

for uptake by nerve endings, where it is the most efficient substrate for the production of releasable glutamate (as is described by Cotman and Nadler).

It was to be expected that studies of glutamate binding would flourish as soon as a sufficiently radioactive marker became available. The studies are reviewed in the book by P. J. Roberts. There is indeed much binding in the cerebral mash, but we are left with the old problem: what is functionally significant binding—and in the context of which function—and how does one explain contradictory observations, such as that *N*-methyl-D-aspartate does not bind? On the other hand, a marked stereospecificity of glutamate binding is not in contradiction with electrophysiological data, though the author surprisingly states that it is. It seems to me that binding studies are illuminating only when junctional receptors have been clearly identified (as at peripheral sites of cholinergic and aminergic transmission) or when a correlation can be made with extensive and reliable pharmacological data (for example, with central receptors for dopamine).

That we are far from this kind of situation with glutamate is made especially clear by a review of the relevant pharmacology by J. C. Watkins. Though late in coming round to the idea that glutamate might be a transmitter, the author has been involved in studies of these amino acids longer than anyone else. He authoritatively reviews studies of the possible amino acid antagonists, the number of which is rapidly increasing. So far, none of the compounds has proved very potent or reliable. Although Watkins makes a brave attempt at a systematic survey, the story is very confusing; it is therefore unfortunate that his is the only paper with neither conclusions nor a summary to help a bemused reader.

A newcomer to the field might well wonder why glutamate was ever proposed (and is now so widely held) to be a major central nervous system transmitter. The reason is that, acting in minimal amounts and in a signally rapid manner, it is a surprisingly effective exciter of nearly all central neurons. After nearly a quarter of a century of central nervous system iontophoresis, no other substance naturally present in the brain in more than trace amount has been discovered consistently to show such "transmitter-like" properties. What is distressing about the present situation—and should be a major point of any survey of glutamate—is that we still know very little about its action and whether it is

identical to that of the natural transmitter presumably released at excitatory synapses.

There is only a hint of this in the book, in a very brief survey of glutamate action in the hippocampus, by P. Andersen. Andersen wonders whether glutamate action is quick enough to explain the short latency of excitatory postsynaptic potentials observed in the hippocampus, and he would like to know more about conductance changes and reversal potentials (and so on). These are the kinds of questions that need to be asked, and until they have been systematically looked into and answered we are unlikely to progress much further toward deciding whether glutamate is or is not a major excitatory transmitter.

K. KRNEJVIĆ

*Department of Physiology,
McGill University, Montreal,
Quebec H3Q 1Y6, Canada*

Books Received

- Adhesion Problems in the Recycling of Concrete.** Proceedings of an institute, Saint-Rémy-les-Chevreuse, France, Nov. 1980. Pieter C. Kreijger, Ed. Plenum, New York, 1981. xii, 420 pp., illus. \$47.50. NATO Conference Series VI, vol. 4.
- Adolescent Marijuana Abusers and Their Families.** Herbert Hendin, Ann Pollinger, Richard Ulman, and Arthur C. Carr. National Institute on Drug Abuse, Rockville, Md., 1981 (available from the Superintendent of Documents, Washington, D.C.). viii, 114 pp. Paper, \$4.50. NIDA Research Monograph 40.
- Building Services Engineering. A Review of Its Development.** Neville S. Billington and Brian M. Roberts. Pergamon, New York, 1981. xvi, 538 pp., illus. Cloth, \$80; paper, \$24. International Series on Building Environmental Engineering, vol. 1.
- The Cambridge Encyclopedia of Earth Sciences.** David G. Smith, Ed. Crown, New York, and Cambridge University Press, New York, 1982. 496 pp., illus. \$35.
- Cancer. A Comprehensive Treatise.** Vol. 1, Etiology: Chemical and Physical Carcinogenesis. Frederick F. Becker, Ed. Plenum, New York, ed. 2, 1982. xxii, 714 pp., illus. \$69.50.
- Cytoarchitecture of the Human Brain Stem.** Jerzy Olszewski and Donald Baxter. Karger, Basel, ed. 2, 1982. 200 pp., illus. \$167.25.
- Cytogenetic Assays of Environmental Mutagens.** T. C. Hsu, Ed. Allanheld, Osmun, Totowa, N.J., 1982. x, 432 pp., illus. \$45.
- The Defense Industry.** Jacques S. Gansler. MIT Press, Cambridge, Mass., 1982. xiv, 346 pp., illus. Paper, \$9.95. Reprint of the 1980 edition.
- Development and Function of Reproductive Organs.** Proceedings of a workshop, Copenhagen, July 1981. Anne Grete Byskov and Hannah Peters, Eds. Excerpta Medica, Amsterdam, 1981 (U.S. distributor, Elsevier North-Holland, New York). xiv, 366 pp., illus. \$74.50.
- Explorations in Basic Biology.** Stanley E. Gunstream and John S. Babel. Burgess, Minneapolis, ed. 2, 1982. x, 260 pp., illus. Paper, \$11.95.
- Extragalactic Adventure. Our Strange Universe.** Jean Heidmann. Translated from the French edition (Paris, 1979) by Maureen Schaeffer and Ann Boesgaard. Cambridge University Press, New York, 1982. viii, 174 pp., illus. Cloth, \$19.95; paper, \$7.95.
- Family Therapy. Major Contributions.** Robert Jay Green and James L. Framo, Eds. International Universities Press, New York, 1982. xxii, 564 pp. \$30.
- Generalized Concavity in Optimization and Economics.** Papers from a NATO Advanced Study Institute, Vancouver, Canada, Aug. 1980. Siegfried Schaible and William T. Ziemba, Eds. Academic Press, New York, 1981. xiv, 768 pp. \$45.
- Genetic Engineering in the Plant Sciences.** Nickolas J. Panopoulos, Ed. Praeger, New York, 1981. xvi, 272 pp., illus. \$32.50.
- Genetic Engineering of Microorganisms for Chemi-**

- icals.** Proceedings of a symposium, Champaign-Urbana, Ill., May 1981. Alexander Hølaender and 5 others, Eds. Plenum, New York, 1982. xiv, 486 pp., illus. \$55. Basic Life Sciences, vol. 19.
- Introductory Spatial Analysis.** David Unwin. Methuen, New York, 1981. xii, 212 pp., illus. Cloth, \$22; paper, \$10.95.
- Isozymes.** Current Topics in Biological and Medical Research. Vol. 5. Mario C. Rattazzi, John G. Scandalios, and Gregory S. Whitt, Eds. Liss, New York, 1981. x, 230 pp., illus. \$36.
- Language Development.** Vol. 1, Syntax and Semantics. Stan A. Kuczaj II, Ed. Erlbaum, Hillsdale, N.J., 1982. xvi, 492 pp. \$39.95. Child Psychology.
- Lymphokines.** A Forum for Immunoregulatory Cell Products. Vol. 3, Lymphokines in Macrophage Activation. Edgar Pick, Ed. Academic Press, New York, 1981. xx, 450 pp., illus. \$49.50.
- Man in Competition with the Spruce Budworm.** An Application of Differential Equations. Philip M. Turchinsky. Birkhäuser, Boston, 1981. viii, 78 pp., illus. Paper, \$7.95. The UMAP Expository Monograph Series.
- Managing Information Security.** A Program for the Electronic Information Age. James A. Schweitzer. Butterworths, Boston, 1982. x, 134 pp. \$15.95.
- Manifolds and Lie Groups.** Papers in Honor of Yozō Matsushima. J. Hano, A. Morimoto, S. Murakami, K. Okamoto, and H. Ozeki, Eds. Birkhäuser, Boston, 1981. xii, 460 pp. \$30. Progress in Mathematics, vol. 14.
- Mycoplasma Diseases of Trees and Shrubs.** Papers from a conference, New Brunswick, N.J., Aug. 1979. Karl Maramorosch and S. P. Raychaudhuri, Eds. Academic Press, New York, 1981. xii, 362 pp., illus. \$29.50.
- Native Language and Foreign Language Acquisition.** Papers from a conference, Jan. 1981. Harris Winitz, Ed. New York Academy of Sciences, New York, 1981. x, 380 pp., illus. Cloth or paper, \$75. Annals of the New York Academy of Sciences, vol. 379.
- Nature Directory of Biologicals 1982.** Macmillan Journals, London, 1982. xxxviii, 196 pp., illus. \$45.
- Network Systems. Modeling, Analysis and Design.** Roshan Lal Sharma, Paulo T. de Sousa, and Ashok D. Ingle. Van Nostrand Reinhold, New York, 1982. xiv, 322 pp., illus. \$29.95. Van Nostrand Reinhold Data Processing Series.
- Pediatric Nephrology.** Proceedings of a symposium, Philadelphia, Oct. 1980. Alan B. Gruskin and Michael E. Norman, Eds. Nijhoff, The Hague, 1981 (U.S. distributor, Kluwer Boston, Hingham, Mass.). xii, 530 pp., illus. \$69.50. Developments in Nephrology, vol. 3.
- Pediatric Nephrology.** Vol. 6, Current Concepts in Diagnosis and Management. Papers from seminars, Miami, Jan. 1979, and Bal Harbour, Fla., Jan. 1980. José Strauss, Ed. Plenum, New York, 1981. xiv, 518 pp., illus. \$49.50.
- Pellagra.** Kenneth J. Carpenter, Ed. Hutchinson Ross, Stroudsburg, Pa., 1981 (distributor, Academic Press, New York). xvi, 394 pp., illus. \$48. Benchmark Papers in Biochemistry, vol. 2.
- Petrology. Igneous, Sedimentary, and Metamorphic.** Ernest G. Ehlers and Harvey Blatt. Freeman, San Francisco, 1982. xviii, 732 pp., illus. \$29.95. A Series of Books in Geology.
- Pulsed Neutron Scattering.** C. G. Windsor. Taylor and Francis, London, and Halsted (Wiley), New York, 1981. xii, 432 pp., illus. \$85.
- Rational Homotopy Theory and Differential Forms.** Phillip A. Griffiths and John W. Morgan. Birkhäuser, Boston, 1981. xii, 242 pp., illus. \$14. Progress in Mathematics, vol. 16.
- Rattlesnakes.** Their Habits, Life Histories, and Influence on Mankind. Laurence M. Klauber. Abridged by Karen Harvey McClung. Published for the Zoological Society of San Diego by University of Chicago Press, Berkeley, 1982. xxii, 350 pp., illus., + plates. \$19.95. Abridgement of the 1972 edition.
- Recent Advances in Differential Equations.** Papers from a conference, Miramare, Trieste, Italy, Aug. 1978. Roberto Conti, Ed. Academic Press, New York, 1981. xiv, 448 pp. \$35.
- Survey of Contemporary Toxicology.** Vol. 2. Anthony T. Tu, Ed. Wiley-Interscience, New York, 1982. xiv, 248 pp., illus. \$50.
- Synopsis and Classification of Living Organisms.** Sybil P. Parker, Ed. McGraw-Hill, New York, 1982. Two volumes. xx, 1166 pp., illus., + plates; and vi, 1232 pp., illus., + plates. \$149.50.
- Taurine in Nutrition and Neurology.** Proceedings of a symposium, Mexico City, Nov. 1980. Ryan J. Huxtable and Herminia Pasantes-Morales, Eds. Plenum, New York, 1982. xiv, 552 pp., illus. \$59.50. Advances in Experimental Medicine and Biology, vol. 139.
- Water Stress on Plants.** G. M. Simpson. Praeger, New York, 1981. xii, 324 pp., illus. \$38.50.
- Wave Propagation Theory.** James R. Wait. Pergamon, New York, 1981. viii, 350 pp., illus. Cloth, \$42.50; paper, \$22.50.

Personnel Placement

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Enzymologist, German citizen, German Ph.D. 1971. Pharmacist by training, fluent in German and English (2 years of postdoctoral research in United States). Research experience (group leader) in enzyme isolation and characterization. Specialty: protein phosphorylation. Teaching: Fungal-, plant physiology, phytochemistry. Seeks teaching or senior research position. Box 117, SCIENCE. X

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HAP Search Committee
School of Allied Health Sciences
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AQUATIC OR VERTEBRATE ECOLOGIST. Indiana State University, Terre Haute. The Department of Life Sciences invites applications for a position as assistant professor (tenure-track, tentative, dependent on budgetary approval) beginning as early as August 1982. Persons with research interests in environmental toxicology, ethology, evolutionary ecology, or systematics are encouraged to apply. Applicants must have a strong interest in teaching at both the undergraduate and graduate levels, and conduct and direct research in the doctoral program. Please send, by 30 May 1982, a résumé, research papers, and three letters of reference to: **Dr. William Brett, Chairperson, Department of Life Sciences, Indiana State University, Terre Haute, Ind. 47809.** *Indiana State University is an Equal Opportunity/Affirmative Action Employer.*

ASSISTANT PROFESSOR, tenure-track position, starting 1 July 1982. Appointee will participate in teaching histology-cell biology, and is expected to develop a productive research program. Postdoctoral training preferred. Send curriculum vitae and a brief statement of research plans, and request three letters of recommendation to be sent to: **Dr. W. Patrick Luckett, Chairman of Search Committee, Department of Anatomy, University of Puerto Rico, Medical Sciences Campus, G.P.O. Box 5067, San Juan, Puerto Rico 00936.** *Equal Opportunity Employer.*

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ASSISTANT PROFESSOR, PARASITOLOGY/MICROBIOLOGY. Applications are invited for position at the assistant professor level (tenure-track) in the Division of Parasitology, Department of Microbiology, New York University School of Medicine. Duties will include teaching medical and graduate students.

Applicants must be strongly motivated toward research. Preference will be given to those interested in areas of molecular biology concerned with nucleic acids, gene expression, and genetic recombination as applied to problems of parasitology, especially malaria and trypanosomes.

In applying, please send curriculum vitae, a brief statement of research interests (one to two pages only), and names of four referees to: **Professor R. S. Nussenzweig, Head, Division of Parasitology, Department of Microbiology, New York University Medical Center, 341 East 25 Street, New York, N.Y. 10010.** Deadline: 1 July 1982. *An Equal Opportunity/Affirmative Action Employer.*

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ASSISTANT/ASSOCIATE PROFESSOR to establish full-time, independent research program. Preference will be given to candidates whose research will complement ongoing biomedical studies on the physicochemical properties, metabolism, and biological functions of lipids. Specialized facilities include computerized optical spectroscopy system, NMR, GC-MS, HPLC-MS, EM, tissue culture laboratories, and laminar flow ventilated animal quarters. Ph.D. or M.D. required; additional research experience desirable. Please submit curriculum vitae, description of research interests, publication list, and the names of three references to: **Dr. Howard Brockman, Chairman of the Search Committee, The Hormel Institute, University of Minnesota, 801 16th Avenue, NE, Austin, Minn. 55912; telephone: 507-433-8804.** Application deadline is 15 June 1982. *The University of Minnesota is an Equal Opportunity Educator and Employer and specifically invites and encourages women and minority applicants.*

ASSISTANT PROFESSOR—ANATOMY

The Anatomy Department, University of Wisconsin-Madison, has a position for an assistant professor with responsibility for teaching histology. Applicants must have experience teaching histology and at least 1 year of postdoctoral training, and be actively engaged in fundable research. Preference will be given to applicants whose research is in developmental biology of the nervous system or reproductive biology. Applications should be sent by 1 June 1982 to: **Dr. David B. Slautterback, Anatomy Department, University of Wisconsin-Madison, 3550 MSC, Madison, Wis. 53706.** *An Equal Opportunity/Affirmative Action Employer.*

ASSISTANT PROFESSOR/BIOLOGIST with strong background in genetics. One-year temporary position beginning September 1982. Primary responsibility will be teaching genetics to undergraduate and graduate students as well as team-teaching introductory biology. Excellence in teaching is emphasized and scholarly research is encouraged. Ph.D. is required. Send curriculum vitae and three letters of reference to: **Dr. Antone K. Fontes, Chairperson, Department of Biology, Millersville State College, Millersville, Pa. 17551,** by 5 June 1982. *Millersville State College earnestly seeks and is eager to receive applications from women and minority candidates.*

ASSISTANT PROFESSOR, CHEMICAL PATHOLOGY

University of California, Irvine, Department of Pathology, is recruiting for a faculty position at assistant professor level. Required: M.D., clinical Board-eligible/qualified, service experience in chemical pathology, and demonstrated interest in independent research. Duties: teach medical students and house staff, limited administrative responsibility in area of chemical pathology. *An Affirmative Action Employer.* Send curriculum vitae and references to: **Hubert Pirkle, M.D., University of California, Irvine, Department of Pathology, 101 City Drive South, Orange, Calif. 92684.** Position effective 1 July 1982. Deadline: 31 May 1982.

ASSISTANT PROFESSOR OF DERMATOLOGY, FULL-TIME. Candidates must be Board-certified in dermatology; have prior experience in immunology, photobiology, particularly monoclonal antibodies; and have demonstrated competence in teaching, research, and patient care. *An Equal Opportunity/Affirmative Action Employer.* Résumés should be submitted to: **Department of Dermatology, College of Physicians and Surgeons, 630 West 168 Street, New York, N.Y. 10032.**

UNIVERSITY OF CALIFORNIA, BERKELEY

The **DEPARTMENT OF GENETICS** invites applications for a tenure-track appointment available 1 July 1982. Appointment will be at the **ASSISTANT PROFESSOR** level at a step commensurate with experience. Preference will be given to candidates with research programs emphasizing gene regulation in higher organisms as part of a developing emphasis in the department. Candidates' research programs should emphasize molecular genetics and should be relevant to understanding broad issues of gene regulation in higher animals such as insects or mammals. Send curriculum vitae, reprints, and a brief statement of research interests and objectives, and have three letters of reference sent to:

Dr. Kenneth Paigen, Chairman of Search Committee
Department of Genetics
University of California
Berkeley, California 94720

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The California Space Institute, La Jolla campus, of Scripps Institution of Oceanography, has an immediate opening in the **ASSISTANT RESEARCH SERIES** for a physical or inorganic chemist or chemical engineer (Ph.D. level) to participate in a University of California, San Diego, program with research background sufficient for the development of procedures and technologies for the separation and processing of lunar soil into useful materials. Initial appointment for 1 year. Anticipate follow-on program leading to demonstration of promising processes. Salary range: \$22,900 to \$30,100, commensurate with qualifications. Send résumé and references to: **David Wirth (S), California Space Institute A030, Scripps Institution of Oceanography, La Jolla, Calif. 92093, by 31 May 1982.** For additional information, contact: **Dr. David Criswell, telephone: 714-452-2047, or above address.** *The University of California, San Diego, is an Equal Opportunity/Affirmative Action Employer.*

CARBOHYDRATE CHEMIST—Independent research institute looking for associate scientist to perform stereo-controlled synthesis of clinically relevant tri- to hexasaccharide structure. Prefer an individual with Ph.D. or equivalent experience. Salary: \$35,000 per year or more, depending on experience. Have complete NMR and mass spectrometry facilities and large, broad funding base within academic medical center environment. Contact: **Dr. John Klock, Institute of Cancer Research, Pacific Medical Center, Box 7999, San Francisco, Calif. 94120.**

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Anticipated opening for fall 1982 for individual with proven record of excellence in research in a biochemical area and in teaching at the graduate and undergraduate levels. Should be eligible for appointment as associate or full professor. Person with administrative experience preferred. The department is in the College of Chemistry and Physics. B.S., M.S., and Ph.D. programs are offered. By 15 June 1982, forward résumé, publication record with a concise summary of research interests, reprints or copies of three recent publications, administrative philosophy, and names of three references to:

**Biochemistry Chairman Search Committee
c/o Dean, College of Chemistry and Physics
Room 338 Choppin Hall
Louisiana State University
Baton Rouge, La. 70803
Telephone: 504-388-4001**

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CHEMISTRY—ASSISTANT PROFESSOR (physical biochemistry). The Biochemistry and Biophysics section of the University of Connecticut will have a tenure-track position available in the area of physical biochemistry, to begin September 1982. We seek a person with postdoctoral training who will establish a research program and teach in our undergraduate and graduate biochemistry and biophysics programs. Applicants should submit curriculum vitae, an outline of proposed research, and names of at least three references to: **Professor Alvah H. Phillips, Head, Biochemistry and Biophysics Section, UNIVERSITY OF CONNECTICUT, U-125, Storrs, Conn. 06268.** Deadline: 1 June 1982. *Equal Opportunity/Affirmative Action Employer (SEARCH 2A57).*

COLLEGE OF THE VIRGIN ISLANDS FACULTY POSITION—MARINE SCIENCE

The College of the Virgin Islands will appoint an assistant or associate professor of marine science to start 15 August 1982. This position is supported by a NSF/CAUSE grant. An earned doctorate in marine geology, marine biology, or related field and college-level teaching experience are required. Interest in tropical shallow-marine ecosystems and invertebrates is desirable. Send résumés and three letters of reference to: **Dr. William P. MacLean, Chairman, Division of Science and Mathematics, College of the Virgin Islands, St. Thomas, U.S. Virgin Islands 00801.**

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MARINE MICROBIAL ECOLOGIST. Tenure-track position available August 1982 at the assistant professor rank. Teaching general and applied undergraduate microbiology, with advanced courses in specialty area. The development of an active research program is expected. Ph.D. required. Salary commensurate with experience and qualifications. Applicants should submit curriculum vitae, three letters of reference, and statement of research interests by 1 June 1982 to: **Dr. H. G. Marshall, Chairman, Department of Biological Sciences, Old Dominion University, Norfolk, Va. 23508.** *An Affirmative Action/Equal Opportunity Employer.*

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Civilian Personnel Office
(#140-82)
1776 ABW/DPCR-82-5
Attn: Mrs. Hittinger
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The National Animal Disease Center, Agricultural Research Service (ARS), U.S. Department of Agriculture (USDA), invites applications for the position **CHIEF, BACTERIOLOGY AND MYCOLOGY RESEARCH LABORATORY**. The Laboratory staff of 47 includes 24 professionals conducting basic and applied research on 14 diseases of economic importance to the U.S. livestock and poultry industry. Also included is an extramural program currently supporting research at 11 universities and several foreign countries. This position is in the career federal service with a possible salary range of \$39,689 to \$46,685 per annum. Location: Ames, Iowa. Applicants must be U.S. citizens, have a D.V.M. or equivalent degree with a minimum of 5 years of professional experience in veterinary bacteriological or veterinary mycological research. A Ph.D. degree in veterinary microbiology and/or diploma status in the American College of Veterinary Microbiologists is desired but not required. Please submit a résumé, references, and a statement of research experience by 30 June 1982 to: **Diane Moseley, Personnel Management Specialist, USDA-ARS/NCR-(2ND4), National Animal Disease Center, P.O. Box 70, Ames, Iowa 50010. The USDA-ARS/NCR is an Equal Opportunity/Affirmative Action Employer.**

FACULTY POSITIONS IN BIOCHEMISTRY and TOXICOLOGY. Two full-time positions open in the Physiology/Chemistry Department beginning July 1982. Responsibilities include teaching of either general biochemistry or toxicology and physiological chemistry, as well as assisting in a biochemistry/clinical laboratory. Minimum educational requirement is a master's degree in an appropriate field. Rank and salary commensurate with qualifications and experience. Preference given to individuals at instructor or assistant professor level. Curriculum vitae, three letters of reference, and copies of transcripts to:

**Dr. Howard T. Silverstein, Chairman
Physiology/Chemistry Department
Palmer College of Chiropractic
1000 Brady Street
Davenport, Iowa 52803**

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FACULTY POSITIONS IN PHYSIOLOGY. Two full-time positions are available in the Physiology/Chemistry Department beginning July 1982. One position involves teaching cardiovascular or renal/pulmonary physiology. The second position is for an individual whose primary responsibility would be the coordination and supervision of a physiology laboratory. Minimum educational requirement is a master's degree in an appropriate field. Rank and salary commensurate with qualifications and experience. Preference given to individuals at the instructor or assistant professor level. Curriculum vitae, three letters of reference, and copies of transcripts to:

**Dr. Howard T. Silverstein, Chairman
Physiology/Chemistry Department
Palmer College of Chiropractic
1000 Brady Street
Davenport, Iowa 52803**

Equal Opportunity/Affirmative Action Employer

MICROBIOLOGIST, assistant professor, tenure-track. Ph.D. with commitment to teaching and research essential. Development of active research program, undergraduate and graduate teaching, as well as interdisciplinary interactions, required. Expertise in molecular genetics highly desirable. Submit curriculum vitae and letters of recommendation to: **Professor E. M. Pearce, Head, Chemistry/Life Sciences Department, Polytechnic Institute of New York, 333 Jay Street, Brooklyn, N.Y. 11201.**

PHYSIOLOGIST

The School of Life and Health Sciences at the University of Delaware is seeking a physiologist with postdoctoral training. Preference will be given to candidates with research expertise in the physiology of cells or cellular processes. This is a tenure-track position and is expected to be filled at the assistant professor rank. The successful candidate will be expected to teach an advanced course in his/her area of interest and an undergraduate course in organ systems physiology. Applicants should submit curriculum vitae, representative publications, a statement of research plans, and three letters of recommendation to: **Dr. Milton H. Stetson, Associate Director for Graduate Programs and Research, School of Life and Health Sciences, University of Delaware, Newark, Del. 19711.** The closing date for applications is 15 May 1982.

POSITIONS OPEN

FACULTY POSITIONS, 1982-1983

Open in biochemistry, physiology, gross anatomy, histology, embryology, neuroanatomy; teaching aide, administrative positions. Salary negotiable. Send curriculum vitae to:

**Personnel Department
P.O. Box 118
Turks-Caicos Islands
British West Indies**

HERITAGE SCHOLAR

**in the
Faculty of Medicine
The University of Calgary**

The University of Calgary, Faculty of Medicine, under the auspices of the **Alberta Heritage Foundation for Medical Research**, invites applications from **GAMETE BIOLOGISTS** with particular interest in gametogenesis and fertilization, for a position as a Heritage Scholar. Applicants should have substantial research experