that fosters creativity and rewards innovative contributions.

PROGRAM LEADERS—The successful candidate will lead a group of creative Scientists developing oligonucleotide therapeutics for treating infectious diseases from initial concepts through clinical trials. As such, you will have primary responsibility for the development of new agents and the evaluation of their effectiveness and safety.

Requirements include a PhD or MD degree in Virology, Microbiology, Cell Biology, Molecular Biology, Pathology, Pharmacology or other relevant discipline, and a minimum of 5-7 years' experience in the pharmaceutical industry in positions of increasing responsibility. At least 2 years' experience in drug development is essential, as are demonstrated managerial and leadership skills and a record of significant scientific accomplishment as evidenced by publications in refereed journals and/or patents. Some experience with antisense agents is highly desirable. **Dept. 296.**

SENIOR RESEARCH SCIENTISTS—We are seeking candidates with 3-5 years' related experience, good supervisory and leadership skills, as well as a proven record of scientific accomplishment.

In Vitro Assay Development

Primary responsibility of this position is the development of *in vitro* assay systems for evaluating oligonucleotide therapeutic agents for treating infectious diseases.

Candidates are required to possess a PhD or MD degree in Virology, Microbiology, Cell Biology, or other relevant discipline, and experience working with infectious viruses, microorganisms including mycobacteria and developing assay systems for monitoring expression of genes in eukaryotic and prokaryotic cells. **Dept. 297.**

Molecular Biology

This researcher will work on a special project requiring familiarity with a broad range of modern techniques

in molecular genetics, including cloning, sequencing, expression systems, and nucleic acid characterization.

Candidates must have a PhD in Molecular Biology, Biochemistry, or a related relevant discipline, and experience with the biological synthesis of nucleic acids. Experience with modern techniques of molecular genetics and with nucleic acid polymerizing enzymes is essential. Experience with eukaryotic systems is highly desirable. **Dept. 298.**

Cell Biology

This researcher will work on a project requiring familiarity with a broad range of modern techniques in cell biology including macrophage tissue culture and fluorescence activated cell sorting.

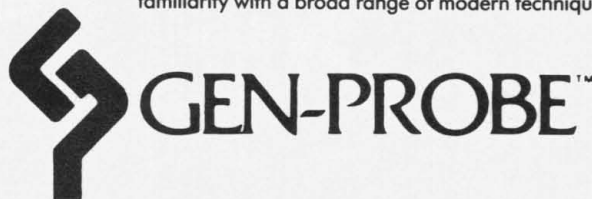
Candidates must have a PhD in Cell Biology, Molecular Biology, Biochemistry, or a related relevant discipline, and experience in macrophage tissue culture, receptor liquid interaction and fluorescence activated cell sorting techniques. **Dept. 299.**

RESEARCH ASSOCIATES—Requirements include an MS or BS in Chemistry, Cell Biology, Molecular Biology, Virology, Biochemistry or related discipline, and a minimum of 2 years' post-degree relevant experience. For one position, previous experience with tissue culture essential.

Successful candidates may take advantage of significant opportunities for career advancement, including tuition reimbursement and the Company's established policy of promoting individuals based upon ability and performance without rigid formal degree requirements. **Dept. 300.**

Gen-Probe offers the advantages of working for an established, successful company which, nonetheless, maintains an entrepreneurial focus. Experienced and highly educated support groups in DNA synthesis, computer analysis, sequencing and probe design, and other relevant areas are in place to allow incoming investigators to concentrate their efforts on development of new approaches. The UCSD campus is just across the street, allowing Gen-Probe researchers to take advantage of excellent library facilities, seminars, and the other resources of a renowned academic institution. As a center for biotechnology companies, San Diego offers a rich schedule of meetings and conferences in addition to the recreational opportunities afforded by its climate and location.

If you are excited by the challenge of working on one of the most difficult and important medical problems of our time, we'd like to hear from you. Please send your resume/C.V. referencing appropriate department code to: **GEN-PROBE INCORPORATED, Attn: Human Resources, 9880 Campus Point Drive, San Diego, CA 92121. EOE.**



Imagine the Possibilities

At Berlex, we've been building an impressive team with some of the finest talent in the pharmaceutical industry. To meet the challenges before us, we're seeking several key members to help advance our scientific mission and arrive at new possibilities in Oncology and Cardiovascular research.

If you've been looking for the opportunity to join forces with an internationally recognized pharmaceutical team, imagine building your career with Berlex at our new state of the art facility in Richmond, California.

Medical & Regulatory Affairs

Associate Director-Clinical Research
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Executive and Administrative Secretary

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Research Associate to Senior Scientist
Executive Assistant

Quality Control

Chemist
Microbiologist Supervisor

Cell Biology

Senior Scientist
Flow Cytometrist

Analytical Peptide Chemistry

Protein Chemistry

Biochemistry

Molecular Biology

Oncology Research

Cell Line Development

Chemical Development

Medicinal Chemistry

Development Research – Pharmacology

Associate Scientist to
Senior Scientist positions

Process Development

Associate I to Research Scientist I

Toxicology

Pharmokineticist

Clinical Trials Management

Associate Director–
Clinical Administration
Medical Writer III

Operations

Senior Project Plant Engineer

As a U.S. subsidiary of an international Fortune 500 company, Berlex offers competitive salaries and a full complement of benefits, including relocation assistance to our new 53-acre campus facility in the San Francisco Bay Area. To join our team, please send your resume today, to: **Berlex, HR Employment, Dept. 019, 15049 San Pablo Avenue, Richmond, CA 94804-0099.** We are an equal opportunity employer.



BERLEX

THE BEST IS YET TO COME



Molecular Modeling

specialized you are in hot technologies, the more in demand you're going to be," says Graper.

The problem, everyone seems to feel, is finding these people. They fear that with so many folks specializing in the needs of the moment, we may be neglecting the needs of the future. That's a worrisome scenario, especially with the perceived decline in the numbers of life-science PhDs. "A trend I see is fewer people graduating in the life sciences, fewer PhDs," says Graper. "In the future, this trend may force companies to look for good MSs and train them for their needs, send them back to school, do whatever they have to to keep up."

"Be looking five, 10 years down the line," says Roach of Corvas. "I'd think that a science PhD, a science graduate at any level, would need to look at the whole industry and where it's going. Don't limit yourself to what you're doing here and now."

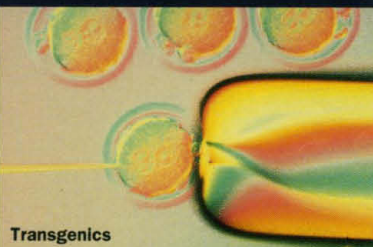
Accordingly, we have classified our "hot fields" under

- **Pure Heat**—areas of pure research where the most excitement is at this very moment;
- **Getting Hot**—job needs that are getting needier;
- **Forever Hot**—areas that promise a lifetime career; if you do these things, almost any biotech or pharmaceutical company would love to meet you.

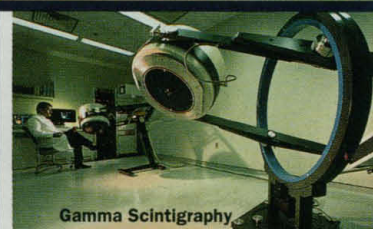
As you read down the lists, keep in mind that heat is unequally distributed. Your job is to learn *what's hot where*.



Protein Synthesis



Transgenics



Gamma Scintigraphy

Pure Heat

Below is a list of the traditional cutting-edge fields in biotechnology and pharmaceuticals. Paradoxically, almost all are both highly advanced and still nascent.

Antibody Research. The immune system may be the most-studied organ in the human body over the past decade. Scientists can now design antibodies for specific diseases, as well as factors to promote creation of antibodies by cells.

Antisense. Researchers integrate small oligonucleotide segments into DNA strands to block or decrease the expression of defective genes.

Gene Therapy and Transgenics. Direct biochemical "surgery" on defective or abnormal genes draws closer as a commercial reality. Transgenics is the technology for introducing new genetic information into an organism.

Monoclonal Antibody Research. Along with genetic recombination, the creation of monoclonal antibodies is the founding art of biotech. Scientists can now design hybridoma cell cultures that manufacture antibodies to fight everything from cancer tissue to lymphocytes involved in tissue rejection and autoimmune diseases. This technique has created an industry unto itself.

Peptide Chemistry. Science graduates at all levels are being hired to perform synthesis and characterization of peptides and peptide analogues for a variety of uses.

Plant Cell Tissue Technology. Scientists in this field study methods of turning plant tissues into mass-production factories for beneficial proteins and therapeutics. It's harder than with single-cell technologies (see **Ag Biotech** below), but the rewards are comparable.

Recombinant DNA. A catch-all term for the grandfather of all biotechnologies. Recombinant technology has proliferated into a highly specialized set of techniques adapted for such diverse fields as antiviral research, ag biotech, and medical diagnostics.

Vaccine Research. An area of great commercial as well as humanitarian potential. Vaccine research is quickly turning into vaccine development.

Ag Biotech. In 1992, the FDA gladdened ag biotechnologists everywhere by deciding not to regulate transgenic agricultural products. We mentioned the Flavr-Savr® tomato, which, according to *Business Week*, could attract a \$150-million market by the late 1990s. Warming up on the sidelines are milk-increasing hormones and pest- and herbicide-resistant corn. Research breakthroughs have come more slowly in ag biotech than elsewhere in the industry. That is partly because of the special difficulties of plant cell biology (e.g., finding vectors that can effectively transport genes into plant cells) and partly because Wall Street is too enamored of the drug market to get down on the farm. Although ag biotech represents only 4% of the total biotech market, it seems a likely candidate for rapid growth. In the meantime, the ag biotech world is calling for scientists expert in plant cell microbiology and plant gene engineering.

Getting Hot

Jobs in this category have always existed in biotech—what's new is the need. **Bioprocess Engineers.** "A very big need right now" was a phrase that leapt from the lips of Iorio, Lindquist, Roach, and many others. The profile: a BS or MS in chemical engineering with six months to a year's experience in large-scale bioreactor design and operation.

Computer/Life Scientists. According to *Computerworld*, the first decade of biotech hiring of computer scientists was disappointing. "The problem was," Lindquist says, "you can't just be a computer jockey. You have to have a background in the science to be able to work with other industrial scientists." Another problem was applications, largely confined to company information systems. "But," Lindquist says, "we're now seeing more of just the right kind of person. On the horizon is the Human Genome Project. The question will be how to marry computing skills to the needs that project creates. Beginning now, the computer science person with a good background in bioscience will be absolutely essential."

Brain Boomers. People who can use biotech tools to design drugs that cross the blood-brain barrier are coming into their golden time. "It's really only starting now," says Lindquist. "This is one area in which biotech, as opposed to more traditional approaches, can make a real contribution now and for the next decade." Researchers like Elaine Tuomanen of the Rockefeller University have begun to understand how microbes can slip in past the guard; research giants like CIBA-Geigy are now hard at work designing barrier-breaking drugs.

The Dedicated Immunologist. A long, intense decade of investigation into HIV, AIDS, and neutropenia has produced new specializations for immunologists. "Instead of an immunologist with a straight bio degree, we're looking for people with specific experience working with anti-infective technologies, especially with HIV, herpes, et cetera," says Graper of SmithKline Beecham. "We're in the era, not only of the molecular biologist, but also of the virologist."

Axial Chromatographers and Mass Spectrometers. Biochemistry graduates (not necessarily PhDs) with experience in these technologies are in increasing demand.

Nurses. As companies move to clinical testing, they will need nurses—especially those with experience in large-scale experimental medicine or clinical trials. Christos Richards, executive vice president for Career Connection, an organization that brings together employers and employees in high-technology fields, says, "Whereas once we were exclusively focusing on chemists and biologists, the industry now requires a much more comprehensive program, which we are addressing by advertising in nursing and clinical research." Desirables include a degree in nursing science with two to five years' experience in clinical testing; a nursing degree and a degree in a relevant science; significant experience at a prominent research hospital; and a great willingness to travel, since traveling to research centers can represent more than half the work-time for entry-level professionals.

Bioremediators. The race is on to design the life-form that can a) eat trash happily for hundreds of years; b) convert it to something people can use, like ethanol; c) live a stable life underground; and d) not hurt anything else.

Forever Hot

Most of these jobs call for specific combinations of a non-life-science field (law, computing, or manufacturing) with a science background. People with these profiles are uncommon, much-cherished, and much-paid.

Patent Attorneys with a Science Degree. Graper of SmithKline Beecham says that "a degree in patent law with a PhD in a relevant scientific area is in very hot demand. Such people can plan their own careers, and they are highly compensated. Our problem is, where do you find these people? They're a very special person; it takes at least 10 years to acquire this particular profile." Other desirable legal specialties include intellectual property rights, regulatory affairs, and industrial law.

Statisticians with a Science Degree. People with a PhD in statistics and a BS or MS in a scientific field can pretty much write their own ticket.

Postdoctoral Research Scientist Program

The Upjohn Company, a recognized leader in pharmaceutical research and development, announces the 1993 Postdoctoral Research Scientist (PRS) Program for our Upjohn Laboratories Division. This program reflects Upjohn's commitment to encourage creative and innovative science, to stimulate new scientific techniques and concepts, and to provide an excellent training environment for our PRS scientists.

The Upjohn PRS Program is designed to provide a top-quality research experience and the opportunity to publish scientific results. A number of PRS positions are currently open with most appointments being decided by mid-year. Appointments are generally made for two years.

In addition to an excellent salary and benefits package, Upjohn Laboratories offers a stimulating, multi-disciplinary research environment at our modern facilities located in Kalamazoo, a southwestern Michigan community located midway between Chicago and Detroit. Our region provides an outstanding mix of cultural and recreational pursuits and a reasonable housing cost market.

Upjohn Laboratories, a division of the The Upjohn Company, invites applications from new or recent doctorates in science, medicine and/or veterinary medicine to conduct research in the following areas:

MOLECULAR AND CELL BIOLOGY

Position Code #140

- Examine the molecular mechanism of regulated exocytosis in endothelial cells.
- Conduct investigations in extending plasma half-life, stability and aqueous solubility. Experience in protein glycosylation, glycosyltransferases, oligosaccharides and/or molecular biology is desirable.
- Investigate dopamine receptor subtypes at the biochemical and molecular level.
- Participate in the development of veterinary vaccines for selected swine pathogens.
- Examine nitric oxide cytotoxicity. Pharmacology, biochemistry, physiology or analytical biochemistry degree is required with a background in either mass spectrometry or the biology of nitric oxide.

ADHESION BIOLOGY

Position Code #141

- Conduct molecular studies of leukocyte-endothelial cell adhesion, including technologies for cellular adhesion molecules, with special emphasis on the discovery of new adhesion receptors-ligands and second messenger systems.

DRUG DELIVERY

Position Code #142

- Delivery of lipophilic substances from emulsions to cells using physical & chemical techniques, including confocal laser microscopy. Experience in either cell biology, lipid chemistry, physical chemistry, or drug delivery kinetics/thermodynamics is desirable.
- Quantitative mechanistic evaluation, including prediction of drug release from extended release hydrophilic matrices. Background in chemical engineering, physical chemistry, polymer science, pharmaceuticals or related discipline is required.

DRUG METABOLISM & PHARMACOKINETICS

Position Code #139

- Study the regulation of P-450, metabolic activation of drugs to reactive intermediates, metabolism of ester prodrugs and heterocyclic amines, *in vivo* and *in vitro* model systems to predict first-pass metabolism. Successful candidates will collaborate with drug metabolism and drug discovery scientists to apply metabolism and pharmacokinetics principles for the discovery of safe & effective therapeutic agents.

COMPUTATIONAL CHEMISTRY

Position Code #143

- Statistician with expertise in high-dimensional data analysis and interest in chemical & biological applications needed to analyze and develop measures of molecular similarity.

PHYSICAL & ANALYTICAL CHEMISTRY

Position Code #144

- Examine the structural biology of adhesion proteins. A background of NMR spectroscopy is required with experience in the application of NMR methods to investigate protein structure or protein-ligand interactions.
- Examine proteins related to HIV. Experience in macromolecular crystallography of proteins is preferred.

MEDICINAL CHEMISTRY

Position Code #145

- Projects will include the development of synthetic methods, particularly as applied to molecules of biological interest, and the design & synthesis of useful medicinal agents. Organic or medicinal chemistry with strong background in organic synthesis is required.

For consideration, please forward your C.V. and a statement of research interests (refer to the appropriate Position Code in your cover letter) to: **THE UPJOHN COMPANY, Corporate Recruiting, 7000 Portage Road, Kalamazoo, MI 49001-0199.** Equal Opportunity Employer.

Upjohn

Our Commitment to Scientific Excellence Continues...

WE'VE MADE IT OVER THE HORIZON

Setting a rapid pace in scientific and financial achievements, San Diego-based GENSLA PHARMACEUTICALS is a top-tier, publicly-traded biopharmaceutical company driven by a sense of urgency in bringing innovative products to the acute-care hospital market. Our research programs are focused in the areas of cardiovascular disease, central nervous system, inflammation and diabetes. We have already completed our first multinational Phase III program and are in late Phase III with our second program, which incorporates a new drug and highly innovative computer-controlled delivery device. This success invites additional dedicated individuals to help us expand and share in our future growth.

Our location in San Diego offers many desirable lifestyle and professional benefits in the heart of one of the nation's biotech and academic centers of excellence.

Biochemistry

PhD-level candidates in any of the following will be considered: Biochemistry, Cellular Pharmacology, Cell Biology or Genetics with extensive experience in intermediary metabolism. Responsibilities include measuring levels of normal cellular metabolites and drugs in cultured and isolated cells to study the effects of drugs and other stimuli on cellular metabolism and developing model systems to evaluate mechanisms of drug action. Candidates with experience in signal transduction including measurement of intermediates in such pathways are also encouraged to apply. Experience in engineering metabolic pathways in mammalian cells and/or yeast will earn special consideration. *Code SC/JA.*

Analytical Chemistry

Candidates at the MS- and PhD-level will be considered with extensive experience in analytical and preparative HPLC and knowledge of synthetic organic chemistry. Knowledge of regulatory procedures and experience in other analytical methods are desirable. *Code SC/ME.*

Immunology

The successful candidate will perform and supervise experimental research focusing on the effect of

novel chemicals on animal models of inflammation. Qualified individuals should possess a PhD in Pharmacology/Immunology and at least 3-5 years of postdoctoral experience with specific training in immunohistochemistry, routine histologic techniques and developing models of inflammation. Drug discovery and industry experience are significant advantages. *Code SC/GF.*

Medicinal Chemistry

Associate Director

The successful candidate will have a minimum of 5 years' experience in a pharmaceutical company, a strong record of scientific accomplishments and a proven ability to organize and lead a chemistry group. *Code SC/ME.*

Chemical Development

Associate Director

The successful candidate will have a minimum of 5 years' experience in a process chemistry group focused on the synthesis of development candidates for a pharmaceutical company. A successful record of scientific accomplishments, good communication skills and the ability to direct a process group is required. *Code SC/ME.*

Future Opportunities

GENSLA's rapid growth will lead us to expand the Research and Development staff throughout the year. Should your talents fall in the areas of clinical research, formulations, or regulatory affairs, we welcome you to send your resume and a letter indicating your interests and professional plans for our future reference.

Stock options, competitive salaries, progressive benefits and a stimulating work environment support the people who work for GENSLA. Please indicate the position of interest and code and send your c.v. to: **GENSLA PHARMACEUTICALS, INC., Human Resources/SCI212, 11025 Roselle St., San Diego, CA 92121-1204.** We are proud to offer equal opportunity employment and a culturally diverse workplace to everyone.



GENSLATM
PHARMACEUTICALS, INC.

"We need them," says Graper, "to work with our research scientists in areas like molecular modeling, where you're really doing the research on computer." The demand is perhaps even greater in clinical research, where trial data need to be processed yesterday.

Chemical Engineers. A sentence we heard almost verbatim from 10 sources: "We need chemical engineers at both ends of the stream: from cell culture and growth on one end to protein purification on the other." Flip through the job advertisements in this magazine and you will see the titles: process engineer, protein purification engineer, recovery development engineer, ferment-

tation laboratory manager. "There seems to be a wealth of biologists and not as many chemists graduating today in the U.S., though internationally there's more of a balance between chemists and biologists," says Graper. "Chemists with a background in organic chemistry or synthetic chemistry are in big demand, and I think always will be." Gary Howell, manager of PhD recruiting for Procter & Gamble, says, "PhD chemists, in general, are in relatively high demand, even in recessionary periods like we have today."

Analysts of Quality. The shift in biotech from research to development (discussed below) has created a need for professionals who vali-

date analytical tests on products, ensuring that all procedures follow FDA guidelines and cGMP regulations. Profile: a PhD in biochemistry; two or more years of related experience; working knowledge of technologies such as high-pressure liquid chromatography, gel electrophoresis, and DNA assays; experience with FDA submissions.

Facilities and Safety. These people manage the setting up of manufacturing facilities and labs. Again, they tend to have both a degree in the relevant science and extensive experience in F&S. "Wherever you're dealing with chemicals, biologicals, and sensitive technologies, safety issues are always coming up," says

Lindquist. "Some companies farm these concerns out to consultants or external specialists, but many others are handling it in-house. It gets to be a full-time job, and in fact you now find a lot of F&S people specializing, say, in organic chemistry, HIV, or immunology. This is a big opportunity now and will become even more of one." **Salespersons.** *Working Woman* (July 1992) lists biotech salesperson as one of its "25 Most Popular Careers." A BS and two years of related sales experience can attract an entry-level salary of \$35,000 to 40,000, growing to \$50,000 mid-range, and reaching up to \$85,000 at the top—equal to what many senior research scientists make.

The Bachelor's Career: Kathy Wortham



Kathy Wortham is one of thousands of American scientists who have built a career based on experience, skills, technical know-how—and a bachelor's degree. Wortham is a senior research associate in the preclinical group at Repligen, and after a long academic career, she decided in the spring of 1992 to make the switch to industry.

It started the way millions of job searches start: She looked in the papers. She wanted to know what the science-based industries in her area were looking for and how her background could fit in.

That background included an AAS in medical technology from Westchester Community College and a BA in biological science from the City University of New York. "I had worked in a hematology laboratory, and so I could claim some lab experience," she recalls. That experience came in handy when she interviewed at Memorial Sloan-Kettering Cancer Center. "Although my lab work had little to do with my eventual work at Sloan-Kettering, it was enough to convince them that I had the maturity and the day-to-day knowledge to handle working with other people in a professional setting." The result: her first job, as a technician in the immunology department at Sloan-Kettering, where she worked for a year and a half.

Wortham moved with her boss to Children's Hospital in the department of neuroscience, where most of her work focused on immunology and the brain. After four years there, she moved to the division of pathology at the University of Massachusetts Medical Center, working in inflammation and ischemia.

Did she encounter any condescension because of being "only" a BA? "As a matter of fact, I didn't," she says. "On the contrary, I received a lot of respect because of my experience. This was a time (the late 1970s), when many newly graduated PhDs were getting hired, and even though I had only a bachelor's, I also had a lot of experience."

Each move brought new skills to learn, new techniques, new science; that's part of the job and part of the fun. "They don't mind giving you a little training, but not from square one." From immunology, inflammation, and neuroscience, she now turned to microsurgery of small vessels, which she pursued for 11 years in the division of plastic surgery.

Which brought her to her decision. "I hadn't thought about jobs in quite a while, and I took a couple of months to mull over my decision. I had my résumé up to date. All I needed was a strategy."

Although she swears she was not particularly organized, she made some good decisions at the very outset. "First, I wasn't going to send out 50,000 job letters. I didn't send out many résumés, and I only had interviews for two or three positions. I was looking for a fit, something I would feel at ease doing."

All that newspaper reading paid off when she spotted an advertisement in the *Boston Globe* for the Repligen position. "The *Globe* is a good place to look in my area," she says, "and they had the position: someone with an animal surgery background, cell inflammation, immunology. A perfect fit."

She sent out her packet and kept reading the papers. A month later, the phone rang with an invitation to an interview at Repligen. "During my visit, I interviewed for two positions actually. At that first interview mostly I met senior scientists, who asked me about my work, and human resources people, who talked about the company. They called me back for a second interview to talk with someone who had been on vacation. Then there was a long wait. Then I got called back a third time. By then they just wanted to be sure, I guess. Less than a week after the third interview, I got the call."

Making the change has involved some adjustments. "Now that I'm here, the main challenge is that there's a lot of reading to do. That takes a lot of time. You do have a learning curve when you come into any new position. Here, I'm learning about the different products being developed and about the science here, which is different but top-notch."

Wortham says she likes life in biotech because it's small. "There are three other scientists in my immediate group, and there's a lot of communication and cooperation because of that. We're not even up to full-scale yet here: we're still building the animal facility! But it's nice to be part of a small, intense group doing science, and being part of a growing concern. I think that, on the whole, my experience is fitting in pretty well."

She has good advice for her BS and MS fellows in the art. "Be organized. Have specific goals. Get your résumé in order. Spend some time on your cover letter. Then look in the papers and see what they're asking for. Get an idea of how your background could fit in and make a contribution."

Non-PhDs and the Shift from R to D

Slowly, fitfully, yet decisively, biotech is shifting from research to development. The effect of this shift varies from company to company—but anyone wanting a biotech job should know about it. Companies that have spent the past five to 10 years rolling up the research and the debt are ready to test products in preparation for manufacture. "This is very much a phase the industry as a whole is moving toward as it grows and matures," says Morrison of Repligen. "Three or four years ago, you were successful if you had some research to publish. Today the emphasis is on clinical trials, especially positive Phase II and III results."

Richards of Career Connection says that in the past two years he has seen an evolution in the nature of industry need for personnel. "As recently as a year ago, we were looking almost exclusively for research professionals. The need for them is still great, but now we have new areas of high activity: as biotech products go into Phase I-IV, you'll see an increased need for clinical research associates and regulatory affairs professionals. As products evolve, you'll see increasing needs in manufacturing, production and validation, quality control and quality analysis. These needs reflect how the companies, their products, and the industry as a whole are evolving at the present time."

Iorio of Serono Laboratories says, "Our perspective is that, though research is very important, we're moving beyond basic research into process development, manufacturing, and the whole enterprise of getting products approved." That means a stronger interest than ever in the non-PhD scientist. Morrison of Repligen says, "We need people with a broad background of practical experience—BA's, MSs, associate degrees in manufacturing." One



THE FUTURE IN BIOTECHNOLOGY

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PerSeptive Biosystems

RESEARCH/DEVELOPMENT OPPORTUNITIES

ISIS Pharmaceuticals, located in Carlsbad, CA (north San Diego County), is currently in Phase II clinical trials with its Human Papilloma Virus antisense compound. With excellent funding and academic ties, ISIS has developed strong corporate partners with leading pharmaceutical companies around the world. Our continued growth has created the need for outstanding individuals for the following positions:

CLINICAL RESEARCH SCIENTIST

The successful candidate will join the Project Team engaged in the development of a Human Papilloma Virus compound currently in Phase II clinical trials. The Project Team seeks an individual with an advanced Scientific (BS, MS/MA) or Allied Health Sciences degree (L.P.N./R.N.) or equivalent clinical research experience. A minimum of 1-5 years of relevant clinical research experience is required. Demonstrated knowledge of GCP's, requisite steps for investigator selection, clinical study initiation, monitoring and close-out of clinical studies in conjunction with well developed written/oral communication skills for effective physician/healthcare interactions are also requirements. The candidate should possess an understanding of the elements of protocol design and the ability to translate these elements into Case Report Forms. Travel will be a minimum of 50-60%. (Code 122).

CLINICAL OPERATIONS MANAGER

The successful candidate will join the Project Team engaged in the development of a compound for the treatment of CMV retinitis currently in pre-clinical development. The Project Team seeks an individual with an advanced Scientific degree (PhD) who can provide scientific and managerial support to the Project Leader and Team. Prior experience in drug development should include one of the following: Clinical Development, Regulatory Affairs, Project Management, etc. The Operations Manager will be responsible for overall maintenance of the project budget and participate in yearly budget planning in cooperation with Department Heads. The Operation Manager will also provide scientific and technical support to the Project Team. The candidate should be able to set and implement priorities and should have well developed written/oral communication skills. (Code 123).

SR. SCIENTISTS, PROCESS RESEARCH

Growth in the department of Development Chemistry has created opportunities for outstanding synthetic organic chemists. These positions require an excellent background in synthetic organic chemistry at the PhD level. Familiarity with the synthetic chemistry of nucleosides and oligonucleotides is a plus, as is experience in total synthesis of challenging natural structures. Experience in pharmaceutical chemical process R&D and scale-up is a plus. (Code 124).

SR. SCIENTIST, SEPARATIONS PROCESS DEVELOPMENT

Outstanding separations specialist in the synthesis and manufacture of defined oligonucleotide and related polymeric structures. The ideal candidate will have a PhD in organic chemistry and strong experience in separations process research, including chromatographic and electrophoretic processes. Experience in scale-up of separations methodologies in a pharmaceutical pilot or manufacturing environment will be a plus. (Code 125).

ISIS' 175 employees enjoy an ideal environment which supports science and scientific interrogation. Our uncongested, smog-free coastal community location affords unlimited recreational advantages and proximity to world-class academic and research institutions. ISIS also offers competitive salaries and excellent benefits, including equity participation. Please submit resume, indicating the code number of position for which you are applying, to: Human Resources, ISIS Pharmaceuticals, 2292 Faraday Avenue, Carlsbad, CA 92008. No phone calls please. We are an Equal Opportunity Employer.

PhD SYNTHETIC ORGANIC OR MEDICINAL CHEMISTS

Senior Scientists with a PhD in synthetic Organic or Medicinal Chemistry are sought to design and synthesize novel oligonucleotides and Peptide Nucleic Acids (PNAs) which will be evaluated in our antisense therapeutic programs. These scientists will have at least 3 years of experience post-PhD in heterocycle, nucleoside, nucleotide, peptide and oligonucleotide chemistry. Major pharmaceutical company experience is desirable. (Code 126).

NUCLEOSIDE/NUCLEIC ACID CHEMISTS

Candidates will join a research group within the Medicinal Chemistry department working on the area of enhancement of uptake and bioavailability of antisense oligonucleotides. We seek candidates at both the BS/MS and PhD levels to support synthetic efforts in making novel nucleosides and modified oligonucleotides. A strong background in organic chemistry, proven expertise in organic synthesis and some knowledge of nucleoside chemistry is expected. Additional experience in the purification and characterization of oligonucleotide and conjugation chemistry of oligonucleotides is desirable. (Code 127).

DRUG METABOLISM AND PHARMACOKINETICS

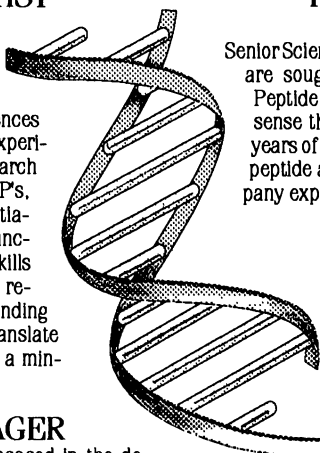
The department has an immediate opening for a Senior Scientist to work on the *in vitro* and *in vivo* disposition of antisense oligonucleotides. The successful candidate will have 2-4 post-doctorate years experience in oligonucleotide or nucleotide biochemistry. A strong analytical chemistry background and some experience in drug metabolism is preferred. (Code 128).

TOXICOLOGY

A position reporting to the Director of Toxicology is available with responsibility for monitoring nonclinical toxicology studies at contract laboratories, participating in investigative programs, and otherwise assisting the Director in evaluating the safety of prospective pharmaceuticals under development. Qualified candidates should have at least 2 years relevant work experience with a pharmaceutical company or contract laboratory; a PhD in Toxicology or a related discipline is desirable, but may be relieved by sufficient work experience. (Code 129).

MOLECULAR PHARMACOLOGY RESEARCH SCIENTIST

Will be involved in the development and application of techniques for studying RNA metabolism and processing. Requires BS or MS with experience in molecular biology. Experience in routine handling and evaluation of RNA *in vitro* and in cells is also desirable. (Code 130).



ISIS PHARMACEUTICALS

adjective is heard more often than others. "There are *tremendous* opportunities," says Iorio, "and yet most fresh-out-of-college graduates don't even know they exist."

To be sure, no one is abandoning the pure researcher. A biotechnology company has a heart of PhD elite supported by a much larger number of research associates, technical workers, and staff. Some smaller companies may be more than one third PhDs, as with Vertex Pharmaceuticals (25 PhDs out of 64, as of mid-1992), and Cytel (35 PhDs out of 97)—but the other two thirds need to be scientists too. "A lot of companies want to be all-science all the way through the organization," says one researcher. "From the people at the front desk to the senior researchers to the CEO's, everybody's got to have at least a BS." Says Lasky of Genetics Institute, "Marketing people, human resource people, accounting—the impression is that these are not 'science jobs,' but increasingly, a science background is an advantage in performing these jobs well in biotech." Besides, companies will always need to anticipate future markets and develop products one step ahead of the competition, ensuring that PhD talent will always be the heart and brains of the outfit. "We're looking to staff our programs with visionary scientists," says Morrison of Repligen.

While there may be more jobs for non-PhD science graduates,

"that doesn't necessarily mean they're easier to get," says Howell of Procter & Gamble. "They're highly competitive all the way down the line. The person who wants a science career in industry must have a sound technical background, acquire relevant summer experience, and develop strong communication and interpersonal skills to be competitive. If you've got all that, the job opportunities are pretty promising."

Rejoice, therefore, and be glad, if you have a BS or MS in biology, biochemistry, molecular biology, chemistry, immunology, or virology, with two to four years of related experience. In many cases, associate-level degrees with experience are also attractive (see Kathy Wortham's story, above). "We need these people in quite a few areas: laboratory support services, biopharm, synthetic chemistry, and drug metabolism," says Graper of SmithKline Beecham. By itself, the degree is not enough. "People who come out of school with just a degree are at a disadvantage compared to those who have the degree plus summer experience working in a pharmaceutical or biotech company," says Lasky of Genetics Institute. "That experience is what catches people's attention when they're looking at résumés of entry-level candidates."

It makes sense, then, for the science undergrad at any level to seek out lab experience in the vanguard arts of biotech. Peruse the ads for research associates (BS or MS with 2-4 years experience) and you'll find the skills that constitute con-

temporary life science: immunoprecipitation and chromatography; ELISA and PCR; cloning and gene library construction; electrophoresis, DNA assays, tissue and cell culture, antibody research; Southern, Western, and Northern blot; autotitrometry, fluorescence microscopy, spectroscopy, and statistics. Good computer skills (e.g., FORTRAN, 3-D graphics and modeling programs) and technical writing expertise are highly valued, as are management and group experience.

Salaries for non-PhD scientists can be quite competitive with those of PhDs. Morrison of Repligen says that "starting salaries for non-PhDs are generally in the mid-20's, though with the right skill sets, it can get up into the mid-30's." Iorio of Sero Laboratories says, "You'd be surprised how much you could make in some of these areas. Mid-range for research associates in many places can exceed \$45,000. People in skills areas such as regulatory are getting even more." The promotion track is also comparable at many companies. James Blackwell, associate scientist at Repligen, tells us that "people with BSs can advance up the same ladder as PhDs in this company. Personally I think that's great. That isn't universally true, though, and if I were a bachelor's- or master's-level person I would check that out in my prospective employers. The bottom line here—and I think most places—is that people get ahead who get results. They couldn't care less what degree you have."

All our contributors agreed on two pieces of advice:

Design Your Degree. The AA, BS, and MS candidate should seek skills and experience early in the degree process, trying to match industry needs. Read the industry papers and see what they're asking for. Then find a scientist whose work employs those skills and become his or her assistant.

Use Your Summers. "People who are interested in industry really should go and ferret out practical work experience," says Blackwell of Repligen. "If the college doesn't have a program, do summer work for a company. If you want it, you can certainly find it. It's even easier to find for MSs than it is for PhDs." Get hands-on experience, make contacts, learn the environment. Says Lasky of Genetics Institute, "Instead of going to France for your vacation or working as a lifeguard, it's a better idea to look for experience: internships, or latch on with a company in any capacity you can."

As Iorio of Sero Laboratories says, "You don't necessarily need a PhD to have a career in science." What you do need is background and experience. Having those can make the BS or MS competitive with much higher degree levels. One anonymous PhD, who now has a very good job at a large pharmaceutical firm, found out just how competitive the non-PhDs are. "In my job search, I had the experience more than once of being told I was too specialized or too highly trained in a certain area. At times I almost questioned the value of my PhD."

"But," he added, "good people get good jobs."



Getting a Job in Industry

Notes from Underground

It's called variously "the pipeline," "the underground job market," and "the network." All these names refer to the fact that much PhD hiring in pharmaceuticals and biotech is semi-formal. A hears about a job from B and tells C about it. C applies, is interviewed, is liked, is

taken. "The pipeline between academia and industry is still of the utmost importance," says Lasky of Genetics Institute. "In some ways our pure research positions are easier to fill because so many of our scientists have contacts at universities across the country. To some extent there's a feeder program in place."

Sometimes the network is very informal. Paul McLean, research scientist in the immunology group at Repligen, had been working for another biotech company that had downsized by half when he decided to look around. McLean admits he "wasn't sure how to go about doing it." The solution, it turned out, was to go have lunch. "I'd done some volunteer work with local teachers, and

through that I met another scientist, who was from Repligen. At lunch one day he mentioned a possible position: to express antibody genes in bacteria. I'd be working with higher-level organisms, but it would involve the expertise I already had." The company had been looking for someone like McLean for a long time. Now he says he's "gotten started, right into the deep end." His new job, much like the way he got it, was "a pleasant surprise."

Two points about the network. First: it's mostly for PhDs. "No feeder program exists for the MS and BS levels, and that's why we're working so much harder to find them," Lasky of Genetics Institute says. Second: the

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"I joined Advanced Tissue Sciences because they offer an environment which combines an enthusiasm for creative research and a dedication to scientific integrity. There's a genuine commitment to applying tissue engineering technology toward the development of products that improve the quality of people's lives."

**Dawn Orton, PhD (MIT '92)
Research Scientist
Advanced Tissue Sciences**



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Advanced Tissue Sciences' proprietary tissue engineering technology has already led to the market introduction of *skin²*TM *in vitro* laboratory testing products. *DermagraftTM*, a living human skin replacement, is currently in human clinical trials for burn and ulcer patients nationwide. We are developing a variety of human tissues and organs for potential therapeutic and laboratory use including skin, cartilage, liver, oral mucosa and bone marrow.

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Now we extend an invitation to creative, motivated Scientists who share our belief that together, we can make a difference.

SENIOR RESEARCH SCIENTIST

Candidates will have a PhD in Cell Biology or Biochemistry to work in our Epithelial Research Lab. Previous research and publications in skin biology, cell and tissue culture, extracellular matrix proteins and growth factors are important. Product development projects focused on cell culture, transplantation, and wound healing are a plus.

POSTDOCTORAL FELLOW

This is a two-year position for a recent PhD, MD, or DVM with demonstrated research experience in skin biology and *in vitro* toxicology as evidenced by publication. The successful candidate will serve as a research investigator in an established product development application laboratory. The emphasis of the research program will be in the area of mechanism of action following exposure to chemical, environmental and biological toxicants, on human co-cultures of fibroblast and keratinocytes.

RESEARCH ASSOCIATE

There are two openings in our Epithelial Research Lab for bright individuals with a BS or MS in Cell Biology or equivalent and at least two years' research experience, preferably in a product-oriented environment. Previous work with mammalian cell and tissue culture is considered a plus.

Advanced Tissue Sciences offers competitive salary and benefits and a superb location in the beautiful biotech and academic center of La Jolla, California. We think you'll find ours an inspiring environment to achieve to your fullest potential. Please mail your C.V. to: Recruiting Manager, Advanced Tissue Sciences, 10933 North Torrey Pines Road, La Jolla, CA 92037. AA/EOE.



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Cell Culture Fermentation
Cell Biology
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Postdoctoral Scientists

Molecular Biology
Immunology
Protein Engineering
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network can get you the interview, but it can't get you the job. You still have to do your own research, and you still have to market yourself.

What You Should Be Thinking About

People seeking science jobs should know their science. Apart from that important consideration, "there really isn't any reason why a prospective candidate shouldn't approach a job search the same way any candidate in industry would," according to Iorio of Serono Laboratories. Blackwell of Repligen says it best: "Your first job is to get a job." To begin doing that, consider two important steps.

STEP ONE: Evaluate the Company.

Get to know your target employer inside and out. Ask:

What and How Is the Company Doing?

Get a hold of the company's 10Ks, annual research reports, financial statements. Also helpful are stock analysts' reports. Peruse scientific journals for published work with the company's name in the credits box. Follow the business journals. "Another important place," says Roach of Corvas, "is to look at the major symposia in your field the past few years. Which companies attended? Whose work was prominent?" Other sources include meetings of biotechnology organizations.

How Many Tricks in the Bag?

Look at the breadth and balance of projects the company has in its pipeline. What products have come out? What products are in testing, and at what stage? Is the company focusing on only one kind of product? One kind of technology? How does it look for five, 10 years down the line?

Who's Minding the Store?

What kind of people are in charge? Are they entrepreneurs? Scientists-turned-managers? If the latter, what were their areas of research as PhDs? If the company is owned from abroad, research the politics and policies at the home base. The idea is to avoid extremes. Morrison of Repligen says that "a solid combination between science expertise and business acumen is what you're looking for." Lindquist says, "You need solid scientists at the top to stay flexible, and solid business sense to stay viable."

Who's in the Money?

For how long is the company financed? What goals has it presented to its stockholders? Who is on the board of directors? Who are the venture capitalists—and how have they treated other companies they have fledged? Roach of Corvas says that "the big question there is, 'Are they in it for the long haul?' Because they'd better be." Good science takes time. Look for patience and value it when found.

STEP TWO: *Nosce Teipsum*

Know yourself, that is.

Benchie or Boss?

Begin with a fundamental question: Am I more interested in hands-on research or in management? For most, science will come first. But if you're planning to move up in biotech, management of some sort is probably part of

your future. Let us quote Velma Jackson, personnel officer of Zeneca Pharmaceuticals, U.K.: "We're looking for specialization initially, but we're also looking for the managers of the future, someone with good interpersonal skills, someone who can manage a small team of good scientists." Lindquist says to put yourself on the couch. "If you're entrepreneurially driven or economically driven, you'll capitalize on the hot fields, where the rewards are related to extra-science issues. On the other hand, if your satisfaction lies in doing good science, the key is finding an area of interest and an environment that gives you the opportunity to do it."

General or Particular?

Do your interests focus on a single, particular issue, or do they take in a broad range of

Rudiments of Self-Marketing

"You can really tell the people who've just been assuming they don't need to work on their communications skills," says one hiring manager. "That's why you're seeing so many programs popping up at colleges nowadays." Such programs are a response to an industry-wide need. Donna Middleton, manager of external relations for the Cornell University Chemistry Department, says, "We have to remind our graduate students that they need to know how to communicate the work they have done so that another person can understand it and grasp it quickly. Not just oral communication, but written also—we

advise them to prepare a brief abstract of their work as the basis for both résumés/cover letters and oral presentations."

Howell of Procter & Gamble says, "The extent to which candidates can communicate their abilities determines their chances for being considered for a position." And how good are science graduates at communicating? "They're learning," says Morrison of Repligen, nicely.

Cover Letter and Résumé

Charles Davis, senior investigator in drug metabolism at SmithKline Beecham, says that "there's no industry standard" for résumés. "Different people have different standards. Just about everyone wants the same thing, though: something that organizes the information in a logical and accessible way." Morrison agrees: "The résumé needs to be presented in more of a synoptic fashion that emphasizes practical laboratory skills and research activity of direct relevance and interest to the company."

Howell has seen many résumés. "I think the key lies in understanding what an industry is looking for—and who's going to be reading your résumé. Many times we'll get lengthy discourses on the specific technical problem a person's working on. Many times I'll receive in the mail a packet with five or six publications, excellent ones, with a résumé I can't read. This puts the candidate at a disadvantage compared to others."

Brevity is the soul of the cover letter. "If it gets much beyond a page, it won't be read," says Howell. "First, state your career objective: What are you looking for? And

sciences? The answer could determine what kind of company you should look for. Will it be an environment in which you can work in mammalian cell cultures or peptidomimetic chemistry all your life, or will it be the intellectual veldt in which you can roam free?

Large or Small?

Big often (but not always) means security and a set pattern of industrial relations in the workplace; it may also mean anonymity. Small often (but not always) means greater risk, greater fluidity, greater movement, greater rewards for entrepreneurship; it may also mean you can't hide. Some would be scared to be one of six scientists in the whole place; others dread the thought of being one of 100 researchers all working on electroporation. This really amounts to a personal question: What



why do you think you'd fit the bill? Then, quickly and effectively, summarize your work experience and responsibilities. The cover letter has an important function: to state exactly where your skills connect with the company's areas of technical need. By all means cross-reference with your résumé—that'll give us one more reason to look at it. But remember: Industry is the land of succinct communications."

The résumé, however, need not be confined to a page; in fact, don't try. Howell says he "frowns upon" the one-page résumé "because science employers appreciate the necessity for a detailed account of a candidate's experience. And they'll take the time to peruse it if the cover letter excites them. The résumé needs to be detailed, specific, and accessible. Think in terms of highlights and brief paragraphs. Here's what I did, here's who I worked with/under; here—in a brief paragraph—is what it was all about. Also, a publications list should be in reverse chronological order."

Kathy Wortham of Repligen had three excellent ideas for her cover letter:

Key its contents to the specific requirements of the job you're applying for. This was as simple as reading the ads, listing the skills, and finding them in her background.

Cross-reference it with the résumé, to "refer my would-be employers to things I had done that they had asked for in the advertisement."

Work like the devil on it. Reorganizing her résumé was tough because of the diversity of her experience and the sheer wealth of information. How to organize all that so a prospective employer could get at the good stuff quickly? "I tried to think about how I would write my résumé to reflect what people were looking for at the moment and what I felt were techniques I had mastered over the years."

Wortham decided to take a topical approach. "I tried to separate it in terms of Responsibilities and Skills—so that someone might give me a job under either head. That seemed better than merging everything all together, strictly chronologically." She also included a separate publications list, cross-referenced on her résumé.

James Blackwell of Repligen showed his résumé to friends and headhunters and "really got a lot of negative feedback." Chastened, he

made some important decisions about the revision:

Simplify the format so that important information was easily accessible.

Highlight skills and responsibilities. The original had been heavily academic. Blackwell de-emphasized the academic side and highlighted the skill content of the background. "Some of the people I was talking to thought that if you were a PhD you were too rarified to do hands-on work. I wanted to show them that that's precisely what I was looking for, and that I had the skills."

Treat the job application as a unified, coherent package. "I tried to communicate and present it that way, as an entire presentation. This is me, these are my skills, this is how they'd fit your needs. It really had a much better feel to it."

Write Your Own. "I'd warn people not to make your résumé and cover letter look like everybody else's—bring out what's good for you." Blackwell wrote the documents to complement each other; he used bullets in the cover letter to draw attention to highlights of the résumé. He saved himself a great deal of work, too, by creating a computer text file that held a "template" letter, with certain blocks that remained the same for all employers and others he could change as appropriate.

The Interview

You wrote a great cover letter and résumé, and now you're walking into an interview. Before getting there, you should have done some extensive research about the company. "Come prepared," says Lasky of Genetics Institute. "Show you think enough of the company that you went and did research on them. Have substantive questions about the company. Show that you're interested in what's going on. If you come to us at Genetics Institute, you might ask, 'I saw that you have an agreement with American Home Products. Can you tell me about that?'" Middleton of Cornell says not to dominate the interview. "Usually, your interviewers will let you know exactly when it's time to ask your own questions—and then, by all means, make the most of it."

kind of fish am I and how big a pond do I need?

The Money Thing

Decide what you're looking for in a pay package. Companies pay on the basis of skills, experience and management responsibility. Base salaries (no perks or bennies included) range on the average from \$35,000 to \$80,000, and salary curves (promotions and raises) can be much faster than in other industries. Six-figure salaries are common in upper management. Benefits include an average of two to four weeks' vacation; 401(K) plans (make sure there's a company matching program); good disability, life, and health insurance; and stock incentives. Other perks include tuition programs for the kids, paid memberships in professional societies, dependent care

assistance, parking privileges, inexpensive cafeteria food, and memberships in local health, golf, and country clubs.

Here? There? Anywhere.

Marriages are not always forever. "The reality of biotech," says Roach of Corvas, "is that you've got to be flexible. Think in terms of a *career* rather than a *company*." Lindquist says, "Yes, there is more risk involved in getting into some of the smaller biotech companies—but if you've had the technology background and the skills, you'll be able to go elsewhere—you're still a scientist first and foremost, and the big thing is your skills and your contributions." Roach calls it "writing yourself into the ever-changing script." Careers in biotech are becoming ever more fluid. Many leave

companies, go into consultancy, contractual relationships, back to academe, into marketing or publishing. The desired characteristic: flexibility.

Skunk Hours




Don't ask this question aloud; osmose the answer. Will you be able to pursue your own crazy ideas in some broom closet somewhere after hours?



Et Cetera

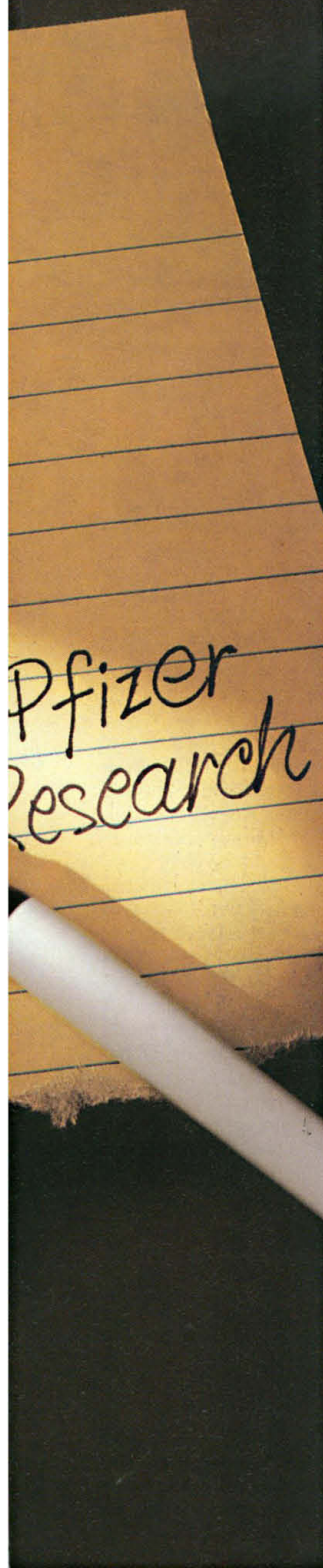
What sorts of cooperative arrangements exist between your company and the local academic institutions? Will you be able to attend meetings (paid/unpaid)? Is publication encouraged, and, if so, what kind of publication? What opportunities will you have for continuing education? Would they send you back to school for another degree or new skills? Will your office be private or shared? Will you have to do windows? Will you *have* windows?

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Cancer: Pharmacology and Molecular Biology—In collaboration with our Cancer Drug Discovery Group, you will develop strategies to exploit cancer cell selective molecular targets and create approaches towards cancer drug discovery as novel targets are identified. Applicants should have a PhD with at least 2 years of postdoctoral research in cancer molecular biology. Experience in the cloning and characterization of novel genes to the field of tumor cell biology (oncogenes, tumor suppressor genes, etc.) is a strong advantage.

Cardiovascular: Molecular Biology—The Cardiovascular Discovery Group is pursuing the role of growth factors and protooncogenes in cardiac hypertrophy and congestive heart failure. We are seeking candidates with a PhD in Molecular Biology and at least 2 years postdoctoral experience in these areas.

Cartilage: Molecular Biology—The Inflammation Group has an exciting challenge for an individual with strong training in molecular biology and expertise in cartilage metabolism. The successful candidate will have at least 2 years postdoctoral experience and a strong publication record in the area.

Neurobiology: Receptor Structure and Molecular Biology—Become a part of a multidisciplinary team where our current research focus is on the discovery of novel receptors expressed in the central

nervous system. Applicants should have a PhD degree with 0-4 years of postdoctoral or industrial experience in molecular biology with emphasis in gene isolation and analysis including: library construction; cDNA cloning; quantitative RNA analysis; DNA sequence analysis; and PCR using degenerate primers. Interest in the molecular biology and biochemistry of neuroreceptors is highly desirable.

Obesity: Gene Transcription—The Molecular Biology Group has considerable interest in the regulation of gene transcription. This position requires a PhD in molecular biology and at least 2 years postdoctoral work in a field such as diabetes or obesity research.

Infectious Diseases: Molecular Biology—The Infectious Disease Department is seeking a highly motivated individual with a background in molecular biology to conduct discovery research in areas related to antibiotic resistance and pathogen-specific diseases. Requires a PhD and at least 2 years postdoctoral experience with a strong background in using modern molecular approaches to address bacterial metabolism.

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In Line at the Jobs Fair

Scientists review their strong points while waiting for an interview at a biotech jobs fair.

Although jobs fairs have been around for years in computer science, environmental science, and other disciplines, they are relatively new in biotech.

Richards of Career Connection says that "you're seeing many more of these fairs now because they're a cost-effective way to bring together large numbers of employers and good scientists." Calabrese of Amgen says, "We're simply amazed at the high level of talent we meet at these fairs. And for the candidates, it's one more way of getting us to take a look at them. It's much better than just sending in your c.v."

When Richards invited us to a biotech jobs fair, we accepted—and beheld many scientists lining up to speak to many companies. We took our place in line with some of the hopefuls and asked them who they were and why they were here.

What we found were professionals from across the entire spectrum of contemporary science:

Nurse with MA in Medical Science; seeks job as clinical research associate in biotech/pharmaceutical firm. "After 15 years at [extremely prestigious research hospital], I've gone as far as I can go, and I want to see what else is out there."

Second-year MS candidate; seeks whatever. "I've got one more year in my program at [Ivy League university], and I'm just out to test the waters."

Chemistry PhD candidate; seeks a future, courtesy of major bio/pharm giant. "I'm in my second year at [major university], and I suddenly woke up and realized, 'Hey, in two years I'm outa here and I don't even know what I'm getting into.' So I'm here to find out. I guess you'd say I'm in informational mode."

Second-time postdoc; seeks a third. "It's the way of the world now. Lots of people ease into the business by piggy-backing postdocs. It's common to see people with 2 or 3 of them. Nobody

holds it against you; in fact, it's a plus in industry, because it means you have a variety of experience. I'm marketing myself as Mister Versatility."

Microbiologist, 5 yrs industrial experience; wants to stay put, looking for the right match. "I had a research position with [company] for five years, but they're moving to Arizona, and I'd rather stay. (They don't even know I'm here.) I think I've got the background and hands-on experience; now I just need the right fit."

Chemical engineer, 7 yrs experience, victim of the recession; seeks mid-level research position. "I just got laid off. This whole state's going belly up economically. I'm pretty confident, though. Everybody needs chemical engineers, don't they?"

Senior researcher, 11 yrs experience with high-profile pharmaceutical firm; seeks dynamic challenges of teamwork in a small- to mid-size bio/pharm. "What can I say? My company got a new CEO and my job was cut. I've got a great track record, though, and I think maybe somebody here'll be interested."

Senior academic researcher; seeks to become ex-academic. "What used to be great about academics isn't that great any more. The grant money's not there, tenure comes up just about the time your first paper's coming out, there's committees, grad students to teach. Forget about it. I can work with people. And I'm good. I'm so good that I should get hired before lunch."

Their coming together reflects some economic realities. Biotech companies move, restructure, merge, and go away. An ill wind blows in academe: there's a widespread loss of security, difficulty in getting grants, risks of late publication, tenure battles. And yet again, we see the shift from R to D: many companies are moving into production maturity, meaning a new balance between research positions and clinical, regulatory, manufacturing, and support jobs.

We were able to follow up (unscientifically) on two of our people. The MS candidate said simply, "I'm surprised. Everybody seems to want me." The nurse had a big smile on her face. But did the academic have to wait until after lunch?

Oz Behind the Curtain: What Goes on in a Job Interview

The scene: a biotech jobs fair. Patient molecular biologists, protein chemists, and research associates line up to speak with one of the Biggies. Booths sporting signs that read AMGEN and GENETICS INSTITUTE are filled with hard-working interviewers, showing intense interest and asking intense questions. Screeners work the lines, determining whether this or that standee should keep standing.

What goes on in an interview? To find out, we ducked into a booth and collared Joe, a pseudonymous human resources manager for an anonymous biotech giant. This man is sharp, witty, simpatico. He's also a true scientist, a former dedicated researcher who moved into human resource management out of what he calls "a sincere desire to be part of the growth of my company."

It's hard work, but it's good work. "It's astounding what we're seeing here today," he says, sitting down and readying himself to interview. "Cutting-edge people. Diverse backgrounds. Very, very good biochemical backgrounds. QC analysts. Very good MSs. Academics from Harvard, Berkeley, Chicago. The caliber of the academics is especially striking."

A screener rushes in bearing a hot résumé. "Excellent background: PhD in Organic Chemistry, U.C. Berkeley. Working now at [name of company], nucleotide chemist in hematopoietic compounds."

Joe does a lightning study of the sheet before him and says, "We have absolutely zero time for details. I barely have the time to grab their résumé and read it." Joe rises, shakes the hand of a quiet-spoken man carrying a valise. "How are your feet from standing in line?" The candidate smiles shyly: "Not too bad."

QUESTION #1: TELL ME ABOUT YOUR RESEARCH.

The candidate gives a brief, clear, powerful explanation of what he and his lab are doing: creating new synthetic processes for proteins to be used in synthetic blood products. In not more than two minutes, he delivers his explanation in a conversational manner, staying relaxed, maintaining eye contact. At one point, he asks, "Is this your field? Am I going too fast?" Joe replies, "So far, I'm with you perfectly." It's clear the candidate knows what he is talking about and is excited about it. That excitement is contagious.

QUESTION #1B: HOW WOULD YOU APPLY YOUR RESEARCH IN AN INDUSTRIAL SETTING?

Joe almost doesn't have to ask. New processes for synthesizing proteins would have immediate industrial applications. The candidate names a few hormone analogues he's been thinking about.

QUESTION #2: DO YOU HAVE ANY SUPERVISORY OR MANAGEMENT EXPERIENCE?

"Oh, yes," the candidate says. "I'm the head of a staff of six." He details his duties, which include purchasing, periodic reviews, and reports to managers. Joe is interested: these are skills he's looking for in any scientist.

Now, one might wonder: If this man is so excited about his work, why is he here? Joe asks,

QUESTION #3: WHY ARE YOU INTERESTED IN MAKING A MOVE?

The response is quick: "Well, I'm with a small company, and my situation is very good there, but I'm interested in being part of a larger research effort. Also, I'm interested in greater stability, if you know what I mean."

QUESTION #4: HOW MUCH DO YOU KNOW ABOUT OUR COMPANY?

"Well, I've read a lot," the candidate says. This answer doesn't exactly resonate, so he follows up with "I know about your HIV research." And he mentions a few papers—their design, methods, results—enough to show he really does know.

"Okay," Joe says. "I was thinking along that line myself. As you know, we are doing a great deal of work in antiretroviral research. How do you think your experience could connect with that work?"

This is the most specific question so far. It is immediately clear, however, that the candidate has thought about it. "I imagine that as part of all that, you have people synthesizing organic compounds and making derivatives, and that's where my skills would come in, I think, without too much problem."

Time for the opening of the envelope. Joe mentions a subsidiary of his company devoted specifically to organic compound synthesis as it relates to HIV research. "I know we have a couple of openings there. Would you be interested in such a position?"

"Yes. My interest—I'm quite interested."

"Okay, then. Here's what I'm going to do. I'll take your résumé back with me and show it around, then pass it on to our subsidiary. If they take action on it—and I have a fair idea that it's probable—they'll give you a call quickly. If there's no word in two weeks, call me back, and I will expedite matters either way for you. Let me give you an annual research report about our company, and here's my card."

Handshakes all around.

The Seminar



Be Organized.

Make an outline of your presentation. Know what comes where. Know how long you've got and time yourself during rehearsal.

Do Not Read Your Talk.

Usually it's less effective to read from a word-for-word text than to use notecards or an outline. One common procedure: write out the entire talk, more or less memorize it, then reduce it to bullet points to guide your presentation.

Consider Your Visuals.

Have good ones and have a limited number. A visual is good if it is clear, legible, and requires you to interact with it, pointer in hand, showing your ability to explain things. Reject visuals that are there just for decoration. There is no right number, but there can be too many. The

"It's amazing that scientists can get through four years of college and never have a course on how to give a decent presentation," says Lasky of Genetics Institute. "Many people have gotten through an interview but failed when it came to the seminar. Now, scientists are people too. Certainly you want to have a well-prepared presentation and present it in a professional manner."

Davis of SmithKline Beecham says that "the seminar is probably the main opportunity to judge whether the qualifications listed on the c.v. check out with the candidate's personality. And that's something we all take very seriously." Helene McConnell, U.S. employment manager at SmithKline Beecham, agrees: "A lot of the decision making about a new candidate is based on these seminars. I think that's standard throughout the industry."

The following tips on oral presentations are compiled from our personnel managers, as well as from communications coaches from all over.

three seminars we observed, all good ones, used from eight to 12 visuals for an hour-long seminar.

Rehearse.

Many universities and companies have science groups whose members practice giving presentations on their work—complete with question-and-answer sessions at the end. If you have a group of friends who can stand the idea, rehearse your presentations in front of them.

Know What You Look Like.

Videotape yourself and watch the tape, preferably with an observer prepared to give frank assessments. It can be a shock—and most people learn fast from it. You'll learn about aspects of your delivery, including posture, volume, intonation, and pace.

Give a Balanced View of Yourself.

You want your prospective employers to know how your skills can fit in. That's your main focus. But companies increasingly want to know the full scope of a candidate's interests.

Free Yourself from the Podium.

Some speakers remain glued to their podium or papers. Move: it will relax both

you and your audience.

Establish Eye Contact, but Don't Overdo It.

By all means look at the audience and talk to them. The idea is not to look down at your papers all the time. The idea is also not to stare.

Give Credit Where Credit Is Due.

Make clear how much of the work and its results are due to your personal contributions. If you did something with a partner or as part of a group, say so and name them. If a result occurred after you left the lab, make that clear—especially if something you did made it possible. Many good presentations end with a credits slide.

Anticipate questions.

Look frankly at your work and ask yourself, "If I were someone else, what questions would I ask?" Many of the questions we heard at seminars concerned four areas: industrial applications (by far the most often-asked kind of question), design and methods, specificity and cleanliness of results, and clarity of charts and graphs. Blackwell of Repligen says it's his favorite part of the seminar: "It's great to see what people come up with, and it shows your

ability to think on your feet and communicate effectively a thought you couldn't possibly have preplanned. The questions are usually getting at how well you know your subject area—or they're interested in something that solves a problem for them or could potentially solve one."

Answer Questions.

Listen to the questioner and try to respond concretely and directly to the question. Stop and think a moment before answering. It helps.

Introduce, Summarize at Intervals, and Conclude.

Three basic ways of taking care of your audience. The introduction will identify your topic and the major divisions of your talk. If you summarize every 10 minutes or so ("So far we've seen how stereochemistry can be used to probe enzyme-catalyzed reaction mechanisms. Now I'd like to turn to . . ."), your audience is more likely to see the progression of your thinking—and so are you. An effective conclusion summarizes the entire talk, provides closure, and gives you an opportunity to dispense thanks and credit.

In a small conference room, a candidate in suit and tie waits to give his seminar. He'll have to work to get his points across: the air conditioner is blasting, and at the back of the room an asthmatic slide projector wheezes. Fourteen people wander in, smile, greet one another and the candidate. The mood is businesslike but informal.

Most of the attendees are those the candidate would work with if hired, plus a few human resources people. Some department managers are here, but no VPs. Unless the seminar touches directly on their areas of expertise, higher-ups generally prefer to make a candidate's acquaintance over dinner, lunch, or a one-to-one interview.

What strikes the observer is the candidate's professionalism. Conditions aren't perfect. It being ten o'clock, there are more than a few sleepy faces. Some of the attendees have work on their laps, at which they sneak a peek from time to time. Arctic morning prevails thanks to the air conditioner, and the groaning slide projector is keeping the decibel level high. Undaunted, the candidate seems primed to give a good 70-minute account of himself. He is introduced, and the podium is his.

This speaker knows how to take care of his audience. He begins with a full introduction of himself: his current position as an industrial postdoc (his second), the work he has done and whom he's done it with. Then he introduces his talk: "I'm going to divide my talk into two parts. The first will concern my graduate work at university A with Dr. B. The second will concern my postdoctoral work, first at university C and later at company D."

He begins by identifying an industrial use for the work he's done. "What's interesting about this technique is that it allows us to determine the steps of reaction X, with applications in Alzheimer's disease that I'm sure you're aware of." They're aware of it, all right: pencils are working away on notebooks.

Active but not frenetic, he uses the pointer to guide us through some of the more complicated slides. When one slide comes up backwards, he just keeps going: "If this slide were the right way, you'd be able to see this

important spike at hour 60—that's a 60—which suggests . . ." The audience is intent and interested. Some grind jaws and shake their heads when they disagree. In the middle of a sentence, a question: "I'm sorry to interrupt, but I couldn't help noticing the purity of the isolate you get after the second inversion. When we do it in the lab, we can't get any values below X."

"Well, you're quite right. The slide is a little misleading. This is a lab experiment and not a full-scale industrial process, so the results are more qualitative than quantitative—" And so on. He acknowledges the justness of the question (always a good idea) and answers as well as possible. When his tongue can't get around one of those long words, he and the audience laugh it off: "We took a deriv— . . . a deriva— . . . we did a reaction with protein X . . ." As he answers questions, he blushes a little (but not much) and stays focused on the questioners' needs and how he can meet them. If he can't meet them, he says so: "Gosh, I don't know how I'd answer that one. It's something to look into."

For the entire 70 minutes, he is mindful of his time and pace. When engaged in particularly involved explanations, he asks, "Have I still got everybody at this point? Anyone want me to back up a little?" He seems to welcome questions, since they allow him to explore a particular part of a region he knows well. He even finds a slide to show as part of an answer.

At the end, he summarizes his points, suggesting possible applications in drug purification and in Alzheimer's disease. His last slide gives the credits and acknowledgments, which he runs down, name by name, to make perfectly clear who did what. Most of his audience stays all the way through—quite a tribute, considering that everybody has work to do. Informal discussions at the podium allow him to draw diagrams and find one more slide.

We can't tell you whether he got the job or not. What's clear is that, despite the air conditioner and the slide projector, the candidate accomplished what he came to do: give his audience a clear and balanced picture of his work and his ability to communicate it.

The Candidate Gives a Seminar

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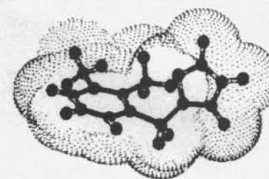
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Europe and Japan: Opportunities Abroad for American Scientists

Western Europe is home to a large, diverse pharmaceutical and biotech industry. According to *Medical Marketing and Media*, of the 35 new chemical entities introduced worldwide in 1989, 17 originated from labs in western European countries. There is, however, as yet no "Eurobiotech" because, despite the EC, economic and industrial conditions differ widely from country to country.

As in the United States, biotech needs the sunshine of a healthy economic environment to make the money tree blossom. And the past year has been variably cloudy for European economies. A traditionally robust economy has made France one of the happier homes for biotech in Europe, yet even France has been dragging because of the global slowdown. All the same, France is doing better than the economy of England, which continues to be a bit of all wrong. Biotech is thriving in Belgium, while Germany is plagued with the burdens of reunification and the power of extremely popular environmental groups such as the Green Party, who favor tough restrictions on recombinant research.

Despite the thousands of lights switched on in celebration on January 1, 1993, the fact remains that where biotech and pharmaceuticals are concerned, Europe is still fragmented into largely independent national markets. Venture capital has been less plentiful in Europe than in the United States, meaning that much of the money for biotech comes from foreign investors, notably the United States and Japan.

Most of the scientists we spoke to agree that the EC has a role to play in biotech . . . someday. In April 1990, the EC passed guidelines regulating research and marketing of genetically manipulated organisms (GMO's). The Community mandated that work with GMO's be scientifically responsible and deliberate, that it be rigidly contained, and that worker safety be observed in all research contexts. Further, GMO research is now subject to a review process involving the home country, the other EC members, and the public.

In the complex political atmosphere of contemporary Europe, these regulations could either help or hurt. Optimists think they presage a European biotech market, with a streamlined approval process in which all 12 members could sign off on a product en masse. Others see only new political and regulatory hurdles. In the end, the regulations will be effective only if nations actually apply them. Only seven of the 12 member states have ratified them so far.

Some EC moves are universally applauded, such as the December 1991 extension of patent protection for medicinal products. At that time, the EC approved the use of supplementary protection certificates for medicinal products. These certificates would extend patent protection for five years, to a maximum of 15 years from first marketing approval.

Most exciting is the EC's commitment to sponsor cooperative ventures. The ultimate ideal is the "European laboratory without walls," the collaborative effort unhindered by borders between nations—or between academe and industry. B. Nieuwenhuis of the EC Directorate General for Science, Research, and Development writes that the EC "aims at the establishment of a Community network for training and research." A program called Biotechnology Research for Innovation, Development, and Growth in Europe (BRIDGE) seeks to bring scientists together with industry as early in their studies as possible. One project on the molecular structure and specificity relationship of microbial triacyl-glycerol lipases brings companies from Germany and England together with academic institutions from Austria, France, Italy, and Portugal.

Throughout Europe, however, most companies (and most nations) still think within their own borders. But as Europe changes, the shape of a scientific career is changing too. Careers like that of Frédéric Carrière (see DENMARK below) may represent a new kind

of Euroscience. Despite the uncertainty created by Maastricht and the GATT talks, European companies are ready for the new world.

American scientists can be part of that excitement. Many U.S. scientists first encounter Europe as postdocs. Although the flow of international postdoctoral work is overwhelmingly toward the United States, the talented American postdoctoral scientist is spoken of with relish in Europe. As for the established American scientist wishing to puddlejump, that tends to be a matter, once again, of the network, as seen in the careers of expatriate scientists such as Daniel Doran (see SWITZERLAND below).

"ENTHUSIASM AND FLEXIBILITY WANTED": UNITED KINGDOM

Rod Cook, head of personnel for British Bio-technology, Oxford, notes that the U.K. has the highest concentration of biotech companies in Europe. Enthusiastic venture-capital activity and the promise of biotech have attracted major second- and third-stage investment from giant global corporations, including some from Japan, and the most successful of the start-ups are soon to offer their first products. Companies such as British Bio-technology, Celltech, Porton, Xenova, Delta, and Agricultural Genetics play in the same market with biotech departments set up by Zeneca and many other established health care companies.

"As a whole, European biotech is not as highly evolved as in the U.S.," Cook says, "but there are signs of increasing momentum. There is, however, some uncertainty over regulatory issues, and problems in Denmark and Germany over recombinant organisms have slowed the pace of development."

The market is growing quickly. "Sales of biotech products in 1991 in Europe were £360 million [about \$641 million], up from £166 million [\$295 million] in 1988. This compares with \$4 billion in the United States for 1991. There are much fewer developmental-stage companies in Europe than in the U.S."

Cook is somewhat skeptical of the role of the EC. "The impact of the EC has probably been to slow the industry down due to regulatory requirements, although attempts have been made to facilitate cross-border collaborations. The EC at least recognizes the commercial potential of biotechnology. Other difficult issues in the EC are pressure groups, which have had profound effects in Germany and Denmark and could threaten EC legislation."

British Bio-technology is hard at work on matrix metalloproteinase inhibitors and on virology, in particular on HIV research. Across Europe, areas of keen interest include "monoclonal antibody treatment for septic shock, transgenic technologies, neurobiologicals, gene therapy, autoimmune diseases, cardiovascular disease, and inflammation."

U.K. job conditions are slightly different from those in the United States. Cook says prospective employees will find a "similar level of facilities but less funding for fewer jobs." Stock option schemes are rarer, tending to be limited to senior management. The differences in pay rate are the same as for other professions. Staff get longer holidays, "25 days generally in the U.K. plus eight statutory."

England is a popular place for American scientists; of all EC countries, it gets by far the largest proportion of American international postdocs, and American scientists often play important roles in British biotech firms. "Enthusiasm and flexibility" are valued most in a prospective employee, "given that technical skills are proven." As in the United States, you have to hit the ground running: "They need to take on board our culture and the urgency of an emerging pharmaceutical company. Good interpersonal and communication skills are also required."

**"As a whole,
European biotech
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We also seek an individual with an **MS** in biological sciences with 5+ years experience, preferably in industry, to coordinate and execute high level throughput of cellular assays. Familiarity with *in vitro* immunological assays including T cell activation, lymphokine/cytokine production, immune effector cell functions, ELISA, receptor binding and antiviral assays is essential. Experience in managing a group of 2-4 people is also necessary; experience with animal models of inflammation is desired.

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The ideal candidate will have a history of research in synthetic organic chemistry, especially in process chemistry research for fine chemicals and pharmaceuticals. Direct research experience with the use of enzymes as selective catalysts in organic synthesis would be highly desirable, but is not required. The candidate must have a PhD in Synthetic Organic Chemistry with 3+ years postdoctoral experience, preferably in industry. A knowledge base in chemical process engineering is desirable. Research experience in bio-organic chemistry, especially involving novel protein-modification, would be a plus. Excellent written and verbal communication skills are required.

Enzymology — Laboratory Head

The ideal candidate will have a research background in enzymology, particularly in the kinetic characterization of enzymes and enzyme specificity. Extensive and direct research experience with a wide variety of enzyme assay methodologies, including spectroscopic and chromatographic, is essential. The candidate will have a PhD in Enzymology or a related discipline with 3+ years postdoctoral experience in industrial research. Research experience with enzymes in industrial applications would be desirable, along with a knowledge base in manufacturing and other industrial processes using enzymes. Excellent written and verbal communication skills are required.

Protein Biochemistry — Laboratory Head

The ideal candidate will have extensive research experience in protein purification, preferably with enzymes, having scaled-up protein purification and processing from the milligram to the multi-gram level. A demonstrated ability for and interest in elegant and efficient processes for protein purification is required; scale (multi-gram) experience is essential. Initially, the candidate will develop protein purification for several key products that can be transferred to manufacturing.

The candidate must have a PhD in Biochemistry or a related discipline with 3+ years postdoctoral experience, preferably in industry. A knowledge base in biological process engineering and the kilogram-scale purification of proteins is desirable. Experience in protein modification chemistry would be a plus; excellent written and verbal communication skills are required.

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- In certain cases, research and trial data may be subject to public hearings.
- Other EC members may also comment on the research.
- Marketing of a product containing GMO's must be approved by one EC member and by the other 11 members within 6 months.

"ADAPTABILITY, CREATIVITY, PRAGMATISM": FRANCE

France is one of the most active centers for biotechnology in Europe, with a significant number of start-ups and many established drug firms with active biotech wings. Professor Pierre Monsan of Bioeurope, Toulouse, says that "the European biotechnology industry is developing, mainly in pharmaceutical applications (e.g., vaccines) and animal nutrition (e.g., threonine). Regulatory problems are still a difficulty, especially in countries like Germany."

As for the science itself, Monsan's big interests include "glycotechnology, especially the glycosylation of recombinant proteins and investigation into bioselective oligosaccharides. Central nervous system applications are also being studied, including vectors for CNS drugs."

In terms of funding for individual projects, the EC has been beneficial. But it hasn't been able to spur intra-European investment: more investment dollars come from the United States and Japan than from within France. Monsan describes interactions with U.S. biotech firms as "limited," though individual companies are making strategic R&D agreements. Luckily, the GATT negotiations centered on rapeseed oil rather than on DNA; U.S.-Europe biotech relationships were not affected.

Americans interested in biotech jobs in Europe will find the same employment crunch abroad as at home. "There may be more opportunities with publicly owned research agencies than with privately owned companies because of employment competition with European researchers," he says. "Good adaptability to new projects" is a must, including "creativity in research and pragmatism in development."

"European biotech is developing, mainly in pharmaceutical applications and animal nutrition."—Pierre Monsan, Bioeurope

"INDUSTRY, PRESSURE GROUPS, AND LAWMAKERS": GERMANY

Dr. Werner Wolf, vice president of R&D and Business Development of the Boehringer Mannheim GmbH Research Center, Penzberg, sees a very complex future for biotech in Europe, especially in Germany. "There is no uniform technological status of biotechnology in Europe," he says. In Germany, biotech's place is complicated by the rigors of reunification and the uncertainty of EC legislation with regard to the food industry. Implementation of EC directives is very strongly influenced by political pressure groups, which either do not want biotechnology at all or want it only if all risks are clearly assessed.

Federal shifting of resources from the "old Länder" to the former eastern part of Germany is having its impact. "The budget situation suffers not only from a global depression but also from the cost of the reunion." The present German approval gantlet is lengthy and expensive, but the federal government, like the American FDA, is discussing ways to streamline the process, perhaps as soon as 1994. In the meantime, not everyone can afford to wait. "No new pilot plants are being applied for, and some industry is moving its activities abroad. There is a danger that this shift might also entail a brain drain." Large companies such as Bayer and Hoechst have moved some research facilities, including probably the need for production, to the United States.

To this point, the EC has had little impact on the growth of this industry in Europe, according to Wolf. Though directives on the use of GMO's have set a legal framework, their effectiveness depends on their implementation on the individual national level.

"Despite all these facts," Wolf says, "there might be good reasons for U.S. companies to move to Europe due to attractive regional development plans and the availability of skilled personnel." United States-Europe relations remain good: the market is still both extremely competitive and extremely open to collaborative efforts.

What's exciting in biotech from Wolf's perspective? Almost everyone would endorse his list: use of recombinant human proteins for diagnostics, therapeutics, and research; biochemical screening and selection methods that "are more efficient by some orders of magnitude than conventional chemical structure variations." As in the United States, much of the excitement now is on the manufacturing, regulatory, and legal side. Wolf stresses the need for the development of processes to convert laboratory-scale methods into plant-scale methods and an urgent interest in patent and licensing law.

One big question is what will happen when the first patents granted to recombinant genetic products expire. Europe may then become "an open market for 'generic rec-products.'"

In the meantime, the future of German biotech "will largely depend on how well the scientific community and industry manage the problem of improving acceptance of this technology by the public, including pressure groups, consumers, and politicians."

"There is no uniform status of biotechnology in Europe."—Werner Wolf, Boehringer Mannheim

The word is similar, but the concept is different. That's because biotech is one market of which Japanese companies have not been at the forefront. So what do you do if you are an economic giant wanting to climb to the top of the beanstalk? First, you get bigger in a hurry: in one decade, Japanese biotech has grown from zero to \$1 billion in total sales, almost a quarter of the U.S. total. Japan ranks with the United States as major investors in biotech companies abroad. According to *Business Week*, spending on biotech exceeds \$2 billion (about one third of U.S. spending), three quarters of it by private companies.

Government has gotten involved. The Ministry of International Trade and Industry (MITI), the Ministry of Agriculture, Forestry, and Fisheries, and the Ministry of Health and Welfare all have large biotech budgets. Again, the palette is diverse—waste treatment, biosensors, electronics—and foresight is built-in. MITI includes an Industrial Science & Technology Agency, which in turn has an office of basic technology for future uses.


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Long-term is a very Japanese way of thinking.

Bolstered by government bullishness on biotech, Japanese companies have taken an approach that serves as a lesson in perspicacity and strategy:

• **If You Don't Have It, Get It.** Most of the technologies we associate with biotech were developed first in the United States or Western Europe. Japanese companies have licensed Western breakthroughs for use in Japanese industry—sometimes before actual uses were thought up for them. Once the uses arrive, the technology will be ready.

• **Diversify.** Rather than focusing almost exclusively on pharmaceuticals and diagnostics, as U.S. and Western European biotech have tended to do, Japanese biotech is exploring many other possibilities. According to *Business Week*, Kirin Brewery, which spends more than 80% of its R&D budget on biotechnology, is hard at work not only on biopharmaceuticals but also on seeds, fruits, rice, and vegetables. The Ajinomoto Company, the largest food processor in Japan, has developed a bacterium that helps make

A surreal painting of a person standing on a dark, reflective surface, reaching up towards a vast, star-filled sky. The person is silhouetted against a bright, glowing nebula or star cluster. The sky is filled with numerous stars of varying brightness, and the overall color palette is dominated by deep blues, purples, and blacks, with a hint of red/pink near the horizon.

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Behavioral Pharmacologist

Will interact in an exciting interdisciplinary environment towards the development of novel pharmacological agents for the treatment of neurological and psychiatric disorders. Candidates must have a PhD in Pharmacology, Neuroscience or related discipline with a minimum of two years' postdoctoral experience. Experience with behavioral and *in vivo* neurochemical models of cognitive dysfunction, depression, and psychosis is desirable. Excellent communication skills and the ability to work effectively in a team setting are required.

Please forward your resume to Melanie M. Lewis.

PULMONARY PHARMACOLOGY

Pharmacologist

This position involves the examination of the abilities of leukotrienes and specific antigen to evoke, and leukotriene antagonists to block, plasma extravasation in the airways. BS/MS in Biological Sciences and 0-2 years' experience in biological research are required. Familiarity with computers and statistics is an asset. Good interpersonal and communication skills permitting positive interaction in a research team environment are also required.

Postdoctoral Fellowship

A 2-year postdoctoral position in pulmonary pharmacology is currently available in the Pharmacology Department. Candidate will be involved in ongoing research concerning effects and mechanisms of effects of C-fiber activation in the airways. Studies will also involve modulation of C-fiber responses. PhD or equivalent in a Biological Science is required. Experience with isolated tissue preparations and measurement of physiological or pharmacological responses is preferred.

Please forward your resume to Melanie M. Lewis.

GENERAL PHARMACOLOGY

Biochemical Pharmacologist

We are currently seeking a Biochemical Pharmacologist with a BS/MS in a related science to participate in the *in vitro* studies on the mechanism of compounds. Experience in radioligand binding of channels/receptors, HPLC, signal transduction and tissue culture is desirable. The position requires good writing and oral communication skills and the ability to work well in a team environment. Familiarity with computers is helpful.

Pharmacologist

Will be involved in ancillary pharmacology of compound screening. The position requires a BS in Biology or other related sciences and experience in techniques of oral and parenteral drug administration. Good written and oral communication skills are also required.

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Due to expansion of formulation research activities, we seek a candidate with a PhD in Pharmaceutical Sciences, Aerosol Sciences, Physical Chemistry, Pharmacology or related field. Postdoctoral experience in drug delivery research preferred. Will conduct basic research in the area of respiratory delivery with particular emphasis on pulmonary delivery systems. Will interface closely with biomedical research teams to support new compound characterization.

We also seek an individual who will be involved with the development of solid, liquid and parenteral dosage forms. Responsibilities include the development of pre-clinical, clinical, sales dosage forms, along with the manufacture of clinical supplies for Phase One through Three studies. Successful candidate will have a PhD in Pharmaceutical Science or related field with experience in development of dosage forms for new chemical entities.

Please forward your resume to M.A. O'Neill.

Physical Pharmacist

This position provides the opportunity for liaison with both the drug discovery teams and development teams. Responsibilities include physiochemical characterization of new drug compounds and evaluations of drug products, performing solubility, x-ray diffraction, particle size measurements, and thermal analysis studies on new chemical entities and various solid and liquid dosage forms. Candidates must have a bachelor's degree in Pharmacy, Chemistry or Biology. Relevant experience preferred.

Please forward your resume to Ron Martin.

We offer competitive compensation, comprehensive flexible benefits, a unique investment plan, and the opportunity for growth with one of the world's leading pharmaceutical companies.

If you are interested in being part of a team that takes new chemical entities from research to production, forward your resume/c.v. to the attention of the person listed below the position of interest, and mail to: **Human Resources Department, ICI Pharmaceuticals, Concord Pike and New Murphy Road, Wilmington, DE 19897.**



Pharmaceuticals

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SCIENTIST/SR. SCIENTIST MEMBRANE RESEARCH

This group is responsible for prototype new drug formulations, biophysical characterization of these prototypes and product formulations as well as basic research into areas including bilayer/non bilayer lipid phases, drug-lipid interactions, altering the pharmacokinetics/biodistributions of liposomes and anti-lipid antibodies.

Qualified candidates will be enthusiastic, independent-thinking, productive scientists with 0-4 years of postdoctoral or industrial experience whose backgrounds include an interest in one or more of the areas listed above.

Ph.D. PHARMACOLOGIST BIOLOGICAL SCIENCES

The Biological Sciences Group is seeking a Pharmacologist or Bioanalytical Chemist with experience in pharmacokinetic studies and drug/metabolite analysis in biological fluids. As an active member of our pre-clinical and clinical drug development team, the successful candidate will develop and validate bioanalytical methods for our novel dosage forms and assist in the design, implementation and analysis of pre-clinical and clinical pharmacology studies.

Qualified candidates will have a Ph.D. or PharmD with 0-5 years of experience. Experience with radioisotopes, HPLC, GC-mass spec, and knowledge or experience in cardiovascular, antiinflammatory, infectious diseases and/or oncology areas desirable.

Ph.D. SCIENTIST ANALYTICAL R&D

This group is seeking a Research Scientist to study the basic physicochemical characteristics of our drug formulations, develop/validate analytical test methods, and investigate analytical methods.

Qualified candidate will have a Ph.D. in a scientific discipline and a strong background in chromatography and spectroscopy. Experience working with cell or artificial membrane systems is preferred but not required.

SCIENTIST PHARMACEUTICAL FORMULATIONS RESEARCH

Responsibilities of this position will include the formulation of liposomal dosage forms, product development, and the characterization and optimization of liposomal dosage form properties.

Qualified candidates will have an MS/Ph.D. in Biophysics, Pharmaceutics or Physical Organic Chemistry. Experience with liposomal systems and interfacial chemistry would be a plus.

POST-DOCTORAL FELLOW CELL BIOLOGY

The successful candidate will possess a Ph.D. and experience in cellular immunology, anatomy and/or histology. Experience with leukocyte isolation and characterization, cell and tissue phenotyping, extracellular matrix and photomicroscopy is highly desirable. Projects will include application of these techniques to in vitro/in vivo cellular interactions, novel therapeutics and gene therapies.

RESEARCH ASSOCIATE BIOLOGICAL SCIENCES

Qualified candidates will have a BS/MS in Biology, Biochemistry, Pharmacology or Toxicology with experience in animal disease models, particularly anti-neoplastic, cardiovascular, anti-fungals or anti-microbials. Experience in biodistribution and basic bio-analytical methods would be desirable.

RESEARCH ASSOCIATE CELL BIOLOGY

The successful candidate will possess a BS/MS in Biological Sciences and 3+ years of experience with in vivo animal research. Previous experience with animal surgery, in vivo immunology and microcirculation is highly desirable.

RESEARCH ASSOCIATE MEMBRANE RESEARCH

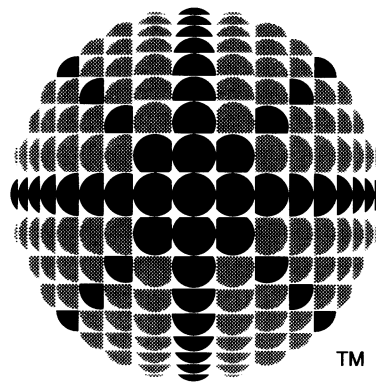
Experience in Biotechnology/Biophysics, specifically with techniques such as NMR, DSC, HPLC, EM and wet analysis. Liposome and in vivo animal experience helpful, but not necessary.

In addition to a creative environment, we offer a competitive salary and comprehensive benefits. Interested candidates, please indicate position of interest, and send resume and salary history to: Ms. Debra Pascale, Human Resources Department, The Liposome Company, One Research Way, Princeton, NJ 08540.



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POSTDOCTORAL RESEARCH ASSOCIATES

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New York.

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The companies listed are currently seeking Post-doctoral Associates for a variety of exciting career opportunities. To help shape the future of the ever-expanding biotechnology industry, please contact the company of interest. All participating companies are equal opportunity/affirmative action employers offering highly competitive compensation and benefit packages.

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As a rapidly expanding genetic diagnostic services company, we are seeking to add two postdoctoral scientists to our staff. One scientist will apply a background in cyto or molecular genetics and a years' experience with FISH to develop in-situ technology for the detection of genetic diseases. The other will develop assays for recognizing tissues of origin. This position requires a background in immunocytochemistry and/or immunoassay development. Please respond with CV and references to: Medigene Inc., 1 Executive Boulevard, Yonkers, NY 10701.

Curative Technologies, Inc.

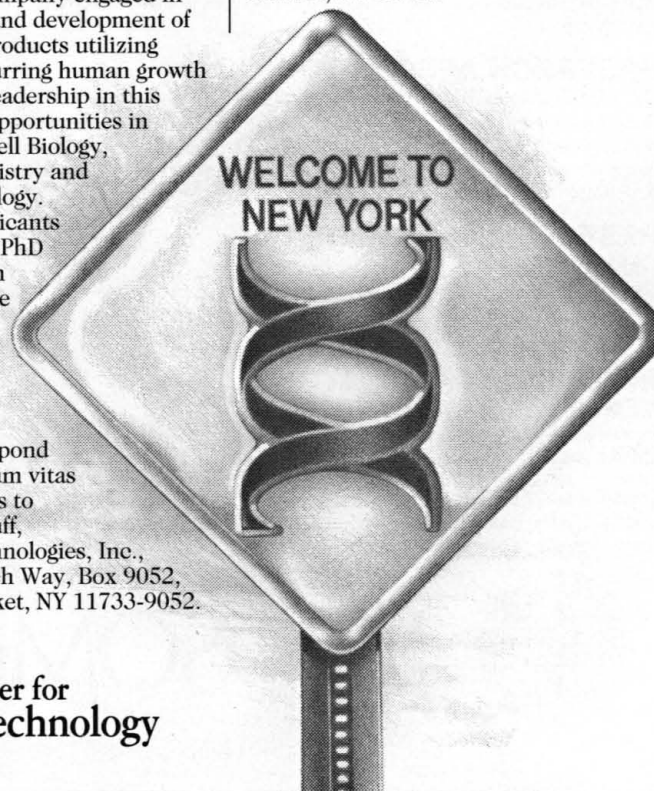
CTI is a publicly traded biopharmaceutical company engaged in the research and development of therapeutic products utilizing naturally occurring human growth factors. Our leadership in this field creates opportunities in the areas of Cell Biology, Protein Chemistry and Molecular Biology. Qualified applicants will be recent PhD graduates with interests in the basic development of polypeptides which exhibit growth factor activities. Respond with curriculum vitae and references to Dr. Ronald Duff, Curative Technologies, Inc., 14 Research Way, Box 9052, E. Setauket, NY 11733-9052.

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We are an established firm in the research and development of wound healing, coagulation and viral sterilization products that is increasing its capabilities in the research and manufacturing of licensed blood components and therapeutics. This has created opportunities for professionals with an MS or PhD, experience in development projects and expertise at the lab/pilot plant scale in protein, lipid, red cell or platelet biochemistry and physiology. These initiatives will span the full scope of development as projects are scaled up to pilot plant level, subjected to clinical evaluation and if successful, brought to manufacturing scale. Send resume to Human Resources, Melville Biologics, 155 Duryea Rd., Melville, NY 11747.



**Center for
Biotechnology**



THE INTERNATIONAL SCIENTIST: DENMARK

Frédéric Carrière is a postdoctoral researcher in the protein chemistry group of Novo Nordisk A/S in Bagsvaerd, Denmark. He received his PhD in enzymology at the Centre National de la Recherche Scientifique in Marseilles, France; his thesis was on the physiological role of digestive lipases, and his main industrial interest is in technical enzymes.

Carrière's career reflects the changing state of science in Europe under the EC. While still a graduate student, he was under contract to a French pharmaceutical company, Jouveinal Laboratories. "Most of the students working on basic research in our laboratory were paid by industry," he says. "Our laboratory was involved with collaborations with several companies mainly through the EC's BRIDGE program."

That is how Carrière became involved with the biochemical characterization and molecular modeling of a new lipase cloned by Novo. "I found in this project the opportunity to extend my background by learning molecular biology and site-directed mutagenesis," he says. As a result, he is now continuing his work at Novo.

"My experience is not really typical in Europe," he says. "Most of the time, the reverse situation is observed: i.e., companies send their own PhDs abroad to extend their knowledge and bring back new ideas. One can assume, however, that experiences similar to mine will occur more often due to the EC's research programs."

"It's not difficult to find a job in the biotechnology industry in Europe—on condition that you've made the right choice during the PhD. Find a dynamic laboratory recognized not only for its basic research but also for its connections with the industry. If you find such a place, it's really not necessary to apply for a job in industry, since usually you can transfer directly from the academic setting."

Carrière's research interests are now focused on third-generation products. "First we had natural proteins like insulin extracted from natural tissues; then we had products produced by genetically-engineered organisms. Now we're moving into organic molecules that can be taken orally and interact with a peptide receptor." Most of all, it has been exciting to see many processes transferred from classical chemical methods into enzyme-catalyzed processes, which are more environmentally compatible. The most exciting products are lipases, cellulases, and proteases to be used in the detergent industry. "We are looking at detergents that will clean clothes at temperatures down to 30° to 40° C."

Prospective employees need "a high degree of education (PhD) and a good capacity to collaborate with other scientists in project groups." Above all, says Carrière, one must be "internationally-minded."

"Experiences similar to mine will occur more often due to the EC's research programs."—Frédéric Carrière, Novo Nordisk A/S

THE FLOWERING OF BIOTECH: THE NETHERLANDS

Dr. R. R. van der Meer, former R&D manager of Florigene and now director of the Netherlands Industrial and Agricultural Biotechnology Association (NIABA), sees a vibrant market in Europe, one that requires strategic partnership. "In the European biotechnology industry, there is greater strength within established industries than there is for independent new starters. In Europe, venture capital is less abundant than in the U.S.A., so new biotechnological companies must seek cash flow in strategic partnerships with established pharmaceutical, food, and agricultural components."

The influence of the EC has been more talk than substance, says van der Meer. "At present, apart from the multinationals, most companies work more nationally than with a European approach. The EC's decision to stimulate R&D is important but still has a strong bias toward basic research." He sees promise in the EC regulations on GMO research and its efforts at patent protection.

Van der Meer admits that the European regulatory system "has the reputation of being pretty complicated." But that may be more reputation than fact. Florigene, a company specializing in recombinant methods for the creation of new, hardier plants and flowers, has so far had quite a good regulatory experience. "The first steps toward commercial approval for our genetically modified chrysanthemum have been taken smoothly. Expectations are that the procedure could take about 180 days for approval in Western Europe. This would be well comparable with the situation in the U.S.A." Exciting fields at Florigene include molecular genetics and molecular biology. The aims: flowers and plants more resistant to pests and disease, and cut flowers with a longer vase-life.

Relations with the United States are strong, from van der Meer's viewpoint; in fact, what strikes him is the role U.S. companies have played in starting up Eurobiotech. "Several NIABA members that started up in Holland were subsidiaries of U.S.A.-based companies, e.g., Mogen, Gene Pharming, and EuroCetus. This U.S.A.-input has been quite important. Florigene has a strategic alliance for R&D activities with DNAP Inc. in Oakland, California. Basic R&D out of DNAP finds its market applications in Europe through Florigene."

Job stability is somewhat better in Europe than in the United States, with somewhat paradoxical results. "People are being laid off easier in the U.S.A. than in most European countries. Accordingly, there is somewhat more mobility and flexibility in the U.S.A." Other than that, van der Meer thinks the differences aren't large. The profile for prospective job candidates: "well-trained and capable in their field, an open and flexible attitude, a pragmatic and critical mind, and a mature, self-supporting personality."

Opportunities are wide open for Americans seeking jobs in European biotech, van der Meer says: "Other than for European soccer teams, I am not aware of any hiring restrictions for foreign people."

"Several NIABA members that started up in Holland were subsidiaries of U.S.A.-based companies."—R. R. van der Meer, NIABA

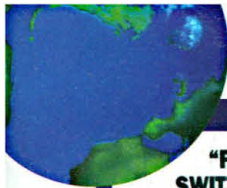
a special paper used in headphones. Mitsui Petrochemical Industries has used recombinant methods to produce new dyes for soaps and cosmetics, as well as developing a new, hardier lily. Kyowa Hakko Kogyo, one of the world's largest suppliers of amino acids, is investigating fish growth hormones, bread yeasts, wine, vegetables, and drugs. Mitsubishi Kasei, Japan's leading chemical company, spends half its R&D budget on biotech, exploring pharmaceuticals (including a hepatitis B vaccine and a version of TPA), seed biology, biochips, and biodegradable plastics.

• **Innovate.** While a few firms plan head-to-head competition in the drug field, Japanese biotech also has many of its own contributions to make. Japanese industry is strong in antibiotic-screening and fermentation technologies, with Kirin the world leader in the latter. Fine chemicals are also a strength, according to Stuart Dambrot of *Chemical Week*; these include oligosaccharides, as well as chiral compounds manufactured in microbial reactors, a technology in which Japan is highly advanced. Marine biology is an area of great activity in a country with a fish-based diet. More than 50 companies are engaged in biosensor research, including Fujitsu, NEC, and Toshiba. Technologies such as the "framing streak"

camera by Hamamatsu Photonics may be useful in electroporation studies. Yet another area of conspicuous activity is bioelectronics, in which living systems are used as media for electronic circuits.

• **Make Strategic Alliances/Acquisitions.** The strategic alliance (a term that smacks of oxymoron) has long been a fact of life in pharmaceuticals and biotech. If company A can't do it, it allies with company B, which can. In pharmaceuticals, Dainippon has allied with Abbott, Shionogi with Merck, Mitsubishi with Monsanto, Suntory with Schering-Plough, and Chugai with Upjohn. Allies aim to secure access to specialized equipment, procure licensed materials (e.g., cell lines), and obtain marketing rights in each other's national territories.

Strategic alliances have a somewhat different flavor in biotech. According to researchers Ashish Arora and Alfonso Gambardella, late entrants have used alliances, acquisitions, and mergers to catch up in biotech (as when Bristol-Myers acquired Oncogen in 1986); larger companies acquire smaller ones to get expertise in specific fields (as when Eli Lilly acquired Hybritech in 1986). Alliances often involve a spider-and-fly act between big, established companies and smaller venture-capital



"POSITION, CAREER, OPPORTUNITIES": SWITZERLAND

Daniel Doran, senior scientist at Hoffman-La Roche in Basel, used to be an assistant director at a tissue typing laboratory at the Medical College of Georgia. "I got involved with tissue typing because that was the one area of my specialty, immunology, that involved computers." Doran was involved in the screening of reagents and tissue types in support of a transplantation program.

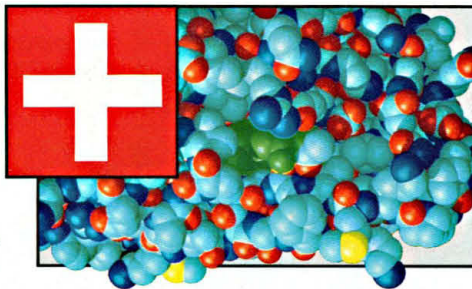
His wife, who was involved in fibronectin research, was invited by a collaborator to take a position in the experimental surgery department at the University of Bern. "It was too good an opportunity for her to pass up," says Doran. "So I basically went out there for my summer vacation looking for a job. The scientific community in Switzerland is very close-knit. If you know someone, you can often find out about job opportunities. Through my wife's collaborator I was able to get a letter of introduction, and from that I was able to get two interviews with established pharmaceutical firms."

Hoffmann-La Roche was very much what Doran was looking for—especially the chance to work more extensively with computers. He joined the computational and structural chemistry group, where his first project was to design a relational data base derived from the Brookhaven National Laboratory's Protein Data Bank. His creation is still in use and being enhanced. "Protein modeling and rational drug design are watchwords right now in European pharmaceuticals," he says, "and what I was doing was contributing to that end."

Doran hesitates to make transatlantic comparisons because he was mainly an academic in America and is wholly an industrialist in Switzerland. The biggest adjustments have come in switching sectors rather than countries. "In industry," he says, "the emphasis is on working with a group; in academe, it was more on expressing your own abilities. The grant application process was always there in academe. That's not true here."

What about the language barrier? "Almost everyone here is conversant in English," he says. "Communications are extremely good. One does have to understand German, though. I tend to use my German for nonscientific things, and when I attend meetings and read the literature, German is important. So, although my German is far from excellent, I haven't found language to be too much of a problem."

Home of Sandoz, Hoffman-La Roche, and other giants, Switzerland is a great center of pharmaceutical and biotech activity.



Always independent, the Swiss have not yet decided whether or not to be part of the EC; in fact, they voted down a plan to enter into a special trade relationship with the Community. But Swiss science is no island in the midst of Europe. "Everyone knows about the problems with biotech in Europe," Doran says, "and

Switzerland is not exempt from them."

Swiss science recently had a close brush with the Swiss initiative system, in which individual issues are put to national referendums. A December 1991 initiative to put severe restrictions on animal testing was only narrowly voted down. Special hiring conditions exist in Switzerland as well. Fully one sixth of Swiss residents are foreign, and the government strictly limits the number of employment permits given to foreigners. "If a pharmaceutical company wants to hire a foreign scientist," Doran says, "often they must get government permission to make the position available."

"If you're early in your career in the U.S. and you want to work in Europe, I'd suggest a postdoc," says Doran. "Postdocs can be had if you know someone and can get into that sort-of-underground information system. In most European countries, the scientific communities are close-knit, and information travels fast."

People often ask Doran when he's going back. "For me, that's not a question right now. I do my work here." Since Hoffman-La Roche is a multinational company with excellent communications with the United States, American science is followed very closely, and it's easy to stay in touch. "Modern communications technology means that I don't have to move from my chair if computer work needs to be done, say, in our Nutley, New Jersey, department."

For Doran, then, there's not only no reason to go back but also very many good reasons to stay. Foremost among these reasons: he likes his work. "I'm in an area my company views as important, and that makes it exciting. The environment for my work is very congenial. I'm satisfied with my position, my career, and my opportunities."

"Protein modeling and rational drug design are watchwords right now in European pharmaceuticals."—Daniel Doran, Hoffman-La Roche

firms. For a smaller firm in perpetual need of money, it can be very hard to resist the blandishments of giants with cash.

Japanese biotech and pharmaceutical companies, then, have simply taken up an established tradition with gusto. Far-sighted Chugai bought a stake in Genetics Institute in 1983. For its pains, Chugai now has the exclusive marketing rights in the United States, Japan, and Europe for Genetic Institute's epoetin beta anti-anemia drug. Chugai also struck an R&D agreement with Gen-Probe of San Diego in 1988; a year later, Chugai had bought Gen-Probe and all its research into genetic probes for sexually transmitted diseases. Daiichi Seiyaku Co. is working with California Biotechnology Inc. on therapeutics for Alzheimer's disease. Yamanouchi Pharmaceuticals Co. Ltd. and Genetics Institute have agreed to co-market rhIL-II, a colony-stimulating factor that promotes platelet and neutrophil proliferation; rhIL-II is used in patients undergoing chemotherapy and bone marrow transplants.

Of all such alliances, perhaps the best known is that between Kirin Brewery and Amgen. The two companies split the cost of developing and marketing Amgen's synthetic erythropoietin. The deal has benefitted both sides: Kirin is learning how biotech becomes bioproduct, and the alliance has helped Amgen become a leader in U.S. biotech sales.

• **Get on Campus, or Get Near It.** Japanese investment has come stateside, looking to underwrite biotech innovation. That means partnerships with American academic science. Investors have been so forward that a National Research Council report (*Science*, 27 November 1992) worried about a growing pattern in which U.S. biotech expertise is flowing one-way toward Japan. In 1987, Otsuka Pharmaceutical Co. contributed \$5 million

to help found the Biomembrane Institute affiliated with the University of Washington. In 1990, Hitachi Chemical Research Inc. spent \$16.5 million on a new research center at the University of California at Irvine. (The first floor is for UCI's scientists, and the second and third are for Hitachi's people.) The Shiseido Company, which specializes in cosmetics, presented Harvard University with \$85 million to sponsor a biotech research center. If you can't get on campus, you can always set up nearby: Japanese research centers have been popping up in or near areas of intense scientific activity, including Princeton, La Jolla, and Palo Alto.

At present, the road to world competitiveness is still uphill for Japanese biotech companies. Investment has slowed because of Japan's sick economy. Paranoia may lead to protectionism in the United States. And despite its vigorous growth and diversification, the Japanese biotech industry remains comparatively parochial. Distribution of biotech products is largely still restricted to local markets. Japanese drug imports are three times its drug exports, striking for a country that is second only to the United States in world drug sales, accounting single-handedly for 19% of the world total. Clearly, there is a lot of growth still ahead.

In this environment, American expertise is highly valued. Outreach programs from both sides seek to bring Japanese bioscientists to America and Americans to Japan. The Osaka Bioscience Institute, co-sponsored by Genentech, seeks to recruit postdocs for life-science research. According to Larry Weber of the National Science Foundation, the NSF "administers a number of programs which place American researchers in university, government, and corporate laboratories in Japan."

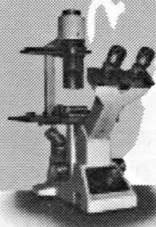
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Applications are invited for the position of Research Scientist in the Molecular Biology Group of the Janssen Research Foundation. The opening can be filled immediately. Applicants must have a Ph.D. in Biochemistry or Molecular Biology, preferably followed by post-doctoral training. Extensive experience with recombinant DNA techniques is essential; a working knowledge of pharmacology, receptor research and enzymology would be an additional asset. There is no citizenship or language requirement for those proficient in English. Salary is commensurate with experience and seniority.

The Molecular Biology Group of the Janssen Research Foundation has been charged with developing recombinant systems at the molecular, cellular and organismal level with a view to facilitating the discovery and development of novel human therapeutics. The techniques involved include the molecular cloning and heterologous expression of human proteins as targets for drug screening, expression in cell lines of cloned proteins such as receptors for functional assays, and the use of transgenic animal models of human disease. The group works closely with other in-house research departments and actively collaborates with a number of academic institutions; it also serves as an interface for contacts with biotechnology firms. The successful candidate will be expected to steer and supervise ongoing projects, set up additional supplementary techniques and develop new research programs.

Informal enquiries can be addressed to Dr. Walter Luyten (32-14-60.26.18) or Dr. Josée Leysen (32-14-60.26.19). Formal applications, to include a résumé and the names, addresses and phone numbers of at least two references, can be sent to: Janssen Research Foundation, Personnel Department, Turnhoutseweg 30, B-2340 Beerse, Belgium. Fax: 32-14-60.28.41.



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ENVIRONMENTAL MICROBIOLOGIST

A full-time tenure-track **ASSISTANT PROFESSORSHIP** is available in the Department of Biology at the University of Dayton beginning August of 1993. Applicants in all areas of environmental microbiology and microbial ecology will be considered, but preference will be given to those with interests in nutrient cycling and research experience in such applied areas as the bioremediation/biodegradation and fate/monitoring of synthetic organic compounds in the environment. The successful applicant will be expected to teach nonmajors general biology as well as an undergraduate service course in applied environmental microbiology and an upper-level course for majors in the area of bioremediation, risk assessment and restoration of polluted and disturbed habitats. The individual will be expected to establish a successful research program, mentor M.S. and Ph.D. students and actively participate in various aspects of the graduate program. A Ph.D. and postdoctoral experience are required. Interested applicants should send curriculum vitae, statement of research and teaching interests and three letters of reference to: **Dr. Robert J. Kearns, Department of Biology, University of Dayton, Dayton, OH 45469-2320.** Closing date is March 19, 1993. *The University of Dayton is an Affirmative Action/Equal Opportunity Employer.*

Virologist—Department of Veterinary Sciences, University of Wyoming, tenure-track **ASSISTANT/ASSOCIATE PROFESSOR** position in virology. D.V.M./Ph.D. or Ph.D. required; consideration given for ACVM certification. Ability to interact with veterinary practitioners is critical. Duties include approximately 50% viral diagnostics with the Wyoming State Veterinary Laboratory, 30% independent and collaborative research, and 20% teaching. Teaching includes an introductory virology course jointly listed with the Department of Molecular Biology. Technical support/competitive salary available. Interested parties should send curriculum vitae and arrange for three letters of reference to be sent to: **Ken Mills, Ph.D., Department of Veterinary Sciences, 1174 Snowy Range Road, Laramie, WY 82070, Telephone: 307-742-6638.** Closing date is April 15, 1993 or until a suitable candidate is found. *Affirmative Action/Equal Opportunity Employer.*

SENIOR RESEARCH ASSISTANT PROFESSOR. Section of Allergy/Immunology, East Carolina University School of Medicine is seeking a senior-level research associate to study anti-inflammatory mediators in asthma. Applicant must have a Ph.D. and experience in animal physiology, immunology, pharmacology, or closely related field and at least two years of postdoctoral experience. Please send curriculum vitae and three references to: **W. James Metzger, M.D., Department of Medicine, East Carolina University, Greenville NC 27858-4354.** *East Carolina University is an Affirmative Action/Equal Opportunity Employer. Federal law requires proper documentation of identity and employee ability prior to final consideration for this position.*

ASSISTANT PROFESSOR, LIFE SCIENCES: Department of Chemistry, U.S. Military Academy, West Point, New York. GS-12 level running through June 1995. Extension possible. Duties: teaching, course/lab development in life sciences, and must be able to teach general chemistry. Must have Ph.D. Position open until filled. For application contact: **Mrs. Giery, Civilian Personnel Office, West Point, NY 10996, Telephone: 914-938-3704.** For information on position contact: **Colonel Springer at 914-938-3909.** *U.S. citizenship required. Equal Opportunity Employer.*

ANATOMIST, ASSISTANT PROFESSOR, new tenure-track position, beginning fall 1993, pending state funding. Ph.D. required. Will teach a cadaver-based Human Anatomy course. Must also be able to teach Human and Vertebrate Physiology as needed. Expected to develop an independent research program in organismal biology. Salary competitive. Submit curriculum vitae, statement of teaching and research interests, and names, addresses and telephone numbers of three references to: **Associate Head, Department of Biology, James Madison University, Harrisonburg, VA 22807.** Applications must be postmarked by March 12, 1993. *The University is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

TENURE-TRACK POSITIONS ASSISTANT OR ASSOCIATE PROFESSOR OF PHYSIOLOGY

The University of Tennessee, Memphis, Department of Physiology and Biophysics has tenure-track positions at the rank of Assistant Professor or Associate Professor. Candidates should have a Ph.D. or M.D. degree, a good track record in publications, and postdoctoral research experience with a background in cellular and/or molecular biology. The abilities to establish an independent research program in the areas of cardiovascular, gastrointestinal, developmental, endocrine or epithelial physiology and to engage in teaching activities of the department are expected. Applicants send curriculum vitae, copies of three representative publications and the names of three references to: **Dr. Leonard R. Johnson, The Thomas A. Gerwin Professor and Chairman, Department of Physiology and Biophysics, 894 Union Avenue, Memphis, TN 38163.** *AN EQUAL OPPORTUNITY/TITLE IX/SECTION 504/ADA/AFFIRMATIVE ACTION EMPLOYER. MINORITIES AND WOMEN ARE ENCOURAGED TO APPLY.*

FOOD AND NUTRITION POSITION

Center for Food and Nutrition Policy, Georgetown University, seeking someone with relevant advanced degree or equivalent experience. Knowledge of food and nutrition policy and government/legislative experience in Washington preferred. Excellent written and spoken English essential. Salary commensurate with experience. **ASSISTANT PROFESSOR level.** *Equal Employment Opportunity Employer.* Contact: **Dr. Gerald E. Gaull, Center for Food & Nutrition Policy, Georgetown University, 218 Kober-Cogan Hall, Washington, DC 20007; FAX: 202-687-7723.**

ASSISTANT PROFESSOR OF MICROBIOLOGY

Applications are invited for a tenure-track faculty position at the University of Southern California School of Medicine Department of Microbiology and Norris Comprehensive Cancer Center. The areas of interest include immunology, prokaryotic and eukaryotic molecular biology, gene regulation, virology and oncogenes. However, all areas of molecular biology will be considered. The successful candidate will be expected to undertake a vigorous research program and to participate in the teaching activities of the medical and graduate schools.

Applicants should send curriculum vitae, a statement of research and teaching interests and three letters of reference to: **Dr. Michael Lai, Department of Microbiology, HMR 401, 2011 Zonal Avenue, Los Angeles, CA 90033-1034.**

USC is an Equal Opportunity/Affirmative Action Employer.

GENETICS BALL STATE UNIVERSITY MUNCIE, INDIANA

Applications are invited for a tenure-track position in genetics at the **ASSISTANT/ASSOCIATE PROFESSOR** level in the Department of Biology, available fall 1993. Candidates are expected to have a commitment to excellence in teaching and to be broadly trained in genetics. Responsibilities: teach courses in general, advanced, and human genetics and introductory biology; conduct research in specialty area (not excluding genetics education) and promote student involvement in research; and be an active member of the academic community. Minimum qualifications: earned doctorate in biological science with broad training in genetics and effective written and oral communications skills. Preferred qualifications: demonstrated teaching ability and publications and/or other evidence of scholarly activity. Submit curriculum vitae, documentation of scholarly activity, and three (3) letters of reference and transcripts to: **Dr. Kemuel Badger, Search and Selection Committee, Department of Biology, Ball State University, Muncie, IN 47306.** Review of applications will begin March 12, 1993, and continue until the position is filled.

Ball State University is an Equal Opportunity/Affirmative Action Employer and is strongly and actively committed to diversity within its community.

Immunopharmacology Research Scientist/ Assistant

Pfizer Central Research has immediate openings for research scientists to join one of our multidisciplinary project teams in discovering novel therapies in the area of immune suppression.

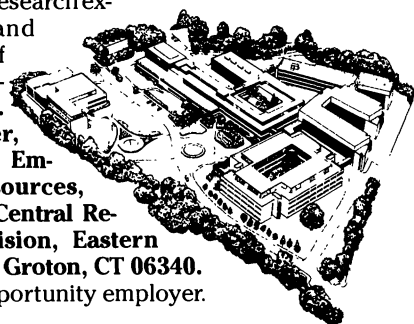
Research Scientist

Apply your thorough knowledge of cell activation at the molecular, biochemical and/or cellular level to identify novel targets for drug discovery. An in-depth understanding of the applications/limitations of currently used *in vivo* transplantation and autoimmune disease models is desirable. This position requires a PhD in the biological sciences with postdoctoral experience; industrial experience would be a distinct advantage.

Assistant Scientist

As a member of our Immune Suppression Research Group, you will participate in our ongoing drug discovery efforts. This position requires a BS/MS degree in one of the biological sciences with 2 years research laboratory experience. Expertise in one or more of the following techniques is desired: organ models of transplantation, cell culture, immunohistochemistry, biochemical assays, and ELISA.

Pfizer offers a stimulating scientific research environment with opportunities to interact with scientists from many disciplines. In addition, we have a competitive compensation/benefit package that includes relocation assistance to this southeastern Connecticut shoreline community. Please send a resume indicating position of interest, a description of your research experience and names of three references to: **Ms. Ellen Buller, Supervisor, Employee Resources, Pfizer Inc, Central Research Division, Eastern Point Road, Groton, CT 06340.** An equal opportunity employer.



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Mitotix is a well-funded new biopharmaceutical company developing cell-cycle based therapeutics for cancer and other proliferative diseases.

We are looking for creative, highly motivated and enthusiastic scientists interested in developing successful strategies for proliferation control.

Assay development scientists,
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Medicinal chemists,
Protein biochemists,
Structural biologists,
Yeast geneticists,
are all invited to apply.

Individuals at senior/junior scientists level will be considered. We offer competitive salaries, equity participation and benefits, a wonderful location in the heart of Cambridge's scientific community, and the chance to work with leading science and business professionals. We are strongly committed to research and encourage participation in scientific meetings and publication of scientific results.

Send a curriculum vitae and the names and addresses of three references in confidence to: Human Resources Dept., **Mitotix, Inc.**, 1 Kendall Sq., Bldg. 600, Cambridge, MA 02139, USA. An Equal Opportunity Employer.



Mitotix

POSITIONS OPEN

LUNG AND VASCULAR BIOLOGY

ASSISTANT PROFESSOR-level positions in research areas related to lung and vascular biology at Rush Medical College/Rush-Presbyterian Medical Center. Applications will be considered in the following areas: endothelial biology, epithelial/endothelial cell-cell interactions at the vessel wall, signal transduction mechanisms, matrix biology, and adhesion molecules. Applicants are expected to compete successfully for extramural funding and may have existing grant support. Expertise in cell and molecular biology techniques is essential. Submit curriculum vitae with names of three references to: **A. B. Malik, Chair, Department of Pharmacology, Rush Medical College, 1653 West Congress Parkway, Chicago, IL 60612.** Rush Medical College is an Equal Opportunity Employer.

NORTHERN STATE UNIVERSITY PHYSIOLOGY

Northern State University invites qualified applicants for a tenure-track position as **ASSISTANT/ASSOCIATE PROFESSOR** of biology with demonstrated skills/competencies in physiology at the cellular/subcellular level. Applicants should have a Ph.D. in biology and preferably have postdoctoral training. The successful candidate's primary instructional duties will include courses in animal physiology, ecology, undergraduate general education courses in biology, and other courses depending upon interests and qualifications. While particular area of research interest is open, the successful candidate must engage in research that promotes student involvement and that is complementary to other research efforts within the department. The candidate should expect to provide service to the institution and the region. Applications are to include a letter outlining teaching, research, and service objectives; résumé; graduate transcripts; and three letters of reference. Consideration of applications will begin April 1, 1993, and continue until the position is filled. Address applications to: **Dr. Samuel Gingerich, Acting Vice President for Academic Affairs, Northern State University, 1200 South Jay Street, Aberdeen, SD 57401-7198.**

Northern State University does not discriminate on the basis of race, color, national origin, sex, religion, age, or disability in employment or the provision of services.

VOLLUM INSTITUTE OREGON HEALTH SCIENCES UNIVERSITY FACULTY POSITION

The Vollum Institute is accepting applications for a faculty position equivalent to **ASSISTANT, ASSOCIATE or FULL PROFESSOR**. Applicants should have a strong record in an area of modern biomedical research which will complement existing Institute programs in transcriptional regulation, neurotransmitter/hormone receptors and transporters, ion channel structure and function, synaptic transmission, and signal transduction mechanisms. Submit curriculum vitae and one-page statement of research interests by March 15, 1993, to: **Faculty Search, Vollum Institute L-474, Oregon Health Sciences University, 3181 S.W. Sam Jackson Park Road, Portland, OR 97201.** An Equal Opportunity/Affirmative Action Employer. Minorities and women are encouraged to apply.

MOLECULAR TOXICOLOGIST

The Department of Environmental Health Sciences at Tulane University School of Public Health and Tropical Medicine is seeking applications for a tenure-track appointment as an **ASSISTANT PROFESSOR** of molecular toxicology. Minimum requirements include an earned doctorate in toxicology or related field, and at least two years of postdoctoral research experience. The successful candidate will develop an innovative, vigorous, independent research program focused on understanding the molecular basis of xenobiotic-induced disease, and participate in the graduate teaching program of the department. Modern research facilities are available in the newly constructed Center for Bioenvironmental Research. Submit applications, including curriculum vitae, summary of past research, a statement of future research goals, and arrange for three referees to send letters of recommendation by April 15, 1993, to: **Dr. William A. Toscano, Jr., Department of Environmental Health Sciences, Tulane School of Public Health and Tropical Medicine, 1430 Tulane Avenue, New Orleans, LA 70112.** Tulane University is an Affirmative Action/Equal Opportunity Employer.

POSITIONS OPEN

The Department of Chemistry of Northern Michigan University is seeking applicants for a tenure-track faculty position in Biochemistry at the **ASSISTANT PROFESSOR** level. Applications are invited from candidates who have a Ph.D. in Biochemistry, ideally with postdoctoral experience and a strong commitment to teaching and research at the undergraduate and graduate level. Primary teaching responsibilities will be undergraduate and graduate biochemistry courses. Supervision of undergraduate and graduate student research is expected and some start-up funds are available for establishing a research program. *Northern Michigan University is deeply committed to developing a diverse applicant pool. Women and minorities are especially encouraged to apply.* Applicant screening will begin March 1, 1993. Interested candidates should send current curriculum vitae, transcripts, a statement of research interests and three letters of recommendation to:

**Roger D. Barry, Professor and Head
Department of Chemistry
Northern Michigan University
Marquette, MI 49855**

Northern Michigan University is an Affirmative Action/Equal Opportunity Employer.

ECOLOGIST

Grinnell College invites applications for a one-year sabbatical leave replacement as an **ASSISTANT PROFESSOR** (Associate Professor possible) of Biology to begin in August 1993. We seek an ecologist well acquainted with field research techniques to teach a sophomore-level course in population and evolutionary biology required for majors, an upper-level course in ecology, and a general education course in environmental studies for non-majors. We seek candidates with broad interests in biology who have completed the Ph.D. Support for student-faculty research and a 365-acre field station 11 miles from campus with a laboratory, pond, restored prairie, savanna and an oak forest are available. Send curriculum vitae, three letters of recommendation and all transcripts to: **Charles H. Sullivan, Ecology Search Committee, Department of Biology, Grinnell College, Grinnell, IA 50112-0806; E-mail: Sullivac@Grinl.bitnet; FAX: (515) 269-4285.** To assure full consideration, applications must be received by March 15, 1993. *Grinnell College is an Affirmative Action/Equal Opportunity Employer and especially seeks women and minority candidates.*

BIOLOGICAL MODELER

The Department of Biology of the University of New Mexico invites applications for a tenure-track position at the level of **ASSISTANT PROFESSOR** to begin in August 1993. We seek candidates with a record of high-quality research in the general area of modeling of biological systems. The successful candidate will be expected to develop an independent research program in some aspect of modeling of biological systems, assist in the lower-division teaching duties of the department, teach courses in biological modeling at the undergraduate and graduate levels, and assist in classes in ecosystem ecology and ecosystem studies as a sabbatical replacement during the 1993-94 academic years. A commitment to excellence in teaching and the ability to interact with colleagues and students working on a wide range of biological problems are essential. Applicants should submit curriculum vitae, a statement of research and teaching interests, three letters of recommendation, and reprints to: **Chair, Biological Modeler Search Committee, Department of Biology, University of New Mexico, Albuquerque, NM 87131** before March 15, 1993. *The University of New Mexico is an Equal Opportunity/Affirmative Action Employer.*

ASSISTANT PROFESSOR: BIOLOGY, tenure-track—July 1993. The candidate is expected to develop a funded research program in molecular cell biology or cell physiology emphasizing eukaryotes. Undergraduate and graduate teaching opportunities in cell/molecular biology, genetics, signalling, and the candidate's specialty. Mail curriculum vitae, 4 letters of recommendation and representative papers by March 13, 1993, to: **Robert Bolla, Chairman, Department of Biology, Saint Louis University, 3507 LaClede Avenue, St. Louis, MO 63103-2010.** Applicant screening will begin early in March, and the position will be filled as soon as possible. *Saint Louis University is an Equal Opportunity/Affirmative Action Employer, M/F/H/V.*

POSITIONS OPEN

UNIVERSITY OF VIRGINIA DEPARTMENT OF PHARMACOLOGY

Applications are invited for two tenure-track positions at the **ASSISTANT PROFESSOR** level to begin in the fall of 1993. Exceptional candidates at a higher rank may be considered. The department is particularly seeking applicants with strengths in molecular aspects of neuropharmacology or signal transduction to nuclei; however, consideration will also be given to outstanding candidates in other areas compatible with existing strengths in cell regulation and signal transduction. Successful candidates are expected to develop externally funded research programs and to participate in graduate and medical student teaching. The University of Virginia provides a highly interactive scientific community well supported by core facilities, research centers and training programs. *Applications from women and underrepresented minorities are encouraged.* Preference will be given to applications completed by March 15, 1993.

Curriculum vitae, statement of research accomplishments and plans, and three letters of recommendation should be directed to either: **Dr. Patrice Guyenet** [neuropharmacology area] or **Dr. Julie Sando** [nuclear signalling area], **Department of Pharmacology, Box 448 Health Sciences Center, University of Virginia, Charlottesville, VA 22908.** *The University of Virginia is an Equal Opportunity/Affirmative Action Employer.*

VISITING ASSISTANT PROFESSOR AQUATIC ECOLOGY

One-year sabbatical replacement, Division of Biological Sciences, University of Montana. Ph.D. required. Teaching responsibilities to include: (1) general biology course; (2) upper-division course in ichthyology/fisheries; (3) graduate-level course in community ecology; and (4) graduate seminar in research specialization. Advising undergraduate majors also expected. Review of applications begins 15 March 1993. Send curriculum vitae and three letters of recommendation to: **Aquatic Ecology Search Committee, Biological Sciences, University of Montana, Missoula, MT 59812.** *Affirmative Action/Equal Opportunity Employer.*

FACULTY POSITION IN NEUROCHEMISTRY

The Department of Biochemistry at the University of Kentucky, in conjunction with the Sanders-Brown Center on Aging, invite applications for a tenure-track faculty appointment at the **ASSISTANT PROFESSOR** level. The appointee will be expected to develop an independent research program involving biochemical studies of aging and/or Alzheimer's Disease. Send letter of interest, curriculum vitae and 3 letters of recommendation to: **Louis Hersch, Ph.D., Department of Biochemistry, University of Kentucky, Lexington, KY 40536.** *An Equal Opportunity Employer.*

ASSISTANT/ASSOCIATE/FULL PROFESSOR

Applications are invited for a tenure-track faculty position in the **Department of Pharmacology at Baylor College of Medicine.** Applications are sought from individuals (M.D. and/or Ph.D.) with research interests in pharmacology. Preference will be given to candidates with a record of strong teaching skills and research support. Appointment will be made at a level appropriate for the successful candidate. Send curriculum vitae and names of three references to: **Dr. Lynn C. Yeoman, Search Committee Chair, Department of Pharmacology, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030.**

ASSISTANT PROFESSOR in Obstetrics and Gynecology (non-tenured research). M.D. Board Certified/eligible in Obstetrics and Gynecology. Fellowship training in Reproductive Endocrinology and Infertility. Research training in Molecular Biology: RNA analysis, PCR technology, Nuclear run-on, Sequencing, Cloning. Knowledge and experience in human breast cancer research preferred. Position is 75% to 90% research. Provide curriculum vitae, and bibliography to indicate research training/experience. Provide the names of three referees, and a summary of proposed research and professional goals to: **Dr. Evan R. Simpson, Obstetrics and Gynecology, Southwestern Medical School, 5323 Harry Hines Boulevard, Dallas, TX 75235-9051.** *THE UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER AT DALLAS IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.*



Pharmaceutical
Division

Miles Inc., Pharmaceutical Division, has an exciting career opportunity for an experienced individual in our West Haven facility.

CYTOKINE BIOLOGY / INFLAMMATION

We are looking for a biologist with a broad background in inflammation who has experience developing animal models of acute inflammation. Of particular interest is research experience in inflammatory cytokines and adhesion molecules. The incumbent should have a PhD in Cell Biology, Immunology, or other inflammation related discipline as well as two to four years of productive postdoctoral research experience documented by publications. The individual selected for this position will become part of a multidisciplinary team of scientists composed of members of the cytokine biology and adhesion molecule groups. Good communication skills and the ability to manage a group staffed with two support personnel are necessary.

We offer attractive compensation and generous health, medical and relocation benefits. Resumes, including salary history and objectives, should be forwarded in confidence to: **Miles Inc., Pharmaceutical Division, Dept. AAPS, 400 Morgan Lane, West Haven, CT 06516.**

An Equal Opportunity Employer M/F/D/V

Harvard Medical School/ Joslin Diabetes Center **FACULTY**

Signal Transduction & Cellular Regulation

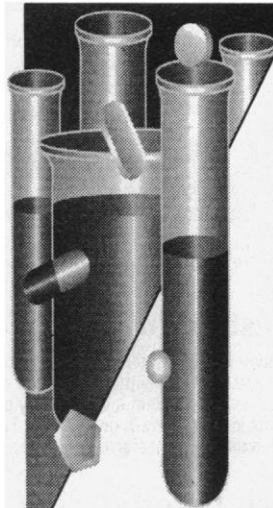


Joslin Diabetes
Center

The Joslin Diabetes Center with the support of the Lucille P. Markey Charitable Trust is expanding its program in signal transduction and cellular regulation. Positions are available for qualified M.D.s and/or Ph.D.s with expertise in the areas of peptide hormone, growth factor, and cytokine action, hormonal regulation of gene expression, vascular cell biology, molecular genetics and transgenic animal research as it might apply to studies of the pathogenesis of diabetes or its complications. Academic appointment at Harvard Medical School appropriate to seniority. Women and minorities are encouraged to apply.

Interested individuals should send a curriculum vitae and the names and telephone numbers of three possible references to Dr. C. Ronald Kahn, Joslin Diabetes Center, One Joslin Place, Boston, MA 02215.

An Equal Opportunity Employer



A DYNAMIC MISSION

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

Glaxo Inc., one of the largest pharmaceutical companies in the world, has an established

record of developing the highest quality prescription medicines for unmet patient needs. Located in Research Triangle Park, NC, the **Glaxo Inc. Research Institute** is a premier facility which provides a stimulating environment for scientists working in all aspects of discovery and development. We invite you to experience the challenges and accomplishments a future with us holds for you. The following opening is available.

SENIOR SCIENTIST Diabetes Research

The successful candidate will join our multidisciplinary team of scientists dedicated to the discovery of novel approaches for the treatment of diabetes, with special emphasis on mechanisms of insulin resistance. This individual should be able to work in a team setting and have good communication skills.

We seek an energetic investigator who possesses a Ph.D. in Biochemistry, Molecular Biology, or Physiology, and has broad knowledge and experience in at least one of the following areas: insulin action and insulin resistance, signal transduction in mammalian cells, mammalian cell biology, transcription factor analysis, gene expression and regulation at the RNA and DNA level, or vesicular trafficking. Expertise in cell culture, Northern and Western gel analysis, and preparation of nuclear and cytosol cell extracts as it relates to diabetes is preferred.

Join Glaxo and enjoy an excellent salary, flexible benefits, an on-site fitness center, a spirit of enthusiasm and teamwork and outstanding opportunities for career satisfaction. Equally appealing is our world famous scientific, industrial, and academic community in Research Triangle Park, NC. Send your resume, which must include position title and salary history, to: **Job# ASC912801, Human Resources Department, Glaxo Inc., P.O. Box 13398, Research Triangle Park, NC 27709.** (No Phone Calls or Agency Referrals, Please.) An Equal Opportunity Employer M/F/D/V.

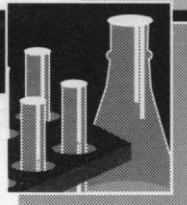
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TOXICOLOGY

The following two positions will be based in our brand new, state-of-the-art pharmaceutical research facility in Upper Providence Township, Pennsylvania.



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Our successful candidate will serve as study director and supervise the conduct of preclinical safety studies in support of the discovery and development of diagnostic imaging agents. You will also serve as toxicology representative on diagnostic imaging discovery project teams to support advancement of compounds. Requirements include a Ph.D. or D.V.M. in Toxicology or related discipline with postdoctoral and/or research experience preferred. Knowledge of GLP is also desirable. (Position #RS-61-91-JRC)

Research Investigator

Our successful candidate will serve as study director and supervise the conduct of preclinical safety studies in support of IND's and NDA's. You will also serve as Toxicology representative on drug discovery and development teams, to support new formulations of products, and to develop testing monographs. Requirements include a Ph.D. or D.V.M. in Toxicology or related discipline with postdoctoral and/or research experience preferred. Knowledge of GLP is also desirable. (Position #RS-36-92-JRC)

At Sterling Winthrop, you'll enjoy a highly competitive salary and a comprehensive/flexible benefits package along with outstanding career opportunities. For confidential consideration, forward your resume and salary requirements (with Position #) to:



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Biogen is a profitable fourteen year old biotechnology company engaged principally in developing genetically engineered human pharmaceuticals. As a result of its early research, Biogen now derives revenues from five products being sold by its licensees or affiliates in various countries. Biogen currently directs its research and development into areas where the company has particular strength - inflammation, cardiovascular disease, AIDS and certain cancers and viruses.

Biophysical Protein Chemistry: Formulation

Our Process Development Group has an opening for a Process Scientist to lead the development of new therapeutic protein formulations. Requirements include a PhD in an appropriate specialty, publications covering some aspect of biophysical protein chemistry (e.g.: spectroscopic, thermal or hydrodynamic analytical methods), experience using HPLC to study protein decomposition products and excellent communication skills. Experience with protein formulation, lyophilization, statistical experimental design, aseptic filling and GMP regulations preferred.

Our compensation and benefits package is one of the best in the industry, and is designed to attract and retain the finest talent available.

For immediate consideration, call Joe Tringali at (617) 252-9802, or mail/fax your resume to his attention at Biogen, Inc., Ref. SM0212, 14 Cambridge Center, Cambridge, MA 02142. Fax: (617) 252-9617. Biogen is an Equal Opportunity Employer.

BIOGEN

ADVANCED DRUGS THROUGH PROTEIN ENGINEERING.

Khepri Pharmaceuticals, Inc. is an exciting, early-stage biotechnology company focused on the development and control of engineered recombinant proteases as human therapeutics. The Company is rapidly assembling a diversified team of outstanding scientists, and has immediate opportunities for degreed professionals who specialize in the following areas:

All positions require a Ph.D., Ph.D./M.D., or BS/MS with equivalent industrial experience..

MOLECULAR BIOLOGIST

You must have proven expertise in the cloning, mutagenesis and expression of recombinant proteins. Post-doctoral training in biochemistry, molecular biology or a related field, and experience in cellular biology and protein chemistry are essential.

ENZYMOLOGIST

You must have expertise in the mutagenesis, selection and characterization of enzymes with emphasis on structure/function relationships. Post-doctoral training in biochemistry or chemistry is required. Experience in enzymology and assay development is highly desirable.

CELL BIOLOGIST

As a key member of a multidisciplinary team, you will develop and implement enzyme assays and techniques in biochemistry and cellular physiology for the discovery and characterization of novel protease activities. Post doctoral training must include cell biology or biochemistry. Experience in the design and utilization of robotic systems is desirable.

DEVELOPMENT SCIENTIST

Your duties will include developing and implementing production processes for recombinant proteins of pharmaceutical interest. You must have experience in recovery at medium to large scale of recombinant proteins from mammalian cell culture and bacterial systems. Experience in design of GMP manufacturing processes is essential. Requires a Ph.D. or BS/MS with equivalent industry experience in chemical engineering or biochemistry.

In addition to a stimulating research environment in the San Francisco Bay Area, Khepri offers competitive salaries, excellent benefits and equity participation. For consideration, please submit your CV to: Deutsch, Shea & Evans, Inc., Confidential Reply Service Dept. 349, 601 Gateway Blvd., Suite 950, South San Francisco, CA 94080. EOE.

**Khepri
Pharmaceuticals, Inc.**



Innovation & Efficiency

Using innovation to improve the efficiency of molecular biology research products has been the cornerstone of Stratagene's development since our founding in 1984. With more than 200 employees and 500 products, Stratagene is now seeking candidates for the following positions:

MARKETING PRODUCT MANAGERS

We currently have two immediate openings for individuals who will be responsible for facilitating the process of moving products from the laboratory to the marketplace and for continued promotion of existing products. Duties will include competitive market analysis, technical writing, training and interfacing with customers and distributors.

The first position requires a BA/BS in Molecular Biology or related field (or equivalent) and a strong practical background in molecular biology. The second position requires a BA/BS in Cellular/Molecular Biology or related field (or equivalent) and a strong practical background in cellular or molecular biology. Both positions require laboratory experience and an in-depth understanding of the specified biology market. A background in sales/marketing is preferred.

TECHNICAL SALES REPRESENTATIVE CHICAGO

This position represents a unique opportunity for a qualified and experienced individual to participate in a growing technical sales organization. The position is available immediately in the Midwest area (base location is Chicago area). Other positions will be available in the near future.

Candidates should have strong practical experience in Molecular Biology or related field. Prior sales experience is beneficial. Sales Representative will attend an extensive training program at our beautiful coastal location in La Jolla, California.

Stratagene offers an excellent company benefits package, including a 401(K) plan, and a competitive salary and incentive program. All qualified candidates forward resume of qualifications indicating position(s) of interest to: **Stratagene, Attn: Professional Staffing, 11099 N. Torrey Pines Rd., La Jolla, CA 92037. AA/EOE.**



STRATAGENE

Principal Investigator
Pharmacology/Inflammatory Diseases

Investigate The Opportunities.

The opportunity to explore new realms. The opportunity to work with some of the top scientific teams in the country. The opportunity for support from one of the most exciting research driven companies in the world. We currently have an exciting and challenging position for a scientist to investigate animal models of inflammation which can lead to the discovery of novel therapeutic modalities for arthritis.

The ideal candidate will have a DVM or PhD in pharmacology, immunology or animal science with a minimum of two years postdoctoral experience and a working knowledge of immunology or inflammatory diseases in the context of animal model systems. Experience in establishing models of inflammation, in the analysis of the pathogenesis of disease progression, in assaying for drug efficacy in animal model systems, or in conducting pharmacokinetic evaluations using surrogate markers preferred. Knowledge of transgenic constructs in the development of new animal models is desirable.

Our location, near Wilmington, DE, offers an attractive lifestyle with easy access to all the cultural, academic and recreational activities of the Eastern Seaboard. We can offer the successful applicant a competitive salary and comprehensive benefits package. For immediate consideration, please forward your resume including salary history and requirements, to: **Excalibur Human Resources, Dept. PI-SCI, P.O. Box 2249, Princeton, NJ 08543. NO PHONE CALLS, PLEASE. An Equal Opportunity Employer, M/F/D/V.**

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POSITIONS OPEN

FACULTY POSITION IN VISION RESEARCH JULES STEIN EYE INSTITUTE University of California Los Angeles

The Retina Division of the Department of Ophthalmology at UCLA and the Jules Stein Eye Institute and Doris Stein Eye Research Center invite applications for the position of **ASSISTANT** or **ASSOCIATE PROFESSOR** of Ophthalmology to establish a research program in Retinal Transplantation. Candidates should possess a Ph.D. in Cell Biology, strong background in vision research, ability and interest in teaching, and desire to collaborate with both basic scientists and clinicians. Preference will be given to candidates with expertise in Retinal Transplantation who have demonstrated research potential and a record of extramural funding. Qualified individuals should submit curriculum vitae, three references, and a letter describing research interests and accomplishments to: **Hilal Lewis, M.D. or Dean Bok, Ph.D., Jules Stein Eye Institute, 100 Stein Plaza, UCLA School of Medicine, Los Angeles, CA 90024.** *UCLA is an Equal Employment Opportunity/Affirmative Action Employer.*

FACULTY POSITION—IMMUNOBIOLOGY

Applications are invited for a full-time tenure-track position at the **ASSISTANT/ASSOCIATE PROFESSOR** level in the Department of Biological Sciences starting August 18, 1993. The candidate will be expected to develop a vigorous basic research program in immunobiology and to teach undergraduate/graduate-level immunology. Applicants utilizing cellular and molecular research approaches will be preferred. This position requires two years of postdoctoral training, a record of productive research, and the ability to interact collegially. Appointment at the Associate level requires a record of funded research activity and a currently funded research program. The Department of Biological Sciences has three new, state-of-the-art Core Facilities in Molecular Biology, Cell Culture, and Protein Analysis. Deadline for applications is March 15, 1993 or the first of the month until the position is filled. Applicants should submit curriculum vitae, reprints of key publications, a statement of current and future research plans, and three names of references to: **Chairperson, Immunobiologist Search Committee, Department of Biological Sciences, The Wichita State University, 1845 Fairmount, Wichita, KS 67260-0026.**

MOLECULAR BIOLOGIST

ASSISTANT PROFESSOR, tenure-track, teaching position at small, private, undergraduate, liberal arts institution, beginning fall 1993. Teach molecular biology, cell biology, and molecular aspects of genetics and development. Establish research program for undergraduates in molecular biology. Ph.D. required. Send curriculum vitae, names and addresses of three references, and a statement of philosophy for undergraduate science education by March 8, 1993 to: **Dr. J. Malcolm, Chair, Department of Biology, University of Redlands, Redlands, CA 92373-0999.**

The University of Redlands is an Equal Opportunity Employer and encourages applications from women and minorities.

NEUROSCIENTIST COLUMBIA UNIVERSITY

The Movement Disorder Division of the Department of Neurology, Columbia University, seeks a neuroscientist at the **ASSISTANT PROFESSOR** level, for a full-time tenure-track position to examine mechanisms of neuron death relevant to Parkinson's Disease. Candidates should have an established research interest in the cellular mechanisms of neurotoxin-induced injury to midbrain dopaminergic neurons or modification of such mechanisms by trophic factors. Expertise with *in vitro* systems is especially desirable. Preference given to candidates who have demonstrated ability or potential to obtain independent, extramural funding. Send curriculum vitae to: **Dr. Stanley Fahn, The Neurological Institute, 710 West 168th Street, New York, NY 10032.** *Columbia University is an Affirmative Action/Equal Opportunity Employer.*

SCIENCE welcomes placement of line classified ads by FAX. Please include name and telephone number for our confirmation call when transmitting ad to:

FAX NUMBER: 202-682-0816

POSITIONS OPEN

BOTANIST. Tenure-track position at the **ASSISTANT PROFESSOR** level to begin August 16, 1993; Ph.D. required. Duties include teaching introductory plant biology, general education courses and advanced courses in area of expertise. The department stresses excellence in undergraduate teaching. Active pursuit of grants to support a research program at SIUE involving undergraduate and graduate students is expected. Send curriculum vitae, a statement of teaching and research interest, names and addresses of three references, and a complete grade transcript to: **Botanist Search Committee, Department of Biological Sciences, Box 1651, Southern Illinois University at Edwardsville, Edwardsville, IL 62026-1651. Telephone: (618) 692-3927.**

Applications will be accepted until April 2, 1993.

SIUE is an Affirmative Action/Equal Opportunity Employer committed to increasing the representation of women and minority groups on its faculty.

FACULTY POSITIONS IN DEVELOPMENTAL AND REGENERATIVE NEUROSCIENCE.

The University of Texas Southwestern Medical Center seeks two tenure-track faculty members, at the level of **ASSISTANT, ASSOCIATE, or FULL PROFESSOR**, whose research concerns the cellular and molecular bases of neural development and regeneration. The individuals selected will benefit from an endowment provided by the Kent Waldrep National Paralysis Foundation. Relevant research topics include, but are not limited to, mitogenesis of neural precursors, neuronal trophic factors, neurite extension, chemical signals for axonal guidance and synapse formation, and synaptogenesis. Departmental appointments for the chosen faculty will be negotiated. Applicants should forward to the address below a letter expressing interest, together with curriculum vitae (including research bibliography), a one-page statement of research interests, and a list of three personal references (with addresses and telephone numbers). **Neural Development and Regeneration Search Committee, Department of Cell Biology and Neuroscience, University of Texas Southwestern Medical Center, 5323 Harry Hines Boulevard, Dallas, TX 75235-9039.** *The University of Texas Southwestern Medical Center is an Equal Opportunity/Affirmative Action Employer.*

DELAWARE STATE COLLEGE DEPARTMENT OF BIOLOGY

ASSISTANT or ASSOCIATE PROFESSOR of Biological Sciences, tenure-track position, 1993-94 academic year. Duties include teaching Microbiology lecture/lab to science and nursing majors plus teaching introductory biology courses. The position may involve teaching other advanced undergraduate courses and participating in the graduate program. A Ph.D. in Biological Sciences or related field and background in Microbiology are required. Rank is dependent on experience. Please submit résumé, official transcripts, and three letters of recommendation to: **Dr. Dorene Petrosky, Chairperson, Department of Biological Sciences, Delaware State College, 1200 North Du Pont Highway, Dover DE 19901.** Screening will begin March 15, 1993, and continue until position is filled. *Affirmative Action/Equal Opportunity Employer.*

RESEARCH ASSISTANT PROFESSOR

The Department of Pediatrics of the University of Pennsylvania School of Medicine, Children's Hospital of Philadelphia is recruiting for an Assistant Professor junior faculty member in the Division of Allergy, Immunology, and Infectious Diseases. Applicants must have an M.D., M.D./Ph.D., or Ph.D. with extensive expertise in retrovirology, cellular immunology, in particular macrophage-HIV interaction, as well as role of other viruses, particularly cytomegalovirus. Candidates should have a record of research productivity and independence in research. Evidence of prior extramural funding and a researcher whose interests focus on the above fields are preferred. Please submit four references and a two-page statement of current research area and future interests to: **Dr. Steven D. Douglas, Children's Hospital of Philadelphia, 34th and Civic Center Boulevard, Philadelphia, PA 19104-4399.** *The Children's Hospital of Philadelphia and The University of Pennsylvania are Equal Opportunity, Affirmative Action Employers. Women and minorities are encouraged to apply.*

POSITIONS OPEN

UNIVERSITY OF WISCONSIN-MILWAUKEE DEPARTMENT OF CHEMISTRY ASSISTANT PROFESSOR—BIOCHEMIST

The Department of Chemistry of the University of Wisconsin-Milwaukee is seeking applicants for the position of Assistant Professor in the area of biochemistry. Fields of research specialization may include metallobiochemistry, chemical aspects of molecular biology or enzymology. Scientists in other areas of biochemistry are encouraged to apply. To be considered, curriculum vitae with a research plan and three letters of recommendation must be received by: **Professor Ralf Vanselow, Chair, Department of Chemistry, University of Wisconsin-Milwaukee, P.O. Box 413, Milwaukee, WI 53201, (FAX: (414) 229-5530)** by March 24, 1993.

The University of Wisconsin-Milwaukee is an Affirmative Action/Equal Opportunity Employer. UWM is required to release upon request the names of applicants and nominees who do not request confidentiality and the names of all final candidates.

HARVARD MEDICAL SCHOOL ASSISTANT PROFESSOR POSITION

The Department of Genetics, Harvard Medical School and the Division of Genetics, Children's Hospital, Boston are seeking applicants for an Assistant Professor position within the Division of Genetics at Children's Hospital. Applicants should have a strong training background in mammalian genetics with particular emphasis on mouse or human genetic diseases. The successful candidate will interact with members of both the basic research faculty of the genetics division and the clinical genetics program. Most of the current staff have strong interests and research programs in the underlying causes of human genetic disease. Although primarily a research position, the selected candidate will be expected to participate in training and teaching programs in genetics. *Women and minority applicants are encouraged to apply.* Applicants should send curriculum vitae and three letters of recommendation by March 15, 1993, to:

**Louis M. Kunkel, Ph.D.
Division of Genetics
The Children's Hospital
300 Longwood Avenue
Boston, MA 02115**

ASSISTANT PROFESSOR POSITION MOLECULAR NEUROBIOLOGY DEPARTMENT OF PSYCHOBIOLOGY UNIVERSITY OF CALIFORNIA, IRVINE (UCI)

Applications are invited for a tenure-track position at the level of assistant professor in molecular neurobiology. Preference will be given to applicants who have demonstrated expertise in research areas of interest to the Department. The Department of Psychobiology emphasizes interdisciplinary approaches to the study of neural plasticity and behavior. The current major research themes of the Department are development, reorganization following injury and disease, and learning and memory. Please submit by 1 April 1993, curriculum vitae, description of research interests, and the names and addresses of three potential referees to: **Herbert P. Killackey, Chair, Department of Psychobiology, University of California, Irvine, CA 92717-4550.**

UCI is an Equal Opportunity/Affirmative Action Employer committed to excellence through diversity.

CHEMISTRY AT NYU. Applications are invited for expected tenure-track **FACULTY POSITIONS** in experimental physical and biophysical chemistry at New York University. Candidates should have a strong record of research accomplishments in any area, including X-ray crystallography or NMR spectroscopy, and be able to lecture effectively at the undergraduate level. While junior-level appointments are planned, outstanding candidates will be considered at any level. Please submit applications, including curriculum vitae, copies of your two most important publications, a statement of research interests, and three letters of reference by March 26, 1993, to: **Search Committee, Department of Chemistry, New York University, 4 Washington Place, New York, NY 10003.** *NYU encourages applications from women and members of minority groups.*

THE SCRIPPS RESEARCH INSTITUTE

La Jolla, California



RESEARCH TECHNICIANS

Positions available for candidates with a BS/MS in the Biological Sciences and/or experience with the following techniques:

- Tissue Culture
- Transgenic Marine Line
- Monoclonal Antibodies
- T-Cell Cloning
- Molecular Biology
- Protein Biochemistry

Please mail resume to:
Human Resources/TCP-11,
10666 N. Torrey Pines Rd.,
La Jolla, CA 92037, or fax to
(619) 554-6668. Reference
021293. AA/EOE/M/F/H.

ROCHE

SENIOR INFORMATION SCIENTIST

Ph.D in Biomedical Science

As a member of the Scientific Information Services Department, you will collaborate in the preparation of expert reports for new drug submissions globally; keep current on molecular sciences and biomedical advances; assess proactively and respond to the information needs of scientists in areas such as oncology, autoimmune diseases and biotechnology; retrieve and evaluate information to support new and existing areas of drug discovery and development; and develop specialized databases. Additional responsibilities will include analyzing information for corporate licensing, strategic planning and marketing.

Requires a Ph.D in a Biomedical Science with an emphasis on biochemical therapeutics, molecular biology and immunopharmacology; laboratory research experience; a proven ability to write in-depth literature reviews; course work in Organic Chemistry; and knowledge of commercially available databases. Reading ability in German and French and experience in database development are desirable.

For consideration, please send resume, indicating salary requirements, to: **Ms. Joanna Harrington, Staffing Department JH033LC, Hoffmann-La Roche Inc., Nutley, New Jersey 07110-1199.** We are an equal opportunity employer.

ROCHE

Hoffmann-La Roche

Ecosystem Modeler—Reno, NV

The Desert Research Institute seeks applications for an ecosystem modeler with its Biological Sciences Center (BSC) in Reno, NV. Incumbent will interact with diverse group of scientists, including plant physiologists, soil scientists, microbial ecologists, paleoecologists & remote sensing/GIS specialists on wide variety of research projects & new proposals. Must have the ability to bridge between process-level studies in either the laboratory or field to regional & global scales, utilizing remote sensing/GIS expertise in the BSC. PhD in either life sciences & strong background in mathematics or the reverse. Must demonstrate success in acquiring research funding, the presentation & publication of research results, ability to interact successfully with other scientists. Experience with remote sensing/GIS highly desirable. Salary commensurate with experience & qualifications. Excellent benefits package. Address inquiries to **Dr. Dale Johnson, Chairman, Search Committee** or **Dr. Carl Fox, Desert Research Institute, P.O. Box 60220, Reno, NV 89506 (702) 673-7379 (Johnson) or (702) 673-7321 (Fox).** Send interest letter, CV & 3 references by 5/31/93 to: Recruitment Office, Desert Research Institute, University & Community College System of Nevada, P.O. Box 19040, Las Vegas, NV 89132-0040. AA/EOE

Research Scientists

The R. W. Johnson Pharmaceutical Research Institute performs R&D activities for the Johnson & Johnson pharmaceutical companies; Cilag, McNeil Pharmaceutical, Ortho Pharmaceutical, and Ortho Biotech.

Due to expanding Drug Discovery activities, we have immediate opportunities at our La Jolla, California location for individuals to perform research leading to novel pharmaceutical agents in our Experimental Therapeutics and Microbiology Departments. These scientists will join a multidisciplinary team of researchers which includes industrial pharmacologists and chemists, as well as a dynamic academic team of molecular biologists, biochemists, and microbiologists which make up our collaborative effort.

Qualifications for the **Research Scientist** position include a Ph. D. in biochemistry or related field, with 1-3 years postdoctoral experience in protein purification, enzyme assays and molecular biology techniques.

Qualifications for the **Associate Scientist** position include an M.S. in biochemistry or related field, with 2-5 years of post-degree laboratory experience in protein purification and biochemistry, along with the ability to supervise others.

These positions provide liberal research support, excellent library facilities and a good benefits package as part of Johnson & Johnson, the world's largest and most comprehensive provider of health care products. Please submit your curriculum vitae to: Human Resources Manager, R.W. Johnson Pharmaceutical Research Institute, 3535 General Atomics Court, Suite 100, San Diego, CA 92121. Equal Opportunity Employer M/F/D/V.



THE R.W. JOHNSON
PHARMACEUTICAL RESEARCH INSTITUTE
a Johnson & Johnson company

SIBIA

SIBIA is continuing to expand its interdisciplinary research on therapeutics for neurodegenerative disorders. SIBIA has established an enviable record in the development of innovative technologies integral to the biopharmaceutical industry. We are currently seeking highly talented candidates who have a strong desire to join an interdisciplinary research group to discover and develop novel therapeutic molecules acting through specific receptors and as protease inhibitors.

CHEMISTRY

PhD in Organic Chemistry with 5+ years' successful track record as a Medicinal Chemist in the pharmaceutical industry.

PhD with 0-5 years' postdoctoral experience in synthetic chemistry. Additional experience in bioorganic chemistry and molecular modeling would be useful, but not essential.

PhD/MS with 5+ years' experience in analytical chemistry to fully support an expanding medicinal chemistry group.

MOLECULAR PHARMACOLOGY

PhD/MD with training in neuroanatomy brain lesioning, immunohistochemistry, and *in situ* hybridization techniques.

PhD plus 2-4 years' postdoctoral training in neuropharmacological techniques including ligand-binding, neurotransmitter uptake and release, *in vivo* microdialysis and HPLC.

MS/BS with 3-5 years' experience in biochemical pharmacology (enzymology, uptake and release studies and/or other studies related to neuropharmacology of ion channels and neurotransmitter receptors).

ELECTROPHYSIOLOGY

PhD plus postdoctoral experience in single channel recording/analysis required. Experience in brain slice electrophysiology, whole cell recording, and a background in calcium channels and/or nicotinic receptor channels desired.

CLINICAL RESEARCH

PhD/MS/BS/RN in Health Sciences with knowledge of CNS to assist with management and monitoring of clinical studies.

Located on the beautiful La Jolla coastline near San Diego, SIBIA offers not only a challenging professional and aesthetic environment, but also an outstanding competitive salary and benefits package. Please send a confidential curriculum vitae with the names of three references to: SIBIA, Lynn Alba, Human Resources Dept., 505 Coast Boulevard South, Suite 300, La Jolla, CA 92037. SIBIA is an Equal Opportunity Employer.

C

ANJI, INC. is a growing biotech company in the San Diego area focusing on tumor suppressor gene technology for cancer therapeutics and diagnostics. We have career opportunities in the following disciplines for dedicated, innovative and enterprising Scientists.

DIRECTOR OF MOLECULAR BIOLOGY—

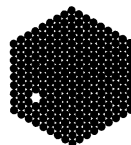
We seek a PhD in Molecular Biology/Cell Biology and 5-7 years' postdoctoral experience in molecular biology/virology; particular expertise may vary. The successful candidate will have experience in a variety of expression systems; the ability to supervise scientists, postdoctoral fellows, and research associates is essential.

PROTEIN BIOCHEMIST—Candidates should have 1-3 years' postdoctoral experience in purification, protein recovery, refolding and the recovery techniques relevant to recombinant protein expression and physicochemical protein characterization.

FERMENTATION SCIENTISTS—Candidates should have a PhD and 2-3 years' postdoctoral experience. Experience in yield optimization and scale-up of recombinant proteins from both mammalian and prokaryotic systems is also required.

RESEARCH ASSISTANTS—MS/BS applicants with 2+ years' lab experience in recombinant DNA, cell or virus culture are sought. Protein purification and characterization experience is desirable.

CANJI offers successful candidates competitive compensation and benefit programs. Please send curriculum vitae and name/address of three references to Personnel at: **Canji, Inc., 3030 Science Park Road, Suite 302, San Diego, CA 92121.** An Equal Opportunity Employer.



EMBL

The European Molecular Biology Laboratory, an international research organization situated in Heidelberg, Germany, has a vacancy for a

CHEMICAL ENGINEER

responsible for the peptide service

The successful candidate will be responsible for the peptide synthesis service of the Protein and Peptide group which also works in the areas of protein sequencing and mass spectrometry. The person will be accountable for the scientific planning of the service and will manage the day-to-day operations together with a technician.

Candidates should have a MSc. degree in chemistry or an equivalent qualification and practical experience in peptide synthesis.

We offer an above-average salary, plus certain allowances depending on personal circumstances.

Please send CV or write briefly for an application form, quoting ref. no: 93/03.

EMBL
Personnel Section,
Postfach 10 22 09
D-6900 Heidelberg
Germany

**SCIENTIST/SR. SCIENTIST
(Position #92-90)**

Opportunity for scientist with demonstrated success in Cancer Cell Biology. Qualified individual will have solid cell biological experience with a variety of normal and malignant human and animal cell cultures. Emphasis will be on *in vitro* model systems for evaluating chemotherapeutic agents. Experience with human tumors in animal pharmacological models is desired. Candidate should have good supervisory skills and ability to work in a team environment. Ph.D. with 2-5 years of experience in cancer biology.

**POSTDOCTORAL SCIENTIST
(Position #93-50)**

A recent Ph.D. is invited to join a 3-year NIH funded project to study the role of growth factors in the development of human benign prostatic hyperplasia (BPH). An *in vitro* model has been developed to analyze the growth factor interactions between epithelial-stromal cells. Qualified individual will have a background in tissue culture with expertise in growth factor biology and immuno fluorescence. Experience with protein purification and molecular biological approaches are desirable.

**ASSOCIATE SCIENTIST
(Position #93-51)**

Opening available for a histologist (B.S. or equivalent) with 2-5 years experience working with paraffin and plastic embedded material for the light microscope. Experience with immuno fluorescence and tissue culture an advantage. Qualified individual will join a group funded by an NIH grant (min. 3 years) to study growth interactions in human hyperplastic prostate.

Panlabs is an international company providing R&D services to the pharmaceutical industry worldwide located north of Seattle. Submit resume/CV with names/addresses of 3 references to:



PANLABS, INC.
Attn: Human Resources
(Include Position #)
11804 North Creek Parkway S.
Bothell, WA 98011-8805
An Equal Opportunity Employer

**HIV/AIDS Research at the
Centers for Disease Control
Atlanta, Georgia**

RESEARCH MICROBIOLOGIST

The Laboratory Investigations Branch, Division of HIV/AIDS is seeking to fill the position of Chief, Molecular Biology Section responsible for managing, directing, evaluating and implementing research on the development of biochemical and molecular approaches for the identification and characterization of human immunodeficiency viruses.

The Branch provides laboratory support for epidemiologic and surveillance studies; conducts investigations for viral pathogenesis and evaluation of control measures through the use of animal models and *in vitro* techniques; performs reference testing for public health laboratories in the U.S. and for the World Health Organization; serves as a reference laboratory for the isolation, detection and serologic testing for HIV in clinical samples; develops and evaluates procedures for the isolation and characterization of HIVs; develops and evaluates new and improved methods for the serodiagnosis of HIV infection and detection of viral genetic information in infected cells; conducts investigations to identify and characterize new HIV isolates and to develop new diagnostic tests; and collaborates with other Federal, academic, and private laboratories.

The person selected for this position will demonstrate the ability to conceive, organize and direct basic and applied research to better understand the biology of human immunodeficiency viruses (HIVs) and other related retroviruses; to oversee reference and diagnostic services to various collaborating laboratories for the identification of HIV from clinical specimens; provide consultation and leadership in the field of virology to research scientists, public health officials, and scientific administrators on a national and international basis; plan and direct training and consultation activities for national and foreign scientists in the laboratory diagnosis of HIV infections; serve as CDC's representative at national and international meetings concerning the laboratory science of HIVs; and have extensive experience in the development and utilization of the gene amplification technology.

Ph.D., or M.D. with 3-5 years experience in the field of molecular biology of retroviruses and extensive research experience in viral biochemistry, genetic analysis and molecular analysis of human viruses of medical importance is preferred. Salary range is \$56,600-\$66,600 and will depend on experience. For additional information regarding this position, contact Dr. Gerald Schochetman, Ph.D. at (404) 639-1000. Interested applicants should send their applications and curriculum vitae to:

**Janie L. Oddy
Personnel Management Specialist
Centers for Disease Control
1600 Clifton Road,
Atlanta, Georgia 30333**

*CDC is an equal opportunity employer and
provides a smoke free environment.*

February 12, 1993

THE REPLIGEN

VOLUME 15

REPORT

Although 1993 is just getting under way, it has already been a year of significant accomplishment for Repligen. In early January, we announced the filing of yet another two investigational new drug (IND) applications covering the testing of recombinant platelet factor-4 (rPF4) in Phase I clinical trials for colon cancer patients and patients undergoing cardiac catheterization. These two IND applications are significant as they represent our third and fourth filings — and bring us ever closer to achieving our goal of initiating five clinical trials by March.

As we enter another promising year of breakthroughs and accomplishments, we seek the following individuals to join us:

RESEARCH SCIENTIST

Participate in the development of large-scale purification procedures for E. coli expressed therapeutic proteins. The appropriate individual will also assist in the optimization of the process necessary to meet demands for clinical trials. A PhD with experience in protein purification, as well as previous industrial experience and knowledge of cGMP preferred.

ASSOCIATE SCIENTIST

We are seeking a Molecular Virologist to participate in our vaccine development program. Responsibilities will include construction of genetically engineered viruses for research studies and potential clinical use, as well as genetic analysis of native virus populations. The ideal candidate will possess a PhD plus 0-3 years' post-doctoral experience in molecular biology or virology.

ASSOCIATE/RESEARCH SCIENTISTS

We are especially interested in individuals who hold a PhD and experience in structure function analysis of recombinant proteins.

Repligen offers competitive salaries, benefits and equity participation. Please submit or FAX a cover letter, CV and references to: Deirdre Purple, Repligen Corporation, One Kendall Square, Building 700, Cambridge, MA 02139. FAX (617) 494-1786. An Equal Opportunity Employer, M/F/D/V.

— **RepliGen**

POSITIONS OPEN



DEAN COLLEGE OF SCIENCE

Wayne State University is seeking nominations and applications for the position of Dean of the College of Science. This is a new position, created by the congregation of science departments formerly in the College of Liberal Arts into a new college. The College of Science includes the Departments of Biological Sciences, Chemistry, Communication Disorders and Sciences, Computer Science, Geology, Mathematics, Nutrition and Food Science, Physics and Astronomy, and Psychology. The graduate program of the College has 823 students and there are approximately 2700 undergraduate majors. The full-time faculty numbers 213.

Qualifications for the position include: an earned doctoral degree and a record of scholarship appropriate for an appointment as professor with tenure in a department of the College; academic leadership and administrative capabilities; effective personnel management skills; demonstrated commitment to affirmative action and equal opportunity practices.

The Dean will report to the Provost of the University. The review of candidates will begin March 1, 1993, and continue until the position is filled. The desired starting date for the position is in the period of September 1993 to January 1994.

Letters of nomination and application, which may include curriculum vitae and names of references when appropriate, should be sent to:

George E. Dambach, Ph.D.

Associate Dean for Research & Graduate Programs
School of Medicine, 1261/69 Scott Hall
Wayne State University
Detroit, MI 48201
Office: (313) 577-1455
FAX: (313) 577-8777

THE NEWMAN H. WATERS CHAIR IN CLINICAL PHARMACOLOGY

The University of Alabama School of Medicine is seeking candidates for the Newman H. Waters Chair in Clinical Pharmacology. Candidates should have a record of significant accomplishments in the field of clinical pharmacology and oncology.

The Waters Chair was established in honor of Mr. Newman Waters, a prominent businessman and philanthropist committed to the advancement of medical education. Nominations and curriculum vitae should be sent no later than March 31, 1993, to:

Antonietta D. Hyche

Director, Academic Support Programs
Medical Education Building, Room 310
University of Alabama School of Medicine
Birmingham, AL 35294-3293

An Affirmative Action/Equal Opportunity Employer.

PRODUCT MANAGER PHYSIOLOGICAL MONITORING

Exceptional opportunity for marketing-oriented individual with strong biomedical/physiology background. Duties include: full marketing and sales responsibilities, and new product development. Strong writing skills and computer literacy required. Some travel. Chicago area. Please submit curriculum vitae with salary requirements to: **Autogenic Systems, 620 Wheat Lane, Wood Dale, IL 60191.**

Available January 1, 1994. **CHAIRPERSON, DEPARTMENT OF PEDIATRIC DENTISTRY, BOSTON UNIVERSITY.** Applicant qualifications should include D.M.D./D.D.S. degree, completion of an advanced educational program in Pediatric Dentistry and a Ph.D./D.Sc. Candidate must have demonstrated a strong commitment to research consistent with a conjoint appointment in the basic or medical sciences. Excellent research space available in new **CENTER FOR ADVANCED BIOMEDICAL RESEARCH.** *Equal Opportunity/Affirmative Action Employer.*

Send letter of application and curriculum vitae to: **Dean's Search Committee, Boston University Medical Center, 100 East Newton Street, Room G317, Boston, MA 02118.**

POSITIONS OPEN



EXECUTIVE DIRECTOR, DIAGNOSTICS RESEARCH & DEVELOPMENT NEOGEN CORPORATION

Ph.D. with 10 years of experience in commercial analytical immunochemistry, research planning and implementation, technical staff management, Quality Control, and market applications. Send curriculum vitae to: **Neogen Corporation, 620 Leshar Place, Lansing, MI 48912.** *Equal Opportunity Employer.*

IMMUNOLOGY LAB CHIEF

Position available in the Immunochemistry Lab within the Biological R&D group at Miles, Inc., Agriculture Division—Animal Health Products in the Kansas City area.

Requirements are: Ph.D. degree in Immunology/Immunochemistry with a minimum of 3 to 5 years of industry experience and proven experience in planning, scheduling and executing research projects; working with antibodies and antigens at the molecular level of immunology; bench-level experience in development of antigen quantitating immunoassays. The Immunology Lab Chief must be able to lead others in the interpretation and analysis of experimental results.

Excellent company benefits package including relocation. Qualified candidates should respond by sending a résumé including salary history to: **Human Resources Department.**

**Miles, Inc., Agriculture Division
Animal Health Products
P.O. Box 390
Shawnee, KS 66201**

An Equal Opportunity Employer; M/F/D/V.

CHAIR

Newly Formed Department of Pharmaceutical Sciences

The University of Maryland at Baltimore School of Pharmacy is seeking a chair for its newly combined departments of biomedical chemistry, pharmaceuticals, and pharmacology. The new department has 24 FTE faculty, extramural funding of \$3 million, and 75 graduate students. The successful candidate must build a strong science base in our Doctor of Pharmacy curriculum, while leading a vigorous research and graduate program. An advanced degree in the pharmaceutical sciences and experience in pharmaceutical education are essential. Faculty rank and salary are open. Screening will begin in February and continue until the position is filled. Send letter of interest with curriculum vitae to: **David A. Knapp, School of Pharmacy, University of Maryland at Baltimore, 20 North Pine Street, Baltimore, MD 21201.** *An Affirmative Action/Equal Opportunity Employer.*

FACULTY POSITION in Developmental Biology. The Department of Embryology of the Carnegie Institution of Washington seeks a faculty member with a nascent or established research program in any aspect of developmental biology. The Department of Embryology is part of a nonprofit research institution (Carnegie Institution of Washington) and is affiliated with and is situated on the campus of the Johns Hopkins University in Baltimore. Applicants should send curriculum vitae, statement of research interest, and have three letters of recommendation sent to: **Director, Department of Embryology, Carnegie Institution of Washington, 115 West University Parkway, Baltimore, MD 21210.** *An Equal Opportunity/Affirmative Action Employer.*

TRANSGENICS

POSTDOCTORAL POSITIONS (2) are available immediately to develop animal models of cardiovascular disease. Experience in either molecular biology or whole animal physiology is required. Both positions include opportunity to learn to make transgenics. Send letter stating interest, curriculum vitae and names of three references to: **Curt D. Sigmund, Ph.D., Transgenic Animal Facility Director, University of Iowa College of Medicine, B150 ORP, 2501 Crosspark Road, Coralville, IA 52241.** *The University of Iowa is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

POSITIONS OPEN

THE TEL-AVIV UNIVERSITY THE SACKLER SCHOOL OF MEDICINE FACULTY POSITION

Announces the opening of a tenure-track position of **LECTURER/SENIOR LECTURER** in the Department of Histology and Cell Biology. Candidates with Ph.D. or M.D. degree, interested in research, having had previous experience in teaching Human Histology to medical students (both in Hebrew and English), and who can immediately join the teaching staff are invited to apply. Excellence in research and teaching are of prime importance. Applicants should send curriculum vitae, list of publications, 3 to 5 selected reprints, a summary of research activities, an outline of proposed activities for the new position and 3 letters of recommendation before April 16, 1993, to: **Professor G. Sperling, Dean, The Sackler Faculty of Medicine, Tel-Aviv University, P.O.B. 39040, Tel-Aviv 69978, Israel.**

THREE POSTDOCTORAL POSITIONS/ HARVARD MEDICAL SCHOOL

Positions 1 and 2: To study biochemical/molecular signaling during lymphocyte apoptosis. Protein phosphorylation, second messenger signaling or molecular biology experience is desirable. Position 3: To use gene targeting to generate mouse models of human disease and develop gene therapy approaches. Stipends available. Candidates with enthusiasm for scientific discovery in a supportive team environment send curriculum vitae to: **Drs. D. H. Sherr or M. C. Carroll, Department of Pathology, Harvard Medical School, 200 Longwood Avenue, Boston, MA 02115.** *Affirmative Action/Equal Opportunity.*

POSTDOCTORAL POSITIONS to study microvascular transport in the renal medulla. Projects: (1) Microperfusion and videomicroscopy to determine microvessel transport properties. (2) Fluorescent videomicroscopy to study signal transduction in endothelial cells. (3) Mathematical simulations of microvascular function. Background in Physiology, Pharmacology, Engineering or Biophysics. Send curriculum vitae and names of references to: **Thomas L. Pallone, Division of Nephrology, Hershey Medical Center, Hershey, PA 17033.** *The Pennsylvania State University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

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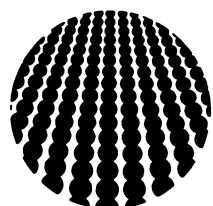
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POSITIONS OPEN

NEW TENURE-TRACK FACULTY POSITION AVAILABLE in the Department of Biochemistry during 1993-94. Minimum qualifications include a Ph.D. or M.D. degree, 3 to 4 years of postdoctoral experience, evidence of significant research accomplishments and the ability to attract extramural funding. Preference will be given to applicants who can interact with existing faculty at UT, Memphis especially in molecular biology, protein chemistry and enzymology or signal transduction. Applicants should send curriculum vitae and three letters of reference to: **Dr. John N. Fain, Department of Biochemistry, University of Tennessee, Memphis, Tennessee 38163.** The University of Tennessee is an Equal Opportunity/Affirmative Action/Title IX/Section 504/ADA Employer. Women and minorities are encouraged to apply.

POSTDOCTORAL POSITION IN NEUROSCIENCES AT THE SALK INSTITUTE

The Salk Institute is currently seeking a Research Associate with interest in neurosciences. Candidates must have Ph.D. degree and maximum of one year of postdoctoral experience. Research involves studies of the mechanisms through which stimuli alter endocrine functions in the rodent. Some experience with rodent surgery and molecular techniques preferred. This position, which is available immediately is for 2 to 3 years. The Salk Institute offers a highly interactive environment, with a number of research groups working in areas of molecular biology and neuroscience. Interested candidates may apply by submitting curriculum vitae along with three letters of recommendation to:

Catherine Rivier
Associate Research Professor
Peptide Biology Laboratory
The Salk Institute
10010 North Torrey Pines Road
La Jolla, CA 92037

The Salk Institute is an Equal Opportunity Employer. Minorities are encouraged to apply.

POSTDOCTORAL POSITION, CLINICAL PHARMACOLOGY/PHARMACOKINETIC OF ANTITUMOR AGENTS. Mayo Comprehensive Cancer Center conducts an extensive experimental therapeutics program for the treatment of cancer. Our laboratory characterizes the pharmacology of new agents in conjunction with NCI-sponsored adult Phase I and Phase II clinical trials, and in conjunction with Children's Cancer Group pediatric clinical trials. The laboratory is also funded to conduct preclinical pharmacology and mechanism of action studies with new agents. Candidates should have a strong background in pharmacokinetics and pharmacology. Please forward application including curriculum vitae, summary of research interests and experience, and names of three references to: **Dr. Matthew M. Ames, Chair, Division of Developmental Oncology Research, Department of Oncology, Mayo Clinic and Foundation, Rochester, MN 55905.** Mayo Foundation is an Affirmative Action and Equal Opportunity Employer.

POSTDOCTORAL POSITION (M.D. or Ph.D.) is available in a research group working on the pulmonary circulation with a particular interest in gene expression of components of extracellular matrix of capillaries. Some background in molecular biology preferred. Salaries according to the NIH guidelines with possibility of supplementation. Position available immediately. *Only U.S. citizens or permanent residents are eligible.* Send curriculum vitae to: **John B. West, M.D., Ph.D., Department of Medicine 0623, University of California, San Diego (UCSD), 9500 Gilman Drive, La Jolla, CA 92093-0623.** UCSD is an Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL POSITION available immediately in the area of Neurochemistry/Neurobehavior. Preference will be given to candidate with Ph.D. in related field and experience in HPLC, RIA and analgesic measurements. Send curriculum vitae, a brief statement of research interest and experience and the names and telephone numbers of three references to: **Dr. Malak Kolta, College of Pharmacy, Florida A&M University, Tallahassee, FL 32307.** FAMU is a Historically Black University/Equal Employment Opportunity/Affirmative Action Employer.

POSITIONS OPEN

DREYFUS FOUNDATION POSTDOCTORAL IN BIOCHEMISTRY. Two-year fellowship balancing research and teaching for new Ph.D.'s interested in careers at undergraduate institutions. Research applies site-specific probes and molecular modeling to aminoacyl-tRNA synthetases. Teaching area open. Submit curriculum vitae with research and teaching interests, career goals; and 3 letters of reference to: **Glenn Nagel, Chair, Department of Chemistry and Biochemistry, California State University, Fullerton, CA 92634.** Affirmative Action/Equal Opportunity, Title IX Employer.

POSTDOCTORAL POSITION: HIV GENE REGULATION

Postdoctoral position available immediately for a Ph.D. in Molecular Biology or Virology to study the role of early response oncogene products on the activation of latent HIV-1 proviral genome expression. The project involves defining the cis-regulatory elements that mediate responses to immediate-early gene products and characterizing the trans-acting protein complexes that interact with them. Experience with molecular biology techniques and/or tissue culture is required. Salary is highly competitive and includes full benefits. For immediate consideration send current curriculum vitae and names, addresses and telephone numbers of three references to: **Dr. Kenneth A. Roebuck, Department of Immunology/Microbiology, Rush-Presbyterian-St. Lukes Medical Center, 1653 West Congress Parkway, Chicago, IL 60612.** Telephone: (312) 942-6554.

An Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL FELLOW

Position open to study membrane lipid peroxidation and the turnover of phospholipids. Studies emphasize phospholipase kinetics and phospholipid metabolism as well as role of intercellular calcium flux following free radical-induced peroxidation in cultured cells and model liposomes. Salary is negotiable. Position is for up to 2 years of support. Send curriculum vitae, personal statement and list of references: c/o **Hazel Peterson, University of Southern California, Institute for Toxicology, 1985 Zonal Avenue PSC-624, Los Angeles, CA 90033.** An Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL FELLOW/RESEARCH ASSOCIATE position is available for a molecular biologist with recent Ph.D. or M.D. to investigate the structure and function of mitochondrial membrane transport proteins. Applicants should have experience in molecular cloning techniques and protein purification. Candidates should send curriculum vitae and two letters of reference to: **Raymond D. Pratt, M.D., Division of Nephrology-Box 3, Cornell University Medical College, 1300 York Avenue, New York, NY 10021.**

POSTDOCTORAL RESEARCH ASSOCIATE BIOCHEMISTRY

Novo Nordisk Entotech, Inc. is a wholly owned subsidiary of Novo Nordisk A/S that researches and develops ecologically sound microbial insecticides.

All highly motivated individuals are invited to apply for a 2-year postdoctoral position in its Biological Chemistry Department. The research project is mode-of-action of *Bacillus thuringiensis* insecticidal proteins; proteolytic activation of protoxins, toxin-receptor interaction, and secondary binding events. Ph.D. in biochemistry or related field with background in protein chemistry and/or insect physiology is required. Experience in receptor studies and computational analysis are desirable. Applicant must have strong oral and written communication skills and be able to work in a multidisciplinary team. Excellent salary and benefits accompany this position.

Send resume to:

Susan MacIntosh
Senior Staff Researcher
Novo Nordisk Entotech, Inc.
1497 Drew Avenue
Davis, CA 95616-4880
Equal Opportunity Employer.



POSITIONS OPEN

POSTDOCTORAL RESEARCH SCIENTIST, Stable Isotopes In Ecological Research, University of Kansas Department of Botany. National Science Foundation and Kansas Science and Technology Advanced Research Program-funded field and laboratory position will open in September 1993 to study carbon and water-use dynamics in riparian forests using stable isotope methods. Laboratory facilities will permit gas extractions for isotopic analyses of carbon, hydrogen, and oxygen in plant water and tissue. Opportunity to make major contributions. Require Ph.D. in some aspect of plant resource-use relationships and at least two years of chemistry. Desire training in plant biology or physiology. Competitive salary and benefits. For information, contact: **Valery J. Terwilliger, Assistant Professor, Telephone: 913-864-5547.** Send application letter, curriculum vitae including a description of research experience and interests, and names/addresses/telephone numbers of three references to: **Rodney Carr, Position #9310, University of Kansas Center for Research, Inc., 2291 Irving Hill Road, Lawrence, KS 66045-2969.** Equal Opportunity/Affirmative Action Employer.

ASSISTANT RESEARCH SCIENTIST

Assistant Research Scientist or postdoctoral position to study the molecular biology and mechanism of entry of *Bartonella bacilliformis*, a pathogenic human parasite of red cells and capillary endothelium (Benson, *et al.*, 1986, *Inf. Imm.*, 54, 347). Research will involve identification of the receptor on human red cells, the bacterial surface protein involved in binding and entry, the characterization of the fibrous meshwork which bind the bacteria together, and cloning and study of *Bartonella* genome. Of special interest is the mechanism by which the bacterium stimulates endothelial cell proliferation. Send curriculum vitae and names of references to: **Dr. Garret M. Ihler, Department of Medical Biochemistry & Genetics, Texas A&M College of Medicine, College Station, TX 77843-1114.**

Equal Opportunity/Affirmative Action Employer.

RESEARCH MOLECULAR BIOLOGISTS

The Research & Development Division of **CytoDiagnostics, Inc.** (CDI), a leading urology oncology company, is expanding its capabilities and is seeking to fill several research positions: (I.) One [1] **Ph.D. SENIOR SCIENTIST/MOLECULAR BIOLOGIST** to formulate and direct clinically applied research in prostate and bladder cancer-related oncogene and tumor suppressor gene expression, growth regulatory factors and signal transduction mechanisms. The qualifying applicant should have 3 to 5 years of postdoctoral molecular biology research experience with publications in the field. (II.) Two [2] **POSTDOCTORAL RESEARCH SCIENTISTS** to formulate and conduct applied research in prostate and bladder cancer projects utilizing most of the following techniques: polymerase chain reaction, Northern, Southern and Western blotting, molecular cloning, two-dimensional gel electrophoresis, nucleic acid probe preparation, *in situ* hybridization and cellular immunohistochemistry. These positions will extend up to a period of three years.

All positions listed are available March 1, 1993. **CytoDiagnostics** offers a very competitive base salary with bonus incentives, relocation costs, and excellent benefits. Please direct curriculum vitae and letters of inquiry to: **Dr. Robert W. Veltri, Vice President for Research & Development, CytoDiagnostics, Inc., 2925 United Founders Boulevard, Oklahoma City, OK 73112.**

ACADEMIC OPHTHALMOLOGISTS/ INSTRUCTORS

The University of Nebraska College of Medicine, Department of Ophthalmology, is seeking two full-time academic ophthalmologists to serve as instructors for the period July 1, 1993 through June 30, 1994. One glaucoma specialist and one retina specialist are desired. A strong commitment to resident and medical student teaching, as well as an interest in research, are essential. Requirements include completion of a satisfactory residency program and prior teaching experience. Send curriculum vitae to: **Michael E. Yablonski, M.D., Ph.D., Professor & Chairman, University of Nebraska Medical Center, 600 South 42nd Street, Omaha, NE 68198-5540.** Equal Opportunity/Affirmative Action Employer. Minorities and Women Are Encouraged to Apply.

LXR Biotechnology Inc.,

an expanding San Francisco Bay Area biotechnology company with a focus on aging and diseases of aging, is seeking highly motivated individuals with expertise and qualifications in the following areas:

M.D. / Ph.D. Preclinical and Clinical Research and Development:

Experience in cardiopulmonary physiology and pharmacology, and/or inflammatory indications is particularly desirable.

Ph.D. Senior Cell Biologist: Candidates sought with an interest in the cell biology of programmed cell death and apoptosis.

Ph.D. Senior Molecular Biologist: This position requires a minimum of 5 years experience in the modern techniques of molecular biology, including gene cloning and heterologous gene expression. Also, an interest in the molecular biology of programmed cell death is highly desirable.

B.S. / M.S. Research Associates / Specialists: General molecular biology and microbiology; DNA sequencing; Tissue culture; Protein purification/isolation.

Postdoctoral Fellows: Cell and molecular biology of programmed cell death and apoptosis; Drug design and experimental application; Synthetic organic chemistry.

LXR offers competitive salaries and healthcare benefits, and an opportunity for equity participation in the company through its stock option program. Applicants should send their resumes, in confidence to the Human Resources Director, LXR Biotechnology Inc., 3065 Richmond Parkway, Richmond CA 94806, specifying the position for which they are applying. LXR is an equal opportunity employer.



LXR

elixir

Biotechnology Inc.

**SENIOR PHD RESEARCH SCIENTIST
DIVISION OF ENDOCRINOLOGY &
METABOLISM
DEPARTMENT OF MEDICINE
THE UNIVERSITY OF WESTERN ONTARIO**

Applications are invited for a Full Time Faculty Position in the Division of Endocrinology & Metabolism in the Department of Medicine at the University of Western Ontario. The successful applicant will already be a senior scientist and will be based at the Lawson Research Institute of the St. Joseph's Health Centre, which is affiliated with the University of Western Ontario. He/she will be expected to complement an expanding research group investigating the role of insulin-like growth factors in metabolic control. As well, the successful applicant will already have a proven record in attracting peer-reviewed funding and a publication base in the area of insulin-like growth factors and their binding proteins. We particularly seek expertise in the measurement of insulin-like growth factor binding proteins within clinical protocols, in defined cell cultures, and in the study of their proteolytic modification during diabetes, cancer, exercise and pregnancy. Applicants should be capable of immediately establishing collaborative studies with both clinician-investigators and non-clinical scientists working within the Lawson Research Institute, including members of the Medical Research Council Group in Fetal and Neonatal Health and Development. Academic rank, salary and term of initial appointment will be commensurate with experience and qualifications. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian Citizens and Permanent Residents of Canada. The University of Western Ontario is committed to employment equity, welcomes diversity in the workplace, and encourages applications from all qualified individuals including women, members of visible minorities, aboriginal persons, and persons with disabilities. This position is subject to budget approval. Competition will close within ninety days of this advertisement. Please send your application with Curriculum Vitae, the names of three referees, and a description of a likely research program to: Dr. David J. Hill, Lawson Research Institute, St. Joseph's Health Centre, P.O. Box 5777, London, Ontario, Canada, N6A 4L6.

TURNING IDEAS INTO REALITY.

At SyStemix, our isolation of the human hematopoietic stem cell was a first, turning our ideas about the human HSC into reality. As we continue our research of human blood and immune systems, we're seeking more talented people to join us.

CURRENT CAREER OPPORTUNITIES

We seek talented R&D professionals with expertise in the following areas:

- **Hematopoiesis research:** cell biology, biology of growth factors, and preclinical pharmacology
- **Immunochemistry:** antibody isolation, purification, and conjugation
- **Carbohydrate and/or nucleic acid chemistry**

- **Monoclonal antibody development**
- **Development of hematopoietic cells and growth factors for clinical applications:** mammalian cell culture, cell separation methods development, and cell product characterization

Candidates should have a PhD, MS, or BS in a related scientific discipline and a minimum of 2 years' industry experience.

We offer an excellent compensation and benefits package and a nice working environment. For immediate consideration, please send your resume to SyStemix, Inc., Attn: Human Resources, Dept. SYD23, 3155 Porter Drive, Palo Alto, CA 94304 or via FAX to (415) 856-4919. EOE.

SYSTEMIX



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AS ITS ENVIRONS.



As a Seattle-based pharmaceutical company of Tredegar Industries, the professionals of Molecumetics enjoy work and recreational environments that are rich in resources.

Here in our sophisticated facility, a dynamic, multidisciplinary group is utilizing a peptidomimetic approach [Proc. Natl. Acad. Sci., 89,5872 (1992)] to rational drug design. This initiative has created opportunities for postdoctoral professionals:

A SR. PHARMACOLOGIST to direct research involving experimental design and supervise research associates. To qualify, you must have a Ph.D. and 2+ years of postdoctoral experience; preferably in the area of immunopharmacology. A strong background in receptor pharmacology, in vitro binding, and ELISA assays is also essential.

A SR. SYNTHETIC CHEMIST with a Ph.D. in Chemistry and 1-2 years of postdoctoral or industrial experience. A strong background in multistep asymmetric synthesis, coupled with an enthusiasm to work in a team including structural biologists and pharmacologists is essential.

After work, there's the famed recreational and cultural diversions that have made Seattle one of the nation's most desirable areas in which to live. Interested candidates should send a resume with salary expectations in confidence to: **Mr. John S. Narcisse, Tredegar Industries, Inc., 1100 Boulders Parkway, Suite 265, Richmond, VA 23225.** No phone calls, please. An equal opportunity employer m/f/h/v.

HYPERTENSION SUMMER SCHOOL

19-24 September 1993, Ross Priory, Glasgow, Scotland

This course is to provide a one-week intensive learning experience for recent M.D. and Ph.D. graduates who wish to pursue a career in clinical and experimental high blood pressure research.

Topics will include: **molecular genetics; transgenic models; brain mechanisms; pharmacokinetics and dynamics; vascular biology and physiology; steroids; receptors and signaling.** Maximum class size will be 20 students.

Faculty: F. Alhenc-Gelas, Paris; J. Connell, Glasgow; P. Corvol, Paris; D. Ganten, Berlin; M. Lathrop, Paris; F. Luft, Berlin; J. C. McGrath, Glasgow; J. Ménard, Paris; G. Milligan, Glasgow; J. Mullins, Edinburgh; M. Paul, Heidelberg; J. Reid, Glasgow; A. Salvetti, Pisa; F. Soubrier, Paris; T. Unger, Heidelberg.

Co-sponsored by The European Society of Hypertension (ESH); The International Union of Pharmacology (IUPHAR); The German Institute for High Blood Pressure Research Heidelberg; The Collège de France/INSERM, Paris; The University of Glasgow; The TRANSGENEUR Program of the European Community; The World Hypertension League (WHL).

To apply please send a CV with publication list, two letters of reference and a note, indicating your scientific and personal interests and expectations with regard to the course **no later than April 15, 1993 to: Hypertension Summer School, Attn: Ms Irmgard Büchler, German Institute for High Blood Pressure Research, Im Neuenheimer Feld 366, 6900 Heidelberg, Germany.** Course fee, including materials and accommodation, is 200.—German marks. A number of travel grants are available and students in need are encouraged to apply informally.

The summer school is supported by an educational grant from the **Parke-Davis Conference Series.**

WE'RE CHANGING MILLIONS OF LIVES. NOW IT'S YOUR TURN.

At Lederle-Praxis Biologicals, a division of American Cyanamid Company, we're pioneering the design, manufacture and marketing of vaccines so sophisticated, they're changing lives—right now.

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MANAGER, REGULATORY AFFAIRS

You will perform regulatory affairs activities in support of all scientific efforts. Responsibilities include interpretation and application of FDA regulations and working closely with our discovery scientists to prepare and support IND submissions for FDA approval.

To qualify, you should have a Ph.D. or equivalent, a background that includes scientific experience, and a minimum of 3 years in regulatory affairs (in the pharmaceutical and/or biotech industry).

At Lederle-Praxis, you'll enjoy a professional atmosphere and a competitive salary and benefits package. Please send a resume to: Human Resources Department, Lederle-Praxis Biologicals, 211 Bailey Rd., West Henrietta, NY 14586-9728. An Equal Opportunity Employer.



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Scientific Opportunities

Celtrix is a biopharmaceutical company engaged in the research and development of potential therapies for debilitating diseases associated with aging or autoimmune conditions.

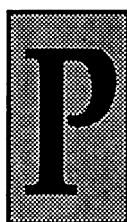
Scientific Manager Immunology & Cell Biology

You will lead a department responsible for investigating cell biology, including the immunomodulating activity of cytokines and antagonists. The Department also provides expertise in the development of immunoassays and serological analyses. This position requires a minimum of eight years' experience, including five years' experience in biotechnology. Strong scientific expertise in monoclonal and polyclonal antibody production, purification and characterization; mammalian cell culture; flow cytometry; and clinical serology is also required. In addition, you must have the ability to productively interact and collaborate with staff, colleagues, senior management and outside investigators.

Postdoctoral Researcher Molecular Biology

You'll conduct independent research on TGF-beta and its receptors, as well as interact with team members to create novel opportunities in human therapeutics. Your recent doctorate in molecular biology should demonstrate a broad understanding of bacterial and mammalian systems. Prior experience in screening DNA libraries, PCR technology, and general nucleic acid manipulation is essential. Protein purification skills highly desirable.

Along with an excellent salary and benefits package, Celtrix offers a highly stimulating R&D environment. Please send your resume to: Celtrix Pharmaceuticals, Human Resources, 3055 Patrick Henry Drive, Santa Clara, CA 95054-1815. An equal opportunity employer.



Postdoctoral & Staff Scientist

Protein Engineering/ Structural Proteins

Du Pont has openings on our team that is designing novel structural proteins and producing them by recombinant DNA methods. We are seeking candidates for two positions that offer wide-ranging experiences in a vital and stimulating industrial environment.

Visiting Scientist

A 1-3 year postdoctoral position is available for an individual with a Ph.D. in Biochemistry, Biophysics, Chemistry or a related discipline. The successful candidate will have demonstrated expertise in the physical and structural characterization of proteins or peptides in solution, using a variety of techniques such as nmr and optical methods. Experience with protein purification will be essential, and familiarity with standard recombinant DNA techniques using bacterial hosts will be helpful.

Staff Scientist

A staff position is available requiring an MS in Biochemistry, Molecular Biology or a related discipline and 3 years' relevant research experience. The successful candidate will be thoroughly familiar with standard recombinant DNA technology, including gene cloning and DNA sequencing, with the construction and analysis of recombinant microorganisms, and with standard techniques for the analysis of recombinant protein products.

If you are interested in these opportunities with a Fortune 100 company, please send CV and names of three references to: Du Pont Human Resources, PSS-0077, Wilmington, DE 19898. Equal Opportunity Employer.



Fibers

Regulatory Affairs

LIGAND Pharmaceuticals, an acknowledged leader in the field of intracellular receptor technology, seeks to provide novel drugs for the treatment of human disease. Currently, we are seeking to add the following two individuals to be part of our team contributing to the discovery and development of drugs for use in oncologic and hormonal therapies.

DIRECTOR, REGULATORY AFFAIRS Metabolism and Endocrine

Reporting to the Vice President of Regulatory Affairs and Compliance, this individual will be responsible for directing regulatory activities and providing regulatory guidance in the drug development of products in the metabolism and endocrine area. The successful candidate will have a PhD, plus a minimum of five years' regulatory background and ten years' or more postdoctoral experience. Also required are several years' experience in negotiating with FDA reviewers, demonstrated proficiency in preparing INDs, NDAs and related documents, and specific scientific and regulatory background with products in the metabolism and endocrine area. Experience with anticancer products is a plus.

ASSOCIATE DIRECTOR, QUALITY ASSURANCE & COMPLIANCE

The Associate Director will be responsible for establishing QA functions as well as performing and directing compliance activities associated with GMP, GLP and GCP. This individual will also provide guidance on and assist in preparing the CMC section of INDs and NDAs. The qualified candidate will have a PhD with four years' or more regulatory experience in the drug industry and a minimum of eight years' postdoctoral experience. Additional requirements are several years' background in QA functions, the ability to interpret regulations with regard to these activities, and experience in preparing INDs and NDAs.

Our rapidly growing company offers a competitive salary and benefit package, a premier team of colleagues and equity participation. Please forward your resume to: LIGAND Pharmaceuticals, Human Resources/Dept. HH, 9393 Towne Centre Drive, Suite 100, San Diego, CA 92121. EOE.



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CHAIRPERSON



Department of Cellular and Molecular Physiology Yale University School of Medicine

The Yale University School of Medicine announces a search for the position of Professor and Chair of the Department of Cellular and Molecular Physiology.

Successful candidates will be of international stature and should have active research programs in the broadly defined area of cellular and molecular physiology. Applicants should have demonstrated qualifications in education of medical and graduate students; experience in administration is desirable.

Applicants are requested to send a letter of interest, statement of research interests, current curriculum vitae and names of references.

James D. Jamieson, M.D., Ph.D.
Chair, Cellular and Molecular Biology Search Committee
SHM C218
Yale University School of Medicine
333 Cedar Street
New Haven, CT 06510

Applications are requested by May 1st, 1993, but may be submitted after that until a candidate is appointed. Yale University is an affirmative action/equal opportunity employer. Women, minority and overseas candidates are encouraged to apply.

Meeting the Challenges to Medicine

Our employees are determined, capable and concerned. They are committed to helping America's Physicians care for America's health, in the most respected association of its kind anywhere in the world. We currently seek a Sr. Scientist who will join us in the Department of Immunology and Infectious Diseases.

Senior Scientist

In this capacity you will review and evaluate information on drug coverage and present it to the medical community primarily in our Drug Evaluations. You'll also develop relationships with external consultants, government agencies, the pharmaceutical industry and related organizations; serve as an information resource; participate in AMA position development and engage in scholarly activities aimed at enhancing our scientific standing.

Our qualifications include a PhD in Pharmacology, Microbiology or related biomedical field, with postdoctorate experience and, ideally, publications in an academic, governmental, or industrial clinical pharmacology area. A background in infectious diseases is desired. Good interpersonal, analytical, writing and presentation skills will be important in this position. Occasional travel will be involved.

As an important member of our professional staff you will receive an excellent compensation package and industry recognition. C.V.s may be sent to: **Division of Placement, Dept CS-SDF-2461, AMERICAN MEDICAL ASSOCIATION, 515 N. State Street, Chicago, Illinois 60610.** Equal Opportunity Employer.

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Lead Discovery

R&D Manager

Lead and manage the divisional R&D team to new heights of discovery and product development.

Reporting directly to the Division Manager, the ideal candidate will have a PhD in Biochemistry or Chemistry, with 5+ years bench experience, and 2+ years recent management in a GMP facility. Product-to-market experience essential. Specialization in protein chemistry, clinical chemistry, chromatography and toxicology desired.

Must be an R&D champion, self-starter, team player and willing to work hands-on as well as lead. Must have excellent oral, written and presentational skills.

Please send CV or resume to: Paul Krueger, Bio-Rad Laboratories, ECS Division, Dept. 045, 3726 E Miraloma Ave., Anaheim, CA 92806. EOE M/F/D/V.

BIO-RAD

Bio-Rad Laboratories

Manager, Microfiltration Product Development

Gelman Sciences, one of the world's leading producers of microfiltration devices for a wide range of applications, is seeking a technical management professional to coordinate new product development efforts for capsule and cartridge products.

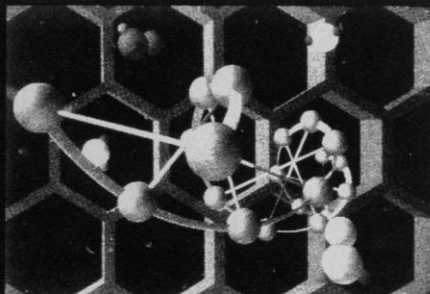
Responsibilities involve evaluating new product opportunities with Marketing, matching customer needs to product performance features and facilitating customer evaluation of prototypes. Additional activities include scheduling builds with Manufacturing, prioritizing/assigning projects, managing budgets and supervising/training team members.

Requirements include a Bachelor's degree in a scientific/engineering discipline or related work experience, strong communication/interpersonal skills, solid background in Technical Project Management and, preferably, supervisory experience.

We provide an excellent compensation and benefit package, including relocation assistance to Ann Arbor, one of the nation's most desirable quality of living communities and home to the University of Michigan. If qualified, please forward resume in confidence to: Gelman Sciences, Human Resources - MMPD, 600 South Wagner Road, Ann Arbor, MI 48106-1448, Fax: (313) 668-6710. Gelman Sciences is an Equal Opportunity Employer.

 **GelmanSciences**

Where Ideas Form Solutions




Fujisawa USA, Inc. is a world leading pharmaceutical manufacturer with a solid reputation for innovative products, unsurpassed service and visionary professionals. As we continue to expand our Research & Development, we're seeking:

CLINICAL RESEARCH ASSOCIATES & SR. CLINICAL RESEARCH ASSOCIATES

These positions will be responsible for monitoring clinical trials, assisting in writing Investigational Drug Brochure/New Drug Application as well as developing protocols. Duties will also entail working closely with investigators, assessing site suitability and monitoring budget/initiating payments. Approximately 30-50% travel will be required.

The selected candidates will possess a BA/BS in Life Sciences (or related discipline) and a minimum of 1+ years experience as a Clinical Research Associate within the pharmaceutical industry. Must also possess knowledge of protocols, clinical drug development process and FDA/GCP regulations. Excellent documentation, communication and organizational skills a must.

As a highly respected \$1.7 billion industry leader, we can provide you with a rewarding career opportunity and an excellent compensation package including a 401(k) plan. For consideration, forward resume to: Sheryl Jordan, FUJISAWA USA, INC., 3 Parkway North Center, Deerfield, IL 60015.

 **Fujisawa USA, Inc.**

(eoe m/f/d/v)

*Diversity
in Products.
Diversity
in People.*

Syntex has earned its reputation in the pharmaceutical industry for significant and innovative research with a continuing commitment to excellence in R&D. Consider these exciting research opportunities working with our Molecular Biology team located in the San Francisco Bay area.

Research Scientist – Molecular Biology

Consider this immediate opportunity for a creative and interactive scientist to participate in a challenging team effort to identify, clone and express novel ion channels and receptors in support of our drug discovery programs. Experience with all facets of molecular biology including RT-PCR, cloning by homology and expression cloning required. Experience with tissue culture, and transient and stable transfections is a plus. Position requires a Ph.D in Molecular Biology or related field and 2 or more years of postdoctoral experience.

Research Associate – Molecular Biology

You will be responsible for identifying, cloning and expressing tissue specific mRNAs. BS/MS degree with 3 or more years of experience with RNA isolation, cDNA library construction/screening and cloning for expression.

Syntex offers a comprehensive benefits package which includes an incentive bonus plan, child care facility, and an on-site health club. For more information, contact: Syntex, Professional Staffing, Job # MCS1212, 3401 Hillview Avenue, Palo Alto, CA 94303. Syntex is an equal opportunity employer committed to the values of a diversified workforce.



PROGRAM DIRECTOR BIOMEDICAL ENGINEERING PROGRAMS

The Whitaker Foundation, a private foundation dedicated to enhancing the field of biomedical engineering, is seeking a Program Director for its biomedical engineering programs. The initial responsibility will be the management of the Biomedical Engineering Research Grants Program. The position will be located in the Washington, DC office of the Foundation. Salary will be commensurate with experience.

Candidates should have a doctorate in biomedical engineering or a closely related field. Further experience in biomedical engineering research and education is desirable. Demonstrated administrative capability is essential.

Qualified candidates should submit a cover letter; curriculum vitae; and the names, addresses, and telephone numbers of at least three references to:

The Whitaker Foundation
1133 Connecticut Avenue, NW, Suite 1010
Washington, DC 20036

A complete job description is available by written request. Applications will be accepted until the position is filled.

**THE WHITAKER
FOUNDATION**



See what
excitement
lies ahead.

The year ahead should be one of pivotal progress for Corvas International in moving our family of products toward commercialization. Targeting thrombosis and acute inflammation, Corvas has the potential to improve both treatment and prevention of these medical diseases which are responsible for so many lost lives.

We are now at a critical point in development, poised to fully capitalize on the potential of our early research. There's no doubt that our company is a science-

based organization. You'll also find a truly integrated team approach among our scientific and business colleagues. Now is an exciting time to be a part of Corvas.

Group Leader— Analytical Chemistry

Will provide technical leadership for the design and implementation of analytical chemistry studies, to include compound purification and characterization via HPLC and other chromatography techniques. (Reference 9309)

Analytical Chemists

BS- or MS-level Chemists will perform analytical chemistry studies for drug discovery programs. (Ref. 9310)

Organic Chemists

BS- or MS-level Research Chemists to perform multistep organic syntheses, obtain and interpret NMR spectra, and purify and characterize intermediate and final products. Pharmaceutical experience desired. (Ref. 9301)

Cardiovascular Pharmacologists

Will conceptualize and implement pharmacology research strategies and tactics to evaluate potential therapeutic antithrombic drugs. (Ref. 9316)

Pharmacologists — Drug Metabolism & Delivery

Analysis of synthetic compounds *in vivo* via different routes of availability. (Ref. 9328)

Protein Separation Scientists

BS/MS-level Biochemists with 2+ years' industrial experience in protein purification and characterization for clinical production of recombinant proteins. GMP desired. (Ref. 9244)

Biochemists

BS/MS-level Scientists with at least 2 years' industrial experience preferably in blood coagulation and enzymology, some enzyme kinetics. (Ref. 9318)

Headquartered in the academic and biotech center of La Jolla, California, Corvas delivers a stimulating milieu, desirable lifestyles, and attractive compensation packages, including equity participation. Please send your resume with job reference to: **Corvas International, Inc., Human Resources, 3030 Science Park Road, San Diego, CA 92121. EOE.**

CORVAS
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RESEARCH OPPORTUNITIES IN BIOTECHNOLOGY

The Department of Biotechnology Research is seeking applicants for our ongoing program of crop improvement. Pioneer offers competitive salaries, excellent facilities and a highly cooperative research environment. Successful candidates will be expected to interact extensively with ongoing programs in transformation, gene expression, gene isolation or RFLP programs.

PROJECT LEADER, PLANT SECONDARY METABOLISM (JOB #1355-A)—We have an immediate opening for a highly motivated scientist to develop a research program investigating the manipulation of plant secondary metabolites for crop improvement. This position will demand extensive interaction with scientists from many different disciplines and will be an important addition to our ongoing research program of identifying agronomically useful genes. **EDUCATION/EXPERIENCE:** PhD or equivalent experience in organic chemistry, biochemistry, molecular biology, natural products chemistry or related field plus 1–2 years relevant post-doctoral or laboratory experience. Research experience in the elucidation or manipulation of plant secondary metabolite pathways or natural products chemistry is required. **CONTACT PERSON:** AMY LaMOTTE

RESEARCH ASSOCIATE (JOB #1352)—An immediate opening is available to conduct experiments, evaluate/develop novel laboratory procedures for the analysis of polymorphism and plant genomes. **EDUCATION/EXPERIENCE:** BS degree or equivalent experience plus one year directly related laboratory experience. Must have basic understanding of classical and molecular genetics. Lab work involving RFLPs, PCR or other DNA manipulations preferred but not required. **CONTACT PERSON:** LISA HALL

Applications received by **MARCH 12, 1993** will be assured of consideration. However, applications will be considered until the positions are filled.

Pioneer Hi-Bred International, Inc. is an Equal Opportunity employer. Please send **TWO (2)** resumes and indicate in your correspondence the **JOB #**, the names, addresses and telephone numbers of three references to:



PIONEER HI-BRED INTERNATIONAL, INC.
Plant Breeding Division
Department of Biotechnology Research
Attn: Contact Person JOB #
P.O. Box 38
Johnston, IA 50131-0038

Lead Development

Software Engineer / Group Leader

Lead projects and develop innovative scientific instrumentation software in our Genetic Systems Division. Join a team of software developers, engineers, scientists, marketers and sales representatives in creating advanced tools for science.

This position requires highly developed skills in software requirements analysis, design specification, UNIX/X-Windows (Motif) application development, and C/C++ programming. Successful candidates will have a BSCS/EE and 6+ years related industrial experience or an MSCS/EE and 4+ years related industrial experience as well as excellent supervisory and communication skills. Dept. #047a.

Software Engineers

Use your knowledge of instrument and machine control to create scientific instruments. Exercise your skills in user interface design, image display and manipulation and scientific programming.

This position requires BSCS/EE or equivalent and at least 4 years of C/C++ programming on the Apple Macintosh, as well as excellent communication skills and the ability to thoroughly document and write code. Dept. #047b.

Please send CV or resume to: Bio-Rad Laboratories, Life Science, *indicate appropriate dept.* #, 2000 Alfred Nobel Dr., Hercules, CA 94547. EOE M/F/D/V.

BIO-RAD

Bio-Rad Laboratories

POSITIONS OPEN

The Department of Biology, Villanova University invites applications for two tenure-track positions at the rank of **ASSISTANT PROFESSOR**. (1) An **ORGANISMAL BIOLOGIST** is sought to participate in the teaching of a General Biology course for science majors. The individual's responsibility in this course will include sections on plant biology and organismal physiology. (2) A **BIOLOGIST** is sought to participate in and coordinate courses to meet the needs of students in the liberal arts and business. An aptitude for and interest in interacting with these students is essential. Both appointments will commence with the fall semester 1993.

The department offers B.S., M.S. and M.A. degrees in biology, and both appointees also would teach courses in an area of specialization. In addition, they will be expected to develop active research programs and to share in the collegiate responsibilities of the faculty. The successful candidates must have postdoctoral experience. Each individual should be able to teach courses in two of the following areas: behavior, genetics, immunology, invertebrate zoology, mammology, plant biology.

Applicants should send complete curriculum vitae including a list of publications, transcripts of all undergraduate and graduate work, a statement describing teaching interests and experience, and a statement describing future plans for research. In addition, applicants should arrange to have three letters of recommendation sent. All materials should be addressed to: **Search Committee, Department of Biology, Villanova University, Villanova, PA 19085**. The search will begin upon appearance of this ad and continue until the positions are filled. *Villanova University is an Augustinian-related Roman Catholic institution and is an Affirmative Action/Equal Opportunity Employer.*

AQUATIC/WETLANDS ECOLOGIST with experience in pollution effects for a tenure-track **ASSISTANT PROFESSORSHIP** beginning fall of 1993. Ph.D. in the biological sciences is required and teaching experience is preferred. Applicant screening will begin February 14, 1993, with interviews planned for late March. To apply send complete résumé including teaching interests and research plans with names, addresses and telephone numbers of three references to: **Search Committee, Dean of Liberal Arts and Sciences, Sangamon State University, Springfield, IL 62794-9243**. *Sangamon State University is an Affirmative Action/Equal Opportunity Employer. Persons with disabilities, women, minorities and veterans are encouraged to apply.*

PHYSIOLOGIST. Teach courses in anatomy and physiology.

TERRESTRIAL ECOLOGIST. Should have a broad background in Ecology and be organismally oriented. Teach courses in introductory biology (including botanical topics) and conservation.

Both positions are tenure-track, **ASSISTANT PROFESSOR** level for fall 1993. A Ph.D. completed by September 1, 1993, is required and postdoctoral experience is recommended. Teach upper and lower division courses for majors and non-majors in their fields of expertise that fulfill the needs of the department and develop and inspire student participation in undergraduate research program which complements our undergraduate research facilities.

Applicants should send a letter of application stating teaching and research interests; curriculum vitae; a list of 4 references (names, addresses, telephone numbers) from whom letters of recommendation have been requested to: **Physiologist or Ecologist Search, Affirmative Action Office, Winona State University, Winona, MN 55987-5838**. Screening will begin March 28, 1993. *Women, minorities, and disabled individuals encouraged to apply.*

Science Recruitment Advertising gladly accepts ads via fax. Our fax number is 202-682-0816. We will call to confirm receipt of your ad.

POSITIONS OPEN

ASSISTANT PROFESSOR OF FISHERIES SCIENCE

Tenure-track faculty position to begin 1 September 1993. A Ph.D. coastal fisheries scientist with expertise in population dynamics or conservation genetics. Experience in collaborative research with federal and state fisheries resources agencies preferred. Responsibilities include leading an active research program, teaching and advising graduate and undergraduate students, and participating in professional service. Salary commensurate with experience and qualifications. For further information, **telephone: (413) 545-2665**.

Send by April 1, 1993, letter of application, official transcripts, curriculum vitae, and three letters of reference to: **Dr. Michael R. Ross, Search Committee, Department of Forestry and Wildlife Management, University of Massachusetts, Amherst, MA 01003**.

The University of Massachusetts is an Affirmative Action/Equal Opportunity Employer.

ASSISTANT RESEARCH PROFESSOR (non-tenure-track) position to conduct research on choline acetyltransferase and the regulation of its gene. Ph.D. in biochemistry and two years of research experience with cholinergic system is required. Applicant should have a strong background in molecular biology and biochemistry. Research experience with the isolation and identification of transcription factors, site-directed mutagenesis, enzyme purification and protein crystallization is required. 40+ hours per week, salary \$26,000 per year. Send curriculum vitae and list of references to: **T. Moore, #915768, Kentucky Job Service, 300 South Upper Street, Lexington, KY 40508**. *An Equal Opportunity/Affirmative Action Employer.*

ANATOMY FACULTY POSITION C.W.R.U., School of Medicine

Primary responsibility will be teaching Gross Anatomy. Program in biomedical, biophysical or anthropological research is expected. Interested in imaging or biomechanics especially welcome. Collaborations available in Radiology, Biomedical Engineering, Neurosciences, Neurological Surgery, and Orthopaedics and at the Cleveland Museum of Natural History and the Cleveland Clinic Foundation. Appointment, at the **ASSISTANT PROFESSOR** level, effective July 1, 1993. Send credentials to: **Dr. J. Douglas Caston, Department of Anatomy, C.W.R.U., 10900 Euclid Avenue, Cleveland, OH 44106-4930**. *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION IN MOLECULAR VIROLOGY AND IMMUNOLOGY is available to investigate strategies used by pathogens to exploit and evade the immune system. Potential areas of study include (1) Molecular determinants of viral (particularly EBV) tropism, (2) Viral homologues of the immune system, (3) Structure and function of proteins containing short consensus repeats (SCRs) which include selectins, viral proteins, and mediators of both complement activation and coagulation. Send curriculum vitae and names of three references to: **Dr. Joseph M. Ahearn, The Johns Hopkins University School of Medicine, 1059 Ross Research Building, 720 Rutland Avenue, Baltimore, MD 21205**.

POSTDOCTORAL POSITION at Harvard Medical School available immediately to study molecular immunology of the autoimmune disease insulin-dependent diabetes mellitus, utilizing the NOD murine model system. Experience in biochemistry or immunology a plus. Please send curriculum vitae, reprints, and names/telephone numbers of three references to: **Dr. Kut-Nie Tan, Division of Pediatric Oncology, Room D1710B, Dana-Farber Cancer Institute, 44 Binney Street, Boston, MA 02115**. *Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

RESEARCH ASSOCIATE: Postdoctoral position to be involved in an ongoing project aimed at understanding the factors controlling the rate of dolichol-linked oligosaccharide intermediate biosynthesis in developing brain. This position requires an in-depth knowledge of cellular chemistry, organic chemistry, natural products purification, enzymology, lipid chemistry, extensive experience with HPLC, GLC, TLC and other chromatographic techniques used in the analysis of lipids and polyisoprenoids. The position also requires experience with primary cultures of embryonic rat brain cells. The applicant must have a Ph.D. in biochemistry with a minimum of two years of related research experience at the postdoctoral level. 40+ hours per week, salary \$25,095 per year. Send curriculum vitae and list of references to: **T. Moore, #917567, Kentucky Job Service, 300 South Upper Street, Lexington, KY 40508**. *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITIONS: Auditory-Limbic Interactions--physiology, anatomy, and behavior. Positions available for (1) auditory physiology research on neurons in the amygdala and in auditory processing areas in thalamus and cortex that project to amygdala, (2) neuroanatomical studies at the light and EM level of sensory projections to amygdala and of the local circuit organization of amygdala, or (3) behavioral/pharmacological studies of fear conditioning. Send résumé and 3 letters of recommendation to: **Dr. J. LeDoux, Center for Neural Science, New York University, 6 Washington Place, New York, NY 10003**. *New York University is an Equal Opportunity Employer.*

The Center for Gene Therapy, City of Hope National Medical Center and the Beckman Research Institute. **POSTDOCTORAL POSITIONS** are available immediately for Gene Therapy-related research in an NIH-funded program focusing upon the development and use of adeno-associated virus (AAV) vectors for: (1) the study of high-efficiency gene transfer into human hemopoietic cells, (2) the expression of molecules to confer intracellular resistance to targeted viruses, including HIV (*Science* 258: 1485, 1992), and to abrogate expression of transforming oncogenes, (3) to resolve safety issues necessary for the use of AAV vectors in clinical gene therapy. Please send curriculum vitae, statement of research interests, and the names, addresses and telephone numbers of three references to: **Dr. Saswati Chatterjee or Dr. K.K. Wong, Division of Pediatrics, City of Hope National Medical Center, 1500 East Duarte Road, Duarte, CA 91010**. *The City of Hope is an Affirmative Action/Equal Opportunity Employer.*

SENIOR RESEARCH SCIENTIST wanted to conduct scientific research in cancer immunotherapy and cellular immunology; establish characterization of activated human T-lymphocytes used in cancer immunotherapy; direct the scientific research activities of research associates with a focus on supporting current products and developing new products for the marketplace; maintain an up-to-date knowledge of cancer immunotherapy, cellular immunology, and related fields; present results at scientific meetings; and submit the results of research and progress made to scientific journals for publication. Must have Ph.D. in Immunology or Biochemistry, 2 years of postdoctoral training in cellular immunology, 3 years of experience in biotechnology research in cellular immunology with a focus on human diseases and including experience in directing the basic scientific research activities of research associates, and experience with experimental animal models of human diseases as evidenced by publication in peer-reviewed scientific journals. Salary \$55,000 to \$70,000 per year. Send two (2) résumés to: **Case #30279, P.O. Box 8968, Boston, MA 02114**.

Place your line classified ad in *Science's* 26 March 1993 issue with bonus distribution at the Experimental Biology (FASEB) meeting!



Onyx Pharmaceuticals has recently assembled a world-class scientific team to discover and develop cancer therapeutics through research into molecular oncology mechanisms. We are seeking several additional highly motivated scientists interested in working in a stimulating and very challenging environment. The opportunity for career growth in this new and vibrant company is excellent.

Medicinal Chemistry

This individual will start up the chemistry effort necessary to support the drug discovery group. Responsibilities will include synthesis of molecules identified by both structure-based computer searches and traditional biochemical screens as well as assisting in the evaluation and acquisition of chemical diversity libraries from outside suppliers or corporate partners. The candidate must have a Ph.D. and 6-8 years post graduate experience, primarily at a pharmaceutical company. Excellent communication and supervisory skills are essential. Familiarity with computer-aided drug design and natural product libraries is desirable.

Assay Development

The successful candidate will be responsible for establishing an assay development group to bridge between the research staff and the screening lab. This person will propose and develop novel screens as well as convert existing assays to high-throughput format. The candidate must have a Ph.D. and at least two years relevant experience, preferably in a pharmaceutical company. Excellent communication skills are a must and a background in molecular oncology or a related field is highly desirable.

Lead Discovery

This person will be responsible for establishing a screening facility for the identification of lead compounds for drug development. To be successful, it is important to have broad experience with a variety of small molecule screens including cell-based, receptor and enzyme-linked approaches as well as a familiarity with colorimetric, fluorescence, luminescence and radioactive detection methods. A knowledge of computer-aided data acquisition and analysis as well as a variety of analytical skills would be helpful. A Ph.D. with at least three years at a pharmaceutical company in a lead discovery lab is required.

Please send resume and list of references to: Human Resources, Dept. D., Onyx Pharmaceuticals, 3031 Research Dr., Richmond, CA 94806. Onyx is an equal opportunity employer.



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Primary duties will include designing and writing clinical protocols, managing clinical trials, analyzing data and preparing reports for submission to the FDA. Requires a Ph.D. in the Biological or Physical Sciences; background in Protein Chemistry or Immunology desired.

Clinical Research Associates

We're seeking individuals with the ability to interpret and evaluate both laboratory and clinical data. These positions require a BS in the Biological or Physical Sciences; lab or clinical research experience preferred.

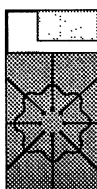
Research Scientists

Ideal candidates will possess a BS in Biochemistry, Biology or a related field. Previous experience in plasma fractionation and the preparation of plasma derivatives helpful. Knowledge of plasma proteins, separation techniques, HPLC and Chromatograph electrophoresis desired.

Regulatory Affairs Specialists

Specialist will maintain and prepare document packages for regulatory submission, internal audits and inspections. Requires BS in Biological or Chemical Science, knowledge of FDA and international regulatory requirements; 2-5 years experience with biological or pharmaceutical company required.

Alpha offers excellent compensation, advancement opportunities and professional challenge. For immediate consideration, please submit your CV/resume (indicating your area of interest) to: **Human Resources Dept., Mail Stop NM-847, 5555 Valley Blvd., Los Angeles, CA 90032. AA/EOE**



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SCIENTIST Supervisor, Analytical/Bioanalytical Chemistry

Develop and implement procedures to support research, development and related projects; coordinate analytical chemistry group activities; write SOPs and validation reports; and provide recommendations and monographs based on generated data. Ideally, you should have a PhD in Analytical Chemistry, Biochemistry, Biology, Immunochimistry or the equivalent. Experience analyzing biological/clinical samples is essential, and knowledge of pharmacokinetics, drug metabolism, cGMP or computers is desirable. **Dept. S/SABC.**

RESEARCH ASSOCIATE Analytical

You'll provide research and development, including methods of analysis for PEG-modified proteins, enzymes and peptides according to cGMP and GLP guidelines; operate/maintain laboratory equipment; provide observations and analysis; and interpret results. Requires a BS/MS in a scientific discipline, or the equivalent with 0-2 years' related experience; and strong organizational and record-keeping skills. **Dept. RA/A.**

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POSTDOCTORAL POSITIONS

Immediately available to study the molecular mechanisms of exocytosis in mammalian regulated secretory cells. Studies will use in vitro secretion assays, immunocytochemistry and molecular biology to determine the role of GTP-binding proteins in exocytosis. A background in cell or molecular biology is preferred. Please send curriculum vitae and names of three references to:

J.D. Jamieson, M.D., Ph.D.
Dept. of Cell Biology
Yale University School of Medicine
New Haven, CT 06510-0082.
Telephone: 203-785-4317
FAX 203-785-7446.

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Alexion Pharmaceuticals, Inc. is an innovative and dynamic biopharmaceutical company engaged in the discovery, development and commercialization of novel pharmaceutical compounds and cell therapies targeting immunologic, cardiovascular and hematologic disorders. We currently have the following positions open:

VASCULAR BIOLOGY

- **Staff Scientists** should have an M.D. or Ph.D. in Cell Biology, Physiology, Pharmacology or Pathology and one or more years of post-doctoral experience in vascular endothelial and/or smooth muscle cell biology or in vivo models of vascular injury and disease. Interest in cell adhesion molecules, cytokines and/or growth factors is desirable.
- **B.S./M.S. Scientists** should have at least two years of experience with primary cell culture, cell characterization, receptor binding assays, immunohistochemistry, tissue processing and/or flow cytometry.
- **Medical Technologists** should be familiar with the preparation and testing of blood components, particularly platelets. Experience in platelet aggregation and flow cytometry is essential.

MOLECULAR DEVELOPMENT

- **Staff Scientists** should have a Ph.D. or M.D. and at least 2 years of post-doctoral training in one or more of the following areas: Mammalian, insect or microbial expression systems, expression cloning, cell signalling, gene therapy, molecular pathogenesis, homologous recombination/gene targeting approaches, membrane biochemistry and/or protein structure and function.
- **B.S./M.S. Scientists** should be familiar with gene cloning, vector construction, PCR, DNA transfection, protein biochemistry and/or assay development.

PROCESS DEVELOPMENT

- **Staff Scientists** should have a Ph.D. and a minimum of 2 years of relevant industry experience in the following areas: microbial fermentation, mammalian cell selection, scale-up, optimization and validation, large scale protein recovery and purification, and familiarity with GLP/GMP production procedures.
- **B.S./M.S. Scientists** should have experience with large scale cell culture, protein purification procedures and quality control procedures. Industry experience is helpful but not required.

IMMUNOBIOLOGY

- **Staff Scientists** should have an M.D. or Ph.D. in Immunology with expertise in one or more of the following areas: transplantation biology, including functional and flow cytometric characterization of lymphocyte subsets, in vivo and in vitro analysis of models of allogeneic and xenogeneic cell and organ transplantation, molecular biology and/or biochemistry of complement or complement inhibitors, and/or monoclonal antibody production and characterization. Interest in the molecular basis of autoimmune and inflammatory diseases is desirable.
- **B.S./M.S. Scientists** should be familiar with lymphocyte culture, flow cytometry, hybridoma production and analysis of monoclonal antibodies, lymphocyte functional assays including proliferation, cytotoxicity and cytokine production and/or animal models of organ transplantation.

We offer a competitive salary and benefits package, relocation assistance and a generous stock option plan. We are located in south central Connecticut, 1 hour from New York and 2 hours from Boston, in an area of many attractive and affordable communities, nationally ranked school systems and in close proximity to a major academic medical center, Yale University.

Please send your curriculum vitae, the names of three references and position of interest to:

Human Resources Dept.

Alexion Pharmaceuticals, Inc.
25 Science Park, New Haven, CT 06511
Equal Opportunity Employer

DEAN COLLEGE OF DENTISTRY University of Florida

Applications and nominations are invited for the position of Dean of the University of Florida College of Dentistry. The College of Dentistry is one of six professional colleges located in the Health Science Center. The College serves as a statewide resource for dental education and patient care and ranks among national leaders in research. The position offers an exciting and challenging leadership opportunity in a research-oriented university environment, and an opportunity to shape the prominence of the College into the 21st century. The dean will be responsible for administering the educational, research and service program of the College and its components which include the DMD program; postdoctoral programs (graduate, postgraduate and continuing education); the faculty practice program, and community service programs. Qualifications: earned doctorate degree in dentistry (DDS/DMD) or related science, extensive experience in dental education including significant prior experience in administration, clinical practice and research and evidence of scholarly achievements. Salary for this position, which will become available on October 1, 1993, is commensurate with qualifications.

Applications (with CV) or nominations should be sent by May 15, 1993 to:

R.R. Gutekunst, Ph.D.
Chairman, Search Committee
UF Health Science Center
P.O. Box 100185
Gainesville, Florida 32610-0185

The University of Florida is an Equal Opportunity Affirmative Action Employer. The selection process will be conducted under the provisions of Florida's "Government in the Sunshine" and Public Records laws.

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P.O. Box 14063
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COLLABORATIVE RESEARCH, INC. has an established research group and is strongly committed to human genome research. We have received major grants and contracts to map and clone disease genes, map human chromosomes, and sequence the genomes of important microorganisms. We are also a leader in developing DNA probe technology for the diagnosis of genetic diseases for cancer testing and for use in personal identification.

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Will develop innovative information management and database tools for large scale genetic and physical mapping and DNA sequencing projects. A PhD or equivalent in Computer Science, Biology, or a related field is required. The candidate should have expertise with relational and object-oriented databases, and a strong interest in molecular biology and genetics. Experience with image analysis, algorithm development, or automated laboratory systems is helpful. Strong leadership and excellent communication skills are essential.

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Seeking PhD's in life sciences with molecular genetics experience and a strong interest in one or more of the following aspects of the Human Genome Project: mapping and cloning disease genes; multiplex and fluorescence sequencing; automation and technology development; computer analysis of DNA sequences.

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The successful applicant will be responsible for leading research projects focused on the application of biotechnology to monitor tobacco quality. Research will include the development of electronic sensors for several possible applications.

Familiarity with informatics and biostatistics will be an asset. Excellent communication skills and interest in interdisciplinary work are required.

Fluency in both written and oral English is required.

Candidates should send their application with curriculum vitae in confidence to our Personnel Department, Human Resources.

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BIOANALYTICAL CHEMISTRY/METABOLISM—Senior Chemist—Group leader to develop and manage programs in pesticide and pharmaceutical metabolism. Design and supervise laboratory operations, maintain regulatory compliance, interpret and prepare analytical results.

BIOTECHNOLOGY—Senior Biochemist—To lead methods development and analyses for proteins and nucleic acids (such as, electrophoresis, immunoassay and DNA analyses) to support pharmaceutical development and preclinical toxicology studies. Skills in bioanalysis and isolation of complex biomolecules as well as drugs.

Successful candidate should possess PhD in related discipline with 5 year relevant working experience.

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POSITIONS OPEN

POSTDOCTORAL CHEMIST to conduct multidisciplinary research in the development of new radiopharmaceuticals for PET and SPECT imaging. Job requires a Ph.D. degree in organic or medicinal chemistry, strong background in synthesis; working knowledge of pharmacology and experience in radioisotope handling helpful but not necessary. Excellent opportunity for chemists to apply synthetic techniques to the *in vivo* diagnostic imaging field. Please send résumé and curriculum vitae to: **Dr. Hank F. Kung, Department of Radiology and Pharmacology, University of Pennsylvania, Room 305, 3700 Market Street, Philadelphia, PA 19104.**

Ph.D.—POSTDOCTORAL POSITION is available in the Division of Gastroenterology. Primary focus of research is the study of mechanisms and control of epithelial and muscle function in animal models of inflammatory bowel disease. Candidate should have a Ph.D. with a background related to inflammatory and/or neural control of epithelium. The position is funded for at least two years. Send curriculum vitae and the names of three references to: **GI Research, Human Resources Department, Winthrop-University Hospital, 259 First Street, Mineola, LI, NY 11501. Equal Opportunity Employer M/F/D/V.**

A POSTDOCTORAL POSITION available immediately to study neutral lipid metabolism in the intestine. Experience in cell biology techniques especially with the Golgi is preferred. Please send curriculum vitae, summary of research experience, and references to: **Dr. Charles M. Mansbach, University of Tennessee, Memphis, 951 Court Avenue, Room 555D, Memphis, TN 38163. The University of Tennessee is an Equal Opportunity/Affirmative Action/Title IX Section 504/ADA Employer.**

AQUATIC PLANT ECOLOGIST. The Center for Aquatic Ecology of the Illinois Natural History Survey has one full-time, grant-funded position to sample and describe vegetation patterns in a large river-floodplain ecosystem, as influenced by natural sediment and water regimes and human disturbances. Application deadline is 19 March 1993. Request application information from: **Ms. Jacqueline Sanders, Telephone: (217) 244-7790. Equal Opportunity/Americans with Disabilities Employer.**

POSTDOCTORAL FELLOW or RESEARCH TECHNICIAN positions open for work in: **DNA bending, homologous recombination, structure of transcription complexes, HIV chromatin structure.** Studies combine molecular biology with visualization of DNA-protein complexes by EM. Background in molecular biology required. EM experience helpful but not required for technician. Postdoctoral fellow may, for example, apply previous training in transcription factors to dissect the structure of transcription complexes on DNA. Research technician to oversee Cancer Center EM facility and pursue work in these areas. Studies involve strong national collaborations. Send curriculum vitae and names of 3 references to: **Dr. Jack Griffith, Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7295. UNC is an Equal Opportunity/Affirmative Action Employer.**

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Projects involve application of microfluorimetric (imaging), radiotracer, and electrophysiological (patch clamp) techniques to the study of shear stress-induced alterations in endothelial cell biology. We are specifically interested in early signal transduction events (ion transport, second messengers) and how these changes may relate to long-term functional and morphological alterations in response to mechanical forces. Additional projects concern the molecular characterization of agonist-induced changes in cytosolic Ca^{2+} . Please submit curriculum vitae and names, addresses, and telephone numbers of at least three references to: **Dr. William P. Schilling, Molecular Physiology and Biophysics, Baylor College of Medicine, Houston, TX 77030; (FAX: 713-798-3475).**

POSITIONS OPEN

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TWO POSTDOCTORAL POSITIONS available for: 1) Secretion of selected enzymes from filamentous fungi, 2) Development of paraxial crosses in filamentous fungi. Molecular Biology and/or Molecular Genetics background necessary. Please state research interests, send curriculum vitae, and names of three references to: **Postdoctoral Committee, Novo Nordisk Biotech, Inc., 1445 Drew Avenue, Davis, CA 95616 or FAX to 916-758-0317. An Equal Opportunity Employer.**

TWO POSTDOCTORAL POSITIONS—MOLECULAR VIROLOGY available immediately to study viral hepatitis and liver cancer. Experience in molecular biology not required. Background in fields such as organic chemistry, biochemistry, microbiology, toxicology or cell biology is preferred. Opportunity to learn advanced molecular biology techniques. Curriculum vitae and letters of reference should be sent to: **Ms. Teri Kingsley, Department of Pathology, University of Texas Medical Branch, Galveston, TX 77555-0605. UTMB is an Affirmative Action/Equal Opportunity Employer/M/F/H/V. UTMB hires only individuals authorized to work in the United States.**

POSTDOCTORAL POSITION within modern, well-funded laboratory to study molecular biology of double-stranded RNA viruses of poultry. Opportunities for interactions with other molecular biologists. Applicants should have a background in molecular genetics or virology. Forward curriculum vitae and names of 2 references to: **Dr. V. Vakharia, Center for Agricultural Biotechnology, University of Maryland, College Park, MD 20742. Call Dr. Vakharia at (301) 935-6083 for more information.**

FACULTY OF PHARMACY UNIVERSITY OF TORONTO

POSTDOCTORAL POSITION available summer 1993 to study the physical chemistry of DNA-protein and DNA-drug interactions. Experience in either biochemistry or physical chemistry is required. Interested persons should submit current curriculum vitae and arrange to have three letters of reference sent before March 15, 1993 to: **Dr. Robert Macgregor, Faculty of Pharmacy, University of Toronto, 19 Russell Street, Toronto, Ontario, M5S 2S2, Canada.**

POSTDOCTORAL/ASSOCIATE RESEARCH SCIENTIST POSITIONS IN HIV PATHOGENESIS—COLUMBIA UNIVERSITY. Two positions are available for the investigation of molecular mechanisms that contribute to the pathogenesis of AIDS. Candidates will join a multidisciplinary group studying the consequences of HIV-1 gene expression on cellular function and cellular gene expression in lymphoid and neuronal cells. Experience in molecular biology or virology required. Send curriculum vitae and references to: **Dr. Ofra Weinberger, Columbia University, Department of Physiology, 630 West 168th Street, New York, NY 10032. An Equal Opportunity/Affirmative Action Employer.**

The University of Michigan, Department of Ophthalmology is seeking to add to its faculty a **GLAUCOMA SUBSPECIALIST.** Faculty rank is flexible and will be based on the individual's academic qualifications. Applicants must be certified by the American Board of Ophthalmology and must have demonstrated interest and experience in patient care, education and research. Individuals interested in this position should submit curriculum vitae and bibliography to: **Paul R. Lichter, M.D., F. Bruce Fralick Professor and Chairman, Department of Ophthalmology, The University of Michigan, W. K. Kellogg Eye Center, 1000 Wall Street, Ann Arbor, MI 48105. The University of Michigan is an Equal Opportunity and Affirmative Action Employer and actively seeks diversity in its applicant pool.**

POSITIONS OPEN

The Basic Science Departments (Cell Biology and Neuroanatomy, Biochemistry, Microbiology, Pathology, Pharmacology, Physiology), Medical School, University of Minnesota, periodically have openings for **POSTDOCTORAL TRAINING.**

For information about possible openings in these programs, write, specifying department of interest, to:

**University of Minnesota Medical School
Box 293-A UMHC
420 Delaware Street SE
Minneapolis, MN 55455
Attention: Diane M. Dufault**

The University of Minnesota is an Equal Opportunity Educator and Employer.

The Human Genome Center for Chromosome 22 at the Children's Hospital of Philadelphia and the University of Pennsylvania School of Medicine is escalating its activities in the areas of physical mapping with YAC's and cosmid and in developing new technologies for gene identification. Hence, the Genome Center is actively seeking Ph.D.-level molecular genetics researchers for **POSTDOCTORAL or RESEARCH ASSOCIATE POSITIONS.** A degree in genetics, molecular biology or a related discipline is required. Individuals with experience in the aforementioned areas of investigation are encouraged to apply, and a minimum commitment of two years is essential. The Genome Center is in a stimulating academic environment with the ability to participate in an ABMG accredited training program.

Please send curriculum vitae and the names of three references to:

**Dr. Beverly Emanuel, Room 5033B
Director, Human Genome Center
Children's Hospital of Philadelphia
34th and Civic Center Boulevard
Philadelphia, PA 19104**

The Children's Hospital of Philadelphia and the University of Pennsylvania are Equal Opportunity Employers. Applications from minorities are strongly encouraged.

POSTDOCTORAL POSITIONS Lymphocyte Development

Applications are invited for postdoctoral positions to study cellular and molecular events in haemopoietic stem cell and lymphocyte development. Please send curriculum vitae, statement of research interests and the names of three references to: **Dr. Ronald Palacios, Department of Immunology, Box 178, University of Texas M. D. Anderson Cancer Center, 1515 Holcombe Boulevard, Houston, TX 77030. An Equal Opportunity Employer.**

POSTDOCTORAL POSITION ANTITUMOR DRUG RESISTANCE

Postdoctoral position immediately available for two to three years to study determinants of resistance to antitumor drugs in multi-drug resistant tumor models and primary cultures of human tumors. Emphasis of ongoing studies includes investigations on cellular pharmacology, modulation of cytotoxic response, and regulation of calcium-calmodulin dependent proteins and phosphorylation systems. Applicants should have a Ph.D. in pharmacology, biochemistry, or cell biology. Salary is competitive and commensurate with experience. Send curriculum vitae and names of three references to: **Dr. Ram Ganapathi, Department of Cancer Biology, Research Institute, Room #M3-30, Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, OH 44195.**

POSTDOCTORAL POSITION available to study the molecular biology of HIV gene expression by various transcription factors and cytokine mediated signal transduction. Experience in cell and molecular biology or protein chemistry is necessary. Send curriculum vitae, names of three references, research background and interest to: **Dr. Ranjit Banerjee, Department of Neoplastic Diseases, Box 1131, The Mount Sinai School of Medicine, One Gustave L. Levy Place, New York, NY 10029-6574. An Equal Opportunity Employer.**

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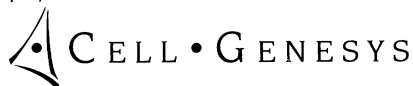
Cell Genesys, an exciting biotechnology company located in the San Francisco Bay Area, is pioneering the human therapeutic applications of gene targeting and related technologies. We're recruiting the following candidates to join our new cell culture process development group:

Scientist, Cell Culture - Essential functions: designing and carrying out lab-scale experiments and minifermentations to develop processes and media for products generated in research; working closely with Research to take novel research products into development. Ph.D. in a biological science (preferably Cell Biology), plus 3 years industrial cell culture process development experience required. (Job #11.2.2)

Research Associate, Cell Culture - Essential functions: responsibility for installation and operation of minifermenters and other equipment, and process development on novel biological products. Bachelors degree in a physical science, minimum 3-5 years lab experience including operation of minifermenters and practical cell culture experience required. (Job #11.2.3)

Research Associate/Engineer, Pilot Plant - Essential functions: assistance in start-up and operation of pilot plant production facility; operation of both batch and perfusion fermentation systems. Bachelor's degree in physical science/chemical engineering, minimum 3-5 years hands-on experience in operation of pilot production scale fermentation equipment, experience with mammalian cell culture, background in GMP environment and documentation required. (Job #11.0)

Cell Genesys offers a competitive salary, excellent benefits, and equity participation. For immediate consideration, send your resume to: **Paula Bogard (please indicate Job #), Cell Genesys, 322 Lakeside Drive, Foster City, CA 94404.** An equal opportunity employer.



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Participate in our Extramural Research program for establishing and managing collaborations with academic investigators. Primary responsibilities will include presentation of information concerning the company's basic research and clinical program to clinical and research groups in academic settings, assistance in management of the company's program for providing academic investigators access to (Immunex materials for preclinical research, and compilation and internal dissemination of data provided by outside investigators. Scientists with a Ph.D. in a biological science or a Pharm. D. are encouraged to apply. Experience with biologics would be helpful. Exceptional presentation skills are essential. (Job #7215230)

LAB MANAGER

Oversee the daily operation of our Hybridoma Group, including hiring, training and evaluating technical staff, preparing technical reports, summaries and protocols. Requires a proven record of achievement in generating and characterizing polyclonal and monoclonal antibodies. The successful candidate will have 5+ years experience with antibody technologies, a consistent history of outstanding technical and managerial performance and the ability to work in a collaborative environment with attention to meeting timelines and project goals. A BS degree in a scientific discipline is required. Ph.D. preferred. (Job #6650239.)

RESEARCH ASSOCIATE

Design, execute and interpret experiments that contribute to the Hybridoma Group. Responsibilities include purification of antibodies and related proteins, optimization of purification methods and development of new methods. BS degree in a scientific discipline and at least 5 years of relevant laboratory experience is required. MS degree preferred. (Job #7615239.)

SCIENTISTS

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- Microbial Fermentation (#7215345)
- Purification Development (#7215347)
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RESEARCH ASSISTANTS/ASSOCIATES

- Histotechnology (#7615235)
- Molecular Biology (#7630231)
- Microbial Fermentation (#7630345)

Immunex Corporation offers a fast-paced, stimulating environment and a competitive compensation package. For consideration, please submit C.V., names of three references a list of publications (if applicable) and the appropriate job number(s) to: **IMMUNEX CORPORATION, Attn: Human Resources Dept., 51 University Street, Seattle, WA 98101. Fax: (206) 623-4572.** Equal Opportunity Employer.

IMMUNEX

CALL FOR PREPROPOSALS

Mexico-U.S. Foundation for Science

Background

The Mexico-U.S. Foundation for Science is a binational, private, non-profit institution headquartered in Mexico City, incorporated in 1992 to promote scientific and technological research on problems of common interest to researchers in Mexico and the United States.

This is a call for preproposals for laboratory or field directed research activities involving collaboration of scientists, engineers, and other researchers from non-profit institutions in the two countries. Preproposals may not be submitted for on-going research. Grants will be awarded for a maximum of two years; preproposals should provide an indication that definite results are likely to be achieved in that period of time. Areas of emphasis are environmental sciences, health, and economic and social problems resulting from closer integration of the United States and Mexican economies, especially in relation to the new North American Free Trade Agreement. Preproposals of exceptional merit in other areas will be considered if available funds permit. Projects in clinical medicine, agriculture, and marketing are specifically excluded.

Preproposal Submission Date and Address

Preproposals in either Spanish or English must be submitted jointly by principal investigators from Mexico and the United States, and must not exceed 4, single spaced, typewritten, standard (8.5 x 11 inch) pages. Preproposals must be received at the address below on or before Monday, March 15, 1993 by 3:00 p.m. local time:

Dr. Gerardo Bueno, Director Ejecutivo, a.i.
Fundación México-Estados Unidos para la Ciencia
Av. Constituyentes 1046
Colonia Lomas Altas
11950 México, D.F., MEXICO
Fax number: 52 + 5+ 327-7416

For details concerning submission format contact the above address. In the U.S.A., an alternate contact address for information purposes only is: Mr. Jay Davenport, BOSTID/NRC FO 2060, National Research Council, 2101 Constitution Avenue, N.W. Washington, D.C. 20418, telefax 202/334-2027, or Bitnet: dhambric@NAS

Note: DO NOT submit preproposals to the U.S.A. address.

Associate Scientist

Molecular Biosystems, Inc. (MBI), a leader in the development of contrast agents for medical imaging is seeking a scientist to join the ultrasound research and development group.

A PhD in Chemistry/Biochemistry w/ 3 years of postdoctoral experience in the area of membrane characterization is required. Previous experience with particle counting methods, and analysis of aqueous suspensions a plus. Excellent written and oral communication skills are required.

This individual will be a member of a research team which has as its aim toward the development of new ultrasound contrast agents. The ability to work cooperatively in a multidisciplinary team is essential. Previous supervisory experience a plus.

We offer competitive salaries, a comprehensive benefits package, and a pleasant working environment. Qualified candidates should submit their resumé with salary history to: MBI, Human Resources Department A245-93, 10030 Barnes Canyon Road, San Diego, CA 92121. Job Hotline: (619) 452-7393 x411.



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Physical Oceanographer

Tenure track faculty, junior or senior rank. PhD required; postdoctoral or equivalent experience preferred; research interests preferred in estuarine/coastal/continental shelf dynamics (particularly in boundary-layer processes and sediment transport); evidence of excellence in teaching and research required for senior rank. Duties are teaching (primarily at graduate level) and energetic research program with a strong commitment to interdisciplinary research.

Organic Geochemist Research Associate

Will operate and maintain GC-Mass Spectrometry analytical facility and develop an independent and/or collaborative research program with faculty. PhD and postdoctoral experience preferred; MS with substantial experience may be considered; research interest in both applied and basic research concerning the fate, transport and transformation of organic compounds in coastal ocean environments required.

Send statement of teaching/research interests, CV, and names/addresses of three references to **Chair, Oceanographer or Geochemist Search Committee, Environmental Sciences Program, UMass-Boston, 100 Morrissey Blvd., Boston, MA 02125-3393**. An Affirmative Action, Equal Opportunity, Title IX Employer.

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In addition to overseeing medium to large-scale risk assessment and toxicology projects, this position also directs and mentors junior staff, prepares cost-effective proposals, provides services in own technical specialty to clients both inside the company and outside, as well as participates in professional activities.

Requirements include a doctoral degree in a relevant discipline and 5+ years experience or an MS with 8+ years relevant experience (including 2+ years in risk assessment or toxicology consulting). Must be able to analyze risk issues both qualitatively and quantitatively. Must also have strong grasp of client needs, excellent communication/presentation skills, plus ability to attract business through own capabilities and some record of publication.

ENSR offers excellent career growth along with a competitive compensation/benefits package, including 401(K) and retirement plan. Please send resume, including salary history, to: ENSR, Consulting & Engineering, Job STS/S/Human Resources, 1320 Harbor Bay Parkway #210, Alameda, CA 94501.

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Laboratory of Molecular Biology
TENURE-TRACK POSITIONS IN
MOLECULAR BIOLOGY

The Protein and Nucleic Acid Chemistry Division invites applications from independent scientists to develop a programme of basic molecular research. Gene therapy, gene manipulation, gene mapping, molecular immunology and molecular oncology are topics of particular interest, but other areas will also be considered.

Successful applicants will join the present Divisional Staff of about 30 scientists and visitors working on a wide variety of problems in molecular biology. An excellent range of shared biochemical and cell culture facilities, instrumentation, computing and workshops is available.

Salary will be at an appropriate point on the MRC non-clinical scientific scale (equivalent to the University Academic scale), ranging from £13,400–£24,736 for an initial period of 3–5 years, during or after which time suitable candidates would be considered for tenure.

Further information can be obtained from Dr. T. H. Rabbitts; Tel (0223) 402286.

Applications including CV, a brief research proposal and the names and addresses of four professional referees should be sent by 5 April 1993, quoting reference PNAC/TTRW to: **Dr. Rosie Ward, Personnel Manager, MRC Centre, Hills Road, Cambridge, CB2 2QH, UK**

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DNAX Research Institute

Staff Scientist

Staff Scientist position in the area of monocyte/macrophage activation

DNAX Research Institute of Molecular and Cellular Biology, Inc., in Palo Alto, California has a Staff Scientist position available with research interest in the area of monocyte/macrophage activation (human/mouse). This appointment is equivalent to an Assistant Professor level in an academic research setting. We are seeking highly qualified candidates who will be expected to develop independent basic research programs including, supervision of research assistants and post doctoral fellows, utilizing any, or a combination of cellular, molecular or genetic approaches.

DNAX Research Institute is located in Palo Alto, California and offers an excellent environment for basic research in immunology, cell and molecular biology. DNAX encourages publications and participation in research conferences. There are no grant writing or teaching responsibilities and scientists benefit from an atmosphere in which immunologists, cell biologists, and molecular biologists collaborate on problems of central significance in immunology and cell biology. DNAX has an active seminar program featuring prominent researchers in a variety of areas of biology. DNAX Research Institute's location (adjacent to Stanford University) also offers proximity to several prominent academic research laboratories.

Applicants should send their curriculum vitae, a statement of research interests and a list of professional reference to Dr. Albert Zlotnik, Search Committee-MM, DNAX Research Institute, 901 California Avenue, Palo Alto, CA 94303-1104.

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We are seeking a Post-Doctoral Fellow to join our Physical and Analytical Chemistry R&D Department, based at our Pharmaceutical Development Facility. A PhD in Biochemistry or Analytical Chemistry, along with experience in HPLC, protein chemistry, protein purification, and protein and peptide characterization are required.

This one year assignment has renewal potential. We offer a highly competitive salary, superior benefits, and all the challenge and growth potential an international industry leader can offer. For confidential consideration, please send your c.v. to: **Ms. Ellen Yaffe, Dept PDF, Schering-Plough Research Institute, 2015 Galloping Hill Road, Kenilworth, NJ 07033-0530.** We are an equal opportunity employer.

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The ideal candidate will have a B.S. or M.S. in Chemistry, Biology or another related field, 2-6 years industrial experience involving protein purification, conjugation chemistry and chromatographic techniques. Knowledge of GMP/GLP are essential along with excellent oral and written communication skills. Knowledge of HPLC and electrophoretic techniques would be an asset.

Coulter Corporation is committed to excellence and invites fresh, innovative ideas. Coulter Corporation offers competitive salaries, as well as a comprehensive benefits package. If you enjoy meaningful challenges, send your resume/CV and salary history to: Coulter Corporation, Attn: Barbara Viamonte, 650 W. 20th St., Hialeah, FL 33010. An Equal Opportunity Employer, M/F/D/V.



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MOLECULAR BIOLOGY/VIROLOGY

POSTDOCTORAL POSITION available immediately in well-equipped NIH-funded laboratory studying the molecular genetics and biochemistry of human cytomegalovirus DNA replication. Projects focus on mechanisms of origin-mediated initiation of DNA replication, and their regulation. Seeking individual with training and/or interests in nucleic acid structure, transcript analysis and transcription regulation, or DNA-protein interactions. Hands-on experience in basic molecular biology, tissue culture or virology preferred. Stipend dependent on experience and qualifications. The Wadsworth Center houses the graduate program of the Department of Biomedical Sciences of the State University of New York at Albany, and maintains centralized state-of-the-art core resources in molecular genetics, biochemistry, immunology, structural analysis, and computer sciences. Send curriculum vitae with names and addresses of references, and publications or research summary to: **David G. Anders, Ph.D., The David Axelrod Institute of Public Health Sciences, Wadsworth Center for Laboratories and Research, New York State Department of Health, P.O. Box 509, Albany, NY 12201-0509.**

POSTDOCTORAL POSITION

Postdoctoral Position is available for a minimum of two years to investigate the role of protein phosphatases in cell growth and regulation using the yeast *Saccharomyces cerevisiae* as a model system. Biochemical and genetic approaches are currently being used in the laboratory to investigate protein phosphatase type 1. Candidates should have Ph.D. in genetics, biochemistry or related field and should be interested in regulatory mechanisms that utilize protein phosphorylation.

Applicants should send curriculum vitae, the names, telephone and FAX numbers of three references, and a brief letter describing present and past research accomplishments to: **Kelly Tatchell, Department of Microbiology, Box 7615, North Carolina State University, Raleigh, NC 27695-7615. North Carolina State University is an Equal Opportunity Employer and operates under Affirmative Action policy. Proper documentation of identity and employability will be required before the hiring process can be finalized.**

POSTDOCTORAL POSITION: AUTOIMMUNITY

Two fellowships available June 1993 at Northwestern University Medical School, Chicago, Illinois, due to Dr. Datta's move there as Solovy Arthritis-Research Professor. NIH-funded research involves structure, specificities and regulation of autoimmune T cell receptor and autoantibody V genes in murine and human lupus (*Proc. Natl. Acad. Sci. USA*, 88:11271, 1991 and 87:7020, 1990). Experience in cellular immunology and molecular biology required. Send résumé and names of three references to: **Dr. Syamal K. Datta, Professor of Medicine, Box 52, New England Medical Center, 750 Washington Street, Boston, MA 02111.**

POSTDOCTORAL POSITION available immediately to investigate the function and regulation of metabotropic glutamate receptors. Ongoing studies are examining the physiological role of a presynaptic metabotropic autoreceptor in synaptic transmission and plasticity at corticostriatal synapses as well as regulation of the receptor by protein kinase C. Experiments examining the functional properties of metabotropic glutamate receptor clones expressed in cell lines are also underway. This position offers an opportunity to use both molecular biological and electrophysiological techniques. Some experience in electrophysiology or molecular biology is desirable. Send curriculum vitae and names of three references to: **D. Lovinger, Department of Molecular Physiology and Biophysics, Vanderbilt University Medical School, 702 Light Hall, Nashville, TN 37232.**

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POSITIONS OPEN

POSTDOCTORAL POSITION to study mouse T cell activation, with emphasis on calcium signals and protein kinase pathways. Experience required in cell and molecular biology of signal transduction. Send curriculum vitae, and names and telephone numbers of 3 references to: **Richard Miller, M.D., Ph.D., Institute of Gerontology, 300 North Ingalls, Ann Arbor, MI 48109-2007.**

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POSTDOCTORAL POSITION available immediately to study the regulation of yeast and mammalian cell division. Project will focus on biochemical and molecular biological analysis of cdc2 protein kinase. Position also will provide the opportunity to participate in the development and implementation of a new medical biochemistry course. Send curriculum vitae to: **Dr. Michael Mendenhall, Department of Biochemistry, University of Kentucky, 800 Rose Street, Lexington, KY 40536. Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL POSITIONS MOLECULAR BIOTECHNOLOGY

Three postdoctoral positions are available immediately to develop techniques to automate human genome mapping, characterize cytogenetic abnormalities, and elucidate the organization of metaphase and interphase chromatin by fluorescence *in situ* hybridization (FISH). Positions will be in the newly formed Department of Molecular Biotechnology at the University of Washington. We seek candidates with experience or interest in one or more of the following areas: molecular and cell biology, biophysics, optical instrumentation, and computer modeling. The positions are for 1 or 2 years. Please send curriculum vitae and 3 letters of reference to: **Barbara J. Trask, Ph.D. (Telephone: (206) 685-7347) or Ger van den Engh, Ph.D. ((206) 685-7345), Molecular Biotechnology, FJ-20, University of Washington, Seattle, WA 98195; FAX: (206) 685-7354. The University of Washington is an Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL—BIOCHEMISTRY

Two postdoctoral positions available May 1 and June 1, 1993, in group investigating the biogenesis and structure of membranes. Ongoing studies involve (i) the enzymology and function of a recently discovered pathway of phospholipid biosynthesis, and (ii) mechanisms that influence the association of prenylated GTP-binding proteins with specific organelles. Send curriculum vitae, three letters of recommendation and summary of career goals to: **Dr. John A. Glomset, Department of Biochemistry, SL-15, University of Washington, Seattle, WA 98195. Equal Opportunity/Affirmative Action Employer.**

CENTER FOR VASCULAR BIOLOGY UNIVERSITY OF WASHINGTON SEATTLE

A POSTDOCTORAL POSITION is available to study the regulation of expression of genes encoding the extracellular matrix proteins type I collagen and the thrombospondins. Of particular interest are the mechanisms by which growth factors influence the expression of these genes and the role of the proteins in angiogenesis and atherosclerosis.

Applicants with experience in molecular biology should send a résumé and the names of three references to:

**Dr. Paul Bornstein
Department of Biochemistry, SJ-70
University of Washington
Seattle, WA 98195**

Equal Opportunity Employer.

POSTDOCTORAL POSITION available July 1, 1993, to study recombination in the yeast *Saccharomyces cerevisiae*. Areas of interest include interactions between dispersed, repeated sequences; the relationship of recombination to chromosome segregation; and the characterization of novel recombination mutants. Applicants should have a strong background in genetics and/or molecular biology. Send curriculum vitae and names of three references to: **Dr. Sue Jinks-Robertson, Department of Biology, Emory University, Atlanta, GA 30322. Emory University is an Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN



POSTDOCTORAL POSITION available immediately to study the role of MITOCHONDRIAL LIPIDS in regulation of organelle biogenesis in yeast. A strong background in molecular biology and/or protein purification is preferred. Send curriculum vitae, summary of research experiences, and names, addresses, and telephone numbers of references to:

**Dr. Miriam L. Greenberg
Department of Biological Sciences
Wayne State University
Detroit, MI 48202
FAX: (313) 577-6891**

Wayne State University is an Equal Opportunity/Affirmative Action Employer.

Two **POSTDOCTORAL POSITIONS** available immediately to study (1) structure of T cell fibronectin and (2) mechanisms of interaction of T cell fibronectin with endothelial cytokines, and arachidonic acid metabolites during the initiation of delayed hypersensitivity inflammatory reactions. Experience in molecular biology, protein biochemistry and/or tissue culture is desirable. Send statement of research interests, curriculum vitae and names of three references to: **Dr. Henry P. Godfrey, Department of Experimental Pathology, New York Medical College, Basic Science Building, Valhalla, NY 10595. An Equal Opportunity/Affirmative Action Employer.**

The Department of Food Science, North Carolina State University, seeks qualified applicants for a Ph.D. USDA National Needs **GRADUATE FELLOWSHIP** in one of three targeted areas including: food safety, molecular mechanisms of food component functionality and aseptic and biological processing of food. Applications will be accepted beginning immediately. For information, contact: **Dr. Duane K. Larick, Box 7624, Department of Food Science, North Carolina State University, Raleigh, NC 27695. North Carolina State is an Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL FELLOWSHIP IN TUMOR IMMUNOLOGY HARVARD MEDICAL SCHOOL

Available immediately. NIH-funded postdoctoral fellowship in tumor immunology. Ongoing studies are seeking to determine the peptide sequence and genes coding a tumor-associated antigen identified by the host. Candidates with molecular biology and protein biochemistry experience preferred. Please send curriculum vitae and references, including telephone numbers to: **Daniel R. Vlock, M.D., Hematology/Oncology Division, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115. Harvard Medical School is an Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL FELLOW/RESEARCH ASSOCIATE—Available immediately for studies in the molecular genetics of Schizophrenia. The successful applicant will assume a highly visible and responsible position within a large collaborative group of basic scientists and clinicians. Requirements include a Ph.D. and/or M.D. with demonstrated experience in Molecular Biology and Molecular Genetics. Salary will be commensurate with experience. Please send letter outlining research experience and interests, curriculum vitae and the names and telephone numbers of three references to: **Larry D. Altstiel, M.D., Ph.D., Department of Psychiatry, The Mount Sinai School of Medicine, One Gustave L. Levy Place, New York, NY 10029-6574. An Equal Opportunity Employer.**

POSTDOCTORAL FELLOWSHIPS in gastroenterological research available for two or more years beginning 1993. Faculty employs multidisciplinary approach using biochemical, cell/molecular biological, immunological, physiological and electrophysiological techniques. Applicant may focus on clinical and/or basic studies. Applicants should have M.D. or Ph.D. degree and must be a U.S. citizen or have permanent visa status. Send curriculum vitae and names of three references to: **N. F. LaRusso, M.D., Program Director, NIH Training Grant, Mayo Clinic, Rochester, MN 55905. Mayo Foundation is an Affirmative Action and Equal Opportunity Educator and Employer.**

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**MOLECULAR/
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Ph.D. with 2+ years' postdoctoral experience to play integral part in interactive biology department. Responsibilities include leading project team involved in developing anticode therapeutics against cytokine/growth factor products. Disease targets may include inflammation, cancer, viral and/or cardiovascular. Reference SCI/139.

**SYNTHETIC
ORGANIC CHEMIST**

Ph.D. with 0-4 years' postdoctoral experience to join a multidisciplinary team responsible for designing and synthesizing novel moieties for conjugation to the company's proprietary antisense technology. Knowledge of molecular modeling, biochemistry and medicinal chemistry preferred. Reference SCI/201.

**BIOLOGISTS/
BIOCHEMISTS
(PROJECT MANAGERS)**

Ph.D. with 3+ years' postdoctoral pharmaceutical experience. Responsible for organizing and managing targeted projects, externally and/or internally. Must be able to effectively interact with outside investigators and collaborators and manage multiple projects simultaneously. Strong molecular/cell biology experience preferred. Reference SCI/215/216.

PHARMACOLOGIST

Ph.D. with 2+ years' postdoctoral pharmaceutical experience and extensive background in toxicology research and animal experimentation. Must be able to exercise independent judgment in developing methods, techniques and evaluation criteria for obtaining results. Reference SCI/217.

Backed by our proprietary technology, secure funding and strong corporate alliances, Genta offers to ambitious Scientists a superb research environment near La Jolla and Torrey Pines, along with an outstanding compensation package. Please send your resume, referencing position of interest, to: Genta, Inc., Human Resources/SCI_____, 3550 General Atomics Court, San Diego, CA 92121. We support diversity in our workforce/EOE.



National Institute of Environmental
Health Sciences
National Institutes of Health/ Public Health
Service
Research Triangle Park, North Carolina

**TENURE-TRACK AND POSTDOCTORAL
POSITIONS TO STUDY MECHANISMS OF
MUTAGENESIS AND GENOME STABILITY**

The Laboratory of Molecular Genetics has openings for tenure-track scientists interested in mutagenesis and genome stability, including any relevant aspect of enzymology, structural biology, chromosome mechanics or organismal biology. Applicants should have two to four years of postdoctoral experience and outstanding accomplishments. Applications will be considered on a continuous basis from March 1, 1993 until the positions are filled.

In addition, non-tenure-track postdoctoral positions are *occasionally* available in groups directed by the following senior investigators:

- **John W. Drake:** DNA prepare and mutagenesis in bacteriophage T4.
- **Thomas A. Kunkel:** DNA replication fidelity.
- **Michael A Resnick:** Recombination chromosome instability and cell progression in yeast.
- **Roel M. Schaaper:** Fidelity of DNA replication and repair in *Escherichia coli*.

Postdoctoral stipends start at or above \$25,000 per year depending on experience. Candidates with 2 years of previous postdoctoral experience are preferred. There is no application deadline.

*We are an Equal Opportunity / Affirmative Action Employer.
Women and minorities are strongly encouraged to apply.*

U.S. citizenship is preferred but not required. Candidates for positions at either level should send a curriculum vitae and the names, addresses and telephone numbers of three references to:

**NIEHS Personnel Office
HN61
P.O. Box 12233
Research Triangle Park, NC 27709
(919) 541-3317**



ONCOLOGY DRUG DISCOVERY

RESEARCH SCIENTISTS/ TECHNICIANS & POSTDOCTORAL RESEARCH FELLOWS

The Bristol-Myers Squibb Pharmaceutical Research Institute is at the forefront of cancer research in drug discovery and continues to expand its intensive efforts in this area. Under the direction of Dr. Bernd Seizinger, several positions are available at our Princeton, New Jersey facility.

Qualified candidates will have thorough experience in cell biology and/or molecular genetics. Research will involve the elucidation and functional analysis of tumor suppressor genes, and the development of mechanism-based screening assays for the systematic discovery of drugs mimicking the function(s) of tumor suppressor proteins. Creativity and the ability to work independently are necessary attributes. A Ph.D. and/or M.D. and an excellent publication record are required for postdoctoral research fellows. A Master's Degree is highly desirable for Research Scientists/Technicians.

A comprehensive benefits package and competitive salary will be offered. Please forward your resume to: **BRISTOL-MYERS SQUIBB PHARMACEUTICAL RESEARCH INSTITUTE, Human Resources**
Department PRI-323BM, P.O. Box 4000, Princeton, NJ 08543-4000. Equal Opportunity Employer, M/F/D/V.



Bristol-Myers Squibb Company

DEAN SCHOOL OF ENGINEERING



UNIVERSITY OF PITTSBURGH

The University of Pittsburgh invites applications and nominations for the position of Dean of the School of Engineering. Pittsburgh, long recognized as one of the nation's most liveable cities, presents a unique engineering environment employing over 25,000 engineers and scientists and maintaining over 170 research laboratories. Founded in 1787, the University of Pittsburgh is one of the oldest institutions of higher education in the United States. A strong, research-oriented university with a commitment to high-quality education, Pitt is a long time member of the Association of American Universities (AAU), the prestige group of research universities.

In its second century of educating engineers, the School of Engineering consists of a distinguished faculty of 123, along with fifteen hundred undergraduate and eight hundred graduate students. The School offers undergraduate and graduate engineering programs in chemical and petroleum, civil, electrical, industrial, mechanical, and materials science. Besides the strong research programs in each of these areas, the School recently implemented new interdisciplinary thrusts in bioengineering, manufacturing systems, and advanced materials.

The successful candidate should possess an earned doctorate in engineering, a distinguished record as a scholar showing commitment to excellence in teaching and research, a vision for the future of engineering education, the ability to provide motivational leadership, a commitment to planning and development, demonstrated administrative and organizational abilities, effective communication and interpersonal skills, an interest in fund raising, and the desire to continue to enhance the national and international prominence of the School.

The position is available September 1, 1993. Applicants should submit a curriculum vita and the names of three references to:

**Professor Savio L.Y. Woo, Chair
Engineering Dean Search Committee
801 Cathedral of Learning
University of Pittsburgh
Pittsburgh, PA 15260**

To ensure full consideration, applications must be received before July 1, 1993. Women and minorities are encouraged to apply. The University of Pittsburgh is an affirmative action, equal opportunity employer.

Courses in Techniques for Separation and Characterization of Complex Carbohydrates June 7-11 and June 14-18, 1993

Two courses will be offered at the Complex Carbohydrate Research Center (CCRC) of the University of Georgia. The first course (June 7-11, 1993), "The Separation and Characterization of Oligosaccharides Isolated from Glycoproteins", is intended for scientists with no experience with carbohydrate analysis. The second course (June 14-18, 1993), "Structural Analysis of Oligosaccharides", is intended for scientists with some experience with glycoconjugates or for those who have completed the first course, and will focus on techniques of composition and linkage analysis. Both courses will consist of hands-on laboratory work, demonstrations and lectures. A lab manual including selected analytical techniques and references will be provided. Each course is limited to 10 participants. Experience with basic biochemical techniques is a prerequisite for participation. The cost of registration per course is \$400 for individuals from non-profit institutions, \$1,000 for others. Lodging and food expenses are not included in the registration fee.

The courses are supported jointly by the Department of Energy-funded Plant and Microbial Carbohydrate Center, and the NIH Biomedical Carbohydrate Resource Center of the CCRC.

For further information or to apply for the courses contact:

**Dr. Roberta K. Merkle
Technical Director for Biomedical Carbohydrates
Complex Carbohydrate Research Center
220 Riverbend Road
The University of Georgia
Athens, Georgia 30602-4712.
Phone: 706-542-4402.
Facsimile: 706-542-4412.**

M.S. MOLECULAR GENETICS

DEKALB Plant Genetics, a leading agricultural seed company, is seeking M.S. level scientists to join our research program in maize biotechnology.

Gene Mapping Technology. Investigation and development of new methodologies in molecular marker mapping of quantitative trait loci in maize for application to our breeding research programs. Experience with current molecular biology techniques required; knowledge of genetics, gene mapping and quantitative trait analysis desirable.

Seed-Specific Gene Expression. Genetic engineering for improved grain composition. The successful candidate will be familiar with current molecular biology techniques for vector construction and analysis of transformed tissue cell culture techniques is desirable.

In addition to a stimulating scientific environment, we offer excellent salary, benefits, and relocation assistance to an attractive southeastern Connecticut shore community. Qualified applicants should submit their resume and the names, addresses and phone numbers of three professional references to:

**Katrina J. Henry
DEKALB Plant Genetics
62 Maritime Drive
Mystic, CT 06355-1958.**

An equal opportunity employer.



Pharmaceutical
Division

Institute for Dementia Research

Miles Inc., an internationally recognized pharmaceutical company and a leader in dementia drug research and development, has the following positions available:

SECTION HEAD OF MOLECULAR NEUROPATHOLOGY

We are currently looking for an experienced neuroscientist to set up and head a Molecular Neuropathology section.

This group will be part of the Institute for Dementia Research at the Miles Research Center, which is the US base of an international CNS business unit. The mission of this institute is to discover and develop new treatment opportunities for neurodegenerative disorders with particular focus on Alzheimer's disease.

Requirements of this position include a PhD or MD in neurosciences, with at least 8 years of successful experience in leading an interdisciplinary research laboratory. The candidate will also have a significant record of scientific achievements in molecular biology, cell biology and biochemistry, ideally in the identification and development of novel therapeutic agents.

For the above position, please send resume to: Dept. AAAU.

SENIOR RESEARCH SCIENTIST

We are looking for an independent research scientist with background and experience in Neuropharmacology/Molecular Cell Biology. This scientist will work together with several laboratories in an interdisciplinary approach

toward the discovery and development of therapeutics for the treatment of Alzheimer's disease and related disorders. This individual should have experience with molecular receptor pharmacology and second messenger systems, and will be involved in studying the molecular mechanisms underlying dementing disorders.

A PhD with 3-4 years' postdoctoral experience and demonstrated expertise as an independent investigator in molecular pharmacologic aspects of neuronal degeneration and regeneration is required.

For the above position, please send resume to: Dept. AARF.

SENIOR ASSOCIATE RESEARCH SCIENTIST

This position requires a BA/BS with 4 or more years' experience in Protein Biochemistry, Cell Biology, or Molecular Biology; or a Master's with 2+ years' experience in any of these areas. Experience in PCR, gene library screening, DNA construction, and RNA/DNA modification and analysis is also required. Tissue culture work is essential.

For the above position, please send resume to: Dept. ELAU.

We offer an excellent compensation, benefits and relocation package. Qualified candidates are invited to send their resume indicating the appropriate department and including salary history and objectives in confidence to: **Miles Inc., Pharmaceutical Division, Dept. _____, 400 Morgan Lane, West Haven, CT 06516.**

An Equal Opportunity Employer M/F/D/V.

R.O. ANDERSON FELLOWSHIP

Lovelace Medical Foundation, Albuquerque, New Mexico provides salary support up to \$35,000 from six to twelve months for visiting senior level scientist to engage in collaborative research with one or more scientists in the Center for Basic and Applied Medical Research and the Center for Health and Population Research.

Visiting Scientist will be actively involved in research in one or more of the following areas: 1) cardiopulmonary and/or environmental physiology; 2) cellular adhesion/signal transduction; 3) DNA damage and repair; 4) health services; 5) health policy; 6) substance abuse; 7) epidemiology; 8) NMRI studies of moving systems; 9) ³¹P MRS of exercising muscle; 10) photomedicine; or, 11) secretory physiology.

Applicants should send letter of interest and curriculum vitae to:

Judy Coalson
Director of Human Resources
Lovelace Medical Foundation
2441 Ridgcrest Drive SE
Albuquerque, NM 87108
505-262-7938.

AA/EEO/ADA EMPLOYER

STAFF SCIENTISTS *Gene Expression*

Targeted Genetics Corporation, a Seattle based company (evolved as an independent spinout of Immunex Corporation) is developing techniques for the treatment of infectious diseases and cancer using gene therapy. Our primary focus is on the reconstitution of immunity by adoptive transfer of genetically modified cytotoxic T lymphocytes.

We are searching for a Staff Scientist with expertise in the regulation of mammalian gene expression to fill a newly-created position in the Gene Expression department. The ideal candidate will have previous experience in the study of T lymphocyte gene expression and function, and experience with a variety of mammalian gene transfer and expression vectors. Several years of postdoctoral experience would be a distinct advantage.

Targeted Genetics offers competitive salaries and an excellent benefits package. We are located in the beautiful Pacific Northwest. For consideration, please submit your resume to: **Targeted Genetics Corporation, Attn: GE/2-93, 1100 Olive Way, Suite 100, Seattle, WA 98101.**

Targeted Genetics Corporation

Equal Opportunity Employer

POSITIONS OPEN

Two POSTDOCTORAL NIH TRAINING GRANT FELLOWSHIPS, available immediately. Fellowship 1, focusing on regulation of gene expression in animal models of obesity, requires molecular biology experience. Fellowship 2 focuses on omega-3 fatty acids and lipoprotein metabolism in humans/animal models. U.S. citizenship/permanent residency required. Send curriculum vitae, names/telephone numbers of 3 references to: Dr. B. Horwitz, Animal Physiology, UC Davis, CA 95616, Telephone: (916) 752-2559, FAX: (916) 752-5582 (Position 1) or Dr. S. Kasim, Division Clinical Nutrition, UC Davis, CA 95616, Telephone: (916) 752-6778, FAX: (916) 752-3470 (Position 2). Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL FELLOWSHIPS

Multidisciplinary research program addressing role of actin and actin-related proteins in cell and organ function. Projects available employing cell biological, biochemical, or molecular genetic (including transgenic) technology. Inquire: Division of Experimental Medicine, Brigham and Women's Hospital (affiliate of Harvard Medical School), 221 Longwood Avenue, Boston, MA 02115. Candidates must be U.S. citizens or permanent residents. Minority candidates encouraged to apply. Brigham and Women's Hospital is an Equal Opportunity/Affirmative Action employer.

POSTDOCTORAL FELLOW: A position is available immediately for a postdoctoral fellow to participate in studies using *in situ* hybridization to explore human vascular disease. The goal of these studies is to define factor(s) synthesized locally in the vessel wall which contribute to inflammation, thrombosis, smooth muscle differentiation and/or proliferation in atherosclerosis and post-angioplasty restenosis. Previous experience in molecular biology, pathology, and/or cell biology is desirable. Send curriculum vitae and names of three references to: Dr. Josiah N. Wilcox, Drawer AJ, Department of Medicine, Emory University, Atlanta, GA 30322. We are an Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL FELLOWSHIP NEUROSCIENCE

Available immediately in the Neurosciences Unit, Loeb Research Institute, Ottawa Civic Hospital & University of Ottawa. We use *in vivo* and *in vitro* preparations, current and patch clamp recording techniques, immunocytochemistry, anatomical tracer methods and *in situ* hybridization. We study the cell biology, neurophysiology and pharmacology of CNS neurons and circuitry regulating hydromineral and cardiovascular homeostasis. Applicants with a strong background in cellular neurophysiology and/or gene expression preferred. Salary commensurate with MRC rates. Send curriculum vitae, a short statement of interests and names of 3 references to: Dr. Leo Renaud, Neurology Division, Ottawa Civic Hospital, 1053 Carling Avenue, Ottawa, Ontario, Canada K1Y 4E9.

POSTDOCTORAL RESEARCH FELLOWSHIP

Laboratory investigating pathophysiology and treatment of focal cerebral ischemia using *in vivo* model. Techniques include microsurgery, autoradiography, microdialysis and blood-flow measurements. Neuroprotective strategies include glutamate antagonists, hypothermia and calcium blockers. Contact: Dr. Gary K. Steinberg, Department of Neurosurgery, Room S-006, Stanford University, Stanford, CA 94305-5327.

POSTDOCTORAL ASSOCIATES GROUNDWATER RESEARCH

The University of Wyoming supports an interdisciplinary research group dealing with detection, prevention, and remediation of groundwater contamination. Several one- or two-year postdoctoral positions are being offered among the following areas: geochemistry, soil chemistry, mathematical modelling, analytical chemistry, geostatistics, microbial/molecular/chemical remediation, soil physics, and hydrogeology. Interested parties should submit a letter of application, résumé, transcripts, and a list of four (4) references to: Wyoming Water Resources Center, P.O. Box 3067 University Station, University of Wyoming, Laramie, WY 82071-3067. Applications will be reviewed by participating faculty as received with a closing date of May 1, 1993. The University of Wyoming is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

POSTDOCTORAL RESEARCH POSITION MEMBRANE SYNTHESIS DURING THE CELL CYCLE

A position is available to study the mechanisms of membrane biogenesis in a macrophage cell line. The ongoing research is focused on the biochemical signals that stimulate the genetic expression of phosphocholine cytidyltransferase, the enzyme which regulates membrane phosphatidylcholine synthesis, and cell cycle control of the posttranslational modification of cytidyltransferase activity. Techniques routinely used include tissue culture, Northern, Southern and Western blots, DNA sequencing, library screening, protein expression using baculovirus vectors, PCR-mediated mutagenesis, metabolic labelling, enzymology, and immunoprecipitation. Interested candidates with a recent Ph.D. degree should send curriculum vitae to: Dr. Suzanne Jackowski, Biochemistry Department, St. Jude Children's Research Hospital, 332 North Lauderdale, Memphis, TN 38101. An Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL RESEARCH ASSOCIATES

Opportunities for postdoctoral research training and experience in Department of Microbiology and Immunology. Available project areas include: aberrant regulation of cytokine and receptor gene expression in transformed hematopoietic cells (Dr. James McCubrey); co-stimulatory pathways regulate cytokine production and tolerance induction in rodent models of autoimmune disease (Dr. Mark Mannie); regulation of glucose transporter isoforms in fibroblast cultures (Dr. Martyn White); and mechanisms and regulation of iron acquisition in *Bordetella pertussis* (Dr. Armstrong). Additional areas may include genetics of metabolic regulation in *Pseudomonas*, genetics of antibiotic resistance and regulation of steroid metabolism in anaerobic bacteria. Nationally competitive salaries with fringes. Applicants should have the Ph.D. degree with training and experience in relevant areas of microbiology, molecular genetics, and immunology. Send cover letter, complete curriculum vitae, publication reprints, and the names, addresses, and telephone numbers of three reference individuals to: Postdoctoral Screening Committee, Department of Microbiology and Immunology, East Carolina University School of Medicine, Greenville, NC 27858-4354.

East Carolina University is an Affirmative Action/Equal Opportunity Employer. Federal law requires proper documentation of identity and employability at time of employment. It is requested this documentation be included with your application.

POSTDOCTORAL RESEARCH POSITION for an M.D. or Ph.D. will be available in the summer and fall of 1993 in the Department of Neurology and Neuroscience, Laboratory of Cellular Neuroscience, Cornell University Medical College to study the molecular and cellular processes that result in neurodegeneration. Our work specifically focuses on the neuroprotective role of peptide growth factors in the brain and retina and the effects of ischemic induced nitric oxide toxicity. Experimental approaches include cultures with primary hippocampal neurons, gene induction, expression of growth factor receptors, pharmacological manipulation of neuronal survival, and global and focal animal stroke models. Salary will be consistent with NIH guidelines. Please send curriculum vitae, a summary of research interests, and three references to: Dr. Kenneth Maiese or Dr. John A. Wagner, Department of Neurology, Room E615A, Cornell University Medical College, 1300 York Avenue, New York, NY 10021. Cornell University Medical College is an Equal Opportunity/Affirmative Action Employer.

NEUROLOGICAL INSTITUTE Columbia-Presbyterian Medical Center

RESEARCH ASSOCIATE position for electrical engineer in hospital-based laboratory investigating clinical motor physiology. Applicant must have Master's degree in electrical engineering or equivalent, expertise with data acquisition electronics and programming in the Macintosh operating system. Preference given to candidates with experience in physiological data collection and analysis. Send curriculum vitae and three letters of reference to: Dr. Seth Pullman, Director, Clinical Motor Physiology Laboratory, The Neurological Institute, Columbia-Presbyterian Medical Center, 710 West 168th Street, New York, NY 10032. Columbia University is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

POSTDOCTORAL RESEARCH ASSOCIATE position available immediately to investigate the mechanism of regulation of the SOS response in *Bacillus subtilis*. A combination of biochemical and molecular biological approaches will be utilized in this study. Experience with protein purification desirable. Please send curriculum vitae and three letters of recommendation to: Dr. Ronald E. Yasbin, Department of Biological Sciences, University of Maryland, Baltimore County Campus, Baltimore, MD 21228-5398. Applications will be accepted until a suitable candidate is found. UMBC is an Equal Opportunity Employer.

Cornell University. Two positions in macromolecular crystallography are available at the Cornell High Energy Synchrotron Source (CHESS). (1) **SENIOR STAFF SCIENTIST** will devote 50% effort to developing macromolecular crystallography at CHESS and 50% effort to establishing independent research projects utilizing synchrotron radiation. (2) **POSTDOCTORAL RESEARCH ASSOCIATE** will carry out crystallographic research utilizing synchrotron radiation for structure determination, especially as applied to structure-based drug design. Resources include both conventional and synchrotron X-ray instrumentation, extensive computing and graphics facilities, the Cornell Supercomputer Center, modern biochemical equipment and a stimulating intellectual environment. Located in the heart of the Finger Lakes Region of New York, the Ithaca area provides a variety of both summertime and wintertime outdoor activities. Salary is commensurate with experience. Contact: Dr. Steven E. Ealick, Section of Biochemistry, Molecular & Cell Biology, 207 Biotechnology Building, Cornell University, Ithaca, NY 14853. Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL RESEARCH POSITION available immediately to study the structure and regulation of myotendinous junctions. Particular emphasis is placed on growth factor-mediated control of junction structure during muscle development and adaptation. Technical approaches used include cell culture, immunocytochemistry, protein biochemistry, electron microscopy, Western and Northern blots. Send curriculum vitae and three letters of reference to: Dr. James G. Tidball, Department of Physiological Science, University of California, Los Angeles, CA 90024-1527.

RESEARCH ASSOCIATE position available for studies of the role of collagenases in tumorigenesis. Research will focus on the use of molecular biological techniques to study collagenases in cell lines. Send curriculum vitae and letters of recommendation to: Drs. L. B. Hersh and S. K. Chan, Department of Biochemistry, University of Kentucky, Lexington, KY 40536-0084. An Equal Opportunity/Affirmative Action Employer.

BIOCHEMIST/PHARMACOLOGIST

An entry-level **TENURE-TRACK POSITION** is available starting September 1993 at Indiana University School of Optometry. The successful candidate is expected to teach medical biochemistry and to give a limited number of lectures in medical and/or ocular pharmacology to optometry students. An active and externally funded research program in vision sciences or in areas that may be extended into vision sciences is expected, as is active participation in the Ph.D. training program. Two years of postdoctoral experience are required. A background in basic medical sciences is preferred. Review of completed applications will begin March 20, 1993. Send curriculum vitae and arrange to have three letters of recommendation sent to: Dr. Sally Hegeman, Associate Professor, Indiana University, School of Optometry, 800 East Atwater Avenue, Bloomington, IN 47405. Indiana University is an Affirmative Action/Equal Opportunity Employer.

SYSTEMS ECOLOGIST sought to assist the climate change integrated assessment project at Carnegie Mellon University in a program to summarize and model views of the ecological research community about possible impacts of climate change. Particular attention will be paid to developing new procedures for obtaining carefully constructed subjective judgments from research experts. Contact: M. Granger Morgan, Head, Department of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA 15213. Telephone: 412-268-2672. Carnegie Mellon University is an Affirmative Action/Equal Opportunity Employer.

DEAN OF SCIENCE

Georgia Institute of Technology

Georgia Institute of Technology invites nominations and applications for the position of Dean of the College of Sciences. The Dean of Sciences occupies a key and central role in the life of the Institute and must function effectively as part of the central management team. Leadership and creativity will be required in further development of strong undergraduate and graduate programs, as well as in the area of economic development.

The Georgia Institute of Technology is situated on an attractive campus in the heart of Atlanta, a large and genuinely livable city with great economic and cultural strengths. The Institute, which is a member of the University System of Georgia, is composed of four Colleges in addition to the College of Sciences: Architecture, Computing, Engineering and the Ivan Allen College of Management, International Affairs and Public Policy. The College of Sciences is the second largest of the Colleges with an annual budget of about \$25,000,000 (\$15,000,000 from state funding and \$10,000,000 from external funding).

The College of Sciences consists of the Schools of Biology, Chemistry and Biochemistry, Earth and Atmospheric Sciences, Mathematics, Physics and Psychology and the Department of Health and Performance Sciences. Through these Schools, the College offers undergraduate and/or graduate degrees in fields spanning traditional, specialized and interdisciplinary areas. In addition there are a number of multidisciplinary programs including: polymer science, surface science, materials sciences, medicinal chemistry, molecular genetics, biophysics, microbiology, environmental science, geochemistry, geophysics, cognitive sciences, discrete mathematics, statistics, and algorithms, combinatorics and optimization.

Professor George L. Nemhauser, Chair
College of Sciences Dean Search Committee
School of ISyE
Georgia Institute of Technology
Atlanta, Georgia 30332-0205

Georgia Tech is an equal opportunity, affirmative action employer.

The nearly 170 academic faculty members of the College of Sciences attracted over 200 new research grants and contracts for fiscal year 1991, totalling over \$10 million. In addition they participated in joint research with faculty in the other colleges of the Institute, the Georgia Tech Research Institute and the Institute for Paper Science and Technology, the research budgets of which exceed \$100 million/yr. A substantial faculty increase is anticipated in the College during the next five years.

The fall 1991 Institute enrollment was nearly 13,000 students made up of 9,500 undergraduate and 3,500 graduate students. Entering freshmen have an average SAT score above 1220. Almost 800 undergraduates and 500 graduate are majoring in areas within the College of Sciences. In the academic year 1991-1992, the College of Sciences granted 134 Bachelor, 63 Master, and 36 Ph.D. degrees.

Search committee review of credentials will begin immediately, but nominations and applications will be accepted for consideration until the position is filled. Acceptable candidates should have a Ph.D. with a minimum of ten years of professional experience, and outstanding career as a scholar and administrative experience. We hope to make a selection in time for the new dean to take over duties on July 1, 1993. Applications, including a curriculum vita and names and addresses of four references, should be mailed to:


DIRECTOR/SENIOR SCIENTIST Protein Biochemistry

Cell Genesys, an exciting biotechnology company located in the San Francisco Bay Area, is pioneering the human therapeutic applications of gene targeting and related technologies.

Cell Genesys is recruiting a **Director or Senior Scientist** to lead the effort to establish protein chemistry capabilities utilized in the discovery of novel proteins and in the definition of initial process recovery procedures of protein products entering clinical development.

This position is responsible for building a protein chemistry group based in the research organization whose essential functions include interacting with other scientists in the identification and characterization of novel proteins with therapeutic potential; the development of methodology for the analytical scale purification of proteins derived from a variety of expression systems; and contributing to the overall product development and regulatory approval process of novel human therapeutic products. Ph.D. in Biochemistry or a related field, plus a minimum of 7 years experience in protein purification in an academic or industry setting as well as 5 years experience in recruiting, training, and managing appropriate staff required.

Cell Genesys offers a competitive salary, excellent benefits, and equity participation. For immediate consideration, send your resume to: **Paula Bogard (11.5.1), Cell Genesys, 322 Lakeside Dr., Foster City, CA 94404.** An equal opportunity employer.

 **CELL • GENESYS**

The Research Triangle Institute (RTI) has openings for individuals with supervisory experience in:

- **Quantitative Immunoassays**
- **Veterinary Clinical Chemistry**
- **Xenobiotic Metabolism.**

A Ph.D. in pharmacology, chemistry, or closely related discipline; thorough theoretical understanding and excellent laboratory, communication (oral and written) and collaborative/personal relationship skills are required. Competence in two of the scientific areas listed above or also in pharmacokinetics, mechanism of enzyme action, or nose-only inhalation metabolism is desired.

The successful candidate will be involved in all aspects of research programs including design of studies, supervision/conduct of the research, organization/interpretation of data, and preparation of research reports and manuscripts.

RTI offers a scientifically stimulating environment in a multidisciplinary research organization. Ongoing programs in organic, bioorganic and medicinal chemistry, toxicology and life sciences offer opportunities for collaborative research. The Research Triangle Park is noted for both its science and its quality of life.

Please send your resume, a description of your pertinent experience and research goals, and the names of 3 references to:



Research Triangle Institute
Office of Human Resources (BOC-F)
P.O. Box 12194
RTP, NC 27709.

An Equal Opportunity/Affirmative Action Employer (M/F/D/V)

Myco Pharmaceuticals Inc., a newly established pharmaceutical company based in Cambridge, MA, is committed to innovation in anti-infective drug discovery and development.

As we accelerate the progress, we're adding strength to our scientific team with these positions:

SENIOR SCIENTISTS

LEAD DISCOVERY

You'll be responsible for all aspects of our innovative microbial and mammalian cell-based assays aimed at the discovery of novel anti-infective agents. Additional responsibilities include improvement of existing assays, introduction of new assays, assay automation, follow-up studies on active materials, quantitative assay support to chemists, record and data base maintenance and involvement in selection, supervision and training of new laboratory staff.

FERMENTATION AND MICROBIOLOGICAL RESEARCH

Responsibilities include the acquisition and maintenance of a substantial and unique fungal culture collection; development of methodology for the selective isolation from their natural habitat of a very broad range of fungi and their reproducible fermentation; taxonomic studies on selected organisms; and provision of appropriately processed fermentation samples to the lead discovery and chemistry groups.

Both positions require a PhD, or the equivalent, preferably with 5 or more years' postdoctoral and/or industrial experience in mycology, fungal genetics, fermentation studies, antimicrobial studies, molecular and cell biology or biochemistry.

These scientists must be of the highest professional and personal caliber with excellent communication skills, a high level of scientific curiosity and the ability to work enthusiastically and cooperatively in a multidisciplinary environment.

ASSOCIATE SCIENTISTS

LEAD DISCOVERY AND FERMENTATION RESEARCH

Requirements include a BS/MS, or the equivalent, with employment and educational backgrounds in microbiology, molecular biology, natural product lead discovery, data and laboratory management, and automation.

If you're intrigued by the opportunities we offer, and our compelling research and development, please send your resume to:
Recruiting, Myco Pharmaceuticals Inc., Suite 2200, One Kendall Square, Cambridge, MA 02139.

MYCO PHARMACEUTICALS INC.

MICROPROBE CORPORATION

Recent market introduction of MicroProbe Corporation's infectious disease diagnostic test system, ongoing research and product development, and expansion of our Therapeutics Division have created numerous career opportunities for highly motivated individuals.

Your education in chemistry or the biological sciences and directly related experience in R&D, DNA probe technology, laboratory, and/or the pharmaceutical or biotechnology industries, coupled with interest in being part of a rapidly growing team, may be a perfect fit with our organization. Headquartered in the Seattle area, we have current and future openings at various levels in:

**Diagnostics Systems Research & Development
Antigene Therapeutics Research
Oligonucleotide Synthesis
Quality Control Management
Sales & Marketing/Technical Services
Reagent Manufacturing**

MicroProbe offers much more than a competitive salary and benefits package, including stock options. To begin exploring opportunities with a biotechnology leader focused on market needs, please send your resume, with cover letter, to: **MicroProbe Corporation, ATTN: HR/Scientific Employment, 1725 220th Street, S.E., #104, Bothell, WA 98021.**

EOE

M/F/V/D

DEAN FOR RESEARCH AND DIRECTOR, FLORIDA AGRICULTURAL EXPERIMENT STATION

The Dean for Research and Director of the Florida Agricultural Experiment Station administers statewide food, agricultural and natural resources research programs for the UF's Institute of Food and Agricultural Sciences (IFAS). Research activities are located in 20 departments in Gainesville, 13 Agricultural Research and Education Centers throughout the state, 8 multidisciplinary centers, the School of Forest Resources and Conservation, and the College of Veterinary Medicine. The Dean reports directly to the Vice President for Agriculture and Natural Resources and provides programmatic leadership for research in food and agriculture, natural resources, environmental quality, human nutrition, rural development and related areas. The Dean provides administrative leadership in the hiring, placement, tenure, promotion and salary of research faculty and staff. The Dean is expected to maintain a close working relationship with the Deans for Extension, Academic Programs and College of Veterinary Medicine. He/she is responsible for implementing the Affirmative Action Programs of the University of Florida and the Florida Agricultural Experiment Station.

Applicants for this position are asked to submit a resume of education, experience and publications, and the names and addresses of five (5) references by May 14, 1993. Those wishing to nominate candidates should do so by contacting the Search Committee Chair by April 2, 1993. Women and Minorities are encouraged to apply.

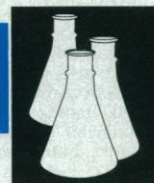
**REFER TO POSITION #918010
SUBMIT APPLICATIONS,
NOMINATIONS AND INQUIRIES TO:
Dr. Robert J. Fert, Chair
Search Committee for the Dean for Research
University of Florida
P.O. Box 110180
Gainesville FL 32611-0180**

POSTDOCTORAL POSITIONS

Postdoctoral openings are available in the Department of Molecular Biology and Biochemistry at the University of California, Irvine. These positions are for 1 or 2 years under the sponsorship of the following faculty members: D. Aswad: biochemistry of neural functions. B.K. Burgess: biochemistry and genetics of nitrogen fixation. M.G. Curnsky: mitochondrial biogenesis, mitochondrial protein import and gene expression in yeast. R. Davis: biochemical genetics of *Neurospora*. E. Ehrenfeld: molecular mechanisms of replication in poliovirus and hepatitis A virus. H.Y. Fan: animal virology nucleic acid studies in murine leukemia viruses. C. Glabe: developmental biology; cell-cell interactions. G.A. Granger: cell and molecular mechanisms operative in cellular immunity. B.A. Harnkalo: eukaryotic chromosome structure and function. A. Henschen: structure-function relationships in proteins. A.A. James: molecular biology of insect vectors of infectious diseases. J.E. Manning: gene sequence organization in eukaryote DNA, electron microscopy. R. Miledi: neurotransmitter receptors and synaptic functions. M.B. O'Connor: molecular genetics of development. T. Poulos: protein x-ray crystallography and protein engineering. D.F. Senear: regulatory energetics and protein-DNA assemblies. T. Osborne: molecular biology of transcriptional regulator proteins. W.M. Stanley, Jr.: protein biosynthesis in eukaryotic cells. A. Tenner: molecular basis of the enhancement of leukocyte function. K.K. Tewari: nucleic acids of chloroplasts and other organelles. S. Tewari: neuro-molecular biology and CNS acting drugs. L.P. Villarreal: molecular biology of small DNA viruses. E.K. Wagner: nucleic acids and molecular biology of herpesvirus replication. C.A. Woolfolk: general microbiology, enzymology. For further information contact or write to: The Department of Molecular Biology and Biochemistry, University of California, Irvine, CA 92717. The Department of Molecular Biology and Biochemistry encourages female and minority applicants to apply. The University of California is an Equal Opportunity/Affirmative Action Employer committed to excellence through diversity.

Make a vital contribution to drug discovery within the Pharmaceuticals Research Division of Sterling Winthrop Inc. Join an interdisciplinary team dedicated to the discovery of novel biologically active molecules from natural sources.

NATURAL PRODUCTS RESEARCH RESEARCH SCIENTISTS



The following positions are available in the Natural Products Biology Department at our new state-of-the-art research and development facility located in Collegeville, PA, north of Philadelphia:

INDUSTRIAL MICROBIOLOGIST

This position involves culturing and curation of a wide variety of soil microorganisms; in addition, growth requirements and secondary metabolism of selected microorganisms will be characterized. Qualified candidates will possess a BS in Microbiology, Biochemistry, Cell Biology, or related field (or equivalent experience). Proficiency with aseptic culturing technique is essential. Familiarity with organic extraction and partitioning procedures is highly desirable. Experience with computer databases management is a plus. (Position #GV-01-93)

MICROBIAL BIOCHEMIST

This position will entail growth of unusual microorganisms, organic solvent and resin extractions of cultures, and analysis of metabolites produced. Biocatalytic reactions and analysis of products will also be performed. Qualifications include a BS plus 2 years related experience (or MS) in Biochemistry, Microbiology or a related field. Skills in analytical biochemistry with emphasis on HPLC are essential. Experience in industrial microbiology, enzymology, and computerized data collection and analysis is highly desirable. (Position #GV-270-92)

FERMENTATION SCIENTIST

This position will be responsible for conducting microbial fermentations and managing the fermentation laboratory as well as scheduling and executing batch fermentations and extractions. Responsibilities also include use and maintenance of computer controlled bench-top fermentation equipment. BS/MS in Biochemical Engineering, Microbiology, or related field necessary. Experience in industrial microbiology, specifically the fermentation of filamentous soil microorganisms, is essential. Working knowledge of computer controlled fermentors and chromatography systems necessary. (Position #GV-02-93)

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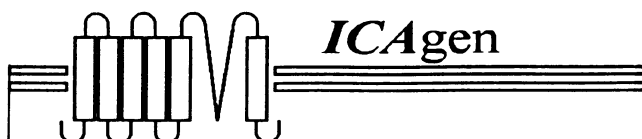


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UNIVERSITY OF WARWICK

LECTURESHIPS IN THE DEPARTMENTS OF MATHEMATICS AND BIOLOGICAL SCIENCES

Applications are invited for the following three lectureships:

Lectureship in Applied Analysis: Required in the **Department of Mathematics**. Preference will be given to analysts in areas such as pde's, fluid mechanics, numerical analysis, stochastic analysis, control theory and nonlinear systems who will contribute to the University's Interdisciplinary Mathematics Research Programme. Candidates from other areas or pure and applied mathematics may apply. Ref. 27/A/92/62

Two Lectureships in Mathematical Biology: Each of the two departments are appointing a lecturer in this area. For the post in the **Mathematics Department**, preference will be given to candidates working in a field of mathematical biology. It is hoped that the candidate will interact with research groups of the **Departments of Mathematics and Biological Sciences**, and in particular with the Nonlinear Systems Laboratory and the newly-created group in Ecosystem Analysis and Management under Professor J.M. McGlade. Applications will also be considered from mathematicians in other fields who will interact strongly with the University's Interdisciplinary Mathematical Research Programme. Ref. 27/2A/92/62

Lecturer in Mathematical Biology or Theoretical Ecology: Required by the **Department of Biological Sciences** as part of the Ecosystem Analysis and Management group. This group is involved in transdisciplinary research and graduate teaching in theoretical ecology and evolutionary biology; coastal and marine science; resource economics, ethics and governance; biomathematics and dynamical systems modelling; and the application of earth observation technologies. The successful applicant will be expected to play an active role in the Interdisciplinary Mathematical Research Programme, and interact with other established groups in the Biological Sciences that cover microbiology, virology and plant biochemistry. Ref. 27/3A/92/62

These positions are tenable from 1 October 1993. Salary on the Lecturer Grade A scale: £13,400 - £18,576 pa.

Informal enquiries to either Professor D.A. Rand (e-mail: dar@maths.warwick.ac.uk) or Professor J.M. McGlade (e-mail: jmg@oikos.warwick.ac.uk). Application forms (returnable by 12th March 1993) and further particulars from the Personnel Office, University of Warwick, Coventry CV4 7AL, UK (telephone UK +44 203 523627) quoting appropriate reference number clearly on envelope.

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POSITIONS OPEN

PHARMACOLOGIST

A progressive and dynamic Bay Area Biopharmaceutical Company seeks Pharmacologist for CNS/PNS drug development. Must have extensive experience with *in vivo* and *in vitro* models including experimental design, interpretation and statistical evaluation. Requires a Ph.D. and a minimum of two years of experience, preferably in industry, and proven communication skills particularly in writing protocols and reports. Send résumé to: BL-S1, Neurex Corporation, 3760 Haven Avenue, Menlo Park, CA 94025.

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The University of Michigan Department of Neurology is seeking applicants for the position of **LECTURER IN NEUROLOGY** to conduct research on the role of GABA_A receptor currents in status epilepticus and partial epilepsy. Candidates must be board eligible in Neurology and have a strong research background in electrophysiology of epilepsy. A clinical fellowship in epilepsy is desirable. Candidates should submit curriculum vitae, and a brief statement summarizing research interests to: Dr. R. L. Macdonald, M.D., Ph.D., Department of Neurology, 1108 Neuroscience Building/1687, University of Michigan, Ann Arbor, MI 48104-1687.

PULMONARY IMMUNOLOGIST

The National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC), is seeking a qualified Immunologist for its new, state-of-the-art laboratory, currently under construction in Morgantown, West Virginia. The position resides in the Immunology Section, Laboratory Investigations Branch, Division of Respiratory Disease Studies, NIOSH. The successful candidate will be expected to develop an applied research program on immunologic aspects of occupational lung disease in addition to supporting and contributing to ongoing research efforts. Prior experience in conducting independent research is preferred. Current research focus for the Section is inflammatory effects of agricultural dusts (including microbial contaminants) and occupational asthma. Specific qualifications are regulated by the U.S. Office of Personnel Management. The position may be filled as a Commissioned Officer in the U.S. Public Health Service or in the Federal Civil Service System. Inquiries about the position can be directed to: Dr. Daniel Lewis, Chief, Immunology Section, DRDS, 304-291-4256.

For immediate consideration, send curriculum vitae to:

Ronda Braham-Smith
DRDS/NIOSH, MS 217
944 Chestnut Ridge Road
Morgantown, WV 26505-2888
Telephone: (304-291-4693)

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Attention: Colette McKenna

For additional information, call Ms. McKenna at (212) 977-9550.

POSITIONS OPEN

ADMINISTRATOR for program and committee support in scientific society in Philadelphia. Five years work experience desired. Requires detail-oriented person with excellent writing skills, versatility, and computer literacy. Graduate degree preferred. Science background or association management experience valuable. Send resume, covering letter, desired salary, and writing sample to: AJ, P.O. Box 54335, Philadelphia, PA 19105.

MOLECULAR BIOLOGIST. Campbell Research and Development, a division of the Campbell Soup Company, is seeking a molecular biologist. Responsibilities include continuation of ongoing tomato genetic improvement projects and development of molecular detection systems for seed-transmitted and food-borne pathogens. Position is available March 1, 1993. Requirements include an M.S. and demonstrated molecular biology expertise. Knowledge of genetics, RFLP's, PCR and plant biology desirable. Salary and benefits competitive and commensurate with qualifications. Send letter of application, résumé, transcripts and names of references to: Ms. Dawn Adams, Campbell Institute for Research and Development, 28605 County Road 104, Davis, CA 95616; Telephone: 916/753-2262 extension 32, FAX: 916/753-2238.

SENIOR RESEARCH SPECIALIST TOXICOLOGY RESEARCH

Senior toxicologist needed for active laboratory conducting GLP studies and basic research. The successful candidate will be expected to spend up to 25% of his or her time in basic research programs. Areas of interest are open; however, preference will be given to individuals with experience in drug metabolism and/or neurotoxicity. A Ph.D. and postdoctoral experience is required. Salary is competitive, depending on experience. Please send curriculum vitae with three references to: Dr. Barry S. Levine, Director, Toxicology Research Laboratory (M/C 868), Department of Pharmacology, The University of Illinois at Chicago (UIC), 1940 West Taylor Street, Chicago, IL 60612-7353. UIC is an Equal Opportunity/Affirmative Action Employer.

RESEARCH PHARMACOLOGIST

Position will involve the development of research plans ranging from experimental design and results interpretation to future research projections for the development of controlled release microcapsule formulations. Additional duties include training junior staff and overseeing his work, writing independent research proposals and reports. Requires Ph.D. in Physical Pharmacy with knowledge of pharmaceuticals involving the encapsulation of various chemical compounds and a demonstrated research capability as indicated by extensive publications in high-quality journals. Educational training should include the use of various analytical instruments such as HPLC, nuclear magnetic resonance, Fourier transform IR spectrometer, and various pharmaceutical equipment including pan coating, Wurster coating machine, and tablet compressor. Salary \$40,500 per year for 40-hour week. Send résumé to: Sandra T. Starnes, Alabama State Employment Service, 3440 Third Avenue South, Birmingham, AL 35222. Job Order #4074187. Affirmative Action/Equal Opportunity Employer.

MOLECULAR GENETICIST: Department of Pediatrics, University of Arizona, is seeking a geneticist with primary research emphasis in basic molecular genetics to join an active section with one molecular, one biochemical and four clinical geneticists. Qualifications include: M.D. degree; ABMG certification or eligibility in molecular genetics. Position is tenure-eligible, ASSISTANT PROFESSOR level, and part of the new Mammalian Molecular and Developmental Genetics Unit of the Steele Memorial Children's Research Center. Contact: Robert Erickson, M.D., Department of Pediatrics, University of Arizona College of Medicine, Tucson, AZ 85724. Telephone: 602-626-5483. University of Arizona is an Equal Employment Opportunity/Affirmative Action Employer. Review of applicants begins March 1, 1993, to continue until position is filled. Women and minorities are encouraged to apply.

POSITIONS OPEN

ENVIRONMENTALIST IV \$31,960-\$38,142

Division of Public Health Services, Bureau of Health Risk Assessment, Concord, New Hampshire. Full-time. Temporary till June 30, 1993. (Position expected to become permanent July 1, 1993.) Duties include: Supervises, plans and assigns work to staff performing environmental health risk assessments and related health studies, develops risk assessment procedures as necessary. Minimum Qualifications: B.A. from a recognized college or university with major in a related environmental science. Each additional year of approved formal education may be substituted for one year of work experience. Six years of experience as an Environmental Engineer or Environmentalist in a public health related area, two years of which shall have involved supervisory duties as well as the preparation of various environmental documents, legal briefs or related research. For further information contact Brook Dupee at 603-271-4664. An official State Application for Employment may be obtained from, and returned to: Department of Health and Human Services, 6 Hazen Drive, Concord, NH 03301, attn: Human Resources, Telephone: 603-271-4286. A transcript must be attached to the application. Recruitment will remain in effect until position is satisfactorily filled. An Equal Opportunity Employer.

Ph.D.: CELL and MOLECULAR BIOLOGIST for colon cancer research project; to work with multispecialty research team. University appointment. For further information write to: Dr. D.G. Miller, Strang-Cornell Cancer Research Laboratory, 428 East 72nd Street, New York, NY 10021.

ANNOUNCEMENTS

SHARING OF LABORATORY RESOURCES: GENETICALLY ALTERED MICE

On March 22 and 23, 1993, the Board on Biology of the National Research Council will hold a workshop in Washington, D.C., to explore factors that influence the sharing of valuable and unique laboratory resources in biological research, focusing on genetically altered mice as a case study that has generated widespread interest and debate. For more information contact: Paulette Adams, National Academy of Sciences, NAS 358, 2101 Constitution Avenue, N.W., Washington, DC 20814, (FAX: 202-334-1687).

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LIFE SCIENCE ASSOCIATES, the country's oldest and largest producer of Bioscience Job Fairs, announces national expansion in 1993! Meet directly with more decision-makers from leading Biotech/Biomed/Pharmaceutical firms than any other source can provide. To attend or have your résumé/curriculum vitae distributed to participating companies at the San Francisco event, send copy to: Life Science Associates/Career Expo, Department S, 2100 Embarcadero, #101, Oakland, CA 94606. For exhibit information, Telephone: 510-436-3992.

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The University of Pittsburgh Medical Center (UPMC) and the Pittsburgh Cancer Institute are seeking applicants for new **FACULTY POSITIONS** in the areas of molecular biology and immunology of human brain tumors. By close cooperation between the Department of Neurosurgery and the Pittsburgh Cancer Institute, a major Brain Tumor Research Program is being developed. Dr. Paul Kornblith from Neurosurgery and Dr. Mark Gilbert from Neuro-Oncology are Co-directors of the Clinical Neuro-Oncology Program. The individual recruited for this research position will be able to focus on their own individual area and have the opportunity to train graduate students, as well as participating in basic molecular biological and/or immunology research in the brain tumor field. Faculty appointment, at the Assistant or Associate Professor level, jointly in clinical and basic science department is available. Salary will be in the \$40,000 to \$75,000 range commensurate with background and training. Successful applicants will be given laboratory space in the new Biomedical Science Tower of the UPMC, start-up equipment and other support. In order to ensure full consideration, applications must be received by February 26, 1993.

To obtain more information and to submit an application, write to **Ronald B. Herberman, M.D., Chairman of Search Committee and Director of the Pittsburgh Cancer Institute, 200 Meyran Avenue, Pittsburgh, PA 15213; telephone: (412) 647-8586.**

The University of Pittsburgh is an Affirmative Action, Equal Opportunity Employer.

BIOLOGY TENURE TRACK FACULTY

Salem State College, a comprehensive liberal arts institution located 25 miles north of Boston, is seeking applicants for 2 tenure track faculty positions in Biology. Preferred are persons who enjoy serving as role models and mentors for a diverse student body, and who have experience in and/or commitment to working in a multiracial, multiethnic environment with students of diverse backgrounds and learning styles. Salary is competitive and commensurate with education and experience. Positions are offered pending funding.

Biological Chemistry. Responsibilities include teaching Biological Chemistry lectures and laboratories and Introductory Biology lectures and laboratories with possible assignment in physiology areas. Qualifications include a Ph.D in Biology or Biological Chemistry, at least 2 years of college level lecture and laboratory teaching, specific and current knowledge of Biological Chemistry, and a general biology background. Additional experience in Allied Health areas and/or supervising undergraduate internships is highly desirable.

Vertebrate Biology. Responsibilities include teaching Comparative Vertebrate Anatomy lectures and labs and Introductory Biology lectures and labs with possible assignments coordinating Allied Health/Biology concentrations. Qualifications include a Ph.D in Biology or Vertebrate Biology, at least 2 years of college level lecture and lab teaching experience, current knowledge of Vertebrate Biology and a General Biology background. Additional experience in Allied Health areas and/or supervising undergraduate research or internships is highly desirable.

To apply, send letter of application specifying position for which you are applying, resume and names, addresses and telephone numbers of 3 references to: **Office of Affirmative Action, Salem State College, 352 Lafayette St., Salem, MA 01970.**

If applying for more than one position at Salem State College, submit separate packages for each. Single applications for more than one position will not be considered.

Closing Date: 3/5/93.

SALEM STATE COLLEGE IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER. PERSONS OF COLOR, WOMEN AND PERSONS WITH DISABILITIES ARE STRONGLY URGED TO APPLY.

Salem State College

ANNOUNCEMENTS

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ADVANCES IN MARICULTURE: A Basic Science Approach to Solving Problems of Maintenance and Culture of Marine Organisms Used In Biological Research. May 16-29, 1993 at the Marine Biological Laboratory. This lab and lecture course is intended for 20 scientists, advanced technicians and students. The course emphasizes four themes: (1) ecological approach to water quality, system design and disease prevention, (2) nutrition and metabolism, (3) settlement, growth and behavior, and (4) reproduction and genetic manipulation. Recent developments in molecular biology, biotechnology and computer automation will be addressed. Participants will visit the MBL's new Marine Resources Center, other Woods Hole laboratories, and local clam, scallop and lobster mariculture facilities. Director: Roger T. Hanlon, Marine Biomedical Institute, Galveston. Tuition: \$1200. Applications Due: March 15, 1993. For information contact: Dori Chrysler, Admissions Coordinator, MBL, Woods Hole, MA 02543. Telephone: (508) 548-3705.

MUTAGENESIS AND TISSUE CULTURE LAB

Three-week, approximately 90-hour Washington, D.C. training, intended as an introduction to the field. Work with CHO cells, human diploid fibroblasts, and Ames test. May 10 to 28, 1993. Tuition \$1750 including materials costs; must provide own accommodations and food. CME credit available. Enrollment limited to four. Information: Dr. David Busch, AFIP-CPV, Washington, D.C. 20306-6000; FAX: (202) 576-2164.

JACKSON LABORATORY announces a course for graduate students and postdoctoral fellows. **Experimental Genetics of the Laboratory Mouse**, August 22-September 2, 1993. An intensive two-week course that provides training in principles of mouse genetics and methods of genome analysis. The combination of lectures, discussion groups, and demonstrations will be presented by a faculty assembled from several leading institutions. Inquiries/Applications: Phyllis Mo-braaten, The Jackson Laboratory, 600 Main Street, Bar Harbor, ME 04609, Telephone: (207) 288-3371, extension 1376. Enrollment: limited to 30 students. Registration Fee: \$950, includes room and board at the historic Highseas Conference Center.

COURSES AND TRAINING

NINTH ANNUAL SOMATIC CELL AND MOLECULAR GENETICS WORKSHOP July 11-24, 1993

Limited to 16 students. This NCI-supported course provides a combined somatic cell and molecular biology workshop experience, designed to provide an intensive "hands-on" introduction to the methodology and concepts of current molecular biology procedures for scientists with established research programs that would benefit from utilizing these techniques. The content of this workshop also provides the basic techniques needed for researchers interested in initiating genome mapping studies. Included in the curriculum are somatic cell fusion and mutagenesis; gene transfer; cloning; DNA and RNA preparation; Southern, Northern and Western analysis; sequencing; cDNA library screening and PCR, FISH, PFGE and YAC technologies. A per diem stipend is provided. Application Deadline: March 31, 1993. Applicants should submit a letter describing how the workshop will assist their current research, along with curriculum vitae that lists publications (no abstracts) for the past five years only, to: Peggy J. Woodson, Somatic Cell & Molecular Genetics Workshop, Eleanor Roosevelt Institute, 1899 Gaylord Street, Denver, CO 80206, Telephone: (303) 333-4515. Registration fee: \$200. Please DO NOT send registration fee at this time.

The Eleanor Roosevelt Institute is an Equal Opportunity/Affirmative Action Institution and invites and encourages applications from women and minorities. Open to U.S. Citizens and Permanent Residents only.

MEETINGS

CALCIUM AND NEURONAL PLASTICITY.
Conference Date: June 7-8, 1993. Sponsor: National Institute of Child Health and Human Development, NIH. Location: Lister Hill National Center for Biomedical Communications, NIH, Bethesda, Maryland, USA. Conference registration is free. For registration materials and preliminary program, call: (301) 654-9321 or FAX: (301) 718-2630, Ober United Travel, Inc., 4407 Willard Avenue, Chevy Chase, MD 20815, USA. Attention: Judith A. Gauchel, Director of Meetings.

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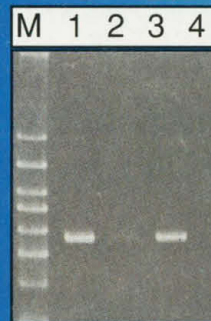
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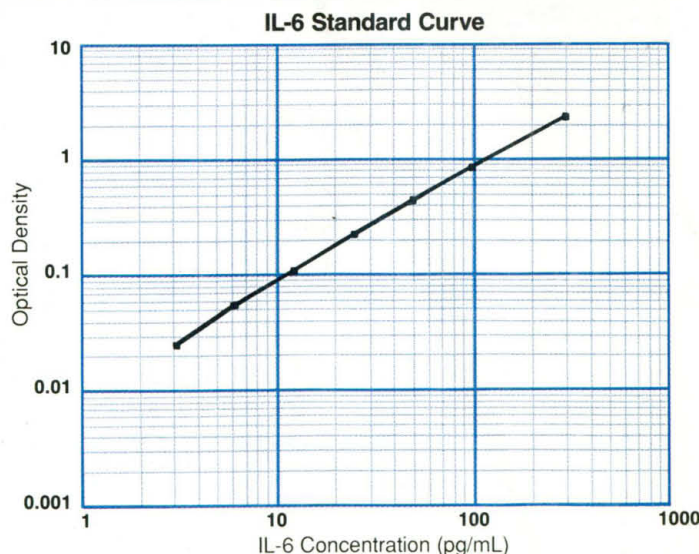
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