Homeostatic Conditioning


For a rat, a shot of alcohol is a chilling experience, but only at first. One cubic centimeter of ethanol dilates the rat's blood vessels, increasing thermal conductance between core and periphery, so that in a typical 23°C environment the animal rapidly loses body heat. However, after a few of these chilling experiences, anticipatory thermoregulatory mechanisms kick in when the shot of alcohol seems imminent, generating heat to offset the anticipated loss. Thus the animal's thermal response to alcohol shows what a pharmacologist would call tolerance. The drop in body temperature becomes less pronounced with each successive administration of alcohol.

Experiment shows that this tolerance is the result of classical conditioning to stimuli associated with the administration of alcohol. The experimenter first administers alcohol under one set of circumstances and saline solution under different conditions to the same animal and then switches substances. When alcohol is injected under circumstances initially associated with it there is no hypothermic response, indicating tolerance, but when alcohol is injected into the same animal under the circumstances associated with the saline solution, there is a full-blown hypothermic response. Moreover, when the saline solution is injected under circumstances associated with alcohol, there is a strong hyperthermic response. The rat that expects alcohol but gets the saline solution generates heat to offset an anticipated loss that does not materialize.

The anticipatory thermoregulatory response illustrates the thesis of Barry Dworkin in Learning and Physiological Regulation, in which he brings together two historically disparate experimental and theoretical traditions—the study of learning and the study of regulatory mechanisms. His goal is to get students of learning to think about classical and instrumental conditioning in a regulatory context and to get students of regulatory mechanisms to appreciate the large role that learning plays in regulation. In the process, he gives a sympathetic review of the often ignored Russian work on the conditioning of interoceptive reflexes.

Dworkin brings into sharp focus a major unsolved problem in regulatory physiology: how the brain achieves accurate long-term regulation of the physiological state in the apparent absence of transducers capable of a prolonged steady-state response. Many physiological variables are held within narrow limits for most of an animal's lifetime. To hold constant such vital internal factors as blood pressure, body temperature, pH, carbon dioxide concentration, salinity, nutrient levels, and so on, the neuroendocrine system receives signals from specialized interoceptive sensors. Many such interoceptors have been identified and studied experimentally. Without fail—as Dworkin goes to some lengths to document—they have one serious shortcoming: they cannot signal drift (slow change). They adapt so rapidly that within a few seconds to, at most, a few minutes after a step change in the value of the sensed variable, the signal from the transducer is essentially zero. Imagine trying to design an effective heating and air-conditioning system when all available thermometers read zero regardless of the actual temperature, provided only that the actual temperature has remained steady for the last few minutes.

Dworkin thinks that instrumental conditioning mechanisms may offer a solution to the problem of how regulatory mechanisms cope with this serious shortcomings in transducer characteristics. The idea is that all the transducers need to do is signal "mystakes" in the patterns of efferent regulatory neural signals. Mistakes are efferent patterns that drive regulated variables outside the bounds of what local buffer-like, non-neural tissue reactions can manage. The mistake signals act the way punishers in instrumental conditioning do, they decrease the frequency of the kinds of outputs that generate them (according to the law of effect, as it applies to punishers). These ideas are developed only in schematic form in the final chapter of the book. It is hard to judge whether they offer serious prospects for resolving the paradox posed by adapting transducers in regulatory pathways.

In contrast, Dworkin devotes two earlier chapters to a more rigorous, mathematical development of the idea that classical conditioning endows regulatory systems with what amounts to anticipatory control. Anticipatory control is a much more sophisticated form of control than that provided by the simple servomechanisms taught in introductory courses in regulatory physiology. Anticipatory regulators extrapolate future challenges and take countermeasures before those challenges materialize. Yet Dworkin's development of this concept is awkward, relying on unconventional discrete time-bin mathematics and equally unconventional diagrams intended to illustrate his arguably more intuitive but certainly less mathematically felicitous approach to the problem of mathematically characterizing the behavior of mechanisms whose outputs and inputs are both continuous functions of time.

Serious students of regulatory physiology will want to read this book. Students of conditioning may also find it thought-provoking, despite what many will think a dated and simplistic treatment of classical and instrumental conditioning.

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THE UNIVERSITY OF GEORGIA

PLANT MOLECULAR GENETICS

The Departments of Botany and Genetics intend to joint-appoint a tenure-track assistant professor beginning fall 1994. We are particularly interested in candidates who are applying for genetic approaches to the study of fundamental problems in plant biology, such as physiology, development, or evolutionary mechanisms. The candidate will also be expected to teach at the graduate and undergraduate levels. Applicants must have postdoctoral experience. Curriculum vitae, up to five reprints, a statement of future research and teaching plans (1 page), and four letters of recommendation solicited by the applicant should be received no later than December 3, 1993, by: Botany/ Genetics, Department of Botany, University of Georgia, Athens, GA 30602, USA. Inquiries may be addressed to the Chair of the Search Committee, Dr. Gary Kochert, by Telephone: (706-542-1820) or Electronic Mail: (kochert@dogwood.botany.uga.edu).

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Send a letter of interest, curriculum vitae, brief statement of research goals and teaching goals, representative reprints, and three letters of reference by November 15, 1993, to: Dr. Marvin Starzyk, Chair, Department of Biological Sciences, Northern Illinois University, DeKalb, IL 60115-2861. Telephone: 815-753-1783.

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FACULTY POSITION IN CELL BIOLOGY

As part of our expanding program, the Department of Biological Sciences invites applications for a full-time tenured-track position in the rank of ASSISTANT PROFESSOR. Applicants must have a Ph.D., postdoctoral research experience and a commitment to excellence in research and teaching. The successful applicant will be expected to seek extramural funding and to establish a vigorous research program involving graduate and undergraduate students. We strongly encourage applications from women and minorities. The Department of Biological Sciences at the University of Washington, which consists of 12 interactive faculty members, most with externally funded research programs, is located in the new Science Center. Applications must include a curriculum vitae, three letters of reference and a statement of research and teaching goals to: Dr. James R. Carey, Chair, Cell Biology Search Committee, Department of Biological Sciences, University of Washington, Seattle, WA 98195. Telephone: 206-685-2072. Application deadline: December 13, 1993. University of Washington is an Affirmative Action/Equal Opportunity Employer.

FACULTY POSITION

Department of Medical Biochemistry and Genetics

The Department of Medical Biochemistry and Genetics invites applications for a tenure-track ASSISTANT PROFESSOR or tenured ASSOCIATE PROFESSOR faculty position. Candidates are expected to establish an active independent research program with additional opportunities for collaboration with other investigators. Experience or potential for development of NIH or other federal resources is required. Applicants should have an interest in biochemistry, molecular biology, or molecular genetics. Review of applications will begin on 1 October 1993 and continue until the position is filled. Women and members of minority groups are encouraged to apply. The University of Oregon Health Sciences University is an Equal Opportunity/Affirmative Action Employer.

ASSISTANT PROFESSOR OF BIOLOGY

The Department of Biology at the University of New Mexico (UNM) is seeking applicants for a full-time, tenure-track assistant professor, to begin August 15, 1994, in one of the following areas: (1) PLANT MORPHOLOGY/DEVELOPMENT. We seek candidates who are actively engaged in research on plant morphogenesis. Applicants should have an established record of research publication or potential for development of a new research program in this area. Ph.D. in related field preferred. (2) PHYLOGENETIC RECONSTRUCTION. We seek a candidate who is actively engaged in the study of phylogenetic reconstruction and comparative molecular evolution. Applicants should have an established record of research publication in this area. Ph.D. in related field preferred. (3) GENETICS. We seek candidates who are actively engaged in research on plant genetic resources or related areas. Ph.D. in related field preferred. Send letter of interest, curriculum vitae, a statement of research and teaching goals, and three letters of recommendation to: Chair, Search Committee, Department of Biology, The University of New Mexico, Albuquerque, NM 87131-1091. Telephone: 505/277-3411; FAX: 505/277-0304. Application materials must be received by December 15, 1993. UNM is an Equal Opportunity/Affirmative Action Employer and Educator.

FACULTY POSITION

BIOCHEMISTRY/WATER QUALITY/BIOTECHNOLOGY

The Department of Forestry seeks applicants for a tenure-track faculty position at the ASSISTANT PROFESSOR level in the general area of forest hydrology, water quality, or biotechnology. Specific research interests are open; however, the department is especially interested in candidates with demonstrated expertise in the interface between biotic and hydrologic processes. The position is open to candidates with broad range of research interests related to forestry and natural resource management, and maintains an active long-term hydrologic monitoring system (20 years of continuous data) which offers the opportunity to analyze the impacts of land use on hydrologic and water quality parameters. Collaboration with other forestry and natural resource specialists is strongly encouraged, and initiation of a successful research program in the area of expertise is expected. Teaching responsibilities (40%) include forest hydrology, collaboration in a course on integrated resource management, an upper-level elective for area of expertise, and direction of graduate students. To apply, send curriculum vitae, transcripts, a statement of research interests, and three letters of recommendation to: Dr. Robert N. Muller, Chairman, Department of Forestry, 205 T. P. Cooper Building, University of Kentucky, Lexington, KY 40546. Applications accepted until January 7, 1994, or until a suitable candidate is found. The University of Kentucky is an Affirmative Action/Equal Opportunity Employer.

ASSISTANT/ASSOCIATE PROFESSOR IN BEHAVIORAL NEUROSCIENCE

Non-tenure-track opening in the Department of Medical Psychology, School of Medicine, Oregon Health Sciences University (OHSU). The appointee would join the faculty at OHSU and their affiliated faculty colleagues at the Oregon Research Institute. Ph.D. or equivalent degree, postdoctoral training in biology and neuroscience supported by NIMH and NIDA training grants and individual research grants. Candidates should have a Ph.D. degree, postdoctoral experience, and demonstrated ability to conduct independent research in an area complementary to ongoing research efforts in the depart- ment. The specific area of expertise is open. The position would require the appointee to provide a portion of his/her own salary support. Position availability depends on final authorization of the continuing education/consulting fee. Send application materials to: Dr. Andrew F. Conover, Director, Department of Medical Psychology, 2100 N.W. Northgate Drive, Portland, OR 97209. Telephone: 503-494-8464. OHSU is an Equal Opportunity Employer.

ASSISTANT PROFESSOR OF BIOLOGY

The Department of Biology at the University of New Mexico (UNM) is seeking applicants for a full-time, tenure-track assistant professor, to begin August 15, 1994, in one of the following areas: (1) PLANT MORPHOLOGY/DEVELOPMENT. We seek candidates who are actively engaged in research on plant morphogenesis. Applicants should have an established record of research publication or potential for development of a new research program in this area. Ph.D. in related field preferred. (2) PHYLOGENETIC RECONSTRUCTION. We seek a candidate who is actively engaged in the study of phylogenetic reconstruction and comparative molecular evolution. Applicants should have an established record of research publication in this area. Ph.D. in related field preferred. (3) GENETICS. We seek candidates who are actively engaged in research on plant genetic resources or related areas. Ph.D. in related field preferred. Send letter of interest, curriculum vitae, a statement of research and teaching goals, and three letters of recommendation to: Chair, Search Committee, Department of Biology, The University of New Mexico, Albuquerque, NM 87131-1091. Telephone: 505/277-3411; FAX: 505/277-0304. Application materials must be received by December 15, 1993. UNM is an Equal Opportunity/Affirmative Action Employer and Educator.
The Centre for Natural Product Research, located in the premises of the Institute of Molecular and Cell Biology (IMCB) of the National University of Singapore, represents a major new development in the biotechnology industry. Supported by Glaxo, the IMCB and the Singapore Economic Development Board, the Centre will be fully operational by the end of 1993 and will be developed as an integrated unit dedicated to the discovery of novel drug candidates from natural sources.

We now wish to appoint a Senior Biochemist to the position of Research Leader of the Bioassay Group. Reporting directly to the Head of the Centre, you will be responsible for the development and supervision of the biological screening programme which will incorporate enzyme, receptor and functional cellular assays designed to detect novel bioactive compounds of potential therapeutic use in a wide range of disease targets. You will have a proven track record of scientific achievement with several years' relevant postdoctoral experience, preferably in the drug discovery field. You will also have a demonstrable capacity for scientific innovation, a broad knowledge base spanning the major areas of modern biological sciences and a dedicated commitment to the goal of drug discovery.

This is a key position in which the successful applicant will play a major role in the development of the Centre's screening programme. Excellent communication, interpersonal and management skills, along with strong leadership qualities and a powerful drive to succeed in a challenging environment will therefore be essential attributes. For the candidate able to provide the necessary expertise, enthusiasm and commitment, the appointment provides a unique opportunity for career and personal development in an environment which combines the widely acknowledged cultures of scientific excellence within the IMCB and Glaxo. Competitive terms and conditions of employment, along with generous relocation assistance to this exciting part of the world will also be offered.

Please send a full CV with covering letter to Dr. Miranda G.S. Yap, Institute of Molecular and Cell Biology, National University of Singapore, 10 Kent Ridge Crescent, Singapore 0511, Fax: 010-65-779-1117.
Health Scientist Administrator (HSA)
GS-601-12/13/14

The National Institute of General Medical Sciences, National Institutes of Health, Bethesda, MD is seeking a HSA, responsible for managing the programming and evaluation of a portfolio of research and research training grants that support work in the fields of biological chemistry, particularly where the emphasis of research is on enzymology, lipid biochemistry, intermediary metabolism and bioenergetics. In addition, the incumbent provides scientific expertise in the above mentioned specialized areas and advises grantees and professional staff members regarding research aspects of grants within these areas of expertise and serves as a source of technical knowledge.

Applicants interested in applying must have a knowledge of biochemistry with specific expertise in at least one of these areas: lipid biochemistry, membrane biochemistry, biophysics, enzymology, intermediary metabolism or bioenergetics; ability to make critical judgements about the management and evaluation of scientific research; and ability to write about complex scientific topics for a varied audience.

For information regarding the qualifications and application requirements, please call the NIGMS Personnel Office (301) 594-7767. Announcement closes 11/08/93. U.S. Citizenship is required.

NIH is an Equal Opportunity Employer

Henry Ford Medical Group

NUCLEAR MAGNETIC RESONANCE SCIENTIST

Upon the appointment of Professor Roger Ordidge to the Joel Chair of Medical Physics at University College, London, the NMR Center in the Department of Neurology at Henry Ford Health Sciences Center is seeking to appoint his replacement. The NMR Center is research dedicated and houses a 3 Tesla 80 cm bore and a 7 Tesla 20 cm bore magnet for clinical and experimental studies. Techniques in use or under development include diffusion imaging, localized spectroscopy, spectroscopic imaging and blood flow and functional imaging. Henry Ford Hospital also houses two GE 1.5 Tesla clinical systems. The NMR Research Center is part of an NIH funded Stroke Center with projects that include the study of human and experimental brain ischemia. In addition we are funded to study vascular dementia, Parkinson's Disease and demyelinating disease. We are searching for a senior NMR scientist at Associate of Full Professor level, experienced in NMR techniques and their biological applications. The successful applicant will be expected to develop independent research programs, participate in existing studies and supervise graduate students. A joint appointment in the Department of Radiology is available. Henry Ford Health Sciences Center is a major teaching affiliate of Case Western Reserve University. Applications should include a letter, complete curriculum vitae and the names and telephone numbers of referees. This should be sent to: K.M.A. Welch, M.D., William T. Gossett Chair of Neurology, Henry Ford Health Sciences Center, 2799 W. Grand Blvd., Detroit, Michigan 48202.

DEPARTMENT OF PHARMACOLOGY
INITIATIVE IN
NEUROSCIENCE


The Department has been awarded an additional lectureship for 5 years following a review of its performance in the recent research selectivity exercise by the Faculty Group and would like to use this appointment to strengthen its contribution to the newly formed Centre for Neuroscience (Director: Professor Richard G M Morris). Applicants will be expected to have an active and substantial research profile in Neuropharmacology, Signal Transduction or Neuroplasticity. Candidates in other areas of pharmacology will also be considered.

Please quote REF: SM 9304/10.

Informal enquiries to Professor J S Kelly on 031-650 3519 or Professor R G M Morris on 031-650 3518.

Further particulars may be obtained from:
THE PERSONNEL OFFICE,
THE UNIVERSITY OF EDINBURGH,
1 ROXBURGH STREET,
EDINBURGH EH8 9TB,
where applications (five copies) including the names and addresses of two referees should be lodged.

Closing date: 18th November, 1993.

ASSISTANT PROFESSOR
MICROBIOLOGY

The Department of Microbiology at the University of Illinois at Urbana-Champaign seeks candidates for a full-time tenure track position at the Assistant Professor level. Applicants should have a Ph.D. degree, postdoctoral experience, and show exceptional promise in developing an active research program in Microbiology. Preference will be given to applicants with research interests in the physiology, biochemistry, or molecular genetics of microorganisms that further expand the Department's breadth of microbial diversity. Responsibilities include teaching undergraduate and graduate students. Starting date August 1994. Salary will be commensurate with experience. The Department of Microbiology offers a supportive and collegial atmosphere and a strong graduate program. There are extensive interdepartmental interactions in microbial and eukaryotic cell and molecular biology, immunology, developmental biology, evolution, biochemistry, and biophysics. The University of Illinois at Urbana-Champaign offers an outstanding and exciting academic research environment including a Biotechnology Center and state-of-the-art facilities for hybridoma production, flow cytometry, electron microscopy, X-ray crystallography, and computer analyses. Applicants should submit a curriculum vitae, a description of research interests and future plans, and have at least three letters of reference sent to:

Stanley Maloy, Chair
Faculty Search Committee
Department of Microbiology
University of Illinois
131 Burrill Hall
407 S. Goodwin Avenue
Urbana, IL 61801
Telephone: (217) 333-1736
FAX: (217) 244-5697

To ensure full consideration, applications should be received by December 15, 1993. Interviews may be conducted before the closing date, but no final decision will be made before that time.

The University of Illinois is an Affirmative Action/Equal Opportunity Employer.
We seek a Ph.D. or M.D. with an established record of external funding, and a commitment to scholarly achievement in research and teaching. We participate in the University's Biomedical Sciences Ph.D. Program and have teaching responsibilities for medical and nursing students.

The School of Medicine has 240 full-time faculty and over $7 million in extramural research support. It is a model for community-based medical education and is a leader in recruiting and retaining minority students.

The combined chair/faculty position has a 12 month salary commensurate with experience, start-up funds, and an opportunity to build and shape the direction of the department. Opportunities exist for collaboration with basic and clinical scientists at the Tri-Services Toxicology Center at WPAFB and the Dayton VA Medical Center.

Submit curriculum vitae, and the names and telephone numbers of three references to Jane N. Scott, Ph.D., Chair, Search Committee, Wright State University, School of Medicine, P.O. Box 927, Dayton, Ohio 45401-0927; (FAX: 513-873-3672).

Review of applications will begin January 15 and will continue until the position is filled.

Wright State University is an EOAA Employer.

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The Bristol-Myers Squibb Pharmaceutical Research Institute in Seattle performs research dedicated to pursuing novel approaches to the development of therapeutic products in the areas of immunology, infectious diseases and cancer.

**POSTDOCTORAL RESEARCH**

**Autoimmunity/Transplantation**
Evaluate role of T cell co-stimulation via CD28 in immunological disease models. Experience with animal (rodent) experimentation and in-vitro immunological assays is desirable. Ph.D. in immunology or cellular biology. Reference #PI.

**Immunodeficiency/Immunosuppression**
Participate in the establishment of embryonic stem cell and gene "knock-out" technology in order to study the function of immunoregulatory proteins. Requires working knowledge of molecular biology and tissue culture techniques. Ph.D. with transgenic mice experience and immunology background preferred. Reference #CC

**Oncology Drug Discovery**
Investigate T cell responses to oncogene products in vivo and in vitro with the goal of developing candidate immunogens for cancer immunotherapy. Also, analyze the deficiency of tumor cells to elicit an efficient immune response. Ph.D. in cellular immunology with molecular biology experience preferred. Reference #LC

**Molecular Immunology**
- Investigate changes associated with cellular transformation and metastasis. Ph.D. with experience in molecular biology and animal (rodent) experimentation desirable. Reference #PF
- Utilize phage display of antibody binding sites to identify novel tumor cell reactivities. Ph.D. with molecular biology experience desired. Reference #PF
- Candidate will conduct research in the area of molecular approaches to targeted therapy. Specific emphasis will be placed on the identification of novel targets and novel cytotoxic or cytokastic proteins. Ph.D. in biological sciences required with background in molecular biology and protein biochemistry. Reference #CS

We offer a creative research environment, competitive salaries, an excellent benefit package and relocation assistance. Our facility offers open and well-equipped laboratories overlooking beautiful Puget Sound and the Olympic Mountains from our downtown site.

Please forward your resume to Bristol-Myers Squibb, Human Resources Department, 3005 First Avenue, Seattle, WA 98121. Please note the position reference code. Equal Opportunity Employer, M/F/D/V.
**POSITIONS OPEN**

**ASSISTANT PROFESSOR OF BIOLOGY**

Tenure-track position, to teach introductory courses in Biology and develop a viable research program in cellular or molecular biology. Ph.D. and postdoctoral experience required. Research specialty must be compatible with existing Ph.D. program in Molecular Biology. Appointment effective September 1994. Interested applicants, especially women and members of minority groups, are encouraged to apply. Three letters of recommendation sent directly to the above address. Screening of applications will begin November 15, 1993, and continue until positions are filled.

**ASSISTANT PROFESSOR OF PLANT MOLECULAR BIOLOGY/GENETICS**

The Department of Biology at Colorado State University (CSU) invites applications for a tenure-track position in plant molecular biology and genetics. CSU is an Equal Opportunity/Affirmative Action Employer. The successful candidate will have a Ph.D. in botany or molecular biology, postdoctoral experience in plant molecular biology or genetics, and a commitment to establishing an active research program in molecular biology or genetics at CSU. Screening of applications will begin November 15, 1993, and continue until positions are filled.

**FACULTY POSITION IN GENETICS: DUKES UNIVERSITY**

Applications are invited for a tenure-track position in the Section of Genetics at Duke University Medical Center. The Department of Genetics at Duke University Medical Center invites applications for a tenure-track position at the ASSISTANT PROFESSOR level. The successful candidate will have a Ph.D. in genetics and will be expected to establish an active research program in molecular biology or genetics. Applications must be submitted by December 1, 1993. Please include curriculum vitae, a statement of research interests, teaching experience, and three letters of recommendation to: Dr. Helen V. Childress, Chair, Department of Genetics, Duke University Medical Center, Box 7074, Durham, NC 27710. Duke University is an Affirmative Action/Equal Opportunity Employer.

**FACULTY POSITION IN MOLECULAR NUTRITION SCIENCE**

The Department of Nutrition and Food Sciences at Utah State University invites applications for a tenure-track position at the ASSISTANT PROFESSOR level. The successful candidate is expected to have a Ph.D. in nutrition, biochemistry, molecular biology, or related fields and is expected to establish an active, externally funded research program. Interested candidates should submit curriculum vitae, a statement of research interests, and three letters of recommendation to: Dean N. K. Hsu, Department of Nutrition and Food Sciences, Utah State University, Logan, Utah 84322-4110.
Program Analyst (PART-TIME)

The Howard Hughes Medical Institute conducts scientific research in laboratories affiliated with leading academic medical centers in the United States. We are seeking a part-time Program Analyst for our headquarters in Chevy Chase, MD.

The successful candidate will assist with the activities of our Office of Grants and Special Programs which supports biological and scientific education at the graduate, undergraduate and precollege levels. This is an ideal position for someone who wants to work 32 hours a week.

Responsibilities include: assisting with the administration of a grants program including undergraduate competitions and proposal reviews; tracking students at grantee institutions; handling administrative inquiries; developing reports and publications; reviewing financial and program reports; and assisting with the preparation of directors' annual meeting.

