

cepts. As defined by Marcia Ascher in a chapter on the mathematical ideas of the Incas, a quipu is "an assemblage of colored knotted cords. The colors of the individual cords, the way the cords are connected together, the relative placement of the knots and spaces between the knots are all part of the logical-numerical recording." The quipus were featured dramatically in the movie *Chariots of the Gods*, but Ascher provides diagrams of quipus with examples of the numerals represented in place-value notation by the knots. She also shows that the knots and colors of the cords of a quipu may represent a matrix-like array of numbers.

Petroglyphs have been found and puzzled over on every continent of the world, but William Breen Murray in his study of numerical representations in North American rock art indicates that only recently have archeologists been able to provide much material evidence bearing on the early forms of numbers. Archeologists assume that a particular example of rock art is more likely to be a number if its graphic representation displays certain logical properties of the numbering process such as symbolic repetition, graphic symmetry, and complex ordering. A particularly intriguing "petroglyphic count stone" found in Mexico is analyzed in detail. Breen provides photographs and diagrams indicating that the marks on the stone constitute a lunar calendar.

What is the motivation for a society to develop the concept of number? This question is addressed in a chapter by J. Peter Denny. Denny illustrates the point that people need numerals when describing objects having unknown properties with a charming account of a courtroom situation in which a hostile attorney concluded that because an Indian hunter did not know how many rivers were in the region under litigation he was unfamiliar with the territory and his testimony should be discounted. According to Denny the hunter had no need for the number of rivers because he knew intimately every turn of every river there. The need for number is also created by machines that turn out identical objects. Numbers are needed in describing sets of objects that differ only in their quantity.

At various points in the papers presented in *Native American Mathematics* reference is made to the opposing viewpoints of the diffusionists and the independent inventionists. As A. Seidenberg writes in a chapter on the zero in Mayan numeration, "The Diffusionist tends to regard the duplicate appearance of a cultural element, say an invention, as evidence of historical connection. Correspondingly, the Independent Inventionist tends to regard such occurrences as evidence that the mind works similarly under similar

circumstances." Scholars of the diffusionist persuasion find it easy to believe that some of the culture of the pre-Columbian Native Americans was influenced by contact with the Old World. The writers of *Native American Mathematics* do not come down definitely on either side of this issue.

Only a few of the 13 chapters in *Native American Mathematics* have been mentioned here. The book should be on the shelf as a companion to a standard history of mathe-

matics, and it will be essential for educators concerned with the mathematical training of modern Native American students. Educators and others interested in ethnomathematics owe a debt of gratitude to the historians, anthropologists, archeologists, and linguists who have contributed to the book.

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- Workshop on Unified String Theories*, M. Green and D. Gross, Eds., 21 Nov. 1986, 1017
- Yeast Cell Biology*, J. Hicks, Ed., 16 Jan. 1987, 374

## Products & Materials

### ***Biodegradable Scintillation Cocktail***

Ready Safe is a biodegradable, drain-disposable liquid scintillation cocktail with a high counting efficiency. Ready Safe's flash point is 150°C, and it is considered non-flammable in most countries. A low vapor pressure minimizes leakage of toxic fumes into the laboratory. Ready Safe has a sample-holding capacity as much as 30% larger than other aqueous cocktails. Beckman Instruments, Nuclear Systems Operations. Circle 605.

### ***Graphics Software for Map Making***

DSI/Contour and DSI/CMap are now available for personal computers and have the same features as the mini and mainframe computer versions. DSI/Contour converts a file of (x, y, z) coordinates into a contour map. Both line and random gridding is possible. Line widths, line styles, and smoothing are at the choice of the user. DSI/CMap translates contour map data into colors; both standard and shaded relief maps are possible. Both programs allow output to more than 100 devices and operate on many 32-bit computers, such as the IBM PC and compatible computers, DEC VAX, Prime, and Data General computers. Dataplotting Services. Circle 628.

### ***Technical Word Processing Software***

T<sup>3</sup> Scientific Word Processing System 2.2 was designed to allow simple entry of complex expressions such as equations, chemical structures, multiple levels of sub- and superscripts, and foreign alphabets. Macros may be created. Equations, boldface, italics, underline, line spacing, fonts, and sub- and superscripts appear on the screen as they will be printed. Included with the system are fonts for italics, script, mathematical symbols, chemistry, accent marks, and the Greek and Cyrillic alphabets; the user may change the keys to which characters are assigned

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.

and design new characters. Decimal tabs and user-defined tabs are available along with regular tabs. The spelling checker contains 80,000 words, and the user may set an interval for automatic document saving. T<sup>3</sup> operates on IBM PC and compatible computers with a graphics adapter or card. TCI Software Research. Circle 614.

### ***Stacking Microplate Reader***

The EL320 Stacking Autoreader measures and analyzes the absorbance values of as many as 25 microplates at once. A computer controls the process from reading the plates and storing the data through restacking the microplates. The user can then perform statistical, regression, or kinetic analysis. The EL320 may be interfaced with a mainframe or personal computer. Bio-Tek Instruments. Circle 632.

### ***Optical Disk Drive***

Each small, removable disk of the 3363 Optical Disk Drive can hold 200 megabytes of data. The write-once, read-many-times disks are especially suited to storing large amounts of data such as catalogs, historical



documents, or sets of technical manuals. The 3363 may also act as a save-restore facility for large hard disks. As many as eight drives may be hooked to some computers, allowing storage of 1.6 billion bytes. The 3363 is compatible with Personal System/2 and most IBM XT and AT computers. IBM. Circle 597.

### ***Interferometric Instrument***

The Laser Doppler Velocimeter and Particle Analyzer measures particle size and velocity of flows. Particles or bubbles with diameters between 0.5 and 8000  $\mu\text{m}$  may be measured in situ and nonintrusively through phase shift data from scattered laser light. Software controls the setup and operation. Data may be collected as fast as 70,000 samples per second. Aerometrics. Circle 633.

### ***NLQ Dot-Matrix Printer***

The P321SL is a 24-pin dot-matrix printer with a near-letter quality (NLQ) mode, a draft mode, and a high-density graphics mode. The printer prints 72 characters per second in high-quality mode and 216 in draft mode. The printer has a built-in tractor feed; cut sheets may be used without unloading the tractor-feed paper. The P321SL has no dual in-line package (DIP) switches; instead, touch controls on the front control functions such as a quiet mode; selection of pitch, emulation, lines per inch, and page length; and courier, prestige elite, draft, condensed, and proportional fonts. Other fonts may be downloaded or inserted in card slots on the printer. The P321SL also has 32 kilobytes of resident memory. Toshiba. Circle 637.

### ***Bookkeeping Software for Grants***

GRANT TRACKER is a menu-driven bookkeeping program designed to keep track of grant funds and expenses. The computer automatically calculates balances and commitments from expenses and other information entered by the researcher. "What-if" calculations are possible; however, the data are only changed if the user requests that these calculations be saved. Searches may be performed. GRANT TRACKER operates on IBM PC and compatible computers. KCS Software. Circle 630.

### ***Literature***

*The Separation Times* is a quarterly newsletter devoted to advances in separation science, especially gas chromatography. J & W Scientific. Circle 619.

*VoluQuant Calibrator Testing Kit* is an instruction manual showing how to check the accuracy of microbiological loops, microtiter diluters, pipettes, pipettors, and automatic diluters. Quantimetrix. Circle 622.

*Controlled Environment Walk-in Rooms* contains specifications for components of rooms with customized environments. Hot-pack. Circle 621.

*High Performance Detectors for Gas Chromatography* is a brochure about eight types of detectors and how to match a detector with an application. Tracor Instruments. Circle 627.

*Shakers* is a 20-page catalog of open-air orbital, controlled-environment orbital, multiwrist, and water bath shakers. Lab-Line Instruments. Circle 643.

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**The Fifth Conference  
on Modern Approaches to Vaccines  
MODERN APPROACHES TO NEW VACCINES  
INCLUDING PREVENTION OF AIDS  
September 9-13, 1987**

Organized by:

**Fred Brown**, *Wellcome Biotechnology Ltd.*  
**Robert Chanock**, *National Institutes of Health*  
**Harold Ginsberg**, *Columbia University*  
**Richard Lerner**, *Scripps Clinic & Research Foundation*

The meeting will provide:

1. *comprehensive updates on strategies for development of vaccines against viral, bacterial, and parasitic diseases;*
2. *discussions on AIDS, presenting latest research on the AIDS retrovirus and prospects for developing a vaccine;*
3. *discussions on the latest research on structural/chemical aspects of antigen-antibody union and antigen presentation and processing.*

The abstract deadline is JULY 1.

Requests for registration and/or abstract materials  
should be forwarded to:

**Meetings Coordinator**  
**Cold Spring Harbor Laboratory**  
**P.O. Box 100**  
**Cold Spring Harbor, NY 11724**  
**(516) 367-8346**

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# Personnel Placement

**SCIENCE** publishes each Friday, except the last Friday of the year. Advertising is accepted only in writing; no abbreviations. Any deadline in ad must be at least 2 weeks after date of issue in which ad appears. Also, personnel advertising is accepted only with the understanding that the advertiser does not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, handicap, or sexual preference.

## LINE CLASSIFIED ADVERTISING DEADLINES:

Thursday, 10 a.m., 2 weeks prior to issue date (mailed on issue date).

**POSITIONS WANTED:** 40¢ per word, plus \$4 for use of box number, per week. \$10 minimum, per week. Prepayment required. This rate is available only to individuals seeking jobs.

**LINE CLASSIFIED (POSITIONS OPEN, COURSES, FELLOWSHIPS, MARKETPLACE, and so forth):** \$35.00 per line; \$350 minimum, per week (minimum charge covers one inch on a single column; one inch equals 10 lines of 52 characters and spaces per line). No charge for use of box number. No agency commission for ads less than 4 inches. No cash discount. Prepayment required for all foreign ads. Purchase orders and/or cover letter including billing address required for all other advertising.

## To ESTIMATE ad cost:

Structure ad copy on a separate page, on lines of 52 characters and spaces. Include any desired heading. Each line of heading, and/or extra line spaces, and all partial lines (including centered reply information) are counted as full lines. Ad titles located within the text are printed in boldface caps and are only 42 characters per line. In ESTIMATING the cost, multiply total lines  $\times$  \$35.00 = approximate cost of ad. (This is an approximate cost ONLY: Allow for variation between estimated lines and actual typeset lines and the resulting final cost. Purchase orders must allow for some degree of flexibility and/or adjustment.)

## CANCELLATION POLICY:

NOTE: Ad cancellations made after Thursday, TWO weeks prior to issue date incur a 10% production charge. Final deadline for cancellations is 12 p.m. Tuesday, ONE week prior to issue date. Cancellations must be in writing.

Send copy for all **Positions Wanted** ads and **Line Classified** ads less than 1/6 page in size (39 lines) to:

**SCIENCE Classified Advertising**  
1333 H Street, NW, Room 940  
Washington, DC 20005  
Telephone: 202-326-6555

Send copy for **Fractional Display** ads, 1/6 page and larger, and all **Marketplace** ads to:

**Scherago Associates, Inc.**  
1515 Broadway  
New York, NY 10036  
Telephone: 212-730-1050

Blind ad replies should be addressed as follows:

**Box (give number)**  
**SCIENCE**  
1333 H Street, NW  
Washington, DC 20005

## POSITIONS WANTED

**Ph.D. Biophysics, computational and theoretical.** Twenty publications; 4 years of postdoctoral experience in protein structure, polymer configuration and conformational analysis; seeks industrial, hospital, academic, or senior postdoctoral position. Box 73, *SCIENCE*. 5/22, 29

**Protein Biochemist/Cell Physiologist.** Ph.D. Ten years of experience isolating and characterizing protein for structure and function; seeks academic or industrial position. Strong background in biochemistry, electrophysiology and retinal physiology. Box 69, *SCIENCE*. 5/22, 29; 6/5

**Zoologist, B.S. Animal Scientist, B.S.** Experience; neural/behavioral, teratology, and toxicology research. Seeks a position in any type of animal research. Will relocate. Available: 15 June 1987. Box 74, *SCIENCE*. 5/22, 29; 6/5, 12

## POSITIONS OPEN

### FBI LABORATORY/ANALYTICAL CHEMISTS

The Forensic Science Research Unit of the FBI Laboratory invites applications for two Ph.D. analytical chemists to conduct research to develop new and improved analytical methods in the analysis of trace physical evidence. The first candidate must have a strong analytical background with demonstrated experience in GC and GC/MS. The second candidate must have experience in liquid, gel permeation, and ion chromatography. The chemists are expected to publish research results in recognized scientific journals, participate in scientific meetings and conduct training in specialized schools for state and local crime laboratory personnel. The FBI Laboratory facilities are located in an academic setting at the FBI Academy, Quantico, Virginia. Please send résumé and names of three references by 15 June 1987 to: SA Michael G. Noblett, Research Unit Chief, FSRTC, FBI Academy, Quantico, VA 22135. Starting salary level \$27,172 to \$38,727 (GS 11-13) commensurate with experience. *The FBI is an Equal Opportunity Employer. U.S. citizenship required.*

**ANIMAL PHYSIOLOGIST.** Assistant professor. Earned doctorate with postdoctoral experience preferred. Tenure track, opening August 1987. Responsibilities include undergraduate and graduate instruction in human anatomy, physiology, and pathophysiology. Direction of master and doctoral students. Evidence of strong teaching competency and research effort are essential. Salary \$24,000. Submit curriculum vitae, official transcripts, and three letters of reference by 19 June 1987 to: Dr. Rod R. Seeley, Department of Biological Sciences, Idaho State University, P.O. Box 8007, Pocatello, ID 83209. *Idaho State University is an Equal Opportunity Employer.*

**ANATOMIST.** The Ohio College of Podiatric Medicine invites applications for a faculty position with primary responsibility for teaching a comprehensive course in lower extremity anatomy. This is a full-time, career position at the assistant or associate professor rank. Applicants must demonstrate the abilities to teach in a medical school setting and to develop an independent research program. Candidates must have a Ph.D., D.P.M., and/or M.D. degree, or the equivalent. Submit letter of interest, curriculum vitae, and three references to:

Cecelia A. Wylie  
Director of Personnel Services  
Ohio College of Podiatric Medicine  
10515 Carnegie Avenue  
Cleveland, OH 44106

Application due date 19 June 1987.  
*Equal Opportunity Employer*

**ASSISTANT PROFESSOR:** Physical chemist to teach physical, inorganic, and analytical chemistry, beginning fall 1987. Ph.D. required. Interest in developing an undergraduate research program. Teaching assignment may include general chemistry and nonmajor physical science. Salary dependent upon experience and qualifications. Liberal fringe benefits. Send letter of application, résumé, and names, addresses, and telephone numbers of three references to: Dr. Thomas J. Craft, Sr., Dean of Faculty, Florida Memorial College, 15800 NW 42nd Avenue, Miami, FL 33054 by 5 June 1987.

