adherence in the Gram-negative organisms appears to be well documented, again because of the relative ease with which fimbriae can be removed in a biologically active form. However, determining the molecular basis of the activity of fimbriae has not been as easy because extraction procedures often inactivate the active molecules or result in such a complex assortment of adhesive substances that analysis for the active component is difficult. Many of these problems also occur in the attempts to determine the nature of the host-cell receptor. Thus, many of the data presented concerning the interaction between Gram-negative fimbriated organisms and host cells come from studies that rely upon hapten inhibition and enzymatic hydrolysis, both of which may lead to erroneous conclusions. In many studies, a hemagglutination test is used despite the observations that adherence to erythrocytes often appears to be mediated by different bacterial adhesins and host receptors from those mediating adherence to epithelial cells. The problems in the interpretation of these types of experiments are well illustrated in chapters 9 and 10, which cover much of the same ground but with clearly differing conclusions. Thus, Watt and Ward (chapter 9) conclude that adhesion of *Neisseria gonorrhoeae* is mediated by hydrogen bonding along the sugar moieties, whereas Pearce and Buchanan (chapter 10), citing similar evidence, conclude that the interaction is more specific and involves a lectin-like receptor.

I was happy to be introduced in chapter 9 to the use of DLVO (Derjaguin-Landau-Verwey-Overbeek: long-range attraction) theory as a way of explaining the affinity between two like-charged cells. The difficulty of explaining such affinity is discussed in some detail in the introductory chapter by Ofek and Beachey. Of most interest to me was their discussion of the adhesion of the Gram-positive organisms, particularly the streptococci. Although the authors suggest that teichoic acids are important in the attachment of these organisms to epithelial cells, the difficulty of removing the surface components of the streptococci without denaturing them suggests that the complete story has not yet been written. Thus, the book is thought-provoking, and, best of all, I learned something.

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A Regulatory Protein

Calmodulin and Cell Functions. Papers from a conference, New York, May 1980. D. MARTIN WATTERSON and FRANK F. VINCENZI, Eds. New York Academy of Sciences, New York, 1980. xii, 446 pp., illus. Cloth or paper, $86. Annals of the New York Academy of Sciences, vol. 356.

Calcium ions have long been implicated in the regulation of such biological processes as contraction, motility, secretion, metabolic adjustment, and cell proliferation. Recently it has become evident that their effects are mediated through a family of structurally related Ca^{2+}-dependent regulatory proteins of common evolutionary origin. Whereas some representatives of this family are specialized and are found only in certain tissues (for example, troponin C in muscle tissue), calmodulin is apparently found in all nucleated cells and serves as a general receptor for the Ca^{2+} signal. Since its discovery a decade ago as an activator of brain cyclic nucleotide phosphodiesterase, calmodulin has been "rediscovered" by a number of investigators as a protein factor that could enhance Ca^{2+} activation of the particular biological system under study. The present book is an attempt to summarize current research on calmodulin and to define future research areas.

Since the conference of which the book is the proceedings attracted representatives of most of the major laboratories involved in calmodulin research either as featured speakers or to give poster presentations (abstracted in the volume), the objective of summarizing current research has certainly been met. Also, many of the papers contain speculative sections that point to possible future developments. Although the quality, scope, and thoroughness of the contributions vary greatly, the standard is generally high, and it would be impossible in a short review such as this to do justice to the many excellent papers contained in the volume. Suffice it to say that the significance and role of calmodulin in the regulation of neurotransmission, cyclic nucleotide metabolism, membrane transport, calcium levels, and smooth muscle contraction are dealt with very adequately by a number of authors.

In addition there are several interesting contributions dealing with such topics as structure-function relationships and mode of action of calmodulin (Jamieson *et al.*, Drabikowski *et al.*, Nairn *et al.*), comparative studies of calmodulin and calmodulin-like proteins (Van Eldik *et al.*), and the isolation and molecular cloning of a portion of the calmodulin gene (Munjaal *et al.*).

Though unavoidably out of date, the book complements the several excellent reviews recently published on the subject because it fills in the details of experimental manipulations and approaches that cannot be found in those reviews. For this reason and because it provides easy and organized access to the calmodulin literature, the book will be extremely useful, and indeed "a must," for anyone who considers entering the field. It will also appeal to anyone generally interested in the regulation of cell function.

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(Continued on page 944)

each oscillation. Such variation in the intrinsic behavior of CGD neurons causes a corresponding alteration in the phasing of the driven responses in the postsynaptic GM cells. Whereas the GM neuron of Fig. 2E is depolarized (and fires its burst of spikes) during the depolarized phase of the presynaptic CGD, in the second case (Fig. 2F) it is driven depolarized by the hyperpolarized phase of the CGD. Thus a shift in the mean membrane potential about which a CGD oscillates seems able to switch the phase relationships between the oscillations of presynaptic and postsynaptic neurons. This shift could be mediated by tonic (excitatory or inhibitory) inputs to the CGD. That such tonic inputs exist is indicated by the fact that complete isolation of the commissural ganglion (Fig. 1A) can reversibly induce the depolarized nonspiking state in CGD, presumably by the removal of some inhibitory influence.

The CGD function thus seems to depend on an interaction between the cell's two membrane potential thresholds and the absolute limits of membrane potential oscillation. An alteration in oscillation (by tonic or phasic influences) results in dramatic postsynaptic effects, one of which is to change the phase relationships between the activity of the CGD and its follower GM neuron. A further effect is that a small change in the depolarized maximum of an oscillatory CGD cell can cause spike inactivation during the peak of oscillation and result in an immediate doubling of GM burst frequency (Fig. 2G). That is, the coupling between driver and follower has changed from 1:1 to 1:2 cycle coordination.

Our results demonstrate that a spiking neuron can become nonspiking at both high and low levels of membrane potential. For an oscillatory neuron, which is subject to control by tonic influences, this provides a means of generating different patterns of rhythmic output. In the context of behavioral flexibility, therefore, the cellular mechanism described here could play a major functional role. It remains to be seen whether this mechanism is a widespread phenomenon among rhythm pattern generators.

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Send copy for all **Positions Wanted** ads and **Display** ads less than 1/6 page in size (125 millimeters) to:

SCIENCE, Room 207
1515 Massachusetts Avenue, NW
Washington, D.C. 20005
Telephone: 202-467-4456

Send copy for **Display** ads 1/6 page and larger to:

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

Blind ad replies should be addressed as follows:

Box (give number)
SCIENCE
1515 Massachusetts Avenue, NW
Washington, D.C. 20005

Effective 1 January 1982, the Display rate will be $9 per millimeter with a minimum charge of $225.

POSITIONS WANTED

Anatomist/D.M.D. M.S. (physiology), Ph.D. (anatomy), D.M.D. (June 1982). Expertise: membrane transport, TEM, SEM, photomicrography, electrophysiological recording. Two years of postdoctoral research. Interested in developing innovative methods of studying cholinergic and adrenergic membrane receptors. Teaching experience: gross anatomy, histology, cell biology, neuroanatomy, physiology. Box 295, SCIENCE. X

Clinical/Analytical Chemist. Ph.D. 1976. England. Five years of international experience in medical research; diabetes, cancer research, glycoproteins, drugs and metabolites, toxicology. Extensive experience in the application of GC, GC-MS, HPLC, electrofocusing, TLC, UV, AA, and IR in the development of methods. Currently World Health Organization employee. Publications. Desires faculty/senior research position. No agencies please, Box 262, SCIENCE. 11/20, 27; 12/4, 11, 18

Food Chemistry M.Sc., **biochemistry** Ph.D. 1972, Germany. Eleven years of teaching. Research in glycolysis, citrate cyclic systems, metabolism, bioregulation. Publications. Experience in analytical food- and biochemistry, pharmacy. Seeking industrial research and development position. Box 293, SCIENCE. X

Gross Anatomist. Ph.D. (1973). Ten years of teaching experience in medical gross anatomy. Specialty courses include histology, embryology, comparative anatomy, and physical anthropology. Seeks teaching/administrative position. Box 294, SCIENCE. X

Pharmacologist—Ph.D., pulmonary pharmacology, Arachidonate metabolism, high-pressure liquid chromatography, lung strip, bioassay, radioimmunoassays, academic and industrial experience, publications. Box 292, SCIENCE. X

POSITIONS WANTED

Tissue Culture Specialist/Horticulturalist. Ph.D. in 1981; 8 years of previous research and teaching at assistant professor level. Seeking industrial research or academic research/teaching position. Will relocate. References and résumé on request. Box 289, SCIENCE. 11/20, 27; 12/4

Tree Tissue Culture. B.Sc., M.Sc. Four years of experience. Seeks position/assistantship. H. Mendis, Guruwasa, Kendala, Boossa, Sri-Lanka. X

POSITIONS OPEN

ANATOMIST, ASSISTANT OR ASSOCIATE PROFESSOR. Applications are invited for a tenure-track position involving participation in the osteopathic medical and/or physical therapy gross anatomy courses, and in the graduate program in the Department of Zoology and Microbiology. A strong research orientation is required. Start-up funds are available. Although the research area is open, one that would complement the existing strong areas of research (functional morphology, neurosciences, muscle biology) would be desirable. A Ph.D. degree or equivalent is required; prior medical or dental school teaching experience is highly desirable. Salary is competitive; campus location is attractive. Earliest starting date: 1 July 1982.

Send curriculum vitae, including a statement of teaching and research interests, before 1 January 1982 to: **Dr. Louise L. Edds, Chairperson, Anatomist Search Committee, Ohio University, College of Osteopathic Medicine, Irvine Hall, Athens, Ohio 45701.** *Ohio University is an Affirmative Action/Equal Opportunity Employer.*

ANIMAL BEHAVIORIST. A tenure-track position is available for an assistant professor or other well-qualified individual in vertebrate or invertebrate animal behavior with a specialization in biopsychology or the neurosciences; beginning fall 1982. Evidence of effective teaching experience and published research or research promise is required. Duties include undergraduate/graduate teaching in learning, and in animal behavior, motivation, and/or comparative psychology. Submit curriculum vitae, reprints, and three letters of recommendation to: **Animal Behavior Search Committee, Department of Psychology, University of California, Santa Barbara, Calif. 93106,** by 31 January 1982. *An Equal Opportunity/Affirmative Action Employer.*

The Centre International de Recherches Medicales de Franceville (CIRMF) welcomes applications for the challenging position of **ANIMAL CARE SUPERVISOR** at its Primatology Centre in Franceville, Gabon. Candidates must be able to communicate in French, have demonstrated supervisory and training skills, be competent in the handling and management of monkeys and apes, and have some background in the biological sciences. The position offers a 2-year contract with the possibility of renewal. The animal facilities, living accommodations, salary, and other benefits are all exceptional. Qualified persons should send their résumés and the names of three references to: **Robert W. Cooper, Veterinarian-in-Charge, Primatology Centre, CIRMF, B.P. 769, Franceville, Gabon (West Africa).**

The Department of Surgery, Southwestern Medical School, is seeking applicants for: **ASSISTANT PROFESSOR**—M.D., accredited general surgery residency, peripheral vascular fellowship, teaching and research experience. **INSTRUCTOR**—M.D., accredited general surgery residency, interest in peripheral vascular surgery. Contact: **William J. Fry, M.D., Hudson-Penn Professor and Chairman, Department of Surgery, 5323 Harry Hines Boulevard, Dallas, Texas 75235.** *The University of Texas Health Science Center at Dallas is an Equal Opportunity Employer.*

ASSISTANT PROFESSOR OF CHEMISTRY, PROJECT MANAGER (SEARCH REOPENED) for training project for local high school students. Temporary appointment; three semesters; one summer. Classroom/laboratory instruction and project administration. Ph.D. in any chemistry area with strong interest in chemical education, instrumentation, and medical applications of chemistry required. Begin January 1982. Salary contingent upon qualifications. Résumé and three reference letters by 10 December 1981 to: **Dr. J. D. Lewis, Box 723, St. Edward's University, Austin, Texas 78704.** *St. Edward's University is an Equal Opportunity/Affirmative Action Employer. Applications from men, women, minorities, and handicapped persons are welcome.*

POSITIONS OPEN

ASSISTANT PROFESSOR

The Department of Biological Chemistry of the University of Illinois invites applications from candidates for the position of assistant professor beginning in the academic year 1982–1983. The candidate is expected to develop a research program in any area of biochemistry that will complement the activities of the existing faculty. Candidates should possess a Ph.D. degree with a strong chemical background, at least 2 years of postdoctoral experience, and published evidence of ability to design productive experiments in their intended area of biochemical research. Curriculum vitae and three supporting letters of recommendation should be sent to: **Biological Chemistry Search Committee, University of Illinois Medical Center, 1853 West Polk Street, Chicago, Illinois 60612.**

The University of Illinois is an Equal Opportunity/Affirmative Action Employer and encourages applications from women and minorities.

ASSISTANT PROFESSOR

The University of Georgia, Department of Microbiology, invites applications for a tenure-track appointment as assistant professor beginning in September 1982. A minimum of 1 or 2 years of postdoctoral experience is required. The appointee will be expected to establish a strong program of research and scholarship in some aspect of physiological microbiology and to participate in the teaching of undergraduate microbiology. We welcome applications from women and minorities. Send curriculum vitae, résumé of past and present research, and the names of three reference sources by 15 January 1982 to:

Dr. W. R. Finnerty
Department of Microbiology
University of Georgia
Athens, Georgia 30602

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

The University of Michigan, School of Natural Resources, is seeking applicants to fill a full-time, 9-month, tenured, tenure-track faculty position at the **ASSISTANT or ASSOCIATE PROFESSOR** level in the area of **FOREST SOILS.** It is expected that the position will be filled by 1 September 1982.

Applications should be sent to: **William J. Johnson, Dean, School of Natural Resources, The University of Michigan, Ann Arbor, Mich. 48109.** Closing date: 15 January 1981. *A nondiscriminatory, Affirmative Action Employer.*

ASSISTANT/ASSOCIATE PROFESSOR—MARINE AFFAIRS. Tenure-track, beginning fall 1982. Teach graduate/undergraduate courses in marine science/technology policy, marine technology, and introductory oceanography in a successful interdisciplinary department. Scholarly research; participate in student advisement, and departmental administration. Ph.D. in a marine science and appropriate relevant experience. Send résumé and three letters of recommendation by 15 February 1982 to: **Employee Relations Officer, Personnel Office-S-020005, UNIVERSITY OF RHODE ISLAND, Kingston, Rhode Island 02881.** *An Affirmative Action/Equal Opportunity Employer, M/F.*

The University of Michigan, School of Natural Resources, is seeking applicants to fill a full-time, 9-month, tenured, tenure-track faculty position at the **ASSISTANT PROFESSOR** level to teach and conduct research in **NATURAL RESOURCE ECOLOGY.** The position is available 1 September 1982. Applications should be sent to: **William J. Johnson, Dean, School of Natural Resources, The University of Michigan, Ann Arbor, Mich. 48109.** Closing date: 15 January 1981. *A nondiscriminatory, Affirmative Action Employer.*

ASSISTANT PROFESSOR—NEUROBIOCHEMISTRY. The Department of Biochemistry, University of Missouri–Columbia, invites applications for a state-funded, tenure-track position at the rank of assistant professor. The department seeks a Ph.D. with postdoctoral experience and interest in developing an independent research program in neurobiochemistry at its Missouri Institute of Psychiatry Laboratories in St. Louis. Please send curriculum vitae, summary of research plans, and three letters of recommendation to: **Chairman, Search Committee, Department of Biochemistry, 322A Chemistry Building, University of Missouri–Columbia, Columbia, Mo. 65211.** The application deadline is 15 January 1982. *The University of Missouri is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

ASSISTANT PROFESSOR—BIOCHEMISTRY. Applications are invited for a tenure-track position at the level of assistant professor to be filled on/or before 1 July 1982. Applicants should hold the Ph.D. degree in biochemistry and have postdoctoral experience. They must have the potential for excellence in teaching, and evidence of outstanding ability in research. The successful candidate is expected to teach biochemical subjects to medical and graduate students, and to develop a productive research program. The area of primary research interest should be in biochemical genetics involving molecular studies of the synthesis and assembly of macromolecular structures. Included are the regulation of expression of receptor molecules, enzymes, and other biologically active proteins. Send curriculum vitae, concise summaries of present and of proposed research, and three letters of recommendation to: **Dr. F. P. Inman, Chairman, Department of Biochemistry, Quillen–Dishner College of Medicine, P.O. Box 19930A, East Tennessee State University, Johnson City, Tenn. 37614.** *An Affirmative Action/Equal Opportunity Employer.*

ASSISTANT PROFESSOR—FISH BIOLOGIST

The Department of Zoology, University of Georgia, invites applications for a tenure-track assistant professorship available 1 September 1982 for a fish biologist with expertise in the ecology, behavior, or physiology of marine fishes. Appointee is expected to teach an advanced undergraduate course in ichthyology and graduate courses in area of special interest and to develop an active research program to complement our highly diversified faculty of marine science. Send curriculum vitae, names of at least three references, and statement of research interests before 27 January 1982 to:

Chairman, Ichthyology Search Committee
Department of Zoology
University of Georgia
Athens, Georgia 30602

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

ASSISTANT PROFESSOR—PHARMACOLOGY. Tenure-track appointment beginning February 1982, or later; Ph.D. in pharmacology or toxicology preferred. Proven record of research productivity and competency in undergraduate and graduate teaching is required. Send curriculum vitae, three letters of reference, and statement of career goals to: **Dr. N. L. Katz, College of Pharmacy, University of Illinois at the Medical Center, 833 South Wood Street, Chicago, Ill. 60612.** *An Equal Opportunity/Affirmative Action Employer.*

Applicants invited for tenure-track position at **ASSISTANT PROFESSOR** level in **DEPARTMENT OF PHARMACOLOGY.** Must have Ph.D. or M.D. degree. Some preference will be given those individuals with postdoctoral and teaching experience with research expertise in drug metabolism or CNS pharmacology. Position requires teaching pharmacology to medical and graduate students and developing an independent research program. Anticipated starting date: 1 July 1982. Curriculum vitae, brief description of proposed or ongoing research, copies of research publications, and three letters of recommendation by 1 February 1982 to: **Dr. Leon Hurwitz, Chairman, Pharmacology Department, University of New Mexico School of Medicine, Albuquerque, N.M. 87131.** *Affirmative Action/Equal Opportunity Employer.*

CELL MEMBRANES/CELL SURFACE

The Department of Developmental and Cell Biology, University of California, Irvine, is looking for a cell biologist who studies cell membranes in relation to one or more of the following areas: cell movement and migration, cytoskeleton and cell shape, cell surface interactions with substrates, and cell-cell interactions. We are looking for a person whose research program could closely relate to some of the 21 other faculty whose emphasis is in developmental biology and cell physiology. Although we are looking primarily for a senior person, the position can be filled at either the senior or junior level. For the former we want an individual who has a well-established research program, and for the latter at least 2 years of postdoctoral experience is desired.

Please submit curriculum vitae plus the names of three references to:

Grover Stephens, Acting Chairman
Developmental and Cell Biology
University of California, Irvine
Irvine, Calif. 92717

An Equal Opportunity/Affirmative Action Employer

SENIOR EXECUTIVE

The U.S. Army is seeking a **Deputy Director** for the Chemical Systems Laboratory, a major laboratory of the U.S. Army Armament Research and Development Command. This Civil Service position is in the Senior Executive Service (SES) and is responsible for the broad management of diverse activities. Salary ranges from $52,247 to $61,600 but currently limited to $50,112.50 by statute.

Located on Aberdeen Proving Ground in Maryland, approximately 20 miles east of Baltimore, Chemical Systems Laboratory conducts research and development activities for materiel related to chemical and biological defense and chemical deterrent. This area has recently received intense attention with the result of substantially increased programs, and support at all levels within the Department of Defense. This position is one of considerable responsibility and challenge requiring a person with vision, insight, and the skill to effectively direct multiple programs of high dollar value. The organization is comprised of four operating divisions and numerous support offices, and employs approximately 1000 personnel.

Candidates should possess as a minimum a B.S. degree in chemistry, chemical engineering, or a related physical science or engineering field and have had direct experience in line management of research and development activities. Further information about the position, including additional qualifications, requirements, and application materials may be obtained by **telephoning Kay Driscoll at 202-274-7676** or by writing to:

Commander
U.S. Army Materiel Development & Readiness Command
Attention: DRCLD
5001 Eisenhower Avenue
Alexandria, Va. 22333

All applications must be received by 8 January 1982.

An Equal Opportunity Employer

RESEARCH MINERALOGIST

The Department of Mineral Sciences at the American Museum of Natural History is re-opening its search for a tenure-track position for ASSISTANT CURATOR OF MINERALOGY beginning July 1982. This is a research position with an average of ¼ time responsibility towards departmental activities, collection management, exhibition, and interaction with the mineral community at large. High quality problem-oriented research is the prime responsibility. The field of specialization within the mineral sciences is open, and may include and combine aspects of X-ray crystallography, ultrastructure analysis, crystal growth, spectroscopy, gemology, petrologic mineralogy, mineral geochemistry, crystal and thermochemistry, medical mineralogy, and mineral physics. Major research facilities include a fully automated ARL-SEMQ electron microprobe, X-ray laboratory, minicomputers, and a 100,000 specimen mineral collection. Opportunities exist for research and/or teaching collaboration with nearby institutions such as Columbia (Lamont-Doherty Geological Observatory), Princeton, SUNY at Stony Brook, Yale and Mt. Sinai School of Medicine (TEM facilities).

Requirements are a Ph.D. in hand by time of appointment, an ability to do creative research, and a desire to learn about collections and relate to the public in terms of exhibition and speaking. Applications should include: (1) curriculum vitae, (2) names of three persons familiar with your work who will write letters of recommendation, and (3) a brief statement of research interests.

These must be submitted by February 1, 1982 to:
Dr. Martin Prinz
Chairman, Department of Mineral Sciences

American Museum of Natural History
Central Park West at 79th Street
New York, New York 10024

An equal opportunity (M/F/H) affirmative action employer

PH.D. SENIOR PHARMACOLOGISTS IN CARDIOVASCULAR RESEARCH

The Cardiovascular Pharmacology Research Division of Lilly Research Laboratories has an immediate need for two individuals to join an expanding research effort in the development of drugs effective in the treatment of cardiovascular disease. Candidates should have a Ph.D. degree with postdoctoral experience in pharmacology or physiology.

Ph.D. Senior Pharmacologist in Cardiovascular Pharmacology–
The candidates should have experience in evaluating drug effects on systemic hemodynamics, as well as a demonstrated ability to conceive and execute novel research.

Ph.D. Senior Pharmacologist in the Regulation of Cardiac Rhythm–
The candidates should have experience in research on the causes and treatment of cardiac arrhythmias. Experience in using *in vivo* models of cardiac disease states is essential for this position.

Send résumé with salary requirements to:
Roger D. Miller
Senior Personnel Representative
Lilly Research Laboratories
307 East McCarty Street
Indianapolis, IN 46285

Lilly

Lilly Research Laboratories
A Division of Eli Lilly and Company
An Equal Opportunity Employer, M/F

ORGANIC CHEMISTS

Openings are available at New England Biolabs, Inc. new laboratory in Beverly, Massachusetts, USA.

Experience with solid-phase synthesis of defined oligodeoxyribonucleotides by phosphite or phosphotriester methods essential.

Send curriculum vitae to N.E. Biolabs, Inc., 283 Cabot Street, Beverly, MA 01915, USA.

NEW ENGLAND Biolabs INC.
32 Tozer Road
Beverly, MA 01915

MIT

STUDY FELLOWSHIPS FOR SCIENTISTS AND ENGINEERS IN SCIENCE, TECHNOLOGY, AND SOCIETY

The Program in Science, Technology, and Society, with the support of the Andrew W. Mellon Foundation, invites applications for several one-year study fellowships on the relationships of science, technology, and society.

Applicants should have a record of outstanding performance in a particular field of engineering, science, or medicine.

Selection of fellows will be based on:

- evidence of a developed interest in the relationship of science and technology with society;
- an indication of plans for continued work in the field;
- a statement of a coherent plan for study at M.I.T. in an area related to the Program's major fields of interest, which include:

  Science, Technology, and Public Policy

  Social and Historical Studies of Science and Technology

  Technology and the Political Economy of Industrial Societies

  Cultural Dimensions (e.g., ideological, aesthetic, ethical) of Science and Technology

Application should consist of a letter of about five double-spaced typed pages, a curriculum vitae, and names of three references. Additional material will be requested if needed. A Ph.D. or equivalent in science or engineering is desirable. Partial or full stipend is available, normally not to exceed $25,000, and to be based on current salary. Appointments will begin in September 1982. Address inquiries and application to:

Professor Kenneth Keniston, Chairman
Mellon Fellowship Committee
STS Program, E51-210
M.I.T.
Cambridge, MA 02139

Deadline for receipt of applications: February 1, 1982

MIT is an Equal Opportunity/Affirmative Action Employer.

PRE- AND POSTDOCTORAL FELLOWSHIPS ARE AVAILABLE in the DEPARTMENT OF MICROBIOLOGY, BOSTON UNIVERSITY SCHOOL OF MEDICINE for a MULTIDISCIPLINARY TRAINING PROGRAM in ONCOBIOLOGY funded by the NCI. Starting dates: January 1982 and September 1982. This 3-year program is directed toward the training of microbiologists/immunologists in cancer biology. Formal training for predoctoral candidates in oncobiology will be interdigitated with normal course requirements for the Ph.D. degree. Postdoctoral (Ph.D. or M.D.) trainees as well are required to participate in the 1-year formal training program (120 contact hours). It is comprised of didactic lectures and discussions in control of proliferation in animal cells, pathology of neoplasia, oncology, and workshops in immunology, cell culture, carcinogenesis (viral and chemical) cell fusion and carcinogen detection. Specialized training consists of participation in cancer-related or basic cell or microbiologic research projects within the laboratories of various members of the departments and of the Hubert H. Humphrey Cancer Research Center. The range of potential research experience is broad and encompasses both clinical and basic areas in cancer etiology and prevention. Full tuition costs and stipends are provided for all trainees. Inquiries should be sent to: **Dr. Selwyn A. Broitman, Department of Microbiology, Boston University School of Medicine, 80 East Concord Street, Boston, Mass. 02118.** *Boston University School of Medicine is an Affirmative Action/Equal Opportunity Educator and Employer, M/F.*

POSITIONS OPEN

ASSISTANT PROFESSOR—PLANT DISEASE PHYSIOLOGIST

Assistant professor in plant pathology (70 percent research, 30 percent teaching) to develop a vigorous program on the physiology and biochemistry of plant-pathogen interactions. Teaching responsibilities will include a graduate-level course in plant disease physiology. Available 1 March 1982. Apply before 15 January 1982 to: **Dr. Arun K. Chatterjee, Search Committee, Department of Plant Pathology, Throckmorton Hall, Kansas State University, Manhattan, Kansas 66506.** *Equal Opportunity/Affirmative Action Employer.*

ASSISTANT/ASSOCIATE/FULL RESEARCH PROFESSOR. Conceive and carry out original research projects in field of physical oceanography. All areas of research will be considered, but some preference will be given to applicants interested in numerical modeling, coastal zone dynamics, physics and dynamics of fronts, mixing/dispersion, mesoscale and large-scale ocean circulation, or air-sea interaction. Development of own research program expected. Excellent opportunities for interacting with ongoing Gulf Stream projects, Sofar float group, and new remote sensing center. Send résumé and statement of research by 1 April 1982 to: **Employee Relations Officer, File Number S-090006, Personnel Office, UNIVERSITY OF RHODE ISLAND, 80 Lower College Road, Kingston, R.I. 02881.** *An Affirmative Action/Equal Opportunity Employer, M/F.*

One junior tenure-track position for September 1982. We seek candidates who can contribute to a program in **BEHAVIORAL MEDICINE** in an **EXPERIMENTAL PSYCHOLOGY** area. Applicants need training in human information processing: for example, neuropsychology, pain perception, clinical psychophysics. Promise for development of a strong research program is extremely important. Send curriculum vitae and three reference letters to: **Dr. Joseph F. Sturr, Department of Psychology, Syracuse University, Syracuse, New York 13210,** by 15 January 1982. *An Affirmative Action/Equal Opportunity Employer.*

BIOCHEMISTRY/PLANT PHYSIOLOGY POSITION

The Biology Department, Williams College, invites applications for a renewable appointment at the assistant professor level starting fall 1982. Teaching duties include a one-semester course in general biochemistry and an advanced course in the instructor's area of major interest. The appointment, which is for a term of 3 years, requires a Ph.D. degree. Send completed application, containing résumé, description of research and teaching interests, and three letters of recommendation, to: **Dr. Henry W. Art, Chairman, Biology Department, Williams College, Williamstown, Mass. 01267.** Application deadline: 10 January 1982. *Equal Opportunity/Affirmative Action Employer.*

CELL BIOLOGIST. A tenure-track position at the assistant professor level will be available beginning September 1982. Applicants should have research expertise in some aspect of cell biology. Teaching responsibilities include courses in cell biology, elementary statistics, and possibly genetics. While this is primarily a teaching position, research is encouraged and expected. Send curriculum vitae, three letters of reference, transcripts, and a statement of research and teaching experience by 1 January 1982 to: **Dr. Glen G. Wurst, Biology Department, Allegheny College, Meadville, Pa. 16335.** *Equal Opportunity Employer.*

CELL/DEVELOPMENTAL BIOLOGY. Full-time teaching position beginning fall 1982 at liberal arts college, in well-equipped department with five other faculty. Doctorate required. Candidates must have a strong professional interest in undergraduate learning and be prepared to teach upper-division laboratory courses, with experimental techniques, in cell biology, developmental biology, and electron microscopy, plus an introductory course for nonscience students, and to supervise undergraduate student research. Experience in routine upkeep of electron microscopes and other instruments desirable. Opportunity for personal research provided, but principal responsibilities are in teaching and departmental development. Appointment as assistant professor or higher, depending on experience. Send curriculum vitae and three letters of recommendation to: **Dr. G. Thomas Crombach, Chairman, Department of Biology, St. John Fisher College, Rochester, New York 14618.** *Equal Opportunity Employer, M/F.*

POSITIONS OPEN

BIOCHEMIST, DEPARTMENT OF BIOMEDICAL SCIENCES

Southern Illinois University at Edwardsville, School of Dental Medicine, invites applications for a full-time faculty position as a biochemist in the Department of Biomedical Sciences. Salary and rank commensurate with training expeience. Ph.D. or equivalent with demonstrated research ability required. The individual filling this position is expected to share the responsibility of teaching human biochemistry to dental students and actively pursue research of own choice. Applications will be received until 15 January 1982. *Southern Illinois University is an Equal Opportunity/Affirmative Action Employer.* Send curriculum vitae to: **Dr. Herbert C. Butts, Dean, School of Dental Medicine, Southern Illinois University, 2800 College Avenue, Alton, Ill. 62002.**

BIOMEDICAL RESEARCH LABORATORY ANIMAL TECHNICIAN. Opening for biomedical research laboratory animal technician. The applicant accepted will assume primary responsibility for a new research facility specially designed to meet current AAALAC requirements. Desired qualifications include B.S. degree in biology, physiology, or other medical specialties: certification as an AALAS technologist (or eligibility for certification); and experience. Salary dependent upon qualifications. Send résumé to: **Personnel Department, Arizona State University, Tempe, Arizona 85281.**

CARDIOVASCULAR PHYSIOLOGIST

A tenure-track position at the rank of assistant professor or associate professor is available in the Department of Physiology and Biophysics of the University of Tennessee Center for the Health Sciences. Candidates should have a Ph.D. or M.D. degree, a minimum of 2 years of postdoctoral training, and a strong research background in cardiovascular physiology. Demonstrated ability to initiate a strong, independent research program and to engage in the teaching activities of the department are expected. Send curriculum vitae, a brief statement of research interests, and the names of three references to: **Dr. Leonard Share, Chairman, Department of Physiology and Biophysics, University of Tennessee Center for the Health Sciences, Memphis, Tennessee 38163.** *An Equal Opportunity/Affirmative Action Employer.*

HARVARD MEDICAL SCHOOL

CARDIOVASCULAR/RENAL PHYSIOLOGIST to play responsible role in design and management of experiment to be flown on NASA Dedicated Life Sciences Space Shuttle Mission. M.D. or Ph.D. with at least 2 years of postdoctoral research experience in fluid and electrolyte homeostasis preferred. Send letter of application, curriculum vitae, and names of three individuals who may be contacted for references to: **Dr. M. C. Moore-Ede, Physiology Department, Harvard Medical School, 25 Shattuck Street, Boston, Mass. 02115.**

CLINICAL PHARMACOLOGIST(S) for full-time faculty position(s), Departments of Medicine and Pharmacology, to develop a Section of Clinical Pharmacology. Salary and rank commensurate with experience and qualifications. Address inquiries and curriculum vitae to: **Department of Medicine, East Carolina University School of Medicine, Greenville, N.C. 27834.** *Equal Opportunity Employer through Affirmative Action.*

DIRECTOR OF MEDIA PRODUCTION. Small, innovative biotechnology company in the San Francisco Bay area is seeking an experienced director of production for large-scale processing and packaging of powdered, liquid, and lyophilized tissue culture media.

Box 297, SCIENCE

EVOLUTIONARY ECOLOGIST with research emphasis on populations or communities. Assistant professor eligible for tenure review; Ph.D. required; postdoctoral experience preferred. Develop an upper division population/community evolutionary ecology course, a graduate level course in area of specialty, and strong research program, directing M.S. students. Teach general ecology (alternate years) and biometry to students who have completed introductory statistics. Send curriculum vitae, reprints of publications, statement of research program, undergraduate and graduate transcripts, and three letters of reference to arrive no later than 5 January 1982 to: **Dr. L. R. Fox, Chairman, Department of Biological Sciences, Wichita State University, Wichita, Kans. 67208.** *Wichita State University is an Affirmative Action Employer.*

STS RESEARCH FELLOWSHIPS

The MIT Program in Science, Technology, and Society with the support of the Exxon Education Foundation, invites applications for several one-year research fellowships on the relationships of science, technology, and society.

Selection criteria include:

a) a record of outstanding performance in a particular field of science, engineering, social science, or the humanities;

b) evidence of a commitment to research involving the interaction of science, medicine, or engineering with society;

c) a proposal of study and research for the fellowship year related to the Program's areas of research and teaching, which include:

- Social and Historical Studies of Science and Technology
- Technological Change and the Political Economy of Industrial Societies
- Cultural Dimensions (e.g., ideological, aesthetic, ethical) of Science and Technology
- Policy Studies involving Science and Technology

Application should be made in a letter of about five double-spaced typed pages and a curriculum vitae. Additional material will be requested if necessary. PhD degree or equivalent desirable. PhD's at all levels of professional career and foreign nationals are eligible. Partial or full stipend available, normally not exceeding $25,000. Stipend based on current salary. Senior candidates are encouraged to supplement stipends with other funds. Appointments will commence in September 1982. Address application to:

Shawn Finnegan, Secretary
Exxon Fellowship Committee
STS Program, Room 20D-219
Massachusetts Institute of Technology
Cambridge, MA 02139

Deadline for receipt of applications: January 15, 1982.

MIT is an Equal Opportunity/Affirmative Action Employer.

MIT

TERATOLOGIST

Rohm and Haas, a leading multinational chemical company, is seeking an individual to supervise its new and rapidly developing Teratology Testing Unit located in Spring House, PA — an attractive suburb of Philadelphia.

Primary responsibilities will be in the design and conduct of teratology and reproductive toxicity studies with a wide variety of chemical agents. You also will be responsible for interpretation of data and the generation of reports suitable for submission to regulatory agencies.

You should have excellent problem-solving abilities and a broad background in general toxicology. A PhD in Teratology or a closely related discipline is required plus experience in teratology testing methods in a variety of animal species. Industrial experience is preferred but not required.

We offer a salary commensurate with your level of achievement; an excellent, fully-paid comprehensive benefits package including relocation assistance; and an environment conducive to professional growth in our expanding Toxicology Department.

Please send a complete resume, in confidence, to:

Recruiting and Placement #5781

ROHM AND HAAS
PHILADELPHIA, PA. 19105

An equal opportunity employer M/F.

SK&F
a SmithKline company

MOLECULAR GENETICS/ BIOTECHNOLOGY

SmithKline, a leader in pharmaceutical research, is seeking additional staff to expand its current research programs employing recombinant DNA technology and other genetic approaches to develop novel therapeutic agents.

A new, superbly equipped research center is under construction at Upper Merion in suburban Philadelphia and will be completed in 1982. Excellent opportunities exist for innovative inter-disciplinary research and we encourage our staff to pursue advanced research, to publish in prestigious journals, to hold adjunct academic appointments and interact fully with the scientific community.

We invite applications from outstanding research scientists with three or more years of post-doctoral experience, from post-doctoral fellows and from B.S. and M.S. research associates with expertise in one or more of the following subjects:

MOLECULAR GENETICS

DNA sequencing/nucleic acid enzymology/gene construction/transfection methods/gene cloning and expression in Bacillus, actinomycetes, yeast and mammalian systems/promotor regulation/gene amplification/ instrumentation design for protein and nucleic acid sequencing and synthesis

FERMENTATION TECHNOLOGY

fermentation methods/whole cell and enzyme immobilization /biochemical and fermentation process engineering

NATURAL PRODUCTS ISOLATION

isolation and characterization of lymphokines and cytokines/advanced chromatographic and spectroscopic methods/micro-analytical techniques/instrumentation development

We offer excellent compensation and benefits and an attractive relocation policy. For confidential review, send your C.V., salary expectations and names of three references citing reference MB-346 to: Mr. Walter B. Flagg, **SMITHKLINE CORPORATION,** P.O. Box 7929, 1564 Spring Garden Street, Philadelphia, PA 19101.

We are an equal opportunity employer, M/F/H/V

POSITIONS OPEN

CHAIRPERSON
DEPARTMENT OF BIOLOGICAL SCIENCES

Applications are invited from individuals with demonstrated competence in teaching, research, and administration for an anticipated position for appointment 1 July or 15 August 1982 as chairperson of a department with 14 faculty members. Curricula lead to the B.S. and M.S. degrees. The candidate is expected to provide academic leadership and to generate grant support for teaching and research. Specialization in animal physiology is preferred but not required. Curriculum vitae, transcripts, three letters of recommendation, and supportive materials are to be forwarded by 5 January 1982 to: **Chairman Search Committee, Department of Biological Sciences, Indiana University–Purdue University at Fort Wayne, 2101 Coliseum Boulevard, East, Fort Wayne, Indiana 46805.**

An Affirmative Action/Equal Opportunity Employer

CHAIRMAN
DEPARTMENT OF IMMUNOLOGY AND MICROBIOLOGY

Wayne State University School of Medicine invites nominations and applications for the position of chairperson of this major department. The department occupies large, modern research and teaching facilities and has close ties with clinical departments and laboratories in the Detroit Medical Center. Candidates must have an established research record and credentials in teaching and administration. The position includes primary responsibility for the medical, allied medical, and graduate teaching programs, as well as leadership responsibility for a large and productive research department.

Submit curriculum vitae and bibliography by 6 January 1982 to:

Sanford N. Cohen, M.D.
Chairman Immunology-
Microbiology Search Committee
Wayne State University
School of Medicine
540 East Canfield Avenue
Detroit, Michigan 48201

Equal Opportunity/Affirmative Action Employer

UNIVERSITY OF PITTSBURGH
AT BRADFORD (UPB)
BRADFORD, PENNSYLVANIA

CHAIRPERSON, Division of Natural Sciences, at the University of Pittsburgh at Bradford, starting September 1982. Applicants should have at least 5 years of teaching experience in one of the disciplines in the division: biology, chemistry, computer science, geology, mathematics, physics, and psychology. Administrative experience desirable. Presently there are 17 full-time faculty positions in the division. UPB is a 4-year college emphasizing excellence in teaching, and the Natural Sciences Division is currently developing 4-year programs in various fields. The teaching load will be 6 hours per term and the renewable appointment is for 3 years. Salary and tenure are negotiable. The search is now open and will continue until a suitable candidate is found. Send résumé and names of references to: **Steven Hoffmaster, Physics Department, University of Pittsburgh at Bradford, Bradford, Pa. 16701.** *The University of Pittsburgh at Bradford is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITION—PLANT BIOCHEMISTRY

A tenure-track position as assistant professor of biochemistry is available at the University of California, Riverside. Applications are solicited from individuals who have demonstrated an ability to carry out basic research in the biochemistry of plants and who have the capability to develop a vigorous independent research program in this area. The individual will be expected to teach a course in plant biochemistry at the upper division/graduate level and participate in other teaching activities of the department. Candidates with postdoctoral experience are preferred. Candidates should send curriculum vitae, a statement of their research accomplishments and future research plans, and the names of three referees familiar with their work. Correspondence should be addressed to:

Chair, Plant Biochemist Search Committee
Department of Biochemistry
University of California
Riverside, Calif. 92521

Applications will be accepted until 15 March 1982 or until a suitable candidate is located.

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

POSITIONS OPEN

ASSISTANT PROFESSOR-IN-RESIDENCE
Departments of Pharmacy and Pharmaceutical Chemistry, School of Pharmacy, University of California, San Francisco, California

The School of Pharmacy invites applications for an assistant professor-in-residence position from Ph.D. scientists with specialization areas related to physical pharmacy. Preference will be given to candidates who have a strong background in solid particle–particle interactions. Applicants must be able to attract a substantial portion of the salary required for this nontenure-track position through extramural grant support. Teaching responsibilities may include portions of the physical pharmacy–biopharmaceutics–drug delivery sequence for professional students and elective and graduate courses in specialty areas.

Send curriculum vitae, a summary of current research, a concise outline of future research plans, and three letters of reference by 31 December 1981 to: **Richard H. Guy, Ph.D., Chairperson, Search Committee, School of Pharmacy, 926-Science, University of California, San Francisco, Calif. 94143.**

An Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

EXPERIMENTAL POPULATION GENETICIST with strong interest in eukaryotic ecology and evolution. A Ph.D. degree is required. This is a tenure-track position as assistant/associate professor in biology. Candidates will be evaluated for their potential to develop an outstanding research program with grant support and to interact with existing faculty in the genetics and ecology programs. Teaching will include upper and lower level courses in the area of specialty. Application deadline: 1 January 1982. Send curriculum vitae, including reprints and three letters of reference, to: **Chairperson, Search Committee, Department of Biology, Box B, 208 Mueller Building, The Pennsylvania State University, University Park, Pa. 16802.** *An Affirmative Action/Equal Opportunity Employer.*

FACULTY APPOINTMENT IN CELLULAR BIOCHEMISTRY. The Department of Chemistry at the University of Oregon intends to make an assistant or associate professor appointment in fall 1982 to augment a multidisciplinary program in cell and molecular biology. The main focus of the program will be the molecular basis of cellular regulation including, but not limited to, the areas of immunology, gene expression, cellular recognition, and organelle biogenesis. Applications should be sent to: **Cell Biochemistry Search, Department of Chemistry, University of Oregon, Eugene, Oregon 97403.** They should include curriculum vitae, three letters of reference, a summary of research accomplishments and teaching experience, and a statement clearly describing research goals. The closing date for applications is 15 January 1982. *The University of Oregon is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS in organic chemistry and inorganic chemistry. Applications or nominations are invited for openings in the Department of Chemistry at Massachusetts Institute of Technology (MIT). Applicants should have demonstrated ability to do exceptional independent research in chemistry. Appointment will probably be at the assistant professor level, but applications and nominations for other levels will be considered. Candidates should submit curriculum vitae, a publication list, and a description of research interests and have three letters of recommendation sent not later than 15 February 1982 to: **Professor J. L. Kinsey, Room 18-399, MIT, Cambridge, Mass. 02139.** *MIT is an Equal Opportunity/Affirmative Action Employer.*

The Department of Radiology at the University of Michigan Medical School on occasion has open **FACULTY POSITIONS.** Physicians filling these positions will take part in the programs of patient care, teaching, and research of the Department of Radiology. They will supervise the activities of the house officers and aid in the teaching of house officers and medical students. Qualified applicants must be American Board of Radiology–certified or Board-eligible. Previous training or work experience in an academic institution as well as demonstration of previous academic research and teaching experience are desirable. Academic rank will depend on qualifications and experience.

Interested applicants should contact: **William Martel, M.D., Acting Chairman, Department of Radiology, University of Michigan Medical School, Ann Arbor, Michigan 48109.** *A nondiscriminatory, Affirmative Action Employer.*

SK&F
a SmithKline company

IMMUNOLOGY
PHARMACOLOGY
MOLECULAR BIOLOGY
RESEARCH

SmithKline, a leader in pharmaceutical research, is undertaking a major expansion of its research division. Applications are invited from research scientists (Ph.D./ M.D./ D.V.M./ M.S./ B.S.) to join interdisciplinary research teams to participate in the development of new therapeutic agents in a stimulating environment that offers significant opportunities for innovative research.

Our scientists are encouraged to publish, to hold adjunct academic posts and to interact fully with the national and international scientific community. A new, superbly equipped $27 million research facility is under construction at our Upper Merion research campus in suburban Philadelphia and will be completed in 1982. This represents the first stage of a $200 million R&D facility under construction at this site for completion by 1985.

We are seeking outstanding individuals at all seniority levels who have expertise in one or more of the following subjects:

IMMUNOREGULATION
(ref: MB-1)

identification of lymphoid cell subsets / cell sorting /lymphokines/macrophage physiology/autoimmune diseases

HYBRIDOMA TECHNOLOGY
(ref: MB-2)

hybridoma production / characterization of monoclonal antibodies/ cell sorting

MOLECULAR GENETICS
(ref: MB-3)

DNA sequencing/nucleic acid enzymology/gene construction/gene cloning and expression in Bacillus, actinomycetes, yeast and mammalian systems/promotor regulation/gene amplification

FERMENTATION TECHNOLOGY
(ref: MB-4)

whole cell and enzyme immobilization / fermentation methods/biochemical and fermentation process engineering

CELL BIOLOGY
(ref: MB-5)

large scale mammalian cell culture / cell fusion / microinjection/bone marrow and tumor stem cell cloning/platelet physiology/mutagenesis/electronmicroscopy/subcellular fractionation

ENZYMOLOGY AND PROTEIN CHEMISTRY
(ref: MB-6)

protein sequencing/peptide synthesis/ isolation and purification of lymphokines and cytokines / macromolecular separation / radioimmunoassays /microanalysis/instrumentation development

RECEPTOR BIOLOGY
(ref: MB-7)

receptor isolation, characterization and reconstitution/pharmacokinetics/radioimmune assays biology of dopaminergic, adrenergic, serotoninergic, histaminergic and peptidergic receptor systems

MOLECULAR PHARMACOLOGY
(ref: MB-8)

drug-chromatin interactions/nucleo-cytoplasmic interactions/regulation of macromolecular synthesis/advanced biophysical instrumentation/ cell fractionation

We offer excellent compensation and benefits, an attractive relocation policy and a work environment that offers substantial opportunity for personal and professional advancement. For confidential consideration, send C.V., salary expectations and names of three references, citing the appropriate reference number listed above to: Mr. Walter B. Flagg.

SmithKline
CORPORATION

P.O. Box 7929, 1566 Spring Garden Street
Philadelphia, PA 19101
We are an equal opportunity employer, M/F/H/V

POSITIONS OPEN

FACULTY POSITION—MOLECULAR BIOLOGY/MOLECULAR GENETICS

Any level, tenure-track or tenured position, depending on qualifications. Our highest priority is to expand our ongoing research in the area of **molecular biology** with emphasis on the use of recombinant DNA techniques to study the dynamics of gene regulation in eukaryotes. We are part of the Detroit Medical Center, a consortium of hospitals, clinics, and one of the largest medical schools in the country. The Biochemistry Department is housed in modern, spacious, and well-equipped facilities. The salary for this position is highly competitive.

The successful applicant will be expected to participate in the teaching of medical students as well as graduate students and establish a vigorous research program.

Applicants should send curriculum vitae, description of research interests, and the names of three references to: **Dr. Ray K. Brown, Chairman, Department of Biochemistry, Wayne State University, School of Medicine, 540 East Canfield Avenue, Detroit, Mich. 48201.**

FACULTY POSITIONS IN PHARMACOLOGY

The Department of Pharmacology of the University of Texas Health Science Center at Dallas seeks applications for tenure-track positions at the level of assistant professor. Applicants must have a relevant Ph.D. or M.D. degree, postdoctoral training, and show evidence of firm commitment to a career in independent research. We are particularly interested in considering individuals with an appropriate background who wish to apply techniques of molecular or cellular biology or biochemistry to fundamental problems of pharmacological interest. Responsibilities will also include teaching of medical and/or graduate students after the first year of employment. The department is expanding its faculty, is well-equipped, and is prepared to offer an excellent environment for research as well as competitive salaries, space, and start-up funds. Send curriculum vitae, a brief description of proposed research, and three letters of reference to: **Dr. Alfred G. Gilman, Chairman, Department of Pharmacology, University of Texas Health Science Center at Dallas, 5323 Harry Hines Boulevard, Dallas, Texas 75235.** *An Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS BIOLOGY/AGRICULTURE

Applications are invited for two anticipated positions at assistant professor level for appointment 1 July or 15 August 1982.

AGRICULTURE. Preferred candidates would have an agronomy or animal science specialty, interest in counseling agriculture majors, and interest in some administrative activity. Half-time teaching responsibility in introductory agriculture and related courses would depend upon the appointee's training and skills.

PHYSIOLOGIST. Preferred candidates would have the Ph.D. and a specialty area in comparative animal physiology. Teaching assignments would be introductory human anatomy/physiology and advanced courses in the area of specialization. An active research program is expected.

Interested persons should initiate three letters of recommendation and send curriculum vitae, transcripts, and other support materials such as statement of teaching/research interests to: **Dr. William Davies, Chairman, Department of Biological Sciences, Indiana University–Purdue University at Fort Wayne, 2101 Coliseum Boulevard, East, Fort Wayne, Indiana 46805.**

Closing date for applications is 5 January 1982.

An Equal Opportunity/Affirmative Action Employer

Applications are invited for a **full-time, tenure-track position**. Candidates possessing a Ph.D. or M.D. degree, at least 2 years of postdoctoral experience, and a strong commitment to developing an independent research program are sought. Outstanding applicants with a primary research interest in cellular and molecular aspects of membrane function are preferred. Responsibilities include participation in the Physiology Department teaching of medical and graduate students. Send summary of research plans, curriculum vitae, and names of three references to: **Dr. Rodney A. Rhoades, Professor and Chairman, Department of Physiology, Indiana University School of Medicine, 1100 West Michigan Street, Indianapolis, Indiana 46223,** by 31 December 1981.

Indiana University is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

University of Missouri–St. Louis
Faculty Position
School of Optometry

The University of Missouri–St. Louis is seeking two faculty members with O.D./Ph.D.'s or Ph.D.'s working in the areas of ocular physiology, especially the cornea, and binocular vision/ocular motility.

Specific responsibilities will include teaching courses in visual science to optometry students and conducting research.

Evidence of scholarly research activities, in the form of published articles in refereed journals and papers presented at professional meetings, will be heavily weighted, as will evidence of teaching ability. Postdoctoral research experience is desirable.

Rank and salary will be commensurate with experience. The date of appointment is negotiable. Letters of application with current résumés, including names of three references, should be submitted no later than 15 February 1982 to:

Dr. Jerry L. Christensen
Dean, School of Optometry
University of Missouri–St. Louis
8001 Natural Bridge Road
St. Louis, Missouri 63121

The University of Missouri is an Equal Employment and Education Opportunity Institution.

FACULTY POSITIONS ENVIRONMENTAL BIOLOGY

In conjunction with a new Ph.D. program in Environmental Biology—Public Policy, the Department of Biology anticipates three tenure-track positions next fall: (i) **Systems ecologist** (with an interest in biological resource management), (ii) **Plant physiological ecologist**, and (iii) **Environmental toxicologist**. Positions will be at the assistant or associate professor levels. Successful candidates will be responsible for directing doctoral students and developing their own research programs, and should have demonstrable interest in undergraduate and graduate education as well as environmental policy decisions.

The deadline for receiving curriculum vitae and names of three references is 15 January 1982. Direct all applications and inquiries to: **Dr. David W. Johnston, Department of Biology, George Mason University, Fairfax, Va. 22030.** *George Mason University is an Affirmative Action/Equal Opportunity Employer.*

MEDICAL ONCOLOGIST—The Comprehensive Cancer Center of the University of Miami School of Medicine invites applications for the position of Associate Director of Education and Training, an associate professor—professor level appointment to Clinical Department of Oncology. Position assumes leadership of broad scope of educational programs for graduate/undergraduate medical students, other allied professionals, and statewide public information service. Submit curriculum vitae by 15 December 1981 to: **John Healey, M.D., Associate Director, Comprehensive Cancer Center, University of Miami School of Medicine, P.O. Box 016960 (D8-4), Miami, Florida 33103.** *An Affirmative Action/Equal Opportunity Employer.*

PLANT PHYSIOLOGIST: Ph.D. Research associate, nontenure position available immediately. Work on physiological nature of seed vigor, processes in seed aging, and possibility of breeding seed vigor; $16,000 to $21,000, based on experience. Send curriculum vitae and minimum of three references to:

Dr. A. Carl Leopold
Boyce Thompson Institute
at Cornell University
Ithaca, N.Y. 14853

Equal Opportunity/Affirmative Action Employer, M/F

POSTDOCTORAL POSITION available immediately (1 year, renewal possible) for recent chemistry Ph.D. with a strong interest in biological molecules. The position is in the synthesis and/or chemical modification of biologically relevant peptides. Familiarity with preparative organic chemistry, chromatography, and spectroscopy is required. Send curriculum vitae and names of two references to:

Dr. Balthasar F. Gisin
Department of Biological Chemistry
University of Maryland
School of Medicine
660 West Redwood Street
Baltimore, Maryland 21201

POSITIONS OPEN

UNIVERSITY OF CALIFORNIA, DAVIS: IGNEOUS PETROLOGIST. The Department of Geology invites applications for a tenure-track position in the field of igneous petrology, at the assistant professor level, effective for the academic year 1982–1983. Preference will be given to candidates whose research demonstrates a thorough understanding of field, theoretical, and experimental approaches to the science and who show promise for high caliber research on fundamental problems. The successful candidate will be expected to contribute effectively to the existing teaching program in igneous petrology at both the undergraduate and graduate levels.

Departmental facilities include a thin-section laboratory and electron microprobe, both of which are supported by full-time personnel, an experimental laboratory with high pressure piston cylinder and low pressure externally heated equipment, a scanning electron microscope, stable isotope laboratory, as well as the usual equipment (XRF, XRD, computers, and so forth). The University of California at Davis is located conveniently to areas containing all types of igneous rocks.

The final date for receipt of applications is 1 February 1982. *The University of California is an Equal Opportunity/Affirmative Action Employer.*

Interested individuals should send their résumés to:

Jere H. Lipps, Chair
Department of Geology
University of California
Davis, California 95616

UNIVERSITY OF SOUTHERN CALIFORNIA (USC) MOLECULAR BIOLOGY FACULTY POSITION

The Molecular Biology Research Section of the Department of Biological Sciences at the University of Southern California invites applications for a tenure-track position at the assistant, associate, or full professor level. Candidates should have an outstanding record of research and publication and will be expected to develop a high quality, independent research program at USC. Some preference will be given to applicants interested in gene expression in eukaryotic organisms. The position includes some involvement in advanced undergraduate and graduate programs; administrative responsibility is optional.

The deadline for acceptance of applications is 1 March 1982. The appointment can be effective as early as 1 September 1982. Letters of interest and curriculum vitae should be addressed as follows:

Dr. John A. Petruska
Director, Molecular Biology
Ahmanson Center for Biological Research
University of Southern California
Los Angeles, California 90007

PHYSIOLOGY

Faculty position at a New England medical school for recent Ph.D. with interest in renal physiology-membrane transport. Must have experience in the manufacture of microelectrodes. Send curriculum vitae to: **Box 296, SCIENCE.**

An Equal Opportunity Employer, M/F

PHYSIOLOGY WASHINGTON UNIVERSITY OF ST. LOUIS

Applications are invited for an academic position in the Department of Biomedical Sciences, School of Dental Medicine. The successful candidate will be expected to participate in the teaching of cellular and general vertebrate physiology, and to develop and maintain an active, fundable research program. Strong preference will be given to those individuals who have completed a postdoctoral training program and whose interests are compatible with the major research activities of the department. These activities include study of: (i) bone and bone marrow cell differentiation pathways, (ii) cell-cell and cell-matrix interactions involved in bone and connective tissue development, and (iii) the biology of tumor cells. Salary and rank will be commensurate with qualifications. Interested parties should send curriculum vitae, representative reprints, and the names of three referees to:

Dr. Brian Clevinger
Washington University School of Dental Medicine
Box 8100
4559 Scott Avenue
St. Louis, Missouri 63110-1087

Washington University is an Equal Opportunity Employer.

National Institute of Child Health and Human Development

National Institutes of Health

Department of Health and Human Services

Opening Date: December 1, 1981

Closing Date: December 31, 1981

All applications must be postmarked by closing date.

Director, National Institute of Child Health and Human Development

One of the world's foremost scientific research and development organizations seeks a Director for the National Institute of Child Health and Human Development. The Director is responsible for formulating overall policies relating to the Institute's program, including the determination of goals and the priority and means of their accomplishment. The Institute is responsible for the conduct and support of research and research training relating to maternal health, child health and human development, including research and research training in the special problems and requirements of mothers, children, and families, and in the sciences relating to human reproduction and population. Nationally and within its own facilities, the Institute administers programs of clinical and fundamental research and research training, promotes the application of research findings to clinical practices, and disseminates information about research advances to scientists, health practitioners, and the public.

This is a Civil Service position in the Senior Executive Service (SES), with salary from $52,247 to $57,673 per annum (currently limited to $50,112.50). Alternatively, candidates may be eligible for appointment in the Commissioned Corps of the U.S. Public Health Service. The SES individual selected, if not presently in the SES, must serve a one-year probationary period.

Qualifications and Rating Process:

All candidates will be evaluated to determine whether they meet the mandatory professional/technical qualification requirements and the mandatory managerial/executive qualifications as outlined below:

Mandatory Professional/Technical Qualifications are either an M.D. or Ph.D., D.P.H. or equivalent or experience, and possesses research experience in pediatrics, obstetrics and gynecology, reporductive sciences or behavioral and social sciences as related to maternal and child health or the population sciences as related to health.

Mandatory Mangerial/Executive Qualifications are:

Experience in the management of a basic or clinical research program, demonstrating competence to assume leadership responsibilities in assuring that national and agency goals and priorities are considered in carrying out the functions and responsibilities of the organization; directing and guiding programs and projects, including long-term and short-term planning and establishing objectives and priorities; establishing procedures for the development and defense of the organization's budget, and allocating fiscal and personnel resources to support program implementation; developing processes and overseeing activities to assure the fair and equitable employment of qualified persons, and implementing EEO objectives, and developing and implementing procedures for monitoring program performance, including periodic analysis and evaluation.

Candidates who meet the mandatory qualifications qill be further evaluated by the Search Committee on the following factors: scientific peer recognition, training and education, honors and awards and research experience and leadership. Additional information may be obtained from Mary Jane Meyers, Personnel Officer, NICHD, (301) 496-3365.

Applications (Personnel Statement of Qualifications SF-171) are to be sent to the above individual at this address: National Institute of Child Health and Human Development, National Institutes of Health, Building 31, Room 2A25, Bethesda, Maryland 20205. A current curriculum vitae, bibliography and references and/or appraisals of performance must accompany all applications.

Applications of women and/or minority group members are especially welcomed.

POSITIONS OPEN

PLANT ECOLOGIST
INVERTEBRATE ECOLOGIST

The Archbold Biological Station of Archbold Expeditions, Inc., invites applications for two positions in the fields of plant ecology and terrestrial invertebrate ecology. The primary responsibility of the appointees will be to develop a strong research program in their respective fields of interest focusing on the environment of the 3900-acre Station property. Additional responsibilities will include directing research of undergraduate and graduate students, curating reference collections, and aiding in the management of the Station's natural areas.

The closing date for applications is 1 February 1982. The preferred starting date is 1 July 1982, although alternative dates are possible. Candidates must possess a Ph.D. at the time of appointment. Applicants should submit a statement of research interests and goals, complete curriculum vitae, list of publications, and three letters of recommendation to: **Dr. James N. Layne, Executive Director, Archbold Biological Station, Route 2, Box 180, Lake Placid, Fla. 33852.**

Equal Opportunity/Affirmative Action Employer

PLANT PHYSIOLOGICAL ECOLOGIST—Applications and nominations are invited for a tenure-track faculty position to begin 1 September 1982. The appointment will be at the assistant professor level. Salary is competitive and commensurate with experience. Postdoctoral experience is desirable. The successful candidate will be expected to develop an active research program in plant physiological ecology and participate in the graduate and undergraduate teaching programs of the department. Applications consisting of curriculum vitae, statement of research and teaching interests, and names of three references should be submitted by 15 December 1981 to: **Dr. A. E. Linkins, Chairman, Search Committee, Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.** *Virginia Tech is an Affirmative Action/Equal Opportunity Employer.*

PLANT TAXONOMIST. Pending final approval, a tenure-track assistant professor position will be available in August 1982. Duties will include: curating herbarium; teaching upper-division taxonomy courses; participating in nonmajors courses; directing master's-level research in floristics and systematics. Applicants should expect to develop a vigorous research program dealing with grassland vegetation. Ph.D. required. Interested candidates should submit curriculum vitae, transcripts, summary of research plans, and three letters of recommendation to: **Dr. F. Potter, Department of Biological Sciences, Fort Hays State University, 600 Park Street, Hays, Kansas 67601-4099.** Deadline is 15 January 1982. *Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL FELLOW IN IMMUNOLOGY/BIOCHEMISTRY to conduct research elucidating several aspects of Kupffer cell function. Experience in culture techniques, radiolabeling, autoradiography, proteolysis, and peptide isolation and analysis will be helpful. Salary: $14,000 plus fringe benefits. Send résumé and two letters of recommendation to: **Dr. Henry Gans, Coordinator for Research and Development, VA Medical Center, 1900 East Main Street, Danville, Illinois 61832. Telephone: 217-442-8000, extension 303.**

An Equal Opportunity Employer

POSTDOCTORAL FELLOW IN IMMUNOLOGY knowledgeable in the methodologies of humoral and cell-mediated immunity to study the effects of gut-derived antigens in human and experimental liver disease. Experience in cell culture and biochemical procedures necessary. Salary: $14,000 plus fringe benefits. Send résumé and two letters of recommendation to: **Dr. Henry Gans, Coordinator for Research and Development, VA Medical Center, 1900 East Main Street, Danville, Illinois 61832. Telephone: 217-442-8000, extension 303.**

An Equal Opportunity Employer

POSTDOCTORAL POSITION available immediately; postdoctoral position in biochemistry to study the regulation of synthesis of specific proteins in normal and diseased animal cells. Research background in protein synthesis, mRNA isolation and translation, and DNA/mRNA hybridization preferred but not essential. Salary: $13,500 to $15,500. Send curriculum vitae, brief summary of research interest and experience, and names of three references to: **Dr. Herbert G. Lebherz, Department of Chemistry, San Diego State University, San Diego, Calif. 92182-0328.** *An Equal Opportunity/Affirmative Action/Title IX Employer.*

INTERNATIONAL LABORATORY FOR RESEARCH ON ANIMAL DISEASES (ILRAD)
NAIROBI
KENYA

Applications are invited from suitably qualified candidates for:

POSTDOCTORAL FELLOW
REFERENCE NUMBER PDF/L3/81/1

A position is available from 1 January 1982 for 2 years to improve laboratory technology in the study of trypanocidal drugs in vitro. Applicants must have Ph.D. (or equivalent) in science or pharmacology, practical experience in cultivating African trypanosomes and various mammalian cells in vitro, solid knowledge of organic chemistry, and must be capable to apply above background to the project without further training on the cultivation of trypanosomes. The successful candidate will work on the joint programme with the collaboration of Cell Biology Laboratory (ILRAD), Kenya Trypanosomiasis Research Centre and GTZ-supported Chemotherapy of Trypanosomiasis Research Project/Ministry of Agriculture. This is an international post and the salary will be paid in U.S. dollars.

Applications identified with reference number and including curriculum vitae, summary of Ph.D. thesis, and three references should be sent by 11 December 1981 to:

Chief Personnel Officer
ILRAD
P.O. Box 30709
Nairobi, Kenya

POSTDOCTORAL POSITION available immediately for recent chemistry Ph.D. with a strong interest in biological molecules. The position is for the synthesis of **MEMBRANE-ACTIVE PEPTIDES** and requires experience and efficiency in preparative organic chemistry. Familiarity with physicochemical experimentation is desirable. Send curriculum vitae and the names of two references to:

Dr. Balthasar F. Gisin
Department of Biological Chemistry
University of Maryland
School of Medicine
660 West Redwood Street
Baltimore, Maryland 21201

POSTDOCTORAL POSITION at the University of California, Irvine, in the laboratory of Dr. G. Wesley Hatfield to work on (i) the regulation and molecular genetics of the isoleucine-valine regulon in *E. coli* K12 or (ii) the molecular cloning and somatic cell genetics of the asparagine synthetase gene in CHO cells or (iii) the molecular cloning of human genes of clinical significance. Experience in recombinant DNA and/or somatic cell genetics techniques desirable. Send curriculum vitae to:

Dr. G. Wesley Hatfield
University of California, Irvine
College of Medicine
Department of Microbiology
Irvine, Calif. 92717

An Affirmative Action/Equal Opportunity Employer

POSTDOCTORAL POSITION available for **cell biologist** with strong background in biochemistry to investigate the structure and function of organelles involved in cell wall formation by plant cells and protoplasts. Some knowledge of plant tissue culture and/or electron microscopy is desirable. The position is available immediately for a 1-year term (renewable for a second year) at a salary of $15,000 to $18,000, depending on experience and qualifications. Some travel assistance is available.

Interested candidates should send curriculum vitae and two letters of recommendation to: **Dr. L. C. Fowke, Department of Biology, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0.**

POSTDOCTORAL POSITION available for studies at the molecular level concerning (i) initiation, direction, and timing of DNA replication in cultured mammalian cells and (ii) relationship between transcriptional activity and DNA replication. Supported by an NIH training grant. Send curriculum vitae and have two letters of reference sent to: **Dr. Carl Schildkraut, Department of Cell Biology, Albert Einstein College of Medicine, Bronx, New York 10461.**

POSTDOCTORAL POSITION is available immediately to study gene expression and recombination in RNA viruses of eukaryotes. Research emphasizes the molecular biology of defective interfering virus particles and their role in virus persistence. Studies include cloning and sequencing of viral genome deletions and regulation of viral polymerase activities. Salary is equivalent to the NIH scale. Send applications, including curriculum vitae and names of three references, to: **Dr. Jacques Perrault, Box 8093, Washington University School of Medicine, St. Louis, Missouri 63110.** *Equal Opportunity/Affirmative Action Employer, M/F/H.*

School of Medicine
University of California, San Diego
Department of Psychiatry

POSTDOCTORAL POSITION available beginning January through September 1982, to join in collaborative study of the neuropsychology of memory in man and nonhuman primates. Ph.D. in cognitive psychology, neuropsychology, or psychobiology required. Salary commensurate with experience. *The University of California is an Equal Opportunity/Affirmative Action Employer.* Send curriculum vitae to: **Dr. Larry Squire, University of California, San Diego, Department of Psychiatry M-003, La Jolla, California 92093.**

POSTDOCTORAL POSITIONS available in Departments of Biochemistry, Molecular and Medical Microbiology, Pharmacology, and Physiology. Applicants must have a Ph.D. or M.D. degree. Positions available during 1981–1982. Send application to: appropriate **Department Head, University of Arizona, Arizona Health Sciences Center, Tucson, Arizona 85724.** *An Equal Opportunity/Affirmative Action/Title IX/Section 504 Employer.*

POSTDOCTORAL/RESEARCH ASSOCIATE—Require Ph.D. in applied microbiology or aquatic microbial ecology, with experience in marine or estuarine systems preferred. To participate in research on the fate and persistence of organic pollutants. The successful applicant will be located at the Institute of Marine Sciences in Morehead City, North Carolina. Salary: $15,000. Send résumé, relevant publications, and three references to: **Dr. Frederic K. Pfaender, Department of Environmental Sciences and Engineering, University of North Carolina, Chapel Hill, N.C. 27514.** *The University of North Carolina is an Equal Opportunity/Affirmative Action Employer.*

MICHIGAN STATE UNIVERSITY (MSU)
POSTDOCTORAL RESEARCH POSITIONS
ENVIRONMENTAL CARCINOGENESIS–MUTAGENESIS

Two positions available immediately (as well as two later) for persons with strong background in molecular biology, biochemistry, biophysics, or microbiology to investigate in diploid human cells in culture the molecular mechanisms of radiation and chemical carcinogen–induced mutagenesis and oncogenic transformation. The multidisciplinary approaches used include comparative studies in cells which differ in DNA repair capabilities; determination of the nature of the DNA lesions responsible for the biological effects; gene isolation, cloning, and sequencing; and site-specific mutagenesis. Send application, including curriculum vitae, reprints, and letters of recommendation, to: **Dr. J. Justin McCormick or Dr. Veronica M. Maher, Co-Directors, Carcinogenesis Laboratory–Fee Hall, Michigan State University, East Lansing, Mich. 48824.** *MSU is an Affirmative Action/Equal Opportunity Institution.*

PROFESSORSHIPS IN PHARMACOLOGY

The Department of Pharmacology at the University of Rochester invites applications for two faculty positions which may be filled at the rank of assistant, associate, or full professor. Applicants should have a Ph.D. in pharmacology, an M.D., or both; postdoctoral research experience; the potential to attract research support and to establish an independent research program; and an interest in professional and graduate education. Research interest and competence in the general area of biochemical pharmacology or carcinogenesis is desired.

Please forward curriculum vitae, bibliography, a description of future research plans, and three letters of reference to: **Dr. M. W. Anders, Department of Pharmacology, School of Medicine and Dentistry, University of Rochester, 601 Elmwood Avenue, Rochester, N.Y. 14642.**

An Equal Opportunity Employer, M/F

Nominations are invited for the 1982 Rosenstiel Award in Oceanographic Science.

This award, which is administered on behalf of the Rosenstiel School of Marine and Atmospheric Science (RSMAS), University of Miami, recognizes outstanding contributions to marine science, including oceanographically relevant aspects of atmospheric science, and fundamental developments in ocean engineering. The award consists of a cash prize, currently $5,000, and a medal. The recipient of the award will be invited to spend a week at RSMAS for discussions with faculty and students. The award will be presented at a banquet at that time.

To accommodate the multidisciplinary value of oceanographic science, the award recognizes, on a rotating basis, achievements in four broad disciplinary areas. In 1982 the emphasized discipline will be marine geology and geophysics. The achievements recognized may consist of contributions towards the development of ocean science in general, or of more focussed individual research or recognized impact on our understanding of the marine environment.

Nominations for the 1982 award for outstanding achievement in marine geology and geophysics should be directed to the **Interim Dean, Warren J. Wisby, Rosenstiel School of Marine and Atmospheric Science, University of Miami, 4600 Rickenbacker Causeway, Miami, Florida 33149,** before March 15, 1982. Nominations should include a brief justification together with relevant references, and a c.v. if possible. The selection panel would especially welcome nominations of outstanding younger scientists whose early contributions suggest a continued role of leadership in the field.

Previous recipients of the award in Marine Geology and Geophysics have been Edward Ringwood, Kenneth Emery, and John Sclater.

POSITIONS OPEN

POSTDOCTORAL RESEARCH ASSOCIATE position available immediately for research on the plasma factors regulating platelet functions in the field of thrombosis and hemostasis. Experiences in protein and/or membrane biochemistry preferred. Salary: $24,300 per year. Send curriculum vitae, statement of research background, and three names for reference to: **Eric Lian, M.D. (D26), P.O. Box 016760, Division of Hematology, University of Miami School of Medicine, Miami, Fla. 33101.** *An Equal Opportunity/Affirmative Action Employer.*

PROFESSOR AND CHAIRMAN
DEPARTMENT OF INTERNAL MEDICINE
WAYNE STATE UNIVERSITY
SCHOOL OF MEDICINE
DETROIT MEDICAL CENTER

Wayne State University School of Medicine invites nominations and applications for the position of **professor and chairman** of the Department of Internal Medicine, which involves leadership of a department with important teaching, service, and research activities and a diverse clinical program. The department is based in the hospitals and outpatient facilities of the Detroit Medical Center. Candidate must be a recognized leader in a discipline of internal medicine and have demonstrated ability as a scholar, clinician, and administrator.

Applicants should forward curriculum vitae and bibliography by 8 December 1981 to:

Dr. Alexander J. Walt
Professor and Chairman
Department of Surgery
Wayne State University School of Medicine
540 East Canfield Avenue
Detroit, Michigan 48201

An Equal Opportunity/Affirmative Action Employer

RESEARCH ASSOCIATE to study a mitochondrial membrane enzyme that converts glutamate to pyrroline-5-carboxylate, an intermediate essential for ornithine and proline biosynthesis. Applicants should have a recent Ph.D. degree in biochemistry or chemistry. Send curriculum vitae and names of three references to: **Dr. M. E. Jones, Department of Biochemistry, School of Medicine, University of North Carolina, Chapel Hill, N.C. 27514.** *Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSOCIATE: B.S. or graduate degree (M.S. or Ph.D.) in biochemistry or cell biology. Work includes research on peptides (extraction and purification, column chromatography, electrophoresis, HPLC), receptor binding, RIA, and related procedures. Salary commensurate with education and experience. Send curriculum vitae to: **Dr. S. I. Said, University of Oklahoma Health Sciences Center, Department of Medicine, P.O. Box 26901, Oklahoma City, Okla. 73190.** *An Equal Opportunity/Affirmative Action Employer.*

SENSORY BIOPHYSICIST. Tenure-track faculty position; rank and salary are open. Strong research, lecture on membrane biophysics of sensory receptors and neurons to graduate and medical students. Sensory Sciences Center, University of Texas Health Science Center at Houston. Send curriculum vitae and names for three references before 15 December 1981 to: **Dr. H. G. Sperling, Box 20708, Room 7.242, Houston, Texas 77025.** *An Equal Opportunity Employer.*

VETERINARY PATHOLOGIST

Position available for a Board-certified veterinary pathologist to join a large group of pathologists and toxicologists performing interdisciplinary biological research in a private laboratory. The ideal candidate would have an interest and/or experience in scientific management and significant experience in neuropathology.

Battelle Columbus Laboratories is a worldwide leader in contract research and offers excellent employee benefits, opportunities for career growth, and salary commensurate with experience. Interested candidates should send résumé to:

Richard Shaw, Senior Personnel Advisor

Battelle
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201
Telephone: 614-424-6424

POSITIONS OPEN

A RESEARCH (ASSISTANT OR ASSOCIATE) PROFESSOR with training in physiology or biochemistry is sought for work in the area of myocardial preservation by the Division of Cardiothoracic Surgery at the University of Arizona Health Sciences Center, Tucson, Arizona. A joint appointment in the Departments of Surgery and Physiology is contemplated. We need a person with postdoctoral training and a strong interest in cardiac physiology, microcirculation, or myocardial metabolism who is capable of and willing to "bridge the gap" between basic science and clinical cardiac surgery. The successful candidate will be expected to develop an independent basic research program as well as provide strong collaboration on clinically oriented research projects. Opportunities for teaching are available. Starting salary is to be based upon experience and is negotiable. *Equal Opportunity/Affirmative Action Employer.*

Please send curriculum vitae to:

Jack G. Copeland, M.D., Professor and Chief
Section of Cardiovascular and Thoracic Surgery
University of Arizona Health Sciences Center
1501 North Campbell Avenue
Tucson, Arizona 85724
Telephone: 602-626-7813

RESEARCH ASSOCIATE

Position available for M.D. or Ph.D. to study epidermal cell surface/ligand interaction using antibodies and lectins. Experiences in immunochemistry and cell culture techniques is desirable. This position involves strong collaboration with the laboratories of Dr. P. A. Ward (pathology) and I. J. Goldstein (biological chemistry). Please send curriculum vitae and three letters of reference to:

Luis A. Diaz, M.D.
Department of Dermatology
University of Michigan
Ann Arbor, Michigan 48109

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FELLOWSHIPS

Fill a staff position on Capitol Hill. Two American Chemical Society (ACS) **CONGRESSIONAL FELLOWSHIPS** for practitioners of the chemical sciences to begin fall 1982. For further information, write:

Amanda B. Huston
1155 16th Street, NW
Washington, D.C. 20036
Telephone: 202-872-4384

POSTDOCTORAL FELLOWSHIPS available for work towards cereal protoplast culture, either using established embryogenic cultures or examining cereal/pathogen interactions. Send curriculum vitae with list of publications to: **Dr. I. Potrykus, P.O. Box 273, CH-4002 Basel, Switzerland.**

TRAINEESHIPS

POSTDOCTORAL TRAINEESHIPS at the University of Virginia in cancer cell biology, molecular biology, virology, and immunology supported by a training grant from the National Cancer Institute (U.S. citizens or permanent residents). Highly competitive stipends and fringe benefits. Primary research interests (and supervisors) include (i) Immune regulation and hybridomas (Benjamin); (ii) Erythroleukemia differentiation and membranes (Brown); (iii) Sarcoma virus gene integration (Collins); (iv) Viral/cell transcription controls (Emerson); (v) Histocompatibility gene expression (Engelhard); (vi) Protein/nucleic acid sequencing (Fox); (vii) Bacterial genetics/recombinant DNA (Kadner); (viii) Regulation and cloning of immunoglobulins (Kuehl); (ix) Sarcoma virus DNA recombinants and sequencing (Parsons); (x) Molecular organization and genetics of bacterial membranes (Schnaitman); (xi) Yeast histone gene DNA sequences and function (Smith); (xii) Molecular biology of leukemogenic viruses (Thomas); (xiii) Viral hybridomas/monoclonal antibodies (Volk); and (xiv) Viral membranes and pathogenicity (Wagner).

APPLICATIONS: Send curriculum vitae, description of research interests, and letters from three references to: **Dr. Robert R. Wagner, Chairman, Department of Microbiology, Box 441, University of Virginia Medical School, Charlottesville, Virginia 22908.**

TRAINEESHIPS

POSTDOCTORAL TRAINEESHIPS IN BURNS AND TRAUMA RESEARCH

Candidates representing cell and molecular biology, biochemistry, endocrinology, metabolism, surgery, pathology, and pediatrics are invited to apply for a unique opportunity to participate in collaborative basic research aimed at eventual solutions to clinical problems relating to burn injury and trauma. Excellent clinical and laboratory facilities at the Shriners Burns Institute in affiliation with Massachusetts General Hospital and Harvard Medical School. Ph.D. or M.D.; U.S. citizen or resident aliens. Write for further details or send résumé, transcripts, names of three references, and letter indicating research interests to: **J. F. Burke, M.D., Chief of Trauma Service, Massachusetts General Hospital, Boston, Mass. 02114.**

ADVANCED STUDY INSTITUTE

SYSTEMATICS AND THE PROPERTIES OF THE LANTHANIDES
A NATO ADVANCED STUDY INSTITUTE
Braunlage, West Germany, 11 to 25 July 1982

Topics include (i) Systematics, (ii) Structural chemistry, (iii) Electronic, spectroscopic, and magnetic properties, and (iv) Geochemistry. For further information and application form, please write to: **Professor S. P. Sinha, Hahn-Meitner-Institut, Postfach 390128, D-1000 Berlin 39, West Germany.**

PROGRAMS

DOCTORAL PROGRAM—PHARMACOLOGY

Medical University of South Carolina, Department of Pharmacology, seeks qualified candidates for Ph.D. program. Interdisciplinary environment with research capabilities ranging from gas chromatography–mass spectrometry through cell cultures and animal studies to clinical studies of patients with disease. Research training is available in biochemical pharmacology, cardiovascular pharmacology, drug metabolism, toxicology, analytical chemistry, and clinical pharmacology. Stipends available. Contact: **Graduate Training Director, Department of Pharmacology, Medical University of South Carolina, Charleston, S.C. 29425.**

The Mount Desert Island Biological Laboratory
Salsbury Cove, Maine 04672

Announces 15 January 1982 as the deadline for applications for research space during the summer season, 1 June to 30 September 1982. Facilities for 30 research groups are available during the summer season. Applications for research space during the winter season, 1 October through 31 May, may be submitted at any time. Facilities for up to six research groups are available. For further information about facilities and fees, write:

Jonathan S. Gormley
Executive Secretary
Mount Desert Island Biological Laboratory
Salsbury Cove, Maine 04672
or **telephone: 207-288-3605.**

MARKETPLACE

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Polynucleotide Kinase From P-L... Since 1974, Used By More Researchers Than Any Other

More researchers have used and referenced P-L polynucleotide kinase (PNK) than any other. They prefer its high activity, proven nuclease-free quality, and economy.

P-L Biochemicals developed the first commercially available PNK in 1974. Since that time, it has gained such high acceptance that it has become the standard for functional purity. Most biochemists and molecular biologists acknowledge that P-L PNK is the best.

P-L polynucleotide kinase was assayed by the Richardson method using DNA substrate prepared according to the published procedure, along with PNK's from other commercial sources. The P-L PNK showed the highest activity at the lowest unit cost (*P-L Analects Vol. 9, No. 4*). Researchers have learned that because of this high level of activity and purity, they are getting more efficient end labeling at a better value with P-L PNK.

An example of the quality and usefulness of P-L PNK is shown in this photograph of an autoradiogram from a RNA sequencing experiment. *E. coli* 5S ribosomal RNA was 5′-end labeled with ^{32}P-ATP in the presence of P-L Cat. No. 0734 PNK and repurified on a polyacrylamide gel. The figure shows the electrophoretic pattern obtained from a T_1 nuclease digestion of the labeled 5S RNA as described in a recent *P-L Analects* article on RNA sequencing. The success of the labeling step with PNK is underscored by the fact that the gel pattern indicated G residues only at the correct positions from the 5′-end of 5S RNA.

P-L PNK Summary

Cat. No. 0734 polynucleotide kinase (2.7.1.78) (T_4-infected *E. coli)*

Preparation: Solution of nearly homogeneous protein in 50% glycerol containing 0.02 M potassium phosphate, 0.025 M KCl, 0.01 M 2-mercaptoethanol, and 10^{-7} M ATP (pH 7.0).

Activity: Not less than 15,000 units per mg protein. One unit catalyzes the transfer of one nanomole phosphate to the 5′-OH end of a polynucleotide from (γ-^{32}P)-ATP in 30 minutes at 37°C.

Contaminating enzymes: Trace or no detectable hydrolysis of supercoiled plasmid DNA, [^{14}C]poly(U), or [^{14}C]poly(dT). Specific contaminating assay data are provided in the certificate of analysis that accompanies each lot of enzyme.

Package sizes: 100 units (200 Richardson units); 500 units (1000 Richardson units).

For more information contact: P-L Biochemicals, Inc., 1037 West McKinley Avenue, Milwaukee, WI 53205. Call toll free (800) 558-7110. In Wis. call collect (414) 347-7442.

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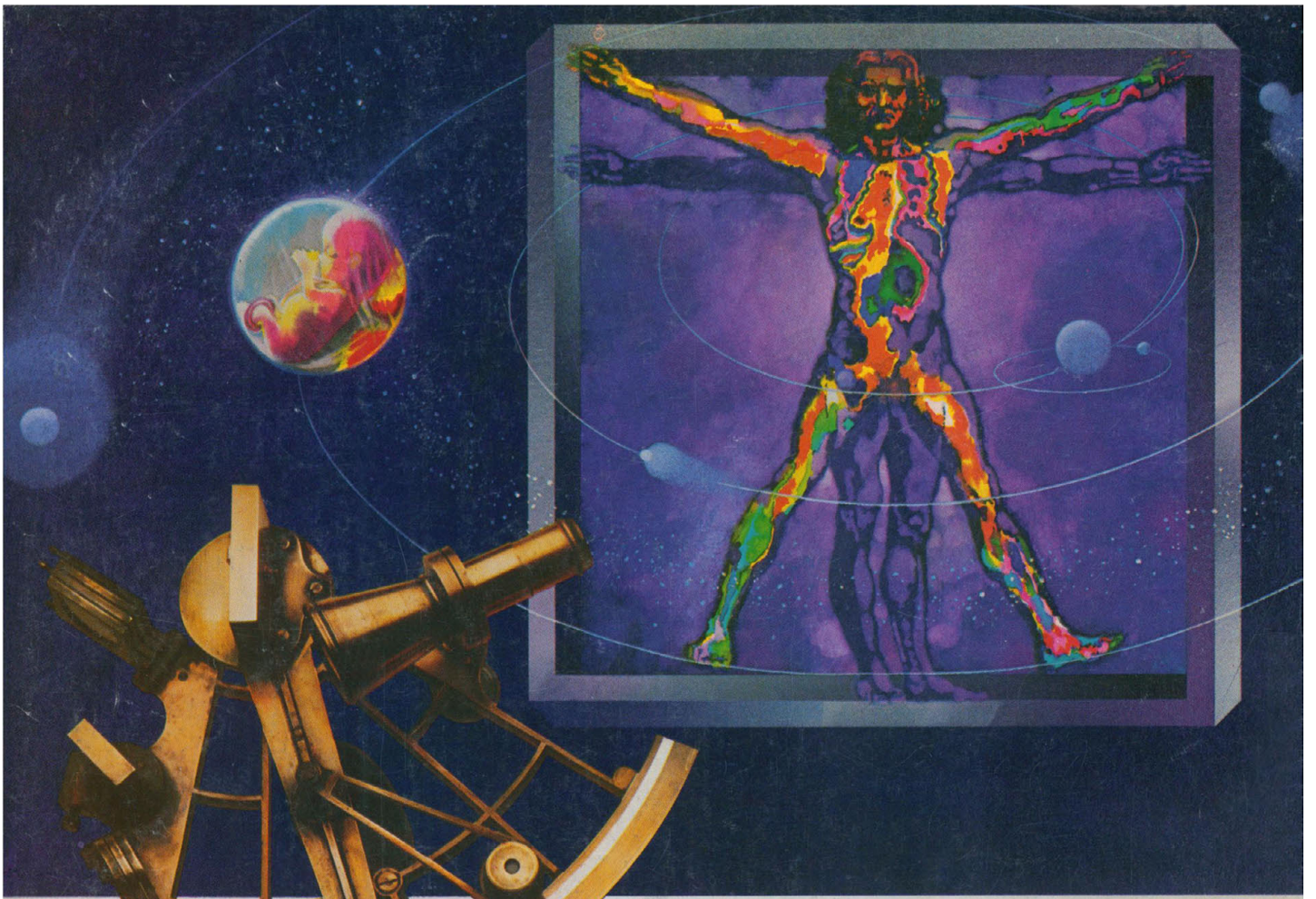

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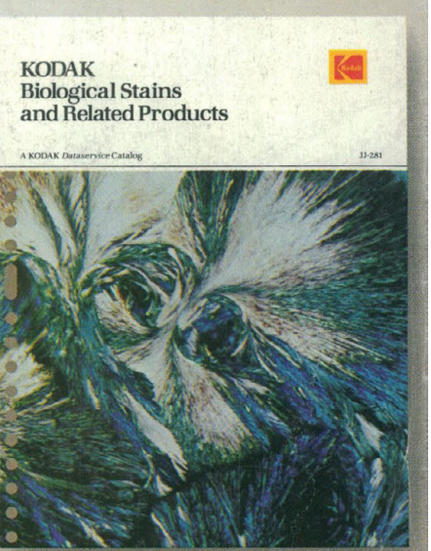

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