Qualifications include at least 2 years related experience, preferably science education, laboratory research administration, or grants management. A master's degree in biological sciences, such as cellular or molecular biology, strong communication skills, knowledge of word processing and databases are also required.

HHMI offers an excellent salary and a generous benefits package. Please send resume to: Howard Hughes Medical Institute, Human Resources Department, 4000 Jones Bridge Rd., Chevy Chase, MD 20815-6789. FAX: (301) 215-8937.

Principal only. No phone calls, please. Equal Opportunity Employer.

Scientist/Inflammation Pharmacologist

Pfizer is a lot more than a pharmaceuticals and healthcare industry leader. It's a group of people dedicated to discovering, developing and marketing innovative pharmaceuticals, animal health and food industry products that improve the quality of life worldwide. As a Fortune 100 company, Pfizer is committed to continuing its remarkable growth by investing close to a billion dollars annually in research and development. Currently, we have an opportunity available for a Scientist/Inflammation Pharmacologist at our Central Research Division in Groton, Connecticut.

The successful candidate will have a BS or MS in Biology or Pharmacology, along with a minimum of 1-3 years of relevant experience in in vitro analyses of ligand/receptor binding assays using whole cells and membrane fractions, as well as a familiarity with ligand-mediated functional responses of cells. Ability to work independently and summarize/communicate results effectively is also desirable.

In addition to a stimulating research environment, we offer a competitive compensation and benefits package, including generous relocation assistance to this southeastern Connecticut shoreline community. Qualified applicants may send a resume, and names of three references, to: Ms. Ellen Buller, Supervisor, Employee Resources, Pfizer Inc, Central Research Division, Eastern Point Road, Groton, CT 06340. We are an equal opportunity employer.

Alexander Hollaender

DISTINGUISHED

Postdoctoral Fellowship Program

Research Opportunities in Energy-Related Life, Biomedical, and Environmental Sciences

- Research in OHER-sponsored programs
- Tenable at various national laboratories
- Stipends $37,500
- Doctoral degree received after April 30, 1992
- U.S. citizens or PRA eligible

Information and applications:

Hollaender Postdoctoral Fellowships
Science/Engineering Education Division
Oak Ridge Institute for Science and Education
P.O. Box 117
Oak Ridge, TN 37831-0117
(615) 576-9975

Deadline January 15, 1994

U.S. DEPARTMENT OF ENERGY
OFFICE OF HEALTH AND ENVIRONMENTAL RESEARCH

National Institutes of Health
Laboratory of Viral Diseases

POSTDOCTORAL POSITION

Regulation of RNAPII Directed Transcription

Herpes simplex virus is used as a model system for the analysis of cellular and viral factors involved in the transcription of RNAPII genes. These studies focus upon the DNA-protein and protein-protein interactions which mediate the assembly of multiprotein enhancer-promoter complexes and upon the biochemical mechanisms of gene transcription.

Applicants should have experience in molecular biology, molecular virology and/or protein biochemistry. Two positions are available immediately. To apply, forward curriculum vitae and names of three references to:

Thomas M. Kristie, Ph.D.
Laboratory of Viral Diseases, NIAID
National Institutes of Health
Building 4, Room 229
9000 Rockville Pike
Bethesda, Maryland 20892
FAX: 301-480-1147

NIH is an Equal Opportunity Employer
Faculty Positions
Florida State University
Program in Structural Biology
and
Institute of Molecular Biophysics

Macromolecular Crystallography
and
Solution NMR of Macromolecules

The Program in Structural Biology at Florida State University invites applications for two full-time tenure track faculty positions, one in Macromolecular Crystallography and one in Solution NMR of Macromolecules. Rank and salary are open and will be commensurate with experience. Academic appointment will be in either the Department of Biological Sciences or Department of Chemistry. Candidates should have demonstrated expertise in the study of macromolecular structure and a well-developed plan for independent research. Resources are available to create state-of-the-art laboratories for the successful candidates.

Florida State University has made a strong commitment to Structural Biology. Funding is provided by grants from the Lucille P. Markey Charitable Trust and the State of Florida. The 50,000 square foot Institute of Molecular Biophysics is being renovated with new laboratories designed and equipped for the study of the structure, activity and engineering of macromolecular systems. Over the next four years the program will be expanded through the addition of seven new faculty members. Extensive new instrumentation has been acquired and will be expanded to provide these faculty with all the necessary facilities to carry on highly productive research programs. In addition, substantial expansion is occurring in computational structural biology at the Supercomputer Computation Research Institute and in solution NMR at the National High Magnetic Field Laboratory at Florida State University. Unique research facilities will be available at these centers.

Applications should be submitted by December 1, 1993 to receive full consideration. A curriculum vitae, brief research plan and a list of at least three people who may be contacted to provide references should be sent to:

W. Ross Ellington
Chairman
Structural Biology Search Committee
Department of Biological Sciences
Florida State University
Tallahassee, Florida 32306-3050

Florida State is an Equal Opportunity/Affirmative Action Employer

BIOLOGICAL SCIENCES: Texas Tech University invites applications for tenure-track positions at the Assistant Professor level. All applicants must hold a Ph.D.; postdoctoral experience is highly preferred. Appointees will be expected to develop extramurally-funded research programs, interact with existing faculty, and have a strong commitment to undergraduate and graduate teaching. The Biological Sciences Department has 30 faculty, over 100 masters and doctoral students, and 500 undergraduate majors.

Mammalian Biologist with interests in specimen-based research in mammalian biodiversity, biogeography, phylogenetics, population or quantitative genetics, or systematics. Appointee will participate in the growth and curatorial activities of the Vertebrate and Frozen Tissue Collections in the Natural Science Research Laboratory at the Museum of Texas Tech University. The successful candidate will be expected to teach vertebrate structure and development. Willingness to teach introductory biology or genetics is desired. Involved in independent research interests that focus on the level of communities or that emphasize plant-animal interactions. Willingness to participate in joint research projects is highly desirable. Possible undergraduate teaching assignments include ecology and introductory biology and botany. Plant Molecular Biologist with a strong background in plant gene expression using molecular approaches to answer questions in areas which may include, but are not limited to: plant/microbe interactions; plant cell development; plant development; plant stress physiology; and plant pathology. Possible teaching contributions include introductory biology and botany, microbiology, cell biology, genetics, plant pathology, and plant gene expression.

Send letter of application including a description of research plans, career goals and teaching interests, curriculum vitae, copies of representative publications, and three letters of recommendation to: Chairperson, Department of Biological Sciences, Texas Tech University, Box 43131, Lubbock, TX 79409-3131. Deadline for applications is December 1, 1993. TTU is an Equal Opportunity/Affirmative Action Employer.

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

Synergen is working to further scientific understanding of how the human body responds to inflammation, injury and disease, in order to produce pharmaceuticals that reduce mortality and help people who have illnesses that currently have no satisfactory treatment. This is difficult, challenging and exciting work. Highly qualified people are drawn to Synergen, attracted by the science, energy, values and informal collegial work environment.

Openings exist in the following areas:

Research Associate - Discovery Research
This position is responsible for the set up and maintenance of cell culture (oligodendrocyte). Requirements include a B.S./M.S. in Cell Biology and a minimum of 2 years tissue culture experience. Extensive experience in identifying various glial precursor cells via immunochemistry and proliferation assay is also desirable.

Lab Manager/Scientist - Protein Chemistry
Experienced manager is needed for our core protein facility. Analytical methods performed by the lab include amino acid composition, N-terminal sequencing, mass spectrometry, and peptide synthesis/purification. This manager will also administer training and documentation to ensure adherence to GMP guidelines and perform analysis of protein samples. Individual will also develop sub-picomole level protein sequencing and analytical methods.

Requirements include a Ph.D. in Biochemistry and a minimum of 3 years previous experience in performing and analyzing all of the above analytical methods and a strong background in structural characterization of proteins and peptides. Synergen offers competitive salaries, generous benefits including relocation and 401(k).

Synergen is nestled at the base of the Rocky Mountains in Boulder, Colorado, a university community just 30 minutes north of Denver. The area's mild, sunny climate fosters an active, casual lifestyle in a community that respects education and technology.

For consideration please send your resume/C.V. to: Employment Manager, Box SC1015, Synergen, Inc., 1885 33rd Street, Boulder, CO 80301. No phone calls, please. We are an Equal Opportunity Employer.

POSTDOCTORAL FELLOWSHIPS IN VECTOR BIOLOGY

The Center for Insect Science, through a grant from the John D. and Catherine T. MacArthur Foundation, is offering postdoctoral fellowships to study various aspects of vector biology. Ongoing research projects, which include vector-borne viral, bacterial and parasitic diseases, vector-borne biochemistry and pharmacology of salivation, biochemistry and molecular biology of gut enzymes, the molecular basis of lipid and iron transport, hormonal control of development and oogenesis, and the search for effective molecular transformation tools in mosquitoes.

The Center includes over 80 scientists in the Department of Biochemistry, Ecology and Evolutionary Biology, Entomology, Molecular and Cellular Biology, Neurobiology, Pharmaceutical Science and Veterinary Science at the University of Arizona in Tucson, the Department of Zoology at Arizona State University in Tempe, the Department of Biology at Northern Arizona University in Flagstaff, and several USDA facilities. Appointment is for two years, depending on availability of funds and satisfactory performance. In addition to a stipend, fellows receive funds to support their research and are expected to develop independent and collaborative projects.

To apply, please send an introductory cover letter with statement of research interests, curriculum vitae, evidence of academic background and degrees earned, and three letters of recommendation to: Dr. José Ribeiro, Chair, Vector Biology Search Committee, 410 Forbes Building, University of Arizona, Tucson, AZ 85721 USA. Review of applications will begin on November 12, 1993 and continue until positions are filled. Foreign applications as well as applications from women and members of minority groups are particularly encouraged. The University of Arizona is an Affirmative Action/Equal Opportunity Employer.
The Howard Hughes Medical Institute conducts scientific research in laboratories affiliated with leading academic medical centers in the United States and supports science education. We are seeking a Procurement Analyst for our headquarters in Chevy Chase, MD. The successful candidate is likely to have research interests in the area of cell biology, immunobiology or inflammation, that will complement the more molecular approaches of the LMB. He or she will be expected to develop effective collaborations with the LMB, with Cambridge University and the Clinical School; in addition, links should ideally be forged with other related national centres and with industry. Space is available to accommodate the new Director and his or her research team.

The Director will be responsible to the MRC and the Trustees for the overall direction of research at the Laboratory, as well as for the management of core facilities and premises, including the central budget and staff. The MRC Centre located at the new Addenbrooke’s Hospital site will provide additional administrative and supporting services.

The salary is negotiable in the range for Council’s Special Appointments (equivalent to UK University professorial salaries). In addition, assistance with the costs of relocation will be available.

A job description and other additional information may be obtained from Dr Diane McLaren, MRC Headquarters, 20 Park Crescent, London W1N 4AL (telephone 071 636 5422 ext 6233).

Applicants should include a brief outline of their plans for the strategic direction of research at the Strangeways Research Laboratory and brief proposals for his or her own research team, together with a curriculum vitae, an up-to-date list of publications and the names of three referees. These should be sent, no later than 10 December 1993 to Sir Dai Rees, Secretary to the Council, at the above address.
ASSISTANT/ASSOCIATE PROFESSORS NEUROSCIENCE

The Department of Anatomy and the Neuroscience Center at Louisiana State University Medical Center seek to identify two neuroscience faculty. A Ph.D. and three years of post-doctoral experience are required. Scientists who study receptor, neurotransmitter, or channel mechanisms and/or molecular approaches to development and plasticity of neural circuitry or motor systems are especially encouraged to apply. However, well-qualified applicants with an outstanding funding record/potential will be considered. Salary levels are competitive with national space programs. Participation in the Interdisciplinary Ph.D. Program in Neuroscience is encouraged. Send curriculum vitae, research interests, and names of three references to: James T. Stull, Ph.D., Department of Physiology, Louisiana State University Health Sciences Center, 1501 Perdido Street, New Orleans, LA 70112. An Equal Opportunity/Affirmative Action Employer.

ASSISTANT PROFESSOR. The Department of Physiology invites applications for one assistant professor position (tenure-track). Ph.D. degree or equivalent with three years of post-doctoral experience is required. Scientists who study receptor, neurotransmitter, or channel mechanisms and/or molecular approaches to development and plasticity of neural circuitry or motor systems are especially encouraged to apply. However, excellent candidates in all areas of cellular and molecular neuroscience will be given serious consideration. Applicants should submit curriculum vitae and a brief statement of research interests, three letters of reference, and a statement of teaching interests. Send these materials to: Dr. Robert D. Wells, Department of Anatomy, LSU Medical Center, 1501 Perdido Street, New Orleans, LA 70112. An Equal Opportunity/Affirmative Action Employer.

ASSISTANT PROFESSOR. The Biology Department at the University of New Mexico invites applications for an assistant professor position. Ph.D. degree or equivalent with three years of post-doctoral experience is required. Scientists who study receptor, neurotransmitter, or channel mechanisms and/or molecular approaches to development and plasticity of neural circuitry or motor systems are especially encouraged to apply. However, excellent candidates in all areas of cellular and molecular neuroscience will be given serious consideration. Applicants should submit curriculum vitae and a brief statement of research interests, three letters of reference, and a statement of teaching interests. Send these materials to: Dr. Robert D. Wells, Department of Anatomy, LSU Medical Center, 1501 Perdido Street, New Orleans, LA 70112. An Equal Opportunity/Affirmative Action Employer.

DEVELOPMENTAL ENTOMOLOGIST

The Department of Biological Sciences at East Tennessee State University (ETSU) invites applications for a nine-month, tenure-track position at the ASSISTANT PROFESSOR level available 15 August 1994. Candidates should have a Ph.D. or equivalent degree in entomology, and have interests in comparative developmental or evolutionary biology. The successful applicant will be expected to teach entomology and General Entomology, and develop and coordinate a new undergraduate research program and be a mentor to research students at graduate and Master's levels; and provide occasional postdoctoral supervision. Submit letter of application, statement of teaching and research goals, curriculum vitae, graduate transcripts, recent publications, and three letters of reference by 15 August 1994 to: Dr. Robert D. Wells, Department of Biology, East Tennessee State University, Johnson City, TN 37614-0703. E.T.S.U. is an Affirmative Action/Equal Opportunity Employer. Applicants should be U.S. citizens or permanent residents.

ASSISTANT PROFESSOR OF BIOLOGY

The Biology Department at the University of New Mexico is seeking applicants for a full-time, tenure-track position as Assistant Professor, to begin August 15, 1994, in the area of MOLECULAR IMMUNOLOGY or DEVELOPMENTAL/MOLECULAR BIOLOGY. Applicants must have a Ph.D. in biology or related discipline, and postdoctoral experience is preferred. We seek a commitment to maintaining and teaching undergraduate and postgraduate classes, research undergraduate and Master's degree students, and potential for developing a vigorous, independent research program. Applications are invited in the areas of allergy, apoptosis, gene expression, immunology, infection, and neurobiology. Send curriculum vitae; at least three letters of reference, representative publications, and a statement of teaching and research interests to: Cell/Molecular Search Committee, Department of Biological Sciences, University of New Mexico, Albuquerque, NM 87131-1091, USA. Telephone: 505-277-5411; FAX: 505-277-0840. Deadline for receipt of applications is December 15, 1993. The University of New Mexico is an Equal Employment Opportunity/Affirmative Action Employer.

FIELD BIOLOGIST

ASSISTANT PROFESSOR (tenure-track), starting fall 1994, to teach a field course, general ecology, introductory biology, and at least one advanced course in either organismal or population biology. We seek candidates with a Ph.D. or equivalent degree in undergraduate or graduate level teaching involving undergraduates is encouraged. Ph.D. required; teaching experience preferred. Submit resume, statement of teaching philosophy, and three letters of reference by December 10, 1993, to: Dr. Margaret Simpson, Chairman, Department of Biology, Sweet Briar College, Sweet Briar, VA 24595. Sweet Briar College is an Equal Opportunity/Affirmative Action Employer and encourages applications from women, minorities, and persons with disabilities.

CELL BIOLOGIST—CARNegie MELLon UNIVERSITY

The Department of Biological Sciences, Carnegie Mellon University, is seeking a Cell Biologist for a tenure-track appointment at the ASSISTANT PROFESSOR level. Exceptional candidates for appointment at a higher level will also be considered. Candidates using innovative molecular and/or technological approaches to fundamental problems in Cell Biology are especially encouraged to apply. To apply, submit curriculum vitae along with a description of past accomplishments, present activities and future research plans, and a list of three letters of reference. Send these materials to: Cell Biology Search Committee, Department of Biological Sciences, Carnegie Mellon University, 4400 Fifth Avenue, Pittsburgh, PA 15213. Application deadline: December 15, 1993. Carnegie Mellon University is an Equal Employment Opportunity/Affirmative Action Employer.

BEHAVIORAL NEUROSCIENTIST. The University of Rochester anticipates an ASSISTANT PROFESSOR position in neuroscience. We are interested in persons making an impact in the behavior of learning and memory or development. A Ph.D. or equivalent degree is required. Development of an active research program and teaching in both graduate and undergraduate programs in neuroscience are expected. Applicants should submit curriculum vitae, a description of research interests, and three letters of reference by 1 February 1994 to: Biopsychology Search, Department of Psychology, University of Rochester, Rochester, NY 14627. An Affirmative Action/Equal Opportunity Employer.

PURDUE UNIVERSITY FOODS AND NUTRITION—FACULTY, TEACHING/RESEARCH POSITION

ASSISTANT/ASSOCIATE PROFESSOR, ten-month, tenure-track position in Foods and Nutrition beginning August 1994. Appointment is 50% research and 50% teaching. Teaching responsibilities include nutrition courses at both undergraduate and graduate levels and 20 hours of teaching annually. We especially encourage applications from candidates with a Ph.D. in nutrition science or a related area. Postdoctoral experience and teaching experience are preferred. The successful candidate is expected to seek extramural funding and to publish scholarly work in his/her area of interest. Application deadline is February 28, 1994. Send curriculum vitae, transcripts, letter of application, and three (3) reference letters to: Dr. Robert D. Wells, Department of Biology, East Tennessee State University, 37614-0703. An Equal Opportunity/Affirmative Action Employer.

ASSISTANT/ASSOCIATE PROFESSOR MOLECULAR BIOLOGIST

Department of Physiological Sciences
College of Veterinary Medicine
Northwestern University

This tenure-track position is available on or after January 1, 1994. Candidates should have a Ph.D. degree or equivalent in molecular biology, biochemistry or related field and postdoctoral experience is preferred. Postdoctoral experience is highly desirable. The successful candidate will be expected to establish a research program in his/her area of research, and will be responsible for obtaining extramural funding and for training graduate and postdoctoral fellows. The successful candidate will be expected to establish a research program in his/her area of research, and will be responsible for obtaining extramural funding and for training graduate and postdoctoral fellows. The successful candidate will be expected to establish a research program in his/her area of research, and will be responsible for obtaining extramural funding and for training graduate and postdoctoral fellows.
DEKALB Plant Genetics, a leading agricultural seed company located in scenic Mystic CT, has openings for two M.S. level scientists to join our research program in maize biotechnology.

**Tissue-Specific Gene Expression**  Genetic engineering approaches will be used for introducing or altering specific gene products in maize seed for improved seed composition. This position requires familiarity with current molecular biology techniques including vector construction, DNA sequencing, PCR, RNA and protein analysis. Plant cell culture experience is also desirable.

**Development of Gene Mapping Technology**  This position will be part of a group involved in genetic mapping of quantitative trait loci in maize through the use of molecular biology techniques for application to our maize breeding programs. The successful candidate will investigate and develop new methodologies for molecular marker mapping. Experience with current molecular biology techniques such as DNA sequencing, genomic cloning and PCR is necessary. Knowledge in genetics, gene mapping or quantitative trait analysis is desirable.

In addition to a stimulating, team-oriented scientific environment, we offer excellent salary and benefit packages and relocation assistance. Qualified applicants should submit their resume to Katrina J. Henry, DEKALB Plant Genetics, 62 Maritime Drive, Mystic, CT 06355-1958.

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**AVIGEN**  is an exciting new gene therapy company that is developing treatments for selected diseases using adenovirus-associated viral (AAV) vectors to insert genes into patients' cells. The company believes that its proprietary gene delivery system represents a major step forward in the clinical utility and commercialization of gene therapy. AVIGEN has openings for outstanding individuals in the following areas:

**Hematology/Molecular Biology**  This individual will conduct state-of-the-art research in our sickle cell anemia program, and will be responsible for leading a major research effort to develop novel gene delivery vectors that target bone marrow. All applicants must have a Ph.D. or M.D. and several years' postgraduate research experience in hematopoiesis, bone marrow transplantation models, and molecular biology.

**Transcription Regulation**  This individual will carry out innovative research to develop gene therapy vector systems for tissue specific gene expression. Applicants should have a Ph.D. and postgraduate research experience in gene regulation and transfer.

**Multidrug Resistance/Tumor Biology**  The successful candidate will develop in vitro and in vivo models to transfer chemotherapeutic drug resistance genes into hematopoietic stem cells and study their function in tumor models. The position requires a Ph.D. or M.D. and postdoctoral experience in gene transfer, tumor biology, and/or hematopoiesis.

AVIGEN is committed to providing exciting career opportunities to creative, highly motivated individuals. We are an equal opportunity employer. Submit resumes to: Human Resources, AVIGEN, Inc., 1201 Harbor Bay Parkway #1000, Alameda, CA 94501.

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**Chairperson,**

**Department of Pharmacology**

Applications and nominations are invited for the Chair of the Department of Pharmacology at the University of Massachusetts Medical School in Worcester. We seek a candidate with a record of academic leadership within an internationally recognized research program, a desire to foster the development of strong research programs, and a commitment to graduate and medical education. Researchers in any field of modern pharmacology will be considered.

Letters of application or nomination should be sent to: Anthony R. Potece, Ph.D., Chair, Pharmacology Search Committee, Department of Molecular Genetics and Microbiology, University of Massachusetts Medical Center, 55 Lake Avenue North, Worcester, MA 01655.

Candidates should include a curriculum vitae, description of research interests, and the names of three references.

Women and minorities are encouraged to apply. The University of Massachusetts is an Equal Opportunity/Affirmative Action employer.

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**Genzyme**

The strength of an organization can be measured by the scope of its products. At Genzyme, we are developing a range of innovative health care products and services that are enabling us to achieve success on a global scale.

**Research Scientist**

**Electrophysiology - Ussing Chamber**

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

Genzyme rewards success with an excellent compensation and benefits package, including 3 weeks paid vacation, a 401(k) plan with a company match, extensive insurance benefits and an Employee Stock Purchase Plan. Please forward your resume to: Human Resources Department, Dept. S1022, Genzyme Corporation, One Mountain Road, Framingham, MA 01701. An equal opportunity employer.
Positions Open

ASSISTANT/ASSOCIATE PROFESSOR: The Department of Physiology and Pharmacology, College of Veterinary Medicine, Auburn University, is seeking applicants for a tenure-track position. The candidate should have a Ph.D. degree in chemistry or pharmacology. A D.V.M. degree and/or postdoctoral experience is desirable. Interested applicants are invited to submit a letter of application, curriculum vitae, current list of research interests, and names of three references to: Dr. Charles E. Branch, Chair, Search Committee, Department of Physiology and Pharmacology, College of Veterinary Medicine, Auburn University, Auburn, AL 36849-5520. Applications will be accepted until January 5, 1994, or until a suitable candidate is found.

Auburn University is an Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.

Chair, and Professor of Botany University of Maryland

The College of Life Sciences at the University of Maryland—College Park invites applications for the position of Professor and Chair of the Department of Botany. The Department consists of 26 faculty members with interests in teaching, research and extension programs that are ongoing in the department. The successful candidate will also be expected to direct a research program in his/her specific area of expertise. Candidates must have an earned doctorate in an area of botany or a closely related field, and have internationally recognized professional accomplishments. Candidates should provide a letter of application accompanied by curriculum vitae, and arrange to have four letters of reference sent directly to the address below.

For complete position description and application procedures, contact: Dr. Alan Philip Tsichlis, Chair, Search Committee, Department of Botany, University of Maryland, College Park, MD 20742-5815. The University of Maryland is an Affirmative Action/Equal Opportunity Employer. Women and minority candidates are encouraged to apply.

The Monell Chemical Senses Center, Philadelphia, Pennsylvania, is seeking a Junior Faculty Member at the Assistant Professor level with recognized professional accomplishments and interests in the general area of molecular biology or molecular genetics. The successful applicant is expected to generate a creative and productive research program that will be sustained through peer-reviewed funding and to play an active role in the training and development of postdoctoral fellows. The Monell Chemical Senses Center is an Equal Opportunity Employer and encourages the application of qualified women and minorities.

Postdoctoral Position available immediately to study protein-RNA interactions using site-directed mutagenesis, chemical modification of proteins, and fluorescence spectroscopy. A Ph.D. in chemistry or pharmacology is required. Experience in protein purification, molecular biology, and fluorescence spectroscopy preferred. Send curriculum vitae, names and addresses of three references to: Karin Musier-Forsyth, University of Minnesota, Chemistry Department, 207 Pleasant Street SE, MN 55455, Tel: 612-626-2824. The University of Minnesota is an Equal Opportunity Educator and Employer.

Positions Open

NEUROSCIENCE FACULTY POSITIONS

Two tenure-track faculty positions are available in the Departments of Cell Biology and Anatomy at the University of Nebraska Medical Center (academic rank dependent on qualifications). We are seeking cellular and molecular neuroscientists for research programs in neurodevelopment, neurobiology or neuroendocrinology. An ability to attract extramural funding is expected. Major teaching responsibilities will be in a 6-week medical neuroscience rotation in the graduate neuroscience program. The University of Nebraska Medical Center is a dynamic and expanding facility that ranks high in national and international surveys for patient care, research productivity and academic atmosphere. Salary and research incentives are highly competitive. Send curriculum vitae and the names of three references to: Dr. Robert H. Norgren, Chair, Search Committee, Department of Cell Biology and Anatomy, University of Nebraska Medical Center, 600 South 42nd Street, Box 986395, Omaha, NE 68198-3950. The University of Nebraska Medical Center is an Equal Opportunity/Affirmative Action Employer.

Postdoctoral Position

Position available in the laboratory of Dr. John Kruipiak at the Weis Center for Research in Danville, Pennsylvania. The successful applicant will have a Ph.D. in biochemistry, cell biology, or pharmacology with experience in molecular biology. The project will involve the expression and characterization of novel forms of adenylate cyclase and related molecules. Emphasis will be placed on determining those structural features of the adenyl cyclases responsible for mediating unique regulatory properties. The Weis Center is a well-equipped, modern research facility in a semi-rural environment. Competitive salary and fringe benefits. Send curriculum vitae with the names and telephone numbers of three references to: George C. Kory, Weis Center for Research, Department of Chemistry, 390 North Academy Avenue, Danville, PA 17822-1529. Equal Opportunity Employer, M/F/H/V.

Postdoctoral Position

Available immediately to assist staff of the NTS Department of Environmental Restoration who are performing baseline studies of Lake Champlain. Appointee will also assist with basin-wide planning efforts to reduce nutrient and toxic contaminant loadings to Lake Champlain. Field and laboratory experience are assets. A Ph.D. in limnology or a related discipline is preferred. Send resume, statement of research interests, selected reprints and names, addresses and telephone numbers of three references to: Dr. James W. Sutherland, Chief Scientist, New York State Freshwater Institute, Room 301, 50 Wolf Road, Albany, NY 12233-3502.

Postdoctoral Position in Ecosystem Ecology

Available immediately to study the response of plants with C3 and C4 photosynthetic pathways to climate change. The study will be conducted at the Rocky Mountain Forest and Range Experiment Station (Fort Collins) and the Ecosystem Center, Marine Biological Lab (Woods Hole, Massachusetts) and thus the individual will spend time at both locations. The study involves the impacts of climate change on the ecological function of grasslands and shrublands in the Western United States using a biogeochemical model. Investigators with interests in ecosystem ecology and mathematical modeling are invited to apply by November 1, 1993, for this one-year position in Fort Collins. Salary is $35,000 per year. Contact: Dana Gray (303) 229-0414. MACA, 2629 Riverside Road, Suite 110, Fort Collins, CO 80526. MACA is an Equal Opportunity Employer.

Postdoctoral Position

Postdoctoral applications are invited from individuals interested in joining a group studying bontulium and ricin toxicity at the cellular/subcellular level. Applicants for this position should be applying for a National Research Council Research Associateship. The minimum starting stipend is $32,400 per annum. Requirements: Ph.D. in chemistry or biology or biochemistry; experience in neuropathology, cell biology, or biochemistry would be advantageous. Please forward curriculum vitae (including names and addresses of three references), R. Richard Croslad or Dr. Robert B. Wellner, Toxinology Division, U.S. Army Medical Research Institute of Infectious Diseases, 2800 Powder Mill Rd., Ft. Detrick, MD 21702-5011. FAX: 301-619-2348. Telephone: 301-619-7181.
Miles Inc., Pharmaceutical Division, located near Yale University, has professional career opportunities for self-motivated, research-oriented scientists. Research positions are available in the structural chemistry group at the Miles Research Center. Structural Chemistry is an integrated, multidisciplinary group that includes NMR, X-ray Crystallography, Mass Spectrometry and Computational Chemistry. Working closely with medicinal chemistry and biology, the focus of the group is to use structural information to understand molecular mechanisms and aid in the design of therapeutic agents. We are currently seeking qualified scientists in the following areas:

PROTEIN BIOCHEMISTRY AND PROTEIN PURIFICATION

Candidates should have a BS/MS degree, 2-4 years of experience in protein isolation and characterization and an interest in protein structure determination. Experience with protein purification techniques such as HPLC, FPLC, affinity chromatography and electrophoresis is required.

COMPUTATIONAL CHEMISTRY

Candidates should have a PhD and 1-3 years of postgraduate or industrial experience in computational chemistry/molecular modeling applications to drug design, a strong background in the chemical and mathematical principles required in computations, and a working knowledge of current molecular mechanics, quantum mechanics software and of organic chemistry.

NMR SPECTROSCOPIST

Candidates should have a BS/MS in Chemistry with 1-4 years of experience in NMR spectroscopy. A background in 1D and 2D NMR data collection, data processing and structure elucidation of organic molecules is required. A strong background in synthetic organic chemistry is desirable.

Miles Inc. has an expanding Pharmaceutical discovery effort that offers a campus-like research environment, stimulating research programs, competitive salaries and comprehensive benefits. Please send resume in complete confidence to: Miles Inc., Pharmaceutical Division, Dept. AART, 400 Morgan Lane, West Haven, CT 06516.

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

FACULTY POSITION IN MOLECULAR BIOLOGY OF CANCER UNIVERSITY OF FLORIDA CANCER CENTER

The Cancer Center and Department of Biochemistry and Molecular Biology invite applicants for a tenure track faculty position at the level of Assistant Professor. Applicants should have experience and a strong research interest in the molecular biology of cancer and cancer related diseases. The Cancer Center has chosen anticancer gene therapy as an area of emphasis, so that applicants whose research is related, even in the broadest sense, are encouraged to apply. The appointee will have excellent laboratory facilities in the recently opened Academic Research Building, access to molecular biology core facilities, a competitive salary, and an attractive start-up package. This interdisciplinary appointment is designed to encourage interaction and collaboration within the College of Medicine and the University of Florida.

Candidates should have a Ph.D. and/or M.D. degree, at least two years of post-doctoral training, and a record of accomplishments indicating potential for developing a strong, independent research program. The anticipated start date is 6/1/94 and the salary is negotiable. A curriculum vitae, a description of research experience and interests, and three letters of reference should be sent to: Gail B. Zavelson, Administrator, Cancer Center, Box 100277, JHMC, Gainesville, FL 32610-0277.

The closing date for submission of completed applications is December 31, 1993.

The University of Florida is an Equal Opportunity/Affirmative Action Employer and specifically invites and encourages applications from qualified women and minority candidates.

EXECUTIVE VICE PRESIDENT

The Massachusetts Medical Society is seeking to fill the full-time position of Executive Vice President to begin in June 1994. The Society supports over 15,000 physicians and enjoys being the country's oldest continuously operating state medical association. Employing over 300 staff, the Society is a dynamic organization which owns and publishes the New England Journal of Medicine and a number of other publications.

Working under the direction of the Society's President and Board of Trustees, the EVP will carry out a wide range of legislative, health policy, and community relations initiatives. Articulating the Society's positions on a multitude of issues before government regulatory bodies and other forums will be fundamental to this role. The EVP will also be entrusted with directing the executive officers, staff, and their operations. In addition, he/she will, through the VP for Publishing, oversee the Society's extensive publishing operations.

An MD degree is required, along with a record of active participation in organized medicine (preferably at state/national levels). Exceptional leadership, coalition building, presentation, and negotiation skills are essential. Developing and implementing appropriate action plans to deal with the critical issues confronting today's physicians will be a major focus. Significant administrative/management skills, the ability to work effectively with trustees/corporate offices, direct staff, prepare budgets and oversee public/community relations are required.

Qualified candidates should submit a letter of interest and a curriculum vitae to: EVP Search Committee, Massachusetts Medical Society, 1440 Main Street, Waltham, MA 02154. An Equal Opportunity Employer.
INSTRUCTOR AND ASSISTANT PROFESSOR NON-TENURE-TRACK POSITIONS

The Department of Physiology and Biophysics at the University of Tennessee, Memphis, seeks applications for non-tenure faculty positions at the levels of Instructor and Assistant Professor in the laboratories of the faculty members in the Department of Physiology and Biophysics. These positions involve bench research in the areas of cardiovascular, respiratory, central nervous system, gastrointestinal, and endocrine and epithelial physiology. Candidates should have a Ph. D. or M. D. and, at least 2 to 3 years of postdoctoral experience. American citizens or permanent residents are preferred. Applications are invited from all areas, although positions availability in any specific area is dependent upon funding. Applicants should send curriculum vitae, copies of three recent publications and the names of three references to: Carolyn Holland, Assistant to the Chairman, Department of Physiology and Biophysics, 894 Union Avenue, Memphis, MN 38163. An Equal Opportunity/Affirmative Action Title IX/Section 504/ADA Employer. Minorities and women are encouraged to apply.

MOLECULAR BIOLOGIST

M.D. ANDERSON CANCER CENTER

Immediate Opening for a molecular biologist with experience in developing recombinant and chimeric antibodies. Primary responsibilities will include design, production and testing of novel fusion proteins and development of unique immunotoxins for cancer therapy. Substantive collaborative opportunities also exist for collaboration within our large, diverse group focusing on development of immunotherapeutic strategies.

Salary commensurate with experience. Contact: Dr. Michael Rosenblum, Ph.D., Chief, Immunopharmacology Section, Department of Clinical Immunology and Hematology, M.D. Anderson Cancer Center, 1515 Holcombe Boulevard, Houston, TX 77030. Equal Opportunity/Affirmative Action Employer. Smoke-free environment.

POSTDOCTORAL POSITION

ONTARIO CANCER INSTITUTE

UNIVERSITY OF TORONTO

A postdoctoral position is available in the laboratories of Professor Michael J. Gnarra. Experience in development of cellular and intracellular targeting agents is desirable. Candidates must possess a Ph. D. degree with training and experience in cell biology, peptide synthesis, and protein chemistry. Send your curriculum vitae and a letter indicating your interest to: Dr. Michael J. Gnarra, Ontario Cancer Institute, Princess Margaret Hospital, 500 Sherbourne Street, Toronto, Ontario, Canada M4X 1K9.

POSTDOCTORAL FELLOW/RESEARCH ASSOCIATE POSITIONS

CENTER FOR GENE THERAPY

BAYLOR COLLEGE OF MEDICINE

Postdoctoral/Research Associate positions are available in the Center for Gene Therapy at Baylor College of Medicine, which is supported by NIH-funded programs. Projects include "Gene Therapy for Hereditary Disorders" and "Gene Therapy for Cardiovascular Diseases". Successful candidates will have Ph. D. or M. D. Applications should be sent with current curriculum vitae to: Royce A. Stone, Ph.D., Director, Center for Gene Therapy, Baylor College of Medicine, One Baylor Plaza, Room 5Q31, Houston, TX 77030.

POSTDOCTORAL FELLOWSHIP

HARVARD MEDICAL SCHOOL, CARDIOVASCULAR DIVISION

Applications are invited for a postdoctoral fellowship to work under the direction of Dr. John C. Woo, MD, PhD. The Rockefeller Foundation is providing funds to support the purchase of a small area at the Harvard Medical School. Applications are invited for appointment on July 1, 1993. Interested individuals should send their curriculum vitae and names of three references to: Dr. John C. Woo, Division of Cardiology, Harvard Medical School, 25 Shattuck Street, Boston, MA 02115.

POSTDOCTORAL POSITION in Veterinary Toxicology

SOUTHERN RESEARCH INSTITUTE

We are seeking a postdoctoral researcher for a position in the Toxicology Department. The researcher will be involved in the development of models and methods for the detection and characterization of xenobiotics and other toxic compounds. This position requires a Ph. D. in Toxicology or a closely related field. Applications should be sent to: Dr. R. L. Lawrence, Chairman, Department of Toxicology, Southern Research Institute, P.O. Box 121, Birmingham, AL 35201.

POSTDOCTORAL FELLOWSHIP in Molecular Genetics

UNIVERSITY OF NORTH DAKOTA

The Department of Biochemistry and Molecular Biology at the University of North Dakota seeks applications for a postdoctoral position in the area of molecular genetics. The research will involve the characterization, manipulation, and cloning of DNA from microbial sources. Applications should be sent to: Dr. J. M. Walsh, Department of Biochemistry and Molecular Biology, University of North Dakota, Grand Forks, ND 58202-9201. Review of applications will begin immediately. Equal Opportunity Employer.

MATERIALS SCIENTIST

The Department of Polymer Science at The Ohio State University seeks applications for a Materials Scientist in the area of polymer characterization. The successful candidate will have a Ph. D. in polymer science or a closely related field. Applications should be sent to: Dr. R. L. Lawrence, Chairman, Department of Toxicology, Southern Research Institute, P.O. Box 121, Birmingham, AL 35201.

POSTDOCTORAL FELLOWSHIP in Molecular Genetics

UNIVERSITY OF NORTH DAKOTA

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MATERIALS SCIENTIST

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ASSISTANT, ASSOCIATE AND FULL PROFESSOR (RESEARCH) - The new Center for Molecular Medicine and Genetics is expanding its research and training programs. Applications are invited for University-funded research-track faculty positions at the assistant, associate, or full professor (research) level. Excellent research laboratories and support facilities are located in the School of Medicine and in the Biological Sciences Building on the main campus of the University in proximity to one of the largest medical centers in the United States. Candidates should have a Ph.D. degree in molecular biology, cellular biology or genetics, or a related area or an M.D. or M.D./Ph.D. degree and also have several years of postdoctoral training. The successful candidates will be expected to establish vigorous independent research programs that will be highly competitive for extramural funding. While all research areas will be considered, candidates with expertise in eukaryotic molecular, cellular, or developmental genetics, human genetic diseases or their animal models, human or model organism genome analysis, or gene therapy are especially encouraged to apply. Applicants should send complete Curriculum Vitae, a brief description of current and future research interests (3-4 pages), a bibliography and reprints of significant publications, and recommendations from at least three references by December 15, 1993, to:

Dr. Robert H. Rownd, Director
Center for Molecular Medicine and Genetics
Wayne State University School of Medicine
3216 Scott Hall
540 East Canfield
Detroit, MI 48201

Wayne State University is an equal opportunity/affirmative action employer and invites applications from all qualified individuals.

GENE DISCOVERY

Human Genome Sciences is an exciting new biotechnology company that utilizes automated large-scale sequencing to identify new human genes and to analyze patterns of gene expression under defined conditions of cell activation and development. We have opportunities for individuals with strong interactive skills in the following areas:

Molecular Biology

Several positions exist for Scientists (Ph.D./M.D. plus 3 years postdoctoral experience) and Research Associates (B.S./M.S. plus several years experience) with experience in cDNA library construction, differential and subtractive screening and protein expression and purification.

Developmental Biology/Signal Transduction

Several positions exist for Scientists and Research Associates to participate in studies of developmentally regulated gene expression in cells of lymphoid and hematopoietic lineages. Successful candidates should possess a strong background in molecular biology and have practical experience in the manipulation of lymphoid and hematopoietic cells. Familiarity with signal transduction mechanisms involved in cytokine and growth factor regulated events is preferred. Opportunities for Scientists with expertise in in situ hybridization analysis as applied to the whole organism also exist.

Bioinformatics

Several positions exist for individuals with expertise in database management design, comparative sequence analysis and pattern recognition. Candidates should have extensive experience in DNA and protein sequence analysis, software development and programming skills in UNIX and Macintosh client/server applications.

HGS is located in Rockville, Maryland in a region of intense scientific and biotechnological activity. The company encourages the pursuit of academic excellence and offers a comprehensive benefits package including medical/dental insurance, 401(k) and tuition reimbursement. For immediate consideration, please forward your resume to:

Human Resource Department
Human Genome Sciences, Inc.
9620 Medical Center Dr., #300
Rockville, Maryland 20850

HGS
An Equal Opportunity Employer
**Director, School of Chemical Sciences**  
**University of Illinois at Urbana-Champaign**

The School of Chemical Sciences at the University of Illinois at Urbana-Champaign includes the Departments of Biochemistry, Chemistry, and Chemical Engineering. It encompasses a large general chemistry program. Support facilities include special service laboratories, shops, storerooms, a business office, and a placement office. Many faculty in the School share appointments in the School of Medicine and in the College of Engineering located on the campus. The Director is the chief academic and administrative officer of the school, with responsibility for administrative and budgetary decisions and for leading the faculty in the development of educational and research policy. The Director reports to the Dean of the College of Liberal Arts and Sciences.

The search committee seeks candidates with distinguished research records in the chemical sciences who will continue active research while serving as Director. The Director will have an important role in determining the future of the chemical sciences on this campus. Commitment is expected to research and educational excellence throughout the full spectrum of chemical sciences, ranging from chemical engineering and chemical physics to molecular biology. Ph.D. is required in one of the fields within the School of Chemical Sciences. Prior experience in academic administration is preferred, though not required. The individual's scholarly record and reputation must qualify him/her as a tenured professor in one of the units within the School of Chemical Sciences. The Director's position is half-time and does not carry tenure.

Salary is negotiable and commensurate with experience. Starting date is August 21, 1994, or as negotiated according to personal circumstances. Completed applications should be received no later than November 24, 1993. Applications (letter of interest and curriculum vitae) should be sent to: Professor Ansel C. Anderson, Search Committee for the Director of the School of Chemical Sciences, 294 Lincoln Hall, 702 S. Wright Street, Urbana, IL 61801. Phone: 217-333-1350.

Interviews may be conducted before the November 24, 1993 closing date, but all applications received by that date will be given full consideration.

The University of Illinois is an affirmative action/equal opportunity employer.

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**Dean**  
**School of Arts and Sciences**  
**The Johns Hopkins University**

The Johns Hopkins University is seeking applications and nominations for the position of Dean of the School of Arts and Sciences. The School has a full-time faculty of 245, and undergraduate student population of 2400, a graduate student population of 900, and a new and growing program for part-time students (both academic year and summer sessions). The School covers a wide range of fields and specialties in its twenty-seven departments in the humanities, social sciences, and natural sciences as well as in several interdepartmental degree programs. Sharing the same campus and many of the same facilities, Arts and Sciences has a close relationship with the G.W.C. Whiting School of Engineering and works collaboratively with each of the other six academic divisions of the University.

The Dean has responsibility for and authority over the School's programs and budget within the context of a highly decentralized university. The University seeks an individual of distinguished accomplishment to work with the faculty and the University in leading a School with a tradition of excellence in research, teaching, and service. Candidates should have demonstrated skills in academic leadership, administration, and fund raising.

Nominations and applications should be sent to:

Dr. Joseph Cooper, Provost  
Chair, Arts and Sciences Search Committee  
The Johns Hopkins University  
Room 265, Garland Hall  
3400 N. Charles Street  
Baltimore, Maryland 21218.

The Search Committee will begin reviewing nominations and applications on November 1, 1993. The University expects to fill this position before July 1994.

The Johns Hopkins University is an Equal Opportunity/Affirmative Action employer.
At Applied Biosystems our commitment to automated instrumentation is driving the future of life sciences research. As a result, we offer high visibility roles in a truly creative environment. Consider this opportunity based in the San Francisco Bay Area where you'll enjoy the natural beauty and cultural benefits of Northern California.

**Director of Business Development**

Provide the leadership to develop strategic business plans for the Applied Genetic Analysis group. Your prime responsibility will be analyzing business opportunities to leverage Perkin-Elmer's and Applied Biosystems' DNA analysis technologies into the human diagnostic and other applied markets. Working closely with product development teams, you will assist in technology assessment, product and systems definition and prioritization of programs. In addition, you will play a key role in technology licensing.

Requirements include an advanced degree in the biological sciences and several years of experience in one or more of the following areas: diagnostics using DNA probe technologies, DNA amplification and detection techniques, molecular genetics, business development and/or product management. Other experience should include working with regulatory agencies in bringing new products to market. Our ideal candidate will have excellent leadership, negotiating and interpersonal skills. (Ref. #1293)

**Scientist**

In this environmental analysis-related R&D position, you will plan and implement projects and develop new collaborations and products. You will also provide support for environmental analysis.

Requires either a Ph.D. in Microbiology or a B.S./M.S. and 5 years' experience. All candidates must possess at least two years of new product development experience and two years' experience performing environmental analysis, with excellent analytical and instrumentation skills and familiarity with PCR, DNA sequencing, and template preparation. (Ref. #1972)

**Scientist**

Your research will form the foundation of new human identification applications and products. Responsibilities include project planning and implementation, forensic validation and casework, and developing new collaborations and new products.

Requires either a Ph.D. in Biochemistry or a B.S./M.S. and 5 years' experience. All candidates must possess at least two years of new product development experience and two years of forensic validation work, with excellent analytical and instrumentation skills and familiarity with PCR, DNA sequencing, and template preparation. (Ref. #1974)

We offer a competitive salary and generous benefits package. Please send your resume, indicating appropriate Reference# to: Applied Biosystems, Human Resources, 850 Lincoln Centre Drive, Foster City, CA 94404. We are an equal opportunity employer.

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**SIGNAL TRANSDUCTION**

The University of Calgary Faculty of Medicine invites applications for a full-time academic position at the Assistant Professor level in the molecular biology of signal transduction. Duties include teaching and graduate student supervision; the position offers an excellent opportunity to develop a vigorous independent research program and collaborative interactions with other researchers at the university. Applications are especially encouraged from scientists studying the regulation of gene expression by transcription factors or the molecular biology of ion channels. Qualifications include a Ph.D. and/or M.D. with a minimum of two years' postdoctoral experience.

The selected candidate must compete successfully for operating funds as a member of the Signal Transduction Group Grant funded by the Medical Research Council of Canada, will have 75% of time protected for research, and will be appointed in an appropriate faculty department.

In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. The University of Calgary has an Employment Equity Program and encourages applications from all qualified candidates, including women, aboriginal people, visible minorities, and people with disabilities.

Please submit a curriculum vitae, a statement of aims and research interests, and arrange to have three letters of reference sent directly, by December 15, 1993, to:

Dr. P.P.M. Schnetkamp
Department of Medical Biochemistry
The University of Calgary
3330 Hospital Drive N.W.
Calgary, Alberta, Canada T2N 4N1

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**BIOTECHNOLOGY RESEARCH SCIENTISTS**

Battelle, a world leader in applying technological solutions to government and industrial problems, has two research positions available to meet the expanding work in molecular and microbial technology. Both positions require a Ph.D. in molecular biology, microbiology, a related field, or an advanced degree and relevant work experience. An established publication record is essential. Applicants selected for these positions will be subject to a security investigation and must meet eligibility requirements for access to classified information.

**MICROBIOLOGIST**—Involves working with a professional team developing and refining nucleic acid and immunological methods for detection of infectious agents. Applicants with experience with standard bacterial identification methods, PCR, immunological techniques, environmental sampling, and/or GLP procedures will be favored.

**MOLECULAR BIOLOGIST**—Involves contributing to a broad range of programs including the development of improved bacterial gene expression systems, pathway engineering, and the cloning of factors important to CNS diseases. The candidate selected will be expected to design and lead research tasks.

Battelle offers competitive salaries, comprehensive benefits, and opportunities for career advancement. If interested, please send your resume to: Mr. Richard Shaw, Dept. 91, BATTELLE, 505 King Avenue, Columbus, Ohio 43201-2683, An Equal Opportunity/Affirmative Action Employer M/F/D/V.
RESEARCH ASSOCIATE POSITIONS

Two positions—one at a Senior level to work on the expression of biologically important proteins and receptors in heterologous cells. Previous experience in Molecular Biology and knowledge of mammalian cell systems is essential. The successful candidate will work in the laboratory of Dr. O. P. Bahl, Department of Biological Sciences, State University of New York at Buffalo, 347 Cook Hall, Buffalo, NY 14260. SUNY is an Equal Opportunity/Affirmative Action Employer.

RESEARCH ASSOCIATE POSITIONS

RAS ONCOGENE

Two Research Associate positions are available immediately investigating (a) the role of p21ras in tyrosine kinase growth factor signal transduction, and (b) p21ras CAAX peptide-mediated effects on cellular transformation. The projects involve use of a novel anticancer therapy target and (c) synthesizing pep- tidomimetics (J. Biol. Chem. October 1993 issue). Stipends range from $22,000 plus health benefits. Interested individuals should send curriculum vitae and letters of reference to: S. M. Sebti, Ph.D., University of Pittsburgh School of Medicine, Department of Pharmacology, W1354 BST, Pittsburgh, PA 15261. An Equal Opportunity/Affirmative Action Employer.

FOX CHASE CANCER CENTER—ANIMAL VIROLOGIST—Fox Chase invites applications for a tenure-track, faculty-level position. Candidates should be well versed in virology and/or molecular virology, and will be expected to maintain an independent, competitive research program. Opportunities exist for interaction with eight principal investigators in the laboratory, including the laboratories of Dr. Susan Astrin (HIV-1 transformation), Dr. Thomas London (HBV epidemiology and intervention), Dr. Vincent Mason (HIV-1 persistence and replication), Dr. John Pugh (herpesvirus receptors), Dr. Christopher Seeger (HBV and HCV replication), Dr. Anna Marie Skalka (retrovirus integration, protein processing and splicing regulation), Dr. John Taylor (hepatitis delta virus structure and replication), and Dr. Philip Tsichlis (retrovirus pathogenesis). Applications should include curriculum vitae, a statement of research interests, and a list of references. Mail before December 1, 1993, to: Dr. Anna Marie Skalka, Director, Research Division, Fox Chase Cancer Center, 7701 Burholme Avenue, Philadelphia, PA 19111—2497. An Equal Opportunity/Affirmative Action Employer.

MRI SCIENTIST wanted by the Department of Radiological Sciences, Deaconess Hospital. Candidates should have: ● Experience with operation and pulse sequence design and implementation of clinical and research MR systems; ● Experience with FORTRAN, C and UNIX; ● Familiarity with the standard MR pulse sequence language; ● Interest in newly emerging clinical applications; ● Strong interest in new 3-D imaging and post-processing techniques. Deaconess Hospital’s Department of Radiological Sciences currently has a whole-body imaging system: Siemens Magnetom 1.5T (19T). This system will be upgraded to a Siemens 3.0T system by January 1995. Other equipment on site includes: a Bruker Biospec 4.7T, 30 cm bore imaging system and GSN300 spectrometer. Deaconess Hospital is an Affirmative Action and Equal Opportunity Employer. Send curriculum vitae to: Melanie E. Clouse, M.D., Department of Radiological Sciences, Deaconess Hospital, 185 Pilgrim Road, Bos- ton, MA 02215.

BIOCHEMIST—Temple University School of Medicine is seeking a Biochemist to join a research group studying protein interactions in the early stages of blood coagulation. Applicants should have a Ph.D. in Biochemistry with at least 3 years of postdoctoral experience in protein chemistry including: purification, characterization, kinetics, and selected physical methods. Familiarity with HPLC, immunohematological methods and molecular biological methods desirable.

This is a non-tenured position with full benefits and is not a tenure-track position. Send curriculum vitae to: Robert W. Colman, M.D., Director, Thrombosis Research Laboratory, School of Medicine, Temple University, 340 North Broad Street, Philadelphia, PA 19140. Temple University is an Equal Opportunity/Affirmative Action Employer and strongly encourages applications from women and minorities.

MACROMOLECULAR X-RAY CRYSTALLOGRAPHER

The Institute for Cancer Research, Fox Chase Cancer Center (FCCC), has a long and distinguished history in the forefront of X-ray crystallography. FCCC is looking to expand its efforts in macromolecular crystallography with the hire of an independent investigator interested in applying the technique of X-ray crystallography to questions of macromolecular structure. FCCC will provide generous start-up funds. Please send curriculum vitae, a brief description of research plans, and the names of three professional references to: J. P. Ghosh, Chair, X-ray Crystallography Search Committee, ICR/FCCC, 7701 Burholme Avenue, Philadelphia, PA 19111. Applications will be accepted until November 10, 1993, or such time as the position is filled.

BIOLOGIST

Full-time tenure-track biologist sought for September 1994 to join a faculty of five in an undergraduate department. Teaching will include vertebrate anatomy and embryology. Research with undergraduates and advising of pre-health students expected. Area of specialization may include endocrinology, neurobiology, immunology, or virology. Ph.D. required. Applications should include curriculum vitae, a letter indicating interest and skills in teaching, a statement of research activities, and the names and addresses of three professional references. Send application to: Dr. James Malcolm, Department of Biology, University of Redlands, Redlands, CA 92373—0999. The University of Redlands is a private, liberal arts university. The College of Arts and Sciences, in which this position exists, enrolls 1500 undergraduates. The University is located in Redlands, a small city in the eastern foothills of the San Bernardino Mountains. The University of Redlands is an Equal Opportunity Employer. Women and minorities are encouraged to apply.

MOLECULAR GENETICIST

The Department of Biology at Occidental College invites applications for a tenure track position for a Molecular Geneticist. Applicants should have a strong commitment to teaching at the undergraduate level and to research; The successful candidate will normally teach courses in genetics and biochemistry. She is expected to develop a vigorous research program involving undergraduates. The exact area of research is open. The new faculty member will have the opportunity to participate in the Cell and Molecular Biology Emphasis and to be involved in the interdisciplinary Biochemistry major. Occidental seeks a faculty member with a liberal arts background, with excellent research and teaching facilities, located in Los Angeles. It is also a nationally recognized leader in multicultural education. Send curriculum vitae, state- ment of your research and teaching interests, copies of significant publications, and arrange to have three letters of reference sent, by December 1, 1993, to: Dr. Roberta Pollock, Department of Biology, Occidental College, 1600 Campus Road, Los Angeles, CA 90041. Occiden- tal College is an Equal Opportunity/Affirmative Action Employer. Women and people of color are particularly encouraged to apply.

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

DEPARTMENT OF PATHOLOGY

Applications are now being accepted for an ASSIST- ANT RESEARCH BIOCHEMIST. Qualifications: Ph.D. with skills in electron microscopy and immunoc- hemistry, and experience with rat liver microsome. Copy. Prior experience working with skin/epidermis and with in situ hybridization is desirable, but not necessary. Prior technical experience is a prerequisite; extensive peer review and grant writing experience. Duties include supervision of the Morphology Core Facility of an NIH-funded program project with possible role as co-investigator in some disease areas. Salary: $30,000 and interests dictate. Salary: Negotiable. Contact: Please forward applications to: Bruce U. Wintrouth, M.D., California, Department of Pathology, University of California, San Francisco, CA 94143—1214 by October 31, 1993. The University of California is an Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.

BIOCHEMIST—The Chemistry Department of Williams College invites applications for a temporary (one-semester) position in biochemistry for spring 1994. The teaching responsibilities involve a senior seminar course on biochemistry (to review current literature in biochemistry and molecular biology) and the supervision of two introductory chemistry laboratory sections. Candidates should have a Ph.D. or be completing dissertation in biochemistry or related areas. The minimum salary for the position is $16,000. Williams College is a highly selective, coeducational liberal arts institution of approximately 2300 students. The College is a leading undergraduate teaching institution located in northwestern Massachusetts. The Chemistry Department, with ten faculty members and 25 to 35 majors each year, is accredited by the ACS and has excellent facilities for teaching and research. Send résumé, undergraduate and graduate transcripts, and two letters of recommendation to: Dr. Charles Lovett, Jr., Department of Chemistry, Williams College, William- stown, MA 01267, by November 23, 1993. As an Affirmative Action/Equal Opportunity Employer, Williams College is especially interested in identifying and women candidates.

RESEARCH TECHNICIAN

Mayo Clinic Jacksonville’s Alzheimer’s disease research group is seeking a research technician with laboratory experience using molecular biological and immuno- logical approaches in studies of the brain. Ongoing projects include studies of muscarinic receptor function, development of new antisense oligonucleotides for expression in aging central cholinergic systems. A Master’s-level degree or a Bachelor’s degree with several years of relevant experience is required.

Mayo provides a competitive salary and an excellent benefits package. Qualified individuals should forward their résumés to: Dr. M. McKinney, Ph.D., Department of Pharmacology, Mayo Clinic Jacksonville, 4500 San Pablo Road, Jacksonville, FL 32224. An Equal Opportunity Employer. Smoke-free and Drug-free workplace.

CELL SCIENTIST

KRUG Life Sciences Biotechnology Laboratory at the NASA Johnson Space Center is seeking to fill a Ph.D. or M.D.-level position to lead comparative ground-based and microgravity-based cell-culture studies. The successful applicant will possess at least ten (10) years of experience with mammalian cell-culture techniques, a solid background in molecular biology, and experience with cell differentiation, cell-surface receptors, protein biochemistry, and cell interactions. The applicant’s research must currently include the expression and characterization of protein sequences, and we are particularly seeking individuals with experience in the study of cell function and behavior in microgravity systems. Preference will be given to applicants who have sustained productive research in an industrial or academic tissue-engineering program. Experience with bioreactors and lab supervision are desirable.

Please send curriculum vitae, a description of career goals and research objective, the names of three references and a salary history, indicating POSITION #93-123-10, to: KRUG Life Sciences Inc., Human Re- source Department, P.O. Box 58827, Houston, TX 77258—8827. Employment Eligibility Verification Re- quired. Equal Opportunity Employer, M/F/H/V. Smoke- free workplace.

ANNOUNCEMENTS

REQUEST FOR REVIEWERS—LAKE MICH- IGAN MASS BALANCE STUDY The U.S. Environ- mental Protection Agency, Great Lakes National Pro- gram Office (GLNPO), will conduct a mass balance study for the Lake Michigan system in 1994. A draft work plan for the study addresses areas of monitoring and research in: contami- nant loads (tributaries and atmospheric deposition, water column exchange, and lake sediments); biotic and food web dynamics, and modelling. Interested scientists are invited to review and comment on the workplan by November 15, 1993. To receive a copy for review, contact: Mr. Wade Jacob- son, U.S. Environmental Protection Agency, Great Lakes National Program Office GS-9J, 77 West Jack- son Boulevard, Chicago, IL 60604 (FAX: 312-353- 2018, Attention: Wade Jacobson).
DIRECTOR OF THE MRC CELLULAR IMMUNOLOGY UNIT

The MRC wishes to appoint a scientist with a distinguished research record to the position of Director at the MRC Cellular Immunology Unit which is located within the Sir William Dunn School of Pathology in Oxford. He or she will be responsible for providing leadership and strategic direction to the staff of the Unit, as well as directing his or her own research team.

The Unit has a distinguished record. It was created and first directed by Sir James Gowans FRS who on his retirement was succeeded by Dr Alan Williams FRS. The existing research programme focuses on lymphocytes, their cell surface structures, differentiation and functions. Immunology is a particular strength in Oxford and the applicant will be expected to build upon existing research interests in the Unit as well as developing key interactions and collaborations with the broader scientific community.

The new Director will be responsible to the MRC for Unit staff and the allocation of resources within the Unit, in accordance with Council policies and the outcome of peer review.

The salary will be negotiable in the range for Council’s Special Appointments (equivalent to UK University professorial salaries). In addition, assistance with the costs of relocation will be available.

A job description and other additional information may be obtained from Dr Jane Frew at MRC Headquarters Office, 20 Park Crescent, London W1N 4AL. Telephone 071-636 5422, ext 6284.

Applications should consist of outline proposals for the strategic direction of the work of the Unit and brief future proposals for the applicant’s own research, together with a curriculum vitae, an up-to-date publications list and the names of three referees. These should be sent, no later than 10 December 1993 to Sir Dai Rees, Secretary to the Council at the above address.

An Equal Opportunities Employer.

CHAIR

Department of Biology and Biotechnology
Worcester Polytechnic Institute
Worcester, Massachusetts

Worcester Polytechnic Institute is seeking applications and nominations for the position of Professor and Chair of the Department of Biology and Biotechnology. WPI is a recognized leader in Biotechnology education with strong ties to the Massachusetts Biotechnology Park in Worcester, and the biotechnology industry in New England. Applicants for this position are expected to have a commitment to undergraduate education and an outstanding record of achievement relevant to Biology and Biotechnology education and research. Research in the department addresses both basic and applied problems in Biology. The successful candidate will lead a growing department of 9 faculty members, 220 undergraduates, and 38 graduate students, and be committed to maintaining and enhancing our nationally recognized and comprehensive undergraduate programs, as well as developing our evolving graduate programs in biology and biotechnology. Minimum qualifications include a Ph.D. in any field of Biology/Biotechnology or Bioengineering and a distinguished record of achievement in both education and funded research with demonstrated leadership abilities. A salary and benefit package will be commensurate with qualifications and experience.

Applications should provide full curriculum vitae, along with names and addresses of three references, and should be sent in confidence to: Search Committee for Biology & Biotechnology, Office of the Provost, Worcester Polytechnic Institute, Worcester, MA 01609.

Consideration of applicants will begin immediately and will continue until a suitable candidate is found.

WPI is an Equal Opportunity/Affirmative Action Employer. Women and Minorities are Encouraged to Apply.

Faculty Positions
Department of Biological Sciences
Southern Methodist University

Applications are invited for two tenure-track positions at the ASSISTANT PROFESSOR level to begin Fall 1994. Applicants should have a distinguished post-doctoral experience. Preference will be given to candidates whose research interest complement existing departmental strengths in molecular and cellular biology. Successful candidates will be expected to establish extramurally funded research programs and to supervise the training of doctoral students.

Position 1. We are seeking applicants with expertise in Molecular Biology and Biochemistry. Individuals working with microbial eukaryotic organisms are encouraged to apply. Primary teaching responsibilities will be in microbiology or biochemistry at the advanced undergraduate/graduate level.

Position 2. We are seeking applicants with expertise in the general area of Molecular or Cellular Biology, although the topic of research interest is flexible. Primary teaching responsibilities will consist of an introductory biology course with a large component of organismal and evolutionary biology, and ecology. This position is designated as The James Trustee Endowed Assistant Professorship.

Applications consisting of curriculum vitae, statement of research interests, sample reprints and the names of three references should be forwarded to: Faculty Search Committee, Position 1 or 2, Department of Biological Sciences, 220 Fondren Science Building, Southern Methodist University, Dallas, Texas 75275. The closing date is December 15, 1993. Southern Methodist University is an Equal Opportunity/Title IX/Affirmative Action Employer.

CHAIR

Biochemistry and Biophysics
Iowa State University is committed to the growth of its programs in the biological sciences with the Department of Biochemistry and Biophysics in a leadership role. Recent major investments in a new Molecular Biology Building, state-of-the-art instrumentation and new faculty have created a stimulating research environment. The Department strives for prominence in research, as evidenced by strong extramural funding of its faculty and excellence in teaching at both the undergraduate and graduate levels. The Department administers B.S., M.S. and Ph.D. programs in biochemistry and biophysics, and participates in several interdepartmental graduate programs.

Applications and nominations are invited for the position of Chair, Department of Biochemistry and Biophysics, Iowa State University. The successful candidate is expected, and will be provided with the means, to promote the national and international stature of the Department. The candidate of choice must have an active, well-funded program of research, a distinguished record of scholarly contributions, and experience in teaching, as well as proven skills in leadership.

Applications and nominations will be received until the opening is filled, but the screening process will begin in January. Applications with curriculum vitae and the names and addresses of three or more references should be sent to: Dr. Duane Enger, Chair, Search Committee, Department of Biochemistry and Biophysics, Molecular Biology Building, Room 1218, Iowa State University, Ames, IA 50011, Telephone (515) 294-0320.

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- National Technical Association. In addition to these organizations, many more will receive this section for use through mailings and at meetings.

Don't miss this advertising opportunity!
Contact Janis Crowley at (212) 496-7704.

Space Reservation Deadline: Tuesday, October 26
Pre- and Post- Doctoral Education and Training in Molecular Virology at the University of Kentucky

The University of Kentucky announces a program of interdisciplinary graduate and postdoctoral education and research in molecular virology. This program provides a unique opportunity for formal instruction and research training in plant, animal, and insect virology. Participating faculty and their research interests include:

- **George Allen:** T-lymphotrocyte recognition of equine herpesvirus antigens
- **Thomas Chambers:** Equine influenza virus
- **Sunit Chatterjee:** Vaccinia vectors for gene therapy
- **Donald Cohen:** Mechanisms of immunodeficiency in murine AIDS
- **Peter Crooks:** Design, synthesis, and evaluation of antiviral compounds
- **Sara Leblanc:** Molecular biology of satellite RNAs of plant and fungal viruses
- **Arthur Hunt:** Genetic engineering of virus resistance in plants
- **Charles Issel:** Persistence and control of the equine lentivirus
- **Patricia Klein:** RNA recombination in virus-infected transgenic plants
- **Robert Jacobs:** Molecular pathogenesis of herpesvirus infections
- **Judy Lesnaw:** Mechanisms of RNA replication by negative-strand RNA viruses

William McCollum: Equine virology

Craig Miller: Early events in herpes virus latency

Tom Pirone: Plant viral genes that regulate insect transmission

John Shaw: Replication and pathogenesis of plus-strand RNA plant viruses

Robert Shepherd: Molecular biology of caulimoviruses

Peter Timoney: Mechanisms of persistence of equine arthritis virus

Mary Lynn Vickers: Diagnostic veterinary virology

Steve Zimmer: Viral transformation and adenovirus vectors for gene therapy

For more information and application materials, contact:

- **Dr. Arthur G. Hunt**
  Department of Agronomy
  University of Kentucky
  Lexington, KY 40546-0091
  Tel: (606) 257-3637
  Fax: (606) 258-1952

UNIVERSITY OF ILLINOIS AT CHICAGO
OFFICE OF THE VICE CHANCELLOR FOR RESEARCH

Associate Director

The Office of the Vice Chancellor for Research (OVCR) at the University of Illinois at Chicago (UIC) seeks candidates for an Associate Director reporting to the Director, Office of Research Services. This position is responsible for the oversight of a staff of five program coordinators responsible for proposal development. Major responsibilities include: Planning and implementing campus research developments programs across all disciplines, targeting own research development efforts within the College of Medicine; increasing federal, state, and corporate support for faculty research projects; and developing and maintaining networks of contact within sponsoring organizations for the purpose of cultivating and expanding potential funding sources; and marketing research proposals to potential sponsors.

Candidates must have a demonstrated ability to work and communicate with faculty. A minimum of three years experience in program and proposal development and/or program and project management is required; experience in acquiring research funding from federal government, industry and foundations for a College of Medicine is highly desirable. Candidates must possess a master’s degree preferably in a life science, a Ph.D. is preferred.

To ensure full consideration, send a cover letter, complete resume, and the names and addresses of five references by November 15, 1993 to:

Ms. Donna J. Debak, Search Coordinator
Office of the Vice Chancellor for Research (M/C 672)
University of Illinois at Chicago
1737 W. Polk Street, 310 AOB
Chicago, IL 60612

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

Wayne State University
Chair, Department of Biological Sciences

Wayne State University invites applications for the position of Professor and Chair of the Department of Biological Sciences in the newly formed College of Science. There are currently 26 faculty members in the Department and at least six additional full-time appointments are anticipated. Over 160 graduate students are enrolled in the Ph.D. and M.S. programs in Biological Sciences and in the M.S. program in Molecular Biotechnology. The Department is housed in over 65,000 square feet of research space, including a recently completed six-story research building. There are strong ties between the Department and the Wayne State University School of Medicine and the new interdisciplinary Center for Molecular Medicine and Genetics. Wayne State University, located in Detroit’s Cultural Center, is an urban research university serving 34,000 students.

We seek an academic leader to enhance the research and teaching programs of the Department. Candidates should have a distinguished record of scholarly activity, an internationally recognized research program, and a strong commitment to graduate and undergraduate education in the sciences. The incoming chair will have an exceptional opportunity to enhance significantly the research and teaching programs of the Department. In order to be assured of full consideration, applications should be received by December 15, 1993. Letters of application, curriculum vitae, and names of at least 4 references should be sent to:

Professor Robert H. Rownd, Chair
Biological Sciences Chair Search Committee
1350 Biological Sciences Building
Wayne State University, Detroit, MI 48202

Wayne State University is an Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL POSITIONS
Emory University School of Medicine
Division of Cancer Biology
Department of Radiation Oncology

Several postdoctoral positions are immediately available in the research programs of the following investigators:

- Dr. Paul W. Doetsch (DNA Damage and Repair), Dr. Victoria L. Stevens (Function and biosynthesis of mammalian glycosylphosphatidylinositol anchors), and Dr. Davis S. Chen (Modulation of radiation sensitivity in mammalian cells).

The Division of Cancer Biology is a newly established research unit and is well equipped with centralized state-of-the-art core resources for conducting molecular biological, biochemical, and radiation biology research.

Interested applicants should send their curriculum vitae and the names and addresses of three references to the appropriate investigators at the following address:

Division of Cancer Biology
Department of Radiation Oncology
Emory University School of Medicine
145 Edgewood Ave., S.E.
Atlanta, GA 30335-3801

Emory University is an Equal Opportunity/Affirmative Action Employer.
According to the ancient Chinese philosophy of yin and yang, the universe is composed of opposing but interdependent forces. Interestingly, this philosophy resembles the concept of homeostasis, the natural balance that occurs within living organisms, including the harmony between antagonists and agonists that regulate vital functions. Thus, an important factor in the search for new medicines is developing compounds that work together with the body's own restorative and regenerative abilities.

To lead healthy lives, we must seek balance with nature, with society, and within ourselves. Through pharmaceutical research, we are striving to help people attain this balance.
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Lower level pools are also provided in 96-well microtiter plates. Each plate corresponds to one well of the top level pools and contains the DNA is provided for 25 PCR reactions.

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