*FMCI is an Equal Opportunity/Equal Access Institution.*

**ASSISTANT PROFESSOR—INDIANA UNIVERSITY SCHOOL OF MEDICINE.** The Department of Physiology and Biophysics invites applications for a full-time tenure-track position in cellular physiology. Outstanding candidates with a Ph.D. and/or M.D. degree, at least 2 years of postdoctoral experience, and a strong commitment to developing an independent research program of high quality are sought. Applicants who use modern approaches to study cell function are preferred. Specific areas include cell-to-cell signaling (transmitters/hormones/growth factors), interactions with cell membrane (ion channels/transport proteins/receptors) and intracellular modulation (effect on cytoskeleton/secretion). Responsibilities include participation in the departmental teaching of medical and graduate students. Send outline of research plans, curriculum vitae, and names of three references by 30 June 1987 to: Dr. Rodney A. Rhoades, Professor and Chairman, Department of Physiology and Biophysics, Indiana University School of Medicine, 635 Barnhill Drive, Indianapolis, IN 46223. *Indiana University is an Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

### UTAH STATE UNIVERSITY DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

**ASSISTANT PROFESSOR.** Tenure track, to participate in interdepartmental Molecular Biology/Biochemistry Program. Research emphasis on molecular approaches to the structure and function of nucleic acids; experience in recombinant DNA technology desired. Teaching includes molecular biology and nucleic acid biochemistry. To be filled during the 1987 to 1988 academic year. Send résumé, description of future research interests, and names of at least three references by 30 June 1987 to: Dr. E. A. Boeker, Utah State University, Logan, UT 84322-0300. *Affirmative Action/Equal Employment Opportunity.*

**ASSISTANT PROFESSOR—MICROBIOLOGY—WILDLIFE/FISH DISEASES (Ph.D.).** Tennessee Technological University is seeking a highly qualified individual to fill a tenure-track position in the Department of Biology beginning September 1987. The individual will be expected to teach general bacteriology and courses in wildlife/fish diseases and related areas. The individual will also be expected to direct the research of graduate students in the program and to develop an extensive program of research and scholarly activity in the area of wildlife and/or fish diseases. Candidates must have the Ph.D., have a demonstrated record of research activity, and be committed to excellence in teaching. Salary will be commensurate with experience and qualifications. Closing date is 1 July 1987 or until filled. Interested persons should send letter of application, complete résumé, and the names, addresses, and telephone numbers of four references to: Dr. Susan H. Goss, Microbiologist Search Committee, Department of Biology, Box 5063, Tennessee Technological University, Cookeville, TN 38505. *An Affirmative Action/Equal Opportunity Employer.*

### ASSISTANT PROFESSOR PHYSIOLOGY

The Department of Physiology at the University of Minnesota invites applicants for a 12-month or 9-month academic year tenure-track appointment at the assistant professor level beginning as soon as September 1987. Selection will be based primarily on demonstrated research excellence. Applicants must have at least 2 years of postdoctoral experience and be prepared to carry out independent research. The research may involve any system or tissue but preference will be given to applicants who utilize the methods of cellular or molecular biology to examine physiological problems. The applicant will be expected to participate in the teaching programs of the department. Last date for receipt of application: 15 July 1987. Send curriculum vitae, graduate transcripts, a summary of planned research, and three letters of recommendation to: Dr. David Levitt, Department of Physiology, 6-255 Millard Hall, 435 Delaware Street SE, University of Minnesota, Minneapolis, MN 55455.

*The University of Minnesota is an Equal Opportunity Educator and Employer and specifically invites and encourages applications from women and minorities.*

The Department of Microbiology at The Ohio State University invites applications for a tenure-track **ASSISTANT PROFESSORSHIP IN VIROLOGY**. Candidates with interests in an aspect of viral disease or disease prevention are particularly encouraged to apply; however, candidates with expertise in any viral system will be considered. The successful candidate must have demonstrated research potential by recent publications and will be expected to develop and maintain an independent research program, teach an undergraduate course in general virology, participate in the general teaching responsibilities of the Department, and train graduate students. Candidates should have a Ph.D. degree and at least 2 years of postdoctoral experience.

Candidates should submit curriculum vitae, a summary of research plans, and names of three references to: Dr. Bruce S. Zwillig, Chairman, Virology Search Committee, Department of Microbiology, College of Biological Sciences, The Ohio State University, 484 West 12th Avenue, Columbus, OH 43210. The position is available starting autumn 1987. Applications will be accepted until the position is filled. *The Ohio State University is an Affirmative Action/Equal Opportunity Employer.*



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The above candidate must also possess strong communications skills and a desire to carry out independent research while functioning as part of an interdisciplinary research team.

The Dow Chemical Company offers a stimulating work environment and a competitive salary and benefits package.

Send resume to:  
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P.O. Box 1655  
Midland, MI 48641-1655**



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Immunex Corporation, a Seattle based biotechnology company pursuing research and development of protein pharmaceuticals and immunoregulatory therapeutic products, currently has an opening for a Research Scientist with post-doctoral experience in cellular immunology.

The successful candidate is expected to have conducted independent research and to have demonstrated an ability to work well in collaborative settings. Recent experience in areas of autoimmunity and/or hematopoiesis is preferred. Applicants are encouraged to have a thorough knowledge of molecular immunology and have demonstrated their research abilities through publications in peer-reviewed journals.

Immunex is a leader in the development of lymphokines as therapeutic agents. We offer excellent opportunity for career development as well as competitive salaries and an excellent benefits package. For consideration, please submit C.V., 3 references and a list of publications to:

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Interested candidates should send resume to:

*The Cutting Edge of Molecular Biology*

**IBI, P.O. Box 9558, New Haven, CT 06535.**



## POSITIONS OPEN

**ASSISTANT PROFESSOR, PLANT IMPROVEMENT—MOLECULAR GENETICIST:** Academic year, tenure-track position. Teach undergraduate course in plant improvement which includes both classical and molecular approaches and graduate level course(s) to meet the needs of the program. Develop a program of research in genetic and molecular mechanisms of plant response to stress, growth, or development that can attract outside funding. Participate in cooperative research within the department; offer expertise and guidance to other programs as needed. Ph.D. required. At least 1 year of postdoctoral training preferred. Submit letter of application, curriculum vitae, names of three professional references, statement of anticipated research interests by 1 July 1987 (applications will be accepted until position is filled) to: **William R. Krul, Search Committee Chair, Assistant Professor, Plant Improvement—Molecular Geneticist (190226) Position, The University of Rhode Island, P.O. Box G, Kingston, RI 02881. An Affirmative Action/Equal Opportunity Employer M/F.**

### ASSISTANT OR ASSOCIATE PROFESSOR

In the Department of Biochemistry, Boston University School of Medicine. The specific research interests of applicants are less important than the quality of the research. However, preferential consideration will be given to applicants whose interests lie in the biochemistry and molecular biology of cellular regulatory mechanisms. The successful applicant will have the opportunity to interact with biochemists, cell biologists, molecular biologists, and clinicians within the Boston University Medical Center. Applicants should submit their curriculum vitae, list of publications, statement of present and future research interests, and three letters of recommendation by 15 July 1987 to: **Dr. Carl Franzblau, Chairman, Department of Biochemistry, Boston University School of Medicine, 80 East Concord Street, Boston, MA 02118. Equal Opportunity Employer M/F.**

### ASSISTANT OR ASSOCIATE PROFESSOR

Position available within the Department of Biochemistry for an individual to develop a basic research program in the cell biology, immunology, and/or molecular biology of the arterial wall in association with a well-funded group of basic and clinical scientists studying mechanisms of atherosclerosis. Send curriculum vitae, statement of research interests, and three letters of recommendation by 15 July 1987 to: **Dr. Carl Franzblau, Chairman, Department of Biochemistry, Boston University School of Medicine, 80 East Concord Street, Boston, MA 02118. Equal Opportunity Employer M/F.**

**BIOCHEMIST—RESEARCH ASSOCIATE** to run a University Central Facility for protein/nucleic acid synthesis/analysis. Responsibility for operation of automated DNA/protein synthesizers, protein sequencer, and amino acid analyzer. Requires competence in general laboratory procedures for proteins and nucleic acids, as well as laboratory management. Competitive salary and benefits, commensurate with experience. Ph.D. preferred. Send résumé and names of references and salary requirements to: **J. N. Hansen, PNA Laboratory, Box 26, Department of Chemistry and Biochemistry, University of Maryland, College Park, MD 20742. An Equal Opportunity Employer. Closing date for applications: 5 June 1987.**

### BIOLOGISTS

We seek two individuals with proven competence in applying the techniques of modern molecular biology using either a plant, animal, or prokaryotic model. The specific field is open. The departmental environment is one of active research programs with the majority of our faculty funded from external sources. The successful candidates should share our philosophies and goals of excellence in both teaching and research. The appointments will be as tenure-track assistant professors, preferably starting January 1988. *Women and minorities are especially encouraged to apply; candidates with postdoctoral experience are preferred.* Applications including three letters of reference, a brief summary of research goals, and representative papers should be sent by 15 July 1987 to: **Dr. Eugene M. Goodman, Department of Biological Sciences, University of Wisconsin—Parkside, Kenosha, WI 53141. Telephone: 414-553-2422. An Equal Opportunity/Affirmative Action Employer.**

## POSITIONS OPEN

**ASSISTANT/ASSOCIATE PROFESSOR OF BIOCHEMISTRY.** An additional tenure-track faculty position is available in 1987 to 1988 for an individual with at least 3 years of postdoctoral experience. Candidates with research interests in cellular biochemistry and metabolism, receptor structure and function, hormone action and transmembrane signaling, molecular biology, and neurochemistry are particularly encouraged to apply. Applicants will be expected to perform independent research, obtain extramural funding, and participate in the teaching of biochemistry to graduate and professional students. Modern laboratory space, core equipment, and competitive salary will be provided to the successful candidate. Applicants should send curriculum vitae, outline of research plans, three letters of reference, and most significant reprints to:

**John N. Fain, Ph.D.  
Van Vleet Professor and Chairman  
Department of Biochemistry, College of Medicine  
University of Tennessee, Memphis  
800 Madison Avenue, Memphis, TN 38163  
Attention: Cheryl M. Colson**

*The University of Tennessee is an Equal Opportunity/Affirmative Action Employer.*

### BIOCHEMIST

Available immediately in a pediatric research hospital setting. Duties include virus growth and purification, cell culture, nucleic acid, gel electrophoresis, data collection and recording, operation of centrifuges, scintillation counters, and optical density instrument, as well as checking cell culture incubators to ensure proper working conditions. B.S. degree required in chemistry or biology, as well as 2 years of biochemist or medical research experience. Experience with preparation of monoclonal antibodies and P-3 pathogenic viruses is also required. Salary \$320 weekly. Send résumés to: **Jack Hiltzheim, Department of Employment Security, 1295 Poplar Avenue, Memphis, TN 38104. An Equal Opportunity/Affirmative Action Employer.**

### BIOMECHANICS

This position provides important support for various research projects as well as provides an opportunity to engage in your own independent studies. A significant portion of your time will be spent performing and analyzing biomechanical tests utilizing an M.T.S. 858 Servohydraulic programmable materials tester and running standard analytical and statistical software programs on an IBM-XT. If you are a graduate-level engineer and are competent in the processing and analysis of histomorphometric specimens, you are invited to send your résumé and salary requirements referring to position #2345 to: **Ron Bowie, The Johns Hopkins University, School of Medicine, 241 Hampton House, 624 North Broadway, Baltimore, MD 21205. Equal Opportunity Employer/Affirmative Action.**

### PHYSIOLOGICAL ADAPTATION TO WEIGHTLESSNESS

**CARDIOVASCULAR/RENAL PHYSIOLOGIST** to play key role in design and management of research projects to be flown on NASA Life Sciences Space Shuttle missions. M.D. or Ph.D. with research experience in fluid and electrolyte homeostasis. Send letter of application, curriculum vitae, and three references to: **Dr. M. C. Moore-Ede, Department of Physiology, Harvard Medical School, 25 Shattuck Street, Boston, MA 02115. Equal Opportunity Employer**

**CHAIRPERSON, DEPARTMENT OF PEDIATRICS,** University of Texas Southwestern Medical School (UTSWS) at Dallas, Dallas, TX. The University of Texas Southwestern Medical School at Dallas, a vibrant academic community, is seeking a Chairperson for the Department of Pediatrics. The Chair also serves as Chief of Pediatrics at Parkland Memorial Hospital (125 beds plus newborn facilities) and the Children's Medical Center (122 beds), teaching affiliates of UTSWS. Candidates shall have demonstrated leadership in academic pediatrics and have carried out meritorious research as evidenced by publication in the peer-reviewed literature. Send curriculum vitae to: **Daniel W. Foster, M.D., The Jan and Henri Bromberg Professor in Internal Medicine, and Chair, Pediatric Search Committee, University of Texas Southwestern Medical School, 5323 Harry Hines Boulevard, Dallas, TX 75235-9030. An Affirmative Action/Equal Opportunity Employer.**

## POSITIONS OPEN

**CELL BIOLOGIST/MICROBIOLOGIST** needed for faculty research associate position. M.S. degree required. Must have experience in animal cell culture and ELISA techniques for anticancer drug discovery research. Contact: **Dr. J. M. Schmidt, Cancer Research Institute, Arizona State University, Tempe, AZ 85287. ASU is an Equal Opportunity Employer.**

### CHAIRPERSON DEPARTMENT OF HUMAN ANATOMY

The School of Medicine, University of California, Davis, invites applications and nominations for the position of Chairperson of the Department of Human Anatomy. The department currently comprises ten tenure-track faculty, is housed in a modern laboratory building, offers graduate training in cell biology, anatomy, and related disciplines, and is responsible for the teaching of gross, neuro-, and microscopic anatomy and aspects of cell biology in the medical curriculum. Candidates must have a distinguished record of scholarship and professional achievement in the area of cell biology, as evidenced by publications and grant awards. They also must have leadership and administrative abilities and an interest in the departmental teaching mission. A commitment is required to building a strong, independent, extramurally funded research program in modern cell biology as well as to augmenting departmental research in this area; an opportunity to appoint a number of new faculty members is available. Applicants should submit a letter of application, curriculum vitae, a summary of research goals, and the names of five references to: **Dr. John W. B. Hershey, Search Committee Chairperson, Department of Biological Chemistry, School of Medicine, University of California, Davis, CA 95616. Open until filled, but not later than 1 July 1988; applications should be received before 15 July 1987, to assure full consideration.**

*The University of California, Davis, is an Equal Opportunity/Affirmative Action Employer.*

### NEHEMIAH AND NAOMI COHEN CHAIR OF PULMONARY RESEARCH AT GEORGETOWN UNIVERSITY

Georgetown University School of Medicine seeks a highly qualified productive scientist to hold this newly endowed Chair of Pulmonary Research in the Department of Medicine. An applicant or nominee may hold an M.D. or Ph.D. or both, may currently be a member of a basic science or clinical department, and must be actively engaged in contemporary basic or clinical investigation related to pulmonary diseases. Curriculum vitae, research summary, and references should be sent before 1 September 1987 to:

**John C. Rose, M.D.  
Search Committee Chairman  
Kober-Cogan 214  
Georgetown University Medical Center  
Washington, DC 20007**

*Georgetown University is an Affirmative Action/Equal Opportunity Employer.*

### CYTOGENETICS TECHNOLOGIST OPENINGS

Newly established human cytogenetics laboratory in northeast Florida seeks highly qualified cytogenetics technologists experienced in high resolution chromosome banding and clinical cell culture. Positions are now open and will also be coming available over the next 24 months. Please send résumé and salary expectations to: **Dr. Carl B. Mankinen, Ph.D., Director, Cytogenetics Laboratory, Nemours Children's Clinic, P.O. Box 5720, Jacksonville, FL 32207. Telephone: 904-721-4200.**

### DIRECTOR CHRISTENSEN RESEARCH INSTITUTE MADANG, PAPUA NEW GUINEA

Applications invited for above position. Independently funded institute devoted to research in marine and terrestrial biology. Applicants should have Ph.D. in a relevant subject and experience in working in tropical Third World environments. Salary PNG Kina 17,000 and residential and travel leave benefits. Send curriculum vitae and names of two referees by 5 June 1987 to: **Dr. Frank Talbot, Executive Director, The California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118-9961.**



## FACULTY POSITIONS AT RUTGERS UNIVERSITY CAFT

The Center for Advanced Food Technology and the Food Science Department invite applications and nominations for three tenured professorial positions at the New Brunswick, Cook College campus.

The areas of research specialization are:

1. Interactions of water and biomacromolecules,
2. Control and inactivation of enzyme systems,
3. Unique approaches to in-line sensing of physical factors in food.

The successful candidates will conduct research and manage the research efforts of a cross-disciplinary team of research leaders from various discipline departments throughout the university. Each research team is supported with \$350,000 to \$500,000 (DCO) of funds provided by the New Jersey Commission on Science and Technology and the Industrial Members of the Center. Appropriate expertise in biophysics, biochemistry, physical chemistry, physics, chemical engineering, electrical engineering, and food science is essential. We seek individuals with proven records of research management and scholarly achievement. Teaching at the graduate level and representation of CAFT in the scientific and industrial environments will be important aspects of the positions.

Salary and rank will be commensurate with professional qualifications.

Applications must include a description of research interest, an up-to-date publications list, curriculum vitae, and the names (address and telephone) of five persons prepared to provide professional references. Applications will be accepted until each position is filled.

Direct applications and nominations to: **Dr. Myron Solberg, Director, Center for Advanced Food Technology, Cook College, PO Box 231, Rutgers, The State University of New Jersey, New Brunswick, New Jersey 08903.** Rutgers University is an Equal Opportunity/Affirmative Action Employer.

# DIRECTOR

## CENTER FOR ADVANCED RESEARCH IN BIOTECHNOLOGY

The University of Maryland and the National Bureau of Standards (NBS) have jointly established the Center for Advanced Research in Biotechnology (CARB). The CARB facility, now under construction, is located near Washington, DC, in Montgomery County, Maryland, in close proximity to industrial and governmental biotechnology research laboratories.

The Center will conduct forefront research in biotechnology with special focus upon structural and functional characterization of proteins using the most advanced measurement instruments. Research areas include structure analysis, computer modeling, biosensors, biotransformations, and protein separations. Applications research will be conducted through collaborative programs and sponsored research with industry and federal agencies. CARB thus represents an exciting and unique venture combining resources and perspectives of a major university, Federal, county and state governments and industry.

The Director of CARB will be responsible for implementation of the Center concept and for the day-to-day operations of the center. He/she will be appointed by the President of the University of Maryland and the Director of NBS. He/she will work closely with a Board of Overseers which includes appointees from the University of Maryland, NBS, the Montgomery County, Maryland government, and private industry. The Director will develop plans and identify staff to conduct research projects in biotechnology. Visiting scientists will be appointed from industry, universities, Federal agencies and other biotechnology research centers to complement the efforts of University of Maryland faculty and NBS scientists at CARB.

The Director must be a well-established scientist with an active research program and a demonstrated ability to create an environment conducive to research consistent with the capabilities and requirements of academic, government, and commercial organizations. He/she will be expected to qualify for a tenured professorship in an appropriate department at the University of Maryland.

The Director will combine strong scientific credentials and an entrepreneurial spirit necessary to bring CARB into a national leadership position in biotechnology. He/she must display skills appropriate to develop harmonious working relationships among universities, federal agencies, county and state governments, and private industry.

For best consideration, all interested candidates should forward their resumes before June 30, 1987 to:

**UNIVERSITY OF MARYLAND, Jane McGlade, Assistant to the Director, Maryland Biotechnology Institute, 1326 Chemistry, College Park, MD 20742, Telephone: (301) 454-1628.**

*The University of Maryland and the National Bureau of Standards are Equal Opportunity/Affirmative Action Employers and actively solicit the names of appropriate men and women and minority candidates.*



THE UNIVERSITY OF MARYLAND

## POSTDOCTORAL FELLOW PLANT BIOCHEMISTRY

The Plant Biochemistry Department of Zoecon Research Institute, a division of Sandoz Crop Protection Corporation, is seeking a postdoctoral scientist to participate in an interdisciplinary research team studying plant enzymology.

The position is available for up to two years. Applicants should have experience in kinetic and biochemical characterization of either membrane bound or soluble enzymes. Previous experience with higher plants is not essential but a strong background in chemistry is preferred.

Zoecon Research Institute has been a leader in innovative agricultural research for more than 15 years. The institute has established research programs in herbicide design, plant biotechnology, insect physiology/biochemistry and chemistry.

Our research laboratories are located in Palo Alto, California, in close proximity to Stanford University. We conduct our research in an open, academic-like environment which encourages publication and interaction with other scientists throughout the world.

To apply for this position, please send curriculum vitae and three references to:

**Sandoz Crop Protection Corporation  
Zoecon Research Institute  
Human Resources Department  
975 California Avenue  
Palo Alto, CA 94304  
EOE/AA**

# SOLAR RESEARCH OPPORTUNITY

A position at the Staff Scientist 2 level is available in the Energy Conversion and Storage Program of Lawrence Berkeley Laboratory. The employee will perform analytical and experimental research on the use of concentrated solar energy for driving high-temperature thermal and thermochemical reactions; will develop and improve analytic models for the chemical, thermodynamic, and optical phenomena involved in using small particles in gas or liquid streams as the absorbing and heat transfer media; plan and conduct experimental investigations to characterize the properties of candidate reactions; direct junior project staff and graduate students; and present and publish research results. Candidates must have a strong theoretical and experimental background in thermodynamics, solar energy conversion techniques, chemical processes, and be familiar with optics. Must be able to plan and carry out original research agenda, including guidance of graduate students. Good organizational and writing skills necessary. Prefer Ph.D. in physics, chemistry, mechanical or chemical engineering. This is a one-year appointment with a good possibility of renewal, and opportunity for permanent appointment at LBL.

Please specify Job #B/3403. Send two copies of resume to:  
**Lawrence Berkeley Laboratory, Employment Office, 90-1042,  
One Cyclotron Road, Berkeley, CA 94720.**

Equal Opportunity Employer. M/F/H.



**LAWRENCE  
BERKELEY  
LABORATORY**

## POSITIONS OPEN

**DEAN**, Tulane University School of Medicine—Tulane University School of Medicine invites nominations and applications for the position of Dean of the School of Medicine. As the fifteenth oldest medical school in the country, Tulane is an established college of medicine with an excellent reputation for professional practice, research, and professional and graduate education. We seek an academian with imagination and insight who will skillfully lead this institution into the 1990s. The successful candidate will have demonstrated scientific capability and have proven broad experience in leadership and decision-making. Candidates must have an M.D. degree. Deadline for applications: 5 June 1987. Please send nominations and applications to: **John E. Lewy, M.D., Head, Search Committee for Dean, Tulane University School of Medicine, Department of Pediatrics, 1430 Tulane Avenue, New Orleans, LA 70112. Affirmative Action/Equal Opportunity Employer.**

The University of California, Irvine, Department of Psychiatry and Human Behavior, under the direction of **William E. Bunney, M.D.**, Professor and Chairman, is seeking a **DIRECTOR** of a 93-bed inpatient psychiatric facility. The position will involve overseeing the inpatient and outpatient clinical, teaching, and research activities of the hospital. This is a full-time university faculty position at the level of professor (tenured). Candidates must be boarded in psychiatry, have extensive inpatient and outpatient administrative experience, have experience administering psychiatric research units, have published extensively in biological psychiatry, and must be recognized internationally and nationally for psychiatric research accomplishments. Experience treating and conducting research in schizophrenia is desired. Salary and academic rank commensurate with qualifications and experience. Send curriculum vitae and letters of reference by 20 July 1987 in care of: **William E. Bunney, M.D., Professor and Chair, Department of Psychiatry and Human Behavior, University of California, Irvine, CA 92715. The University of California is an Affirmative Action/Equal Opportunity Employer.**

### DIRECTOR OF DENTAL RESEARCH INSTITUTE MINNESOTA

The University of Minnesota's School of Dentistry is conducting a search for a Director of a newly designated Dental Research Institute. The Director will provide academic and research leadership to the Institute which includes a strong cadre of established basic science and clinical investigators from the University's health science units, the College of Biological Sciences, and other colleges within one of the nation's largest multidimensional universities. A close cooperative liaison with scientists in the corporate sector exists. The Director will be responsible for administration of financial and physical resources and research training programs, and will represent the Institute to the public. Candidates must have a doctorate (Ph.D., M.D., or D.D.S.), at least 6 years of research experience beyond the doctorate, administrative experience, a record of substantial research accomplishment, and independent research grant support. Academic rank, tenure, and salary will be commensurate with qualifications and experience. *The University of Minnesota is an Equal Opportunity Employer and Employer and specifically invites and encourages applications from women and minorities.* Send curriculum vitae to: **Dwight L. Anderson, Ph.D., School of Dentistry, University of Minnesota, 515 Delaware Street SE, Minneapolis, MN 55455** by 1 July 1987.

### UNIVERSITY OF MIAMI DIRECTOR OF DEVELOPMENT FOR ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCE (RSMAS)

The University of Miami seeks a professional fund raiser to develop and sustain private gift/grant support for research, student/faculty assistance, equipment and special projects, for RSMAS. Candidate should have a bachelor's degree and previous successful experience in fund raising, preferably in higher education. Knowledge of scientific research and technology is a definite plus. Must have excellent communication skills, be well organized, assertive, and energetic. Send résumé and letter of application to:

**Director of University Development  
University of Miami  
P.O. Box 248073  
Coral Gables, FL 33124**

*An Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

### U.S. DEPARTMENT OF AGRICULTURE (USDA) AGRICULTURAL RESEARCH SERVICE

**DIRECTOR**, U.S. Dairy Forage Research Center in Madison, Wisconsin. The Agricultural Research Service is seeking a person (GM-0482-15) who will provide leadership to over 20 professionals in the Dairy Forage Research Center. This involves planning, organizing, assembling, coordinating, and reviewing programs and controlling resources for solving complex research problems of dairy forage production and of forage utilization of dairy cattle.

Candidates must have knowledge of (i) agricultural research administration and (ii) problems and potentials in the utilization of forage in the production of milk by dairy cows.

Ph.D. is desirable. Must be a U.S. citizen. Salary is commensurate with experience (\$53,830 to \$69,976). For information on the research program and/or position, contact: **Dr. Kenneth L. Lebsack on 612-349-3848. For information on application procedures/forms, contact Janie Carr on 301-344-2756.** Applications in response to this advertisement should be marked 6N021.

Applications must be received by 19 July 1987.

Mailing address: **USDA, Agricultural Research Service, Personnel Operations Branch, North Central Section, Building 419, BARC-East, Beltsville, MD 20705.**

*An Equal Opportunity Employer*

**DIRECTOR/PROFESSOR—FORESTRY AND RESOURCE MANAGEMENT.** The Forest Products Laboratory, University of California—Berkeley is an Organized Research Unit with responsibility for research, extension, and graduate education reporting to the Dean of the College of Natural Resources.

Applications or nominations are invited for the position of Professor and Director of the Laboratory. The position has administrative, research, and teaching responsibilities. Candidates must have an earned Ph.D. in wood science and technology, forestry, or other appropriate technical field, and be nationally recognized in research and teaching in wood science and technology. Research background should be in an area that complements the Laboratory's overall research program. Teaching includes an undergraduate course and a graduate student seminar in wood science and technology. An appreciation of the challenges and opportunities associated with attracting extramural funds for program support is needed. He/she should be capable of providing vigorous leadership and have administrative skills relating to planning, defining objectives, budgeting, managing personnel and coordinating activities within the Laboratory and with other units. A proven ability to work with industry, government, and professional organizations is required.

Applications including curriculum vitae and names of three references should be sent by 15 August 1987 to: **Chair, Search Committee, University of California Forest Products Laboratory, 1301 South 46 Street, Richmond, CA 94804. Telephone: 415-231-9452.**

*The University of California is an Equal Opportunity/Affirmative Action Employer.*

**DIRECTORS—PROGRAMS FOR UNIVERSITIES IN SCIENCE AND TECHNOLOGY.** Not-for-profit organization in the physical sciences and technology seeks a Director and Regional Directors to represent its programs and services to colleges, universities, and other nonprofit research institutions. As head of institutional relations, the Director will create and implement programs to market technology transfer services, and to assist colleges and universities in strengthening basic research programs. The Director will be assisted by Regional Directors.

Qualifications: candidates for the position of Director should have a background in university research and administration. Desirable would be experience in negotiating research agreements and invention rights, and in administering institutional patent policies. Candidates for the post of Regional Director should have a strong background in research and teaching. All candidates must possess strong oral and written communication skills, and an ability to work effectively with science and engineering professionals. **Box 72, SCIENCE.**

## POSITIONS OPEN

### DIRECTOR, TOXICOLOGY AND MICROBIOLOGY DIVISION

The U.S. Environmental Protection Agency (EPA) is seeking candidates for the position of Director, Toxicology and Microbiology Division (TMD). The position is located in the Health Effects Research Laboratory, Cincinnati, Ohio. This is a permanent full-time federal civil service position. The salary range is \$53,830 to \$69,976 per annum. Candidates having an M.D. degree may be eligible for an additional \$10,000 annual supplement.

The incumbent is responsible for directing/supervising TMD's research studies to identify, characterize, and quantify health risks that may result from exposure to biological or chemical agents found primarily in water. Appropriate epidemiological methods, animal models, and in vitro test systems are utilized to identify overt or potential effects of pollutants. The Division has a current staff of about 85 persons, 20 of whom are principal investigators trained at the doctoral level.

Desired qualifications for the position include: a Ph.D. (toxicology, biology, biochemistry, microbiology, or chemistry) or an M.D. degree; research experience including environmental and/or health effects; supervisory and managerial experience. U.S. citizenship is required.

Further information including detailed qualification requirements and an application packet may be obtained by contacting: **Vicki Horsley, telephone: 513-569-7804, Monday through Friday, 7:00 a.m. to 4:30 p.m. EST.** In order to receive an application packet, you must call by close of business on 5 June 1987. *An Equal Opportunity Employer.*

### ECOLOGY/ECOSYSTEMS RESEARCH

The Woods Hole Research Center is seeking an Associate or Senior Scientist to join in research on biotic aspects of the global carbon dioxide problem. Ph.D. required. Experience in research on terrestrial ecosystems and in modeling desirable. Send letter, résumé, list of referees, and list of publications by 5 June 1987 to: **Dr. G. M. Woodwell, Director, Woods Hole Research Center, Box 296, Woods Hole, MA 02543. An Equal Opportunity Employer.**

### FACULTY POSITION

**DEVELOPMENTAL BIOLOGIST.** The Department of Biology, State University of New York (SUNY) College at Fredonia, invites applicants for a temporary teaching position for fall 1987. This is a 10-month temporary appointment with possible renewal on a tenure-track vacancy.

Major teaching responsibilities will be developmental biology with labs, an upper-level specialty course, and introductory biology.

Send curriculum vitae and three letters of recommendation by 15 June 1987 to: **Dr. Wayne N. Yungmans, Department of Biology, SUNY College at Fredonia, Fredonia, NY 14063. Telephone: 716-673-3282.**

*SUNY College at Fredonia is an Equal Opportunity/Affirmative Action Employer. Women and Minorities are Encouraged to Apply.*

**Food Science—Department of Food Science—University of Delaware. THREE FACULTY POSITIONS—ASSISTANT PROFESSOR—ANALYTICAL BIOCHEMISTRY.** Tenure track with faculty teaching, research, and advisement duties, research in analytical biochemistry in analytical methodology. Ph.D. in food science or related field. Postdoctoral experience a plus. **ASSISTANT PROFESSOR—FOOD PACKAGING/FOOD ENGINEERING.** Tenure-track teaching in food engineering and packaging research in food-packaging technology, interest in packaging with polymeric materials a plus. Ph.D. in chemical engineering or food science with a strong background in food process engineering, experience with packaging technology desirable. **ASSISTANT PROFESSOR—FOOD PROCESSING.** One-year position—teach undergraduate and graduate courses, maintain research program. Ph.D. in food science or closely related field, capabilities for research in food processing/biotechnology a plus. **ALL POSITIONS AVAILABLE: 1 September 1987.** All searches open until position is filled. Submit curriculum vitae and three letters of recommendation to: **Chair, Search Committee, Department of Food Science, University of Delaware, Newark, DE 19716. Telephone: 302-451-8979. The University of Delaware is an Equal Opportunity Employer which encourages applications from minority groups and women.**

## POSITIONS OPEN

### FACULTY POSITIONS ANATOMY

The Department of Anatomy of the F. Edward Hébert School of Medicine, Uniformed Services University, invites applications for three faculty positions. Applicants must have either an M.D. or Ph.D. degree in the biological sciences. Teaching assignments involve gross anatomy, microscopic anatomy, and/or neuroanatomy and it is expected that applicants will have research experience and/or postdoctoral training. Preference will be given to candidates with research interests in cell biology, endocrinology, or various aspects of neuroscience. Applications should be received by 15 June 1987. Send curriculum vitae, bibliography, statement of teaching and research experience, and three letters of recommendation to:

**Director, Personnel/Manpower  
Uniformed Services University of the Health Sciences  
(USUHS)**

**4301 Jones Bridge Road  
Bethesda, MD 20814-4799**

*USUHS is an Equal Opportunity/  
Affirmative Action Employer*

### IMMUNOLOGIST

Mercer University School of Medicine invites applications for a tenure-track position in immunology. Applicants must possess a Ph.D. and/or M.D. with postdoctoral training. The successful candidate will participate as a tutor in a problem-based curriculum and be expected to develop an active research program. Applications will be accepted until 15 June 1987. Applicants are requested to submit curriculum vitae, a brief statement of professional objectives and research interests, and the names and addresses of three references to: **Dr. Robert Moon, Chairman, Division of Basic Medical Sciences, Mercer University School of Medicine, Macon, GA 31207.** *An Equal Opportunity/Affirmative Action Employer.*

### MOLECULAR BIOLOGY HORMONES AND GROWTH FACTORS

Individuals with a strong background in molecular biology and a Ph.D. degree are invited to apply for **POSTDOCTORAL FELLOW AND/OR RESEARCH ASSOCIATE** position in an established molecular endocrinology laboratory. Projects include the study of the structure, function, and regulation of newly discovered members of the prolactin family of hormones, and pituitary growth factors. Applicants should send curriculum vitae, a brief description of their research interest, and three letters of reference to: **Dr. Henry G. Friesen, Department of Physiology, University of Manitoba, 770 Bannatyne Avenue, Winnipeg, Manitoba, Canada R3E 0W3.** Both men and women are encouraged to apply. *In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents of Canada.*

### NEUROBIOLOGIST UNIVERSITY OF ALABAMA AT BIRMINGHAM

Applications are invited for a tenure-track faculty position at the level of assistant or associate professor. Candidates must have an established competitive research record and teaching experience in medical neuroanatomy. Criteria for appointment will include (i) highly creative and competitive research potential in modern neurobiology; (ii) strongly motivated teaching interests and skills as indicated by outstanding communicative ability and command of subject; and (iii) interest and potential to contribute to faculty, university, and community growth.

Salary and benefits competitive. Submit your letter of intent including research plan for the next 5 years, current curriculum vitae, and the names of four references by 5 June 1987 to:

**B. R. Brinkley, Ph.D., Professor and Chairman  
Department of Cell Biology and Anatomy  
Basic Health Sciences Building—Room 690  
University of Alabama at Birmingham  
University Station  
Birmingham, AL 35294**

*An Equal Opportunity/Affirmative Action Employer.*

## POSTDOCTORAL FELLOWSHIPS

### Research Training in Lipid Metabolism Related to Atherosclerosis

Traineeships supported by an NHLBI grant are currently available at the Hormel Institute, a unit of the Graduate School, University of Minnesota. Basic, multidisciplinary research related to atherosclerosis with emphasis on membrane structure and function includes: polyunsaturated fatty acids in nutrition, metabolism and disease; control of mitochondrial function; ionophore catalyzed cation transport; analysis and biosynthesis of prostaglandins and related compounds; inhibition of platelet aggregation; metabolism of furan fatty acids; phospholipid deacylation/reacylation and LDL uptake by endothelial cells; NMR of lysophospholipid and cholesterol interactions; carbohydrate and lipid metabolism in isolated cell systems related to development/prevention of obesity; regulation of lipases and phospholipases; the role of membrane phospholipids in signal transduction and cell injury; protein-regulated lipid transfer processes; and biogenesis of membrane proteins and membranous organelles. Faculty members include Drs. W.J. Baumann, H.L. Brockman, R.E. Brown, M.P. Cleary, R.T. Holman, D.R. Pfeiffer, H. Schlenk, H.H.O. Schmid and C.W. Zwizinski. Beginning salaries are substantially above NIH scale with complete fringe benefit package. Appointments are annually renewable. Applicants must be U.S. citizens, non-citizen nationals, or permanent U.S. residents with a Ph.D., M.D. or equivalent degree. Applications should include curriculum vitae, list of publications, and the names of three references. Send curriculum vitae to: **Dr. Margot P. Cleary, The Hormel Institute, University of Minnesota, 801 16th Avenue N.E., Austin, MN 55912. Telephone: 507/433-8804.** *The University of Minnesota is an Equal Opportunity Educator and Employer and specifically invites and encourages women and minority applicants.*

## TENURED POSITION

### REPRODUCTIVE BIOLOGIST TO DIRECT GAMETE BIOLOGY RESEARCH PROGRAM

Established Ph.D. basic scientist to direct research program in academic environment and run new IVF-ET program. Experience in tissue culture and sterile technique mandatory. Previous IVF-ET experience preferable. Salary negotiable. For more information send C.V. to:

**Sandara Ann Carson, M.D.  
Department of Obstetrics and Gynecology  
University of Tennessee, Memphis  
University Physicians Foundation, Inc.  
956 Court Avenue, Room D-324  
Memphis, TN 38163**

*Affirmative Action/Equal Opportunity Employer*

## Careers in Biotechnology

Join the leading producer of research products for the molecular biology and cell biology industries.

GIBCO/BRL, a division of Life Technologies, Inc. is a successful biotechnology company with a strong reputation in the industry. The leadership enjoyed by our products is evidence of our commitment to excellence.

We currently have positions available in several departments for Ph.D., M.S. and B.S. degreed individuals in molecular biology, biology and chemistry.

Our salary and benefits are highly competitive. Our location combines the scenic country of Maryland with the cultural vitality of Washington, D.C.

In addition, marketing and administrative positions are available.

We invite you to submit your curriculum vitae or resume for consideration to:

**Mr. Richard L. Hotaling, Jr.  
Personnel Manager  
Life Technologies, Inc.  
8717 Grovemont Circle  
Gaithersburg, MD 20877**

*An equal opportunity employer, M/F/H/V*

## POSITIONS OPEN

**NEUROANATOMIST:** Applications are invited for a tenure-track position as research scientist at the Wadsworth Center for Laboratories and Research, New York State Department of Health, with a simultaneous faculty appointment as Assistant Professor in the School of Public Health Sciences, State University of New York-Albany. Applicants should be able to participate in ongoing investigations of neuronal plasticity and local neuronal circuitry and to develop grant-supported neuroanatomical projects in these areas. Applicants should be at least 2 years postdoctoral and experienced with modern techniques such as tract-tracing methods, immunocytochemistry, radioreceptor ligand binding, and in situ hybridization. Current neuroscience staff is an interactive group of nine neurophysiologists, neurochemists, and cell biologists. The Wadsworth Center has excellent facilities for light and electron microscopy, including a 1.2-MeV HVEM. Applications must be received by 3 July 1987. Submit curriculum vitae and the names of three references to: **David L. Martin, Wadsworth Center for Laboratories and Research, New York State Department of Health, Albany, NY 12201.**

**PATHOLOGIST—MOLECULAR.** The Department of Pathology at the University of California, Los Angeles (UCLA), School of Medicine has a position available at the assistant professor level to start on or before 1 January 1988. Qualifications include an M.D. degree, Board eligibility or certification in anatomic and clinical pathology, eligibility for California licensure, and demonstrated research ability. Specialized training in molecular genetics and/or cell biology is required, and the individual selected will be expected to develop independent diagnostic and research programs in this area. Other duties will include teaching of undergraduate and graduate students and residents. Applications including curriculum vitae, summary of research interests, and names and addresses of four references should be sent to: **P. A. Cancilla, M.D., Chairman, Department of Pathology, UCLA School of Medicine, Los Angeles, CA 90024.** *UCLA is an Equal Opportunity/Affirmative Action Employer. Minority and women candidates are encouraged to apply.*

**PHYSIOLOGIST.** Full-time position at assistant professor level beginning 2 September 1987. Ph.D. with teaching experience in human physiology and general physiology is desired. Other teaching responsibilities will include a semester course in human anatomy and physiology, laboratory sessions in general biology, and others depending upon interest of the individual. Applicants should send curriculum vitae with introductory letter and three letters of recommendation by 15 July 1987 to: **Dr. James Phifer, Vice President for Academic Affairs, Coe College, Cedar Rapids, IA 52402.** *Affirmative Action/Equal Opportunity Institution.*

## PLANT MOLECULAR BIOLOGIST

The College of Agriculture at the University of Nevada, Reno invites applications for a full-time (12 month) tenure-track joint appointment in the departments of plant science and biochemistry at the level of assistant or associate professor. The primary responsibility of the successful candidate will be to develop a vigorous, independently funded research program in some area of plant molecular biology. He or she will also be expected to participate in Ph.D. level graduate training and teaching. Generous set-up funds and laboratory space will be made available. A Ph.D. and postdoctoral experience in plant molecular biology is required. Applicants should submit their curriculum vitae, a statement of research interests and goals, selected reprints, and arrange to have three letters of reference sent to: **Plant Molecular Biologist Search, Plant Science Department, University of Nevada, Reno, NV 89557.** Application deadline is 1 July 1987. *The University of Nevada is an Equal Opportunity/Affirmative Action Employer.*

**POSITION AVAILABLE IMMEDIATELY.** Position requires mathematical analysis and modeling in the biological sciences. Candidate will provide mathematics, statistics, and computer science support within a multidisciplinary environment. Candidates must respond by 5 June 1987 with curriculum vitae and the names of three references to: **Dr. K. A. Krohn, Radiology, RC-70, University of Washington, Seattle, WA 98195.** *The University of Washington is an Affirmative Action/Equal Opportunity Employer.*

## POSITIONS OPEN

### PLANT MOLECULAR BIOLOGISTS

Two anticipated tenure-track positions available as early as fall 1987 in an established Plant Molecular Biology Research Center with appointment(s) in the Departments of Biological Sciences and/or Chemistry.

**Assistant Professor.** Candidates must have a demonstrated competence in plant molecular biology and experience in a field of plant biology such as biochemistry, genetics, tissue culture, or recombinant DNA technology. Postdoctoral experience is required. Development and maintenance of a vigorous research program with external funding is expected. Other duties will include a limited amount of formal teaching and the supervision of master's/doctoral students.

Northern Illinois University is a comprehensive university of 25,000 students located in a pleasant, attractive community 65 miles west of Chicago. Send curriculum vitae, statement of research goals, and three letters of reference by 15 July 1987 to: **Dr. Arnold Hampel, Director, Plant Molecular Biology Center, Department of Biological Sciences, Northern Illinois University, DeKalb, IL 60115.** Telephone: 815-753-1753. *The University is an Affirmative Action/Equal Opportunity Employer.*

**POSTDOCTORAL ASSOCIATE** position available in NIH supported tumor biology laboratory concentrating on metastasis. Candidates should have a strong background in protein and/or nucleic acid biochemistry. Evidence of research productivity is essential. Current areas of research include: extracellular matrix invasion, interaction of tumor cells with endothelium and the role of selected oncogenes in metastasis. Competitive salary commensurate with experience and productivity. Screening of applications will begin 1 July 1987 and will continue until a suitable applicant is found. Application, curriculum vitae, and three letters of reference should be sent to: **Dr. Jean R. Starkey, Microbiology Department, Lewis Hall, Montana State University, Bozeman, MT 59717.** *Montana State University is an Equal Opportunity/Affirmative Action Employer.*

### POSTDOCTORAL ASSOCIATE POSITION

Available now for research on the behavioral pharmacology of opioid drugs and peptides in small primates and rodents. Applicants should have recent doctorate in pharmacology or other basic medical science, or in experimental psychology. Skill in stereotaxic surgery and in use of microcomputers is desirable.

Send curriculum vitae and names of three references by 31 July 1987, to: **Stephen G. Holtzman, Ph.D., Department of Pharmacology, Emory University School of Medicine, Atlanta, GA 30322.** *Affirmative Action/Equal Opportunity Employer.*

**POSTDOCTORAL ASSOCIATE** trained in biological sciences to clone the mucin peptide gene. cDNA probe will be established to monitor mucin synthesis in airways epithelium as a function of developmental age, infection, and/or diseased state. The project is part of a multidisciplinary program consisting of basic and clinical scientists. Send curriculum vitae and references to: **Pi-Wan Cheng, Ph.D., Department of Pediatrics, University of North Carolina, Chapel Hill, NC 27514.** Telephone: 919-966-1055.

### POSTDOCTORAL ASSOCIATE/FELLOW

A position is available to investigate the molecular cell biology of intestinal lactase. The primary focus is upon microsequence, intracellular processing, and gene cloning. Send curriculum vitae, statement of research interests, and the names of three references to: **Dr. Richard J. Grand, Pediatric Gastroenterology and Nutrition, New England Medical Center, Box 213, 750 Washington Street, Boston, MA 02111.**

**POSTDOCTORAL POSITION** available immediately to study gene expression in the mammalian retina. Prior background in molecular biological techniques preferred. Please send curriculum vitae and letters of recommendation to: **Dr. P. V. Sarthy, Department of Ophthalmology, RJ-10, University of Washington, Seattle, WA 98195.** *University of Washington is an Affirmative Action and Equal Opportunity Employer.*

## POSITIONS OPEN

**POSTDOCTORAL FELLOW IN PROTEIN MAPPING AND BIOCHEMISTRY.** Position available as early as 1 July 1987. Seeking neurochemist/protein biochemist to expand protein mapping research in childhood neuropsychiatric disorders. Also expected to engage in parallel studies of specific neuroproteins and mechanisms relevant to neuropsychiatric disorders. Send résumé and outline of current research interests to: **Dr. George M. Anderson, Yale University School of Medicine, Child Study Center, P.O. Box 3333, New Haven, CT 06510.**

*The University is an Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL POSITION** available immediately in cellular and transplantation immunology. Areas of research include marrow stem cell purification, monoclonal antibody development, and tolerance induction in murine and nonhuman primate models. Send curriculum vitae and three references to: **Morton J. Cowan, M.D., Pediatric Bone Marrow Transplant Program, University of California San Francisco, San Francisco, CA 94143-0105.** *The University of California is an Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL POSITION** available immediately to study the structure and regulation of gene expression of glycoproteins in differentiation and oncogenesis. The studies involve characterization of proteins which are tissue- or cell lineage-specific by cDNA analysis and transfection. Experience in isolation and sequencing of cDNA or transfection of cDNA is desirable. The expected salary range is \$18,000 to \$26,000, depending on experience. Please send curriculum vitae and names of three references to: **Dr. Minoru Fukuda, La Jolla Cancer Research Foundation, 10901 North Torrey Pines Road, La Jolla, CA 92037.**

**POSTDOCTORAL POSITION** available immediately to take part in a project concerned with regulation of expression of mammalian heat shock genes. The applicant chosen will study control of heat shock gene translation. Candidate should have expertise in protein chemistry and/or molecular biology. Send curriculum vitae and names of three references to: **Dr. Stuart Calderwood, or Dr. Clayton Hunt, Joint Center for Radiation Therapy, Harvard Medical School, 50 Binney Street, Boston, MA 02115.** *An Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL POSITION** available 1 July 1987 in the Division of Arteriosclerosis and Human Nutrition to study the regulation of the expression of apolipoprotein genes. Applicants must have a Ph.D. or M.D. Experience in techniques of molecular genetics and cell culture is desirable. Send curriculum vitae and names and addresses of three references to: **Howard A. Eder, M.D., Department of Medicine, Albert Einstein College of Medicine, Bronx, NY 10461.**

**POSTDOCTORAL POSITION** available in neurobiology to study regeneration of peripheral and central nerves. Experience in use of animal models, cell biology, and immunocytochemistry desirable. Send curriculum vitae and three letters of reference to: **R. W. Mahley, M.D., Ph.D., Gladstone Foundation Laboratories for Cardiovascular Disease, University of California, P.O. Box 40608, San Francisco, CA 94140.**

**POSTDOCTORAL POSITION** available July 1987. Seeking phycologist/protozoologist to participate in an ultrastructural study of the euglenoid flagellates. Must have experience with transmission and scanning electron microscopy. Applicants should send curriculum vitae and names of three references to: **Dr. Richard E. Triemer, Department of Biological Sciences, Rutgers University, P.O. Box 1059, Piscataway, NJ 08855-1059.**

**POSTDOCTORAL POSITION** available immediately to study the molecular biology and immunology of *Shigella* infections. Must have experience in bacterial genetics and protein and lipopolysaccharide purification. Send résumé, publications, and three letters of reference to: **Harvey Rubin, M.D., Ph.D., University of Pennsylvania, School of Medicine, Infectious Diseases Section, 536 Johnson Pavilion/6073, 36th Street and Hamilton Walk, Philadelphia, PA 19104.**

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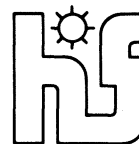
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### PHYSICAL BIOCHEMIST

to investigate the protein conformation and other in-solution physical chemical characteristics of our protein therapeutics. You should possess a PhD in physical chemistry or a related field, plus experience with the physical chemical characterization of proteins. Additional experience in optical instrumentation/methods is highly desirable.

Please send your resume in confidence to:

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## TOXICOLOGISTS

The State of California's Department of Health Services is recruiting TOXICOLOGISTS for immediate openings. Vacancies exist in Sacramento and Berkeley. The areas of involvement are environmental and occupational toxicology, with specific emphasis on quantitative risk assessment, carcinogenicity, and reproductive toxicity. The annual salary is \$46,152–\$55,824.

Employment with CDHS depends on successful completion of an oral civil service examination, which may be taken over the telephone. Applications are accepted on a continual basis.

**Requirements:** Possession of a doctoral degree in toxicology or a closely related field and three years postdoctoral experience, including consultation on an interpretation of toxicological findings relative to probable human health hazards.

**Position Description:** Generally, the toxicologist serves as a statewide expert on the toxicological properties of products and chemicals as they relate to human health problems; interprets experimental study results in terms of toxicological properties and hazards, including risk assessments for carcinogenicity and reproductive toxicity; evaluates, advises and consults on the adequacy of toxicological data submitted by other organizations; advises on precautionary labelling for hazardous chemicals and products; advises in cases of accidental exposure or poisoning; testifies as a witness in hearings and court procedures; and prepares reports and scientific papers for publication.

**Application:** Send curriculum vitae to:

**California Department of Health Services**  
Office of Environmental Health Hazard Assessment  
714 P Street, Room 476  
Sacramento, CA 95814

*The California Department of Health Services is an equal opportunity employer.*

Creative BioMolecules, Inc. seeks highly motivated and well qualified candidates to join our **Process Development Group** in developing methods leading to the production of therapeutic proteins produced by recombinant DNA technology. Positions available are:

## Protein Purification Scientist

Candidate will develop and scale-up processes for pilot production of material for clinical testing. Position requires a Ph.D. in Protein Biochemistry plus industrial experience in product recovery methods. Knowledge of GMP would be a plus.

## Biochemical Engineer

BS/MS to develop scale-up of production processes including fermentation, product recovery, and immobilized enzyme reactions. Biochemical/Chemical Engineering degree or equivalent experience is required.

Creative BioMolecules offers competitive salaries and health benefits along with the opportunity to make a significant contribution to the success of the Company. Please send resume to **Personnel Department**.

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Biotechnology company with laboratories in **Geneva**, engaged in the development of pharmaceutical products through genetic engineering has vacancies for

## A CELLULAR IMMUNOLOGIST

with several years of postdoctoral experience in the field of lymphokines.

## A MOLECULAR BIOLOGIST

having, at least, an MSc degree and experience in cDNA synthesis and library construction.

If this offer appeals to you, please send your resume, list of publications and the names of three references to:

**Rita Gloor, Personnel Manager, BIOGEN**  
S. A. 46, Route des Acacias, 1227 CAROUGE  
— GENEVA, Switzerland

All replies will be evaluated in strict confidence.



## Research Scientist Protein Chemist, PhD

Wyeth Laboratories, a pacesetter in the pharmaceutical industry, with a firm commitment to research and development, has an immediate opportunity available in its Microbiology Division, to join dynamic research group developing blood protein products and vaccines.

We seek a PhD level protein chemist with at least two years post-doctoral experience in protein characterization and purification at research and pilot scale. The candidate must have strong background in diverse approaches including affinity chromatography, HPLC; experience with immobilized enzymes helpful.

We offer a highly competitive salary, extensive benefits, and a state-of-the-art environment at our Radnor Corporate headquarters in suburban Philadelphia. Qualified candidates are invited to submit c.v. with salary expectations, in confidence, to **Recruitment Manager, Wyeth Laboratories, Inc., P.O. Box 8299, Philadelphia, PA 19101**. An equal opportunity employer. M/F/V/H

**Wyeth Laboratories**



## CELL AND DEVELOPMENTAL BIOLOGISTS

The Department of Cell Biology and Neuroanatomy at the University of Minnesota seeks highly qualified applicants for positions in **Cell and Developmental Biology**. Appointments may range from **Assistant Professor** (tenure-track) to **Professor (tenured)**, depending upon qualifications (guidelines for appointment at each level will be sent on request). Areas of research interest of those appointed must complement ongoing programs in the department in the areas of **Cell and Developmental Biology**, since it is our intent to provide critical masses of scientists to interact with and extend existing strengths in the department and the University. Particular consideration will be given to those with interests in early vertebrate development (including cell-cell interactions and cell-extracellular matrix interactions), molecular structural biology (including macromolecular organization of cell organelles, the cytoskeleton, cell membranes, chromosomes), intracellular trafficking (including endocytosis, Golgi function, lysosomes), immunobiology as related to basic aspects of tissue and organ transplantation, or structural aspects of nuclear-cytoplasmic interactions. Applicants must have a relevant graduate degree (PhD, MD [or both] or equivalent foreign degree) with at least two years of productive postdoctoral experience. Technical expertise of successful applicants must be appropriate to their fields, but must show evidence of the broad use of many techniques for solving biological problems, which could include structural (light and electron microscopes and/or diffraction and image reconstruction), molecular biological (recombinant DNA technology, NMR) and biochemical approaches. Teaching will be related to cell and developmental biology courses taught to medical and dental students by the department. In addition, training of graduate students and teaching in appropriate graduate programs will be required.

Applications or nominations (to be received *no later than August 1, 1987*) should be sent to: Cell/Development Search Committee, Department of Cell Biology and Neuroanatomy, 4-135 Jackson Hall, 321 Church Street, S.E., Minneapolis, MN 55455.

The University of Minnesota is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities.

## AUSTRALIA CSIRO

**RUMEN MICROBIOLOGIST**  
**A\$28,107-A\$41,339**  
**DIVISION OF TROPICAL ANIMAL SCIENCE**  
**TROPICAL CATTLE RESEARCH CENTRE**  
**ROCKHAMPTON QLD**

**THE DIVISION:** The Division of Tropical Animal Science undertakes research activities on the improvement of animal production, particularly cattle production, in Tropical Australia. It has programs of breeding and management, disease and parasite control and nutrition.

**THE PROGRAM:** Beef production in northern Australia is based on Zebu crossbred cattle harvesting their nutrients from pastures of variable but generally low nutritional value. The Division has established research groups at Rockhampton and Townsville with the aim of increasing cattle growth and reproduction through the improved use of available feed. From quantitative studies of nutrient release in the digestive tract and of nutrient metabolism in the tissues, it is believed that major improvements in cattle nutrition require the development of rumen microbes with superior ability to ferment dietary fibre. Studies to achieve this end have commenced with rumen modifiers and artificial rumen.

**THE JOB:** A microbiologist is being sought to take a more specialized part in the above research. The appointee will be located at the Division's modern Rockhampton Laboratory and will undertake independent and collaborative research within the broad nutrition program. The work will include characterization of microbial populations and their manipulation to improve the digestibility of low quality roughage diets and the composition of the end products of digestion. The appointee will be encouraged to develop projects to take advantage of the multidisciplinary nature of the Division.

**THE PERSON:** Applicants should hold a PhD degree or equivalent qualification with demonstrable research ability and a sound knowledge in the field of ruminant microbiology. Consideration could be given to the appointment of an outstanding applicant at a higher level.

**CONDITIONS:** Appointment will be indefinite and Australian Government superannuation benefits are available.

**MORE INFORMATION:** Prospective applicants are invited to telephone Dr John Vercoe on (079) 36 1288 for further information. Dr Vercoe can also provide a copy of the detailed job description and selection criteria.

**APPLICATIONS:** Applications should be submitted by June 26, 1987 and should quote reference number A5984. They should be framed against the selection criteria and provide details of relevant personal particulars, including qualifications and experience. Applicants should nominate at least two professional referees, and address their applications to:

The Chief  
CSIRO Division of Tropical Animal Science  
Long Pocket Laboratories  
Private Bag No. 3  
INDOOOROPILLY QLD 4068  
AUSTRALIA

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## Assistant Scientist

Ocean Engineering Department seeks tenure-track Assistant Scientist to join established group working on ocean acoustic tomography. Successful candidate will conduct original research in areas of coastal and deep ocean tomography, numerical modeling of ocean dynamics, and inverse theory and contribute to the development of these and related research programs. Position requires appropriate doctoral degree with background in physical oceanography, numerical modeling, inverse theory, and ocean acoustics. In addition to research opportunities, the Institution has a joint program with the Massachusetts Institute of Technology which affords teaching and student interaction. Applicants should send a detailed resume to:

Personnel Manager  
Box 54P



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# SCIENTIST & POSTDOCS

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Genentech, Inc. is a research and development company which utilizes recombinant DNA technology to produce pharmaceutical products for the treatment of a variety of human diseases.

## **Protein Purification & Characterization**

Working in tandem with other biochemists, you'll help develop and scale up methods for the purification/characterization of recombinant proteins and peptides to be used in human pharmaceuticals and animal health care products. Several positions are available. Some will focus on recovery processes and others will focus on rapid protein purification and characterization in conjunction with research. Knowledge of HPLC, FPLC, affinity and other protein purification/analysis techniques is essential.

Successful candidate will have a PhD in Biochemistry/Biochemical Engineering and at least 2 years relevant postdoctoral experience in academia or industry. (JG-2033)

## **Medicinal & Analytical Chemistry**

Position will supervise the testing and release of new products for clinical trials. The candidate we seek will have creative abilities in protein/peptide characterization, and the expertise to establish and implement final product specs. This position also involves writing scientific reports in support of IND submissions, so excellent communications skills are essential.

Successful candidate will have a PhD in Biochemistry or related field and at least 2 years related experience in academia or industry. Pharmaceutical experience highly desirable. (JG-1351)

## **Biological Chemistry**

An individual with a strong background in cell biology and protein biochemistry is sought to investigate the basic mechanisms of action of growth factors at the

molecular and cellular level and to study the biochemistry of signal transduction.

The successful candidate should have several years of post-graduate experience and extensive hands-on experience with cell culture, receptor binding techniques and experience with protein/receptor purification. (5000SW)

## **Peptide Chemistry**

An individual with a strong background in organic and/or protein chemistry is sought, with a special emphasis on peptide chemistry.

The successful candidate should have several years of post-graduate experience with synthesis, purification, characterization and chemical modification of biologically active peptides. (1129)

## **Postdoctoral Fellow Protein Biochemist**

An individual with a strong background in protein biochemistry and enzymatic characterization is sought to investigate the biochemical and structural characterization of the growth factor receptors.

The successful candidate should have extensive hands-on experience with protein/receptor purification, receptor binding techniques and determination of enzymatic parameters. (5001SW)

Genentech, Inc. offers an excellent salary and benefits package coupled with the opportunity to make a significant contribution to our organization. Please send resume, indicating position title and number, to Human Resources Department, Genentech, Inc., 460 Point San Bruno Boulevard, South San Francisco, CA 94080. An equal opportunity employer.

**See you at the ASBC meeting, June 7, 8 and 9, 1987.**



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## POSITIONS OPEN

**POSTDOCTORAL POSITION.** Available summer/fall 1987 to participate in studies on ligand receptors and signal transduction in cultured Leydig cells. Must hold Ph.D. or equivalent degree. Send curriculum vitae and the names and addresses of three persons who can be contacted for reference to: **Dr. Mario Ascoli, The Population Council, 1230 York Avenue, New York, NY 10021.**

**POSTDOCTORAL POSITIONS** available immediately for studies on the structures and biosynthesis of proteoglycans and their interactions with plasma proteins. Experience in polysaccharides and/or proteins; blood coagulation; or cell culture is preferred. Send curriculum vitae and references to: **Dr. Isidore Danishefsky, Biochemistry Department, New York Medical College, Valhalla, NY 10595.**

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## POSTDOCTORAL POSITIONS

**HUMAN IMMUNODEFICIENCY VIRUS REPLICATION**—Position involves participation in a project to clone and express the HIV reverse transcriptase in microorganisms, to develop assays for the purification of human host factors, and to reconstitute HIV reverse transcription in vitro.

**ENZYMOLGY OF DNA REPLICATION**—Position involves characterizing the unique reactions of a natural multiprotein replicative complex and/or determining its structure.

**GENETIC REGULATION OF REPLICATION PROTEIN SYNTHESIS**—Position involves studying the regulation of replication protein expression and the coordination of this process with the global control of cell division.

Applicants should send their curriculum vitae, a description of their research and career goals, and the names of three references, by 6 June 1987 to: **Dr. Charles McHenry, Professor, Department of Biochemistry, Biophysics and Genetics, B-121, University of Colorado School of Medicine, 4200 East Ninth Avenue, Denver, CO 80262.** *Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

**POSTDOCTORAL POSITIONS** available immediately to work on area of cellular stimulus-response coupling mechanisms involving GTP-binding proteins,  $Ca^{2+}$ , phosphoinositides and arachidonic acid,  $IP_3$  and protein kinases. A strong background in one or more of the following areas is essential: biochemistry (proteins and/or lipids, enzymology) or biophysics (membrane transport, fluorescent probes). Address, curriculum vitae, and three letters of reference to: **Dr. M. B. Feinstein, Department of Pharmacology, University of Connecticut Health Center, Farmington, CT 06032.** *Affirmative Action/Equal Opportunity Employer M/W/H.*

## POSTDOCTORAL POSITIONS

Available immediately to join a research project involving in vivo and cell culture experiments on pattern formation and growth control in developing mouse limb buds. Ph.D. required, with experience in one or more of the following: cell culture, growth factor biology, extracellular matrix, protein chemistry, molecular biology. Submit curriculum vitae and statement of research interests, and ask three individuals to write letters of recommendation to:

**Dr. Susan Bryant  
Developmental Biology Center  
University of California, Irvine  
Irvine, CA 92717**

*The University of California is an Equal Opportunity/Affirmative Action Employer.*

## YALE MEDICAL SCHOOL DEPARTMENT OF PHYSIOLOGY

**POSTDOCTORAL POSITIONS** are available immediately to study the molecular mechanism of Na,K-ATPase in red cell, kidney, and cloned enzyme preparations. Approaches include membrane biochemistry, kinetics of intermediates and transport, subunit interactions, involvement of anions and electrical parameters in purified preparations, ghosts, vesicles, and reconstituted systems. Background in biochemistry and cellular physiology desirable. Send curriculum vitae and three letters of reference by 15 June 1987 to: **Joseph F. Hoffman, Department of Physiology, Yale Medical School, 333 Cedar Street, New Haven, CT 06510.** *Yale University is an Equal Opportunity Employer.*

## POSITIONS OPEN

**POSTDOCTORAL POSITIONS** available for **molecular biologist** with training in site-directed mutagenesis and transgenics, **physical biochemist** with experience in protein structure and stability, and **cell biologist** Studies related to the cellular and molecular biology of lipoproteins and their receptors. Send curriculum vitae and three letters of reference to: **R. W. Mahley, M.D. Ph.D., Gladstone Foundation Laboratories for Cardiovascular Disease, University of California, P.O. Box 40608, San Francisco, CA 94140.**

**POSTDOCTORAL RESEARCH AFFILIATE** Appointment available 1 July 1987 for biochemica pharmacology/toxicology studies of cancer chemotherapeutic agents. The research program focuses (i) on enzymatic mechanisms of activation of alkylating and DNA-reactive agents and (ii) on modulation of cytotoxic selectivity in animals. Recent training or experience in experimental cancer chemotherapy with strong biochemistry background is preferred. Appointment is for 1 year renewable, with a competitive stipend and benefits commensurate with experience and qualifications. Curriculum vitae and summary of pertinent research experience may be sent to: **Dr. Herbert S. Schwartz, Department of Experimental Therapeutics, Roswell Park Memorial Institute, 666 Elm Street, Buffalo, NY 14263.**

## POSTDOCTORAL RESEARCH ASSOCIATE POSITION PROTEIN CHEMISTRY/HUMAN GENETICS UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER

A postdoctoral/research associate position is available immediately to conduct research on the protein structure and molecular genetics of the human alkaline phosphatases, a family of cell surface glycoproteins of clinical and genetic interest. Experience in molecular biology is desirable. Applicants should send curriculum vitae, description of research interests, and the names of at least three references to: **Dr. Clive A. Slaughter, Howard Hughes Medical Institute, University of Texas Health Science Center at Dallas, 5323 Harry Hines Boulevard, Dallas, TX 75235-9050.**

# Pathology & Toxicology Research

The Pathology and Toxicology Research Group of The Upjohn Company has several staff openings (BS or MS level) for qualified research associates. Primary responsibilities will be to determine the toxicity of new chemicals and to study the mechanisms of toxicity. Successful candidates will have a BS or MS in biochemistry, biological or biomedical science, at least one year of relevant laboratory experience and must not have a history of allergies.

## Biology Associate

Design and conduct experimental studies regarding the mechanisms of toxicity and the effects in laboratory animals; utilize standard laboratory equipment; prepare protocols and technical reports; familiarity with computers, cardiovascular physiolo-

gy and/or pharmacology highly desirable. Please refer to position number 20485-A.

## Biochemistry Associate

Study the mechanisms of compound toxicity requiring application of *in vivo* and *in vitro* techniques which include the operation of laboratory equipment (chromatograph, ISC, spectrophotometer, and radiochemical methods); conduct biochemical studies utilizing laboratory animals; assist in presentations and preparation of scientific manuscripts. Please refer to position number 20099-A.

Kalamazoo is a medium-sized, Southwestern Michigan community with immediate access to a rich mix of cultural, educational and recreational pursuits including numerous lakes and a four-season climate. Upjohn offers the opportunity for career growth, a competitive salary commensurate with experience, a comprehensive benefits program and relocation assistance. For confidential consideration, please call from outside of Michigan toll free 1-800-253-8600, ext. 3-6767, (inside Michigan call collect 616-323-6767) to request an employment application be sent to you immediately. When calling, please refer to one of the above position numbers.

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## SENIOR RESEARCH SCIENTIST (Peptide Chemistry)

The LILLY RESEARCH LABORATORIES, a Division of Eli Lilly and Company, is seeking highly qualified peptide chemistry candidates for a Senior Scientist position in the Biochemical Research Division.

Applicants must have a doctoral degree in either biochemistry, organic chemistry or medicinal chemistry and post-doctoral experience in the synthesis of amino acids and/or peptides.

In search for new therapeutically active compounds, the Senior Scientist will study peptides and their interactions in biological systems. A working knowledge of molecular modeling, structure-activity relationships, and purification of synthetic peptides is highly desirable.

Qualified candidates should send their curriculum vitae to:

John W. Crooks  
Manager, College Relations (SPC)  
Eli Lilly and Company  
Lilly Corporate Center  
Indianapolis, Indiana 46285



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## POSITIONS OPEN

**POSTDOCTORAL RESEARCH ASSOCIATE** positions for well-trained, highly motivated biochemists to study molecular, regulatory, and pathophysiological aspects of protein kinase C systems in heart, cancer, and brain. Expertise in protein and lipid biochemistry and enzymology essential; experience in cell culture helpful. Send résumé to: **Dr. J. F. Kuo, Departments of Pharmacology and Biochemistry, Emory University School of Medicine, Atlanta, GA 30322. An Equal Opportunity/Affirmative Action Employer.**

**POSTDOCTORAL RESEARCH ASSOCIATE** position available 1 July 1987 in a laboratory specializing in comparative endocrinology. Research will involve the production and purification of monoclonal antibodies to biologically active neuropeptides. A working familiarity with radioimmunoassays, HPLC, and monoclonal technology is essential. The position requires teaching of human gross anatomy to Medical Students and prior experience in gross anatomy is preferred. Send applications to: **Dr. Noelle Granger, Department of Anatomy, University of North Carolina at Chapel Hill, 350 Swing Building 217H, Chapel Hill, NC 27514. The University of North Carolina at Chapel Hill is an Equal Opportunity/Affirmative Action Employer.**

### UNIVERSITY OF NEBRASKA-LINCOLN VETERINARY SCIENCE DEPARTMENT POSTDOCTORAL RESEARCH FELLOW

Position available to conduct research in area of herpesvirus latency including identification and characterization of herpesvirus genes and gene products involved in initiation, maintenance, and reactivation of latent virus infections. Ph.D. in microbiology, biochemistry, or molecular biology with experience in molecular biology, protein biochemistry, and/or virology/tissue culture is desired. Send curriculum vitae and three letters of reference by 19 June 1987 to: **Dr. Daniel Rock, Veterinary Science Department, University of Nebraska-Lincoln, Lincoln, NE 68583-0905. Affirmative Action/Equal Opportunity Employer.**

**POSTDOCTORAL RESEARCH POSITION** available for studies on neurochemical basis of intracranial self-stimulation. Research involves monitoring released dopamine with in vivo voltammetry and microdialysis during ICSS. Previous experience with ICSS desirable. Interdepartmental program in Chemistry (J. B. Justice, Jr.) and Psychology (D. B. Neill). Position available September 1987. Send curriculum vitae and names of three references to: **J. B. Justice, Jr., Department of Chemistry, Emory University, Atlanta, GA 30322. Telephone: 404-727-6585.**

*Emory University is an Equal Opportunity/Affirmative Action Employer.*

### U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL RESEARCH SERVICE

Postdoctoral research position is available in the Horticultural Crops Quality Laboratory. Position is to study membrane-associated enzymes involved in biosynthesis of cell wall polysaccharides. Knowledge or experience in plant biochemistry and enzymology associated with plant membranes required. For information contact: **Dr. Alley E. Watada, telephone: 301-344-3128.** Salary is \$27,172. U.S. citizenship required. Address for application is: **USDA, Agricultural Research Service, Personnel Operations Branch, Beltsville Area, Beltsville, MD 20705.** Applications must be marked 7E024. *An Equal Opportunity Employer.*

### POSTDOCTORAL OR RESEARCH POSITION AVAILABLE IN CELLULAR IMMUNOLOGY FOR Ph.D. OR M.D.

Studies deal with immunopharmacology of immunosuppressive agents including mechanisms of action at the cellular and molecular level, and use in tolerance induction as part of a major program in transplantation. Salary range from \$24,000 to \$34,000, depending on prior experience.

Send curriculum vitae together with names of three references to: **Marvin R. Garovoy, M.D., Director, Immunogenetics and Transplantation Laboratory, HSE-520, University of California, San Francisco, Third and Parnassus Avenues, San Francisco, CA 94143.**

*The University of California is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

## POSITIONS OPEN

### POSTDOCTORAL OR RESEARCH POSITION—AVAILABLE IN MOLECULAR-CELLULAR IMMUNOLOGY FOR Ph.D. OR M.D.

Studies deal with human lymphokine regulation, cell and gene cloning as part of a major program on the induction of transplant tolerance. Salary range from \$24,000 to \$34,000, depending on prior experience.

Send curriculum vitae together with names of three references to: **Marvin R. Garovoy, M.D., Director, Immunogenetics and Transplantation Laboratory, HSE-520, University of California, San Francisco, Third and Parnassus Avenues, San Francisco, CA 94143.**

*The University of California is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

**POSTDOCTORAL RESEARCHER POSITION** available immediately for 2 to 3 years to study the regulation of I-A expression by murine peritoneal macrophages. Work will focus on the biochemistry and molecular biology of continuous I-A expression that is controlled by the Bcg gene [J. Immunol. 138, 1372 (1987)]. Send curriculum vitae and names of three references to: **Dr. Bruce S. Zwilling, Department of Microbiology, The Ohio State University, 484 West 12th Avenue, Columbus, OH 43210. The Ohio State University is an Affirmative Action/Equal Opportunity Employer.**

**PROTEIN CHEMIST** sought by the Joint Protein Structure Laboratory of the Ludwig Institute for Cancer Research and The Walter and Eliza Hall Institute for Medical Research in Melbourne to study structure-function relationships of growth factors, receptors, and mediators of growth factor action. Candidates should have extensive experience in microisolation techniques, sequencing, 2-D gel electrophoresis, or peptide synthesis. Salary A\$28,379 to A\$33,376; 2-year tenure with opportunity for renewal. Candidates should submit by 5 June 1987 their résumé and names of three referees to: **The Director, Ludwig Institute for Cancer Research, PO Royal Melbourne Hospital, Victoria 3050, Australia.**

### RESEARCH ASSISTANT

Immediate opening in project developing novel immunoassays. Successful applicant will have experience in particle agglutination and surface coating procedures and B.S. in a biological science. Individuals with advanced degrees also encouraged to apply. Fully competitive salary commensurate with qualifications. Excellent benefits and free parking. Near public transportation. Send curriculum vitae to:

**Nrapendra Nath, Ph.D.  
American Red Cross  
Biomedical Research and Development  
Jerome H. Holland Laboratory  
for the Biomedical Sciences  
15601 Crabbs Branch Way  
Rockville, MD 20855**

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**RESEARCH ASSOCIATE**—Job order 656156. Research in the field of arthropod biology and asbestos analysis. Work in the Electron Microscope laboratory. Must be familiar with arthropod biology and asbestos analysis by scanning electron microscope (SEM), transmission electron microscope (TEM), and selected area electron diffraction (SAED). B.S. in biology. Forty hours per week; 8:30 a.m. to 4:30 p.m.; \$18,000 per year. Contact: **Louisiana Department of Employment Security, 617 St. Charles Avenue, New Orleans, LA 70130.**

**RESEARCH ASSOCIATE** for university in north-eastern Ohio to conduct advanced research in macromolecular (polymer) science. In particular, (i) theoretical and experimental analysis to determine helix-coil stability parameters for naturally occurring amino acids in sodium dodecyl sulfate solutions. (ii) To study the dynamics, using computer simulation techniques, of protein-ligand or drug-receptor interactions. Requires Ph.D. in macromolecular science and engineering plus 1 year of experience in job described; 40 hours per week, \$17,100 per year. Qualified applicants reply immediately with résumé to: **L. Ellison, JO # 1025047, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.**

## POSITIONS OPEN

**RESEARCH ASSISTANT** position available for recent Ph.D. with bachelor's and doctorate degrees in pharmacy or a related science. Research will involve experimental cancer chemotherapy, molecular biology, and biochemical pharmacology, both in vivo and in vitro. The applicant must be experienced in in vitro drug metabolism, receptor binding methodology, high performance liquid chromatography, two-dimensional gel electrophoresis, DNA and RNA hybridization and must be familiar with in vivo studies of antineoplastic agents in human tumor xenografts. Salary \$24,000. Send curriculum vitae and names of three references to: **Dr. J. A. Houghton, Department of Biochemical and Clinical Pharmacology, St. Jude Children's Research Hospital, 332 North Lauderdale, Memphis, TN 38101. An Equal Opportunity/Affirmative Action Employer.**

### RESEARCH ASSOCIATE/ ASSOCIATE DIRECTOR

The University of Missouri invites applications for a 12-month state-supported position as Associate Director of a Monoclonal Antibody Facility. Duties include supervising operations of the Facility, performing daily routines of hybridoma and monoclonal antibody production, and interacting with faculty users of the Facility. Candidates should have Ph.D. degree or equivalent experience in immunology, hybridoma technology, and immunoassays. Send applications to: **Dr. Richard Wang, Dalton Research Center, University of Missouri, Columbia, MO 65211. An Equal Opportunity Employer.**

**RESEARCH ASSOCIATE/POSTDOCTORAL FELLOW:** A position is available to study structure/function relationships of contractile proteins in muscle and nonmuscle motility. Techniques include immunoelectron microscopy, fluorescence spectroscopy, protein purification by HPLC, site-directed mutagenesis. Experience in physical biochemistry or protein chemistry required.

Send résumé and three references to: **Dr. S. Lowey, Rosenstiel Basic Medical Sciences Research Center, Brandeis University, Waltham, MA 02254.**

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Need **TWO RESEARCH ASSOCIATES** to perform studies on (i) developmental neurochemistry of polyamines, (ii) neurochemical regulation of GABA receptor function. Contact: (i) **Dr. Theodore A. Slotkin, (ii) Dr. Rochelle D. Schwartz, Department of Pharmacology, Box 3813, Duke University Medical Center, Durham, NC 27710. Duke University is an Equal Opportunity/Affirmative Action Employer.**

**RESEARCH FELLOW—GEOGRAPHIC INFORMATION SYSTEMS.** The Natural Resources Research Institute of the University of Minnesota, Duluth, has an opening for a Research Fellow specializing in Geographic Information Systems (GIS) in its Water Division. Minimum qualifications: M.S./M.A. degree with major emphasis in geography or biology and course work in advanced cartography, quantitative methods, and computer programming, plus 2 years of experience in a laboratory setting. Desired qualifications: M.S./M.A. degree with major emphasis in geography or biology and course work in advanced cartography, quantitative methods, and computer programming, plus 2 years of experience in a laboratory setting, plus experience with GIS, particularly ERDAS and ARC/INFO. Experience in use of mainframe and IBM-PC microcomputers, plus computer peripherals required for entering and generating mapped data (digitizing table, nine-track tape drive, graphics printers, and plotters). Experience in use of statistical packages (SAS, SPSS, BMDP) for analysis of spatial features. Salary: approximately \$22,000 dependent on experience. Starting date: 1 July 1987 for 1 year with possible extension. Applications must be postmarked by 5 June 1987. To apply, please send curriculum vitae, transcripts, and names, addresses, and phone numbers of four references to: **Personnel Manager, Natural Resources Research Institute, University of Minnesota, Duluth, 3151 Miller Trunk Highway, Duluth, MN 55811. The University of Minnesota is an Equal Opportunity Educator and Employer and specifically invites and encourages applications from women and minorities.**





**Agricultural  
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Service**

**United States  
Department of  
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## **NUTRITIONIST SCIENTIFIC PROGRAM OFFICER BOSTON, MA**

This individual is the primary government liaison official to the research leadership at the USDA Human Nutrition Research Center on Aging, carried out under contract by Tufts University. Located in Boston, MA, in a new facility, the program is a multidisciplinary attempt to uncover: (1) the adequacy of nutrient consumption of adults as they age; (2) nutrient needs of aging adults; (3) relationship of nutrient intake to age-related changes in physiologic functions.

The Scientific Program Official represents the Agricultural Research Service in program planning, resource allocation and program delivery evaluation.

The job requires a broad and indepth knowledge of science encompassed by nutrition particularly biochemistry, physiology and related disciplines.

Must be a U.S. citizen. Salary is commensurate with experience. For information on application procedures, contact Alice McNamara, 301/344-2944. Applications in response to this advertisement should be marked 7E019. Applications should be sent to: **Alice McNamara, ARS, USDA, PD, Rm. 123, Bldg. 003, BARC-West, Beltsville, MD 20705.** Applications must be received by **June 15, 1987.**

**Grade:** GM 14 or 15

**Salary Range:** mid \$40's to low \$60's

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## **PROCESS ENGINEER/ SCIENTIST**

Agracetus, a world leader in agricultural biotechnology, seeks an innovative individual to be in charge of formulation, process development and packaging for commercial-scale production of microorganisms to be used in plant agriculture. Experience in industries utilizing live microorganisms and sterile conditions is essential. Desirable educational credentials would include advanced work in chemical engineering.

This position offers the excitement and opportunity to be instrumental in the development of new products and processes. It requires close interaction with business staff and with scientists who are developing these microorganisms.

If you enjoy the challenge of being in a growth company, please send your resume and salary history to: **Personnel Department, Agracetus, 8520 University Green, Middleton, WI 53562.**



Repligen Corporation is a biotechnology company that develops and produces biochemical and biocatalytic products for the health care, personal care and industrial markets. We are seeking highly qualified candidates for the following positions:

### **Principal Investigator Mammalian Cell Expression**

Ph.D. with 5+ years post-doctoral experience. This is a senior scientist position to establish and direct a mammalian cell expression laboratory to produce recombinant proteins. The successful candidate will possess an exceptional record of achievement and have proven program management skills.

### **Research Scientist Protein Chemistry/Subunit Vaccine Development**

Ph.D. with 2-5 years post-doctoral experience. Requires a working knowledge of vaccine development and adjuvant technology and a strong background in protein structure-function studies, physical characterization and chemical modification of polypeptides. Peptide synthesis ability would be useful.

### **Research Scientists/ Research Associates Molecular Biology**

Ph.D. with 2-5 years post-doctoral experience or M.S./B.S. with 2-4 years relevant experience. Areas of expertise are cloning, site-directed mutagenesis and gene expression in bacterial and other systems. Experience with molecular immunology and virology and protein chemistry would be useful.

### **Research Scientist Protein Chemistry**

Ph.D. with 2-5 years post-doctoral experience. Relevant research areas include protein structure and function, membrane protein chemistry and receptor analysis and characterization. Techniques/experience in microbiology would also be useful.

### **Research Scientist/ Research Associate DNA Sequencing**

Ph.D. or B.S./M.S. with extensive experience in DNA sequencing and computer organization and analysis of sequence data. Experience in project organization, technician supervision and use of DNA synthesizer a plus.

### **Research Associate Antibody Purification Applications Development**

B.S. with 2-4 years relevant experience. Requires a working knowledge of monoclonal antibody purification and characterization — preferably at process scale. Excellent oral and written communication skills are essential. A working knowledge of protein purification process development would be useful.

Repligen offers a competitive salary, excellent benefits and equity participation. Please submit cover letter, resume, references, and salary requirements to: **Personnel Director - R&D, One Kendall Sq., Bldg. 700, Cambridge, MA 02139.** An Equal Opportunity Employer.

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## POSITIONS OPEN

### RESEARCH FELLOW

Research fellow position available immediately for accomplished molecular biologist. Five years of experience with recombinant DNA techniques required, and some experience with transfection of mammalian cells is desirable but not essential. Successful applicant will interact closely with other laboratory members in research projects concerning pathways of intracellular protein degradation and cellular aging. Send curriculum vitae and names of three references to: **Dr. J. Fred Dice, Department of Physiology, Tufts University, 136 Harrison Avenue, Boston, MA 02111.**

**RESEARCH SCIENTIST**—Apply AIRSHED photochemical oxidant numerical model to simulate the ozone concentrations to evaluate ozone control strategies in urban areas; develop dispersion modeling techniques for heavier-than-air (dense) gases in the atmosphere. Requires B.S. in atmospheric science and 2 years of professional research experience in numerical air pollution modeling, or M.S. in atmospheric science and 1 year of professional research experience in numerical air pollution modeling. Areas of research experience must include peer-reviewed publications; the use of AIRSHED and DEGADIS numerical models, and graphics and statistics software on UNIVAC 1100 and IBM 3083 systems. 37.5 hours per week/\$26,354 to \$32,801 per year. Send résumé and two letters of recommendation by 30 June 1987 to: **Bureau of Personnel, NY State Department of Environmental Conservation, 50 Wolf Road, Room 100, Albany, NY 12233. Attention: M. Hines.**

**RESEARCH SCIENTIST:** Surgical laboratory in university-based surgical department seeks basic science researcher with Ph.D. in biochemistry, immunology, or physiology. Must be qualified for academic appointment with specific interest in wound healing, collagen, and/or elastin metabolism. Attractive salary and comprehensive benefits. Please send curriculum vitae or contact: **Jean Cogswell, Employment Representative. Telephone: 718-470-8842. Long Island Jewish Medical Center, New Hyde Park, NY 11042. An Equal Opportunity Employer.**

### SCIENCE ASSOCIATE

The Environmental Defense Fund, a national non-profit environmental organization, invites applications for the position of staff scientist. Responsibilities include research on environmental problems and its application to public policy. Areas of interest include acid rain and global atmospheric change, and their effects. Applicants with advanced degrees in physical sciences such as atmospheric sciences or aquatic chemistry are encouraged to apply. Applicants should apply to: **Jane Ceraso, Environmental Defense Fund, 257 Park Avenue South, New York, NY 10010.**

**SCIENTIST:** Conduct research leading toward development of pharmaceuticals for treatment of reproductive disorders. Includes characterization and isolation of receptor proteins of reproductive hormones by affinity techniques for primary structure analysis to lead to cloning DNA: isolation, purification, and characterization of reproductive hormones from tissues and cell culture media; developing and standardizing bioassays and immunoassays for such hormones; direct research in reproductive neuroendocrinology. M.S. or Ph.D. or equivalent in chemistry or biochemistry; 5 years of experience or 5 years of experience in reproductive endocrinology research. Research experience must include peptide and protein biochemistry as well as reproductive endocrinology. Demonstrated ability to conduct scientific research as required of the position. Salary: \$46,700 per year. Job site: South San Francisco, California. Clip ad and send with résumé to: **Job Order #CR4401, P.O. Box 9560, Sacramento, CA 95823-0560, no later than 12 June 1987.**

**SENSORY NEUROPHYSIOLOGIST.** Tenure-track possibility for position available at assistant professor level. Serious commitment to collaborative work within the Microsurgical Research Center. Expertise required to characterize electrophysiologically the properties of central axons which have regenerated along peripheral nerve implants. Preference given to applicants experienced in spinal cord neurophysiology and tract-tracing and histological techniques. Please send curriculum vitae with three letters of recommendation to: **Dr. Julia Terzis, Microsurgical Research Center, Eastern Virginia Medical School, P.O. Box 1980, Norfolk, VA 23501.**

## POSITIONS OPEN

**SOIL-PLANT RELATIONSHIPS/NUTRIENT CYCLING. ASSISTANT/ASSOCIATE PROFESSOR,** 12-month, 50 percent teaching/50 percent research, tenure-accruing position available 1 September 1987. Expertise required in soil-plant relationships and nutrient cycling on rangeland systems. Ph.D. in range science, plant ecology, or closely related area required. Submit letter of application, curriculum vitae, and three letters of reference to: **Dr. J. L. Schuster, Department of Range Science, Texas A&M University, College Station, TX 77843-2126. Telephone: 409-845-5579.** Application deadline is 15 June 1987. *Texas A&M is an Equal Opportunity/Affirmative Action Employer.*

**TOXICOLOGIST**—for a new program for evaluating drinking water additive products, for example, water treatment chemicals, pipes, coatings. A Ph.D. in toxicology and 3 years of experience or a Ph.D. in a related field and 6 years of toxicology experience are required. American Board of Toxicology Certification is preferred. The position requires above average writing and speaking skills. Send résumé and salary history to: **Personnel Manager, National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48106.**

### VETERINARY MORPHOLOGIC PATHOLOGIST

The Department of Pathology, Colorado State University, is seeking applicants for a tenure-track faculty position at the assistant or associate professor level. The person will participate in teaching in the graduate and professional veterinary curricula, independent and/or collaborative research, and pathology service rotation. The appointed faculty member will be expected to develop a research effort in an area of interest and seek competitive funding support. Candidates should possess the D.V.M. and Ph.D. degrees. ACVP Board certification or impending eligibility is desired. The academic rank and salary will be competitive and commensurate with the qualification of the individual selected. Applicants should submit curriculum vitae, a detailed letter of intent, and direct three reference letters to: **Dr. Robert W. Norrdin, Search Committee Chairman, Department of Pathology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO 80523.** Applications will be accepted through 15 July 1987 or until a suitable candidate is identified. *Colorado State University is an Affirmative Action/Equal Opportunity Employer.*

**VIROLOGIST (M.D. OR Ph.D.),** with interest in mechanisms of disease or development of viral detection techniques, to establish a research program. Must be capable of obtaining independent research funds and eligible for medical school faculty appointment. Send curriculum vitae and outline of proposed research programs to: **Sherrill J. Slichter, M.D., Scientific Director, Puget Sound Blood Center, Terry at Madison, Seattle, WA 98104.**

## FELLOWSHIPS

### MAGNESIUM TRANSPORT

**POSTDOCTORAL FELLOWSHIP:** A postdoctoral fellowship is available to study the mechanism of Mg transport across cell membranes. Significant advances into the mechanism of Mg transport across membranes are expected in view of the unique model tissue used and a new approach of measuring intracellular Mg activity. The basic methods of investigations are electrophysiological, probing Mg transport with intracellular conventional and ion-selective microelectrodes and patch-clamp techniques. After defining and characterizing the dominant Mg transport pathway in the natural membrane, the aim is to develop a cell line of the Mg transporting epithelium with the long-term objective of isolating and reconstituting the Mg transporter. The project is a joint venture between the Departments of Physiology and Chemistry at Cornell. Candidates interested in this work should call: **Dr. Klaus W. Beyenbach, telephone: 607-253-3482, or send curriculum vitae to me in the Department of Physiology, VRT826, Cornell University, Ithaca, NY 14853.**

## FELLOWSHIPS

**POSTDOCTORAL FELLOWSHIP**—available July 1987 to study translocation of membrane receptors and other aspects of activation of phagocytosis in human neutrophils and macrophages. Experience with immunoassays, monoclonal antibodies, and/or cell fractionation and membrane protein biochemistry techniques desirable. Send curriculum vitae and names of three references to: **Melvin Berger, M.D., Ph.D., Rainbow Babies & Childrens Hospital, Division of Immunology, 2101 Adelbert Road, Cleveland, OH 44106. Rainbow Babies & Childrens Hospital is an Equal Opportunity Employer.**

**HARRINGTON ARTHRITIS RESEARCH CENTER, POSTDOCTORAL FELLOWSHIP IN BONE BIOLOGY.** Two-year position available July 1987 for research on bone response to biomaterials, implants, and drugs with bone histology and histomorphometry. Applicants must have Ph.D. degree or equivalent, and ability to participate in an active multidisciplinary program devoted to arthritis. For information, contact: **Thomas Gruen, Director of Education, Harrington Arthritis Research Center, 1800 East Van Buren, Phoenix, AZ 85006.**

**HARRINGTON ARTHRITIS RESEARCH CENTER, POSTDOCTORAL FELLOWSHIP IN IMMUNOLOGY.** Two-year position available July 1987 for research on cellular immunology, immunohistochemistry, and immunoassays associated with arthritis and biomaterials. Applicants must have Ph.D. degree or equivalent, and ability to participate in an active multidisciplinary program devoted to arthritis. For information, contact: **Thomas Gruen, Director of Education, Harrington Arthritis Research Center, 1800 East Van Buren, Phoenix, AZ 85006.**

**POSTDOCTORAL FELLOWSHIP** available immediately in the department of Laboratory Medicine, Yale University School of Medicine, to study molecular mechanisms of transplacental transfer of cytomegalovirus in guinea pigs. Applicant should be a Ph.D. in immunology. Experience with monoclonal antibody production and characterization, protein purification, molecular biology methods, and broad knowledge of cellular immunology are essential. Opportunity to interact with a large community of scientists at the Yale University School of Medicine. Applicants should provide curriculum vitae, academic transcripts, and names, addresses, and phone numbers of three references. For more information contact: **Dr. Brigitte P. Griffith, Virology Laboratory 151B, VA Medical Center, West Haven, CT 06516. Telephone: 203-932-5711, extension 744.**

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## **ImmuLogic Pharmaceutical Corporation**

Recent developments in the understanding of immune system function have inspired the formation of a company dedicated to research and development of novel therapeutic agents for the treatment of infectious diseases and immune disorders. The company will employ molecular biology, genetic engineering, and protein engineering in novel and creative ways to alter the immune response. We are seeking outstanding scientific and technical personnel for the following positions:

### **Senior Scientists Immunology**

Will lead a research team engaged in independent and collaborative research. M.D./Ph.D. or Ph.D. with at least three years' experience in molecular immunology, cellular immunology, or immunochemistry is required.

### **Senior Scientists Molecular Biology**

Will lead a research team engaged in independent and collaborative research. Ph.D. with at least three years' experience in recombinant DNA technology, preferably in mammalian systems, is required.

### **Senior Scientists Protein Chemistry**

Will lead a research team engaged in independent and collaborative research. Ph.D. with at least three years' experience in protein and/or peptide structure/function analysis is required.

### **Research Associates**

Will be part of a research team under the guidance of a Senior Scientist. Master's degree or minimum of five years' experience in immunochemistry, molecular biology, or biochemistry required. An individual with knowledge of peptide synthesis and purification is also being sought.

### **Research Assistants**

Will perform laboratory procedures and participate in research as member of a project team. Bachelor's degree in biological sciences and some laboratory experience is required.

ImmuLogic is committed to providing a challenging, creative interactive environment. You will work in collaboration with leading scientists in immunology, molecular biology, and biochemistry, and you will contribute to building a new and dynamic company which will be a leader in its field. ImmuLogic is conveniently located in Cambridge, MA within walking distance of MIT. We offer competitive salary and benefits as well as an incentive stock option program.

Please send curriculum vitae and list of publications and/or resume to:

**ImmuLogic Pharmaceutical Corporation**  
P.O. Box 1376  
Kendall Square  
Cambridge, MA 02142  
Attn: Human Resources Dept.  
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## **BIOTECHNOLOGY**

The Amoco Research Center is expanding its dynamic staff and currently has several exciting career opportunities available in the following areas:

### **CHEMIST**

We seek a Bioorganic Chemist with PhD to work with molecular biologists and engineers to develop process for synthesis of novel analogs of isoprenoid compounds. Position requires experience with natural products chemistry and analytical/separations techniques, as well as a strong background in structure elucidation.

### **MICROBIAL PHYSIOLOGIST/ ENZYMOLOGIST**

We seek a PhD to join our Molecular Biology program dedicated to the development of genetically engineered microorganisms, including yeast, capable of producing selected secondary metabolites. This position requires a background in microbiology, experience with enzyme assays/purification and knowledge of natural products chemistry/analysis. Industrial experience is preferred, but not necessary.

### **FERMENTATION SPECIALIST**

Qualified candidate will possess a PhD or MS with a strong microbiological background to optimize production and scale-up of non-protein products from genetically engineered yeast. Some experience with yeast and genetically engineered organisms desirable. This position will require extensive interaction with molecular biologists and process engineers. Some industrial experience is required.

These positions offer the distinct advantage of working with a top flight team of professionals and both personal and professional advancement. Selected candidates will receive salaries commensurate with experience, a comprehensive benefits package and a convenient suburban Chicago location. Please forward resume, INDICATING POSITION OF INTEREST, in strictest confidence, to:

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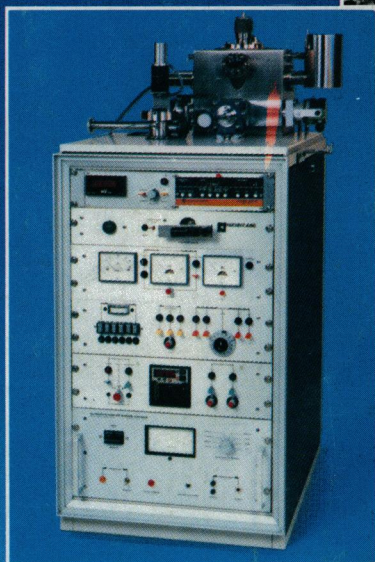
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Using liquid Nitrogen or liquid Helium as the coolant, you can fracture specimens at temperatures down to 5 °K (-268 °C) in a clean ultra-high vacuum of  $10^{-9}$  torr. Accurate temperature control allows user to deep etch with reproducibility. Water-cooled electron beam guns facilitate high-resolution replicas shadowed with either Pt/C or pure Ta.



Micrograph at left shows complementary images of pits and particles from porcine renal microsomal membranes enriched in Na<sup>+</sup> K<sup>+</sup> ATP ase. Fractured at 5° K and shadowed with 0.6 nm Pt/C at 20°. Courtesy of H.P. Ting-Beall, F.M. Burgess and J.D. Robertson, Duke University.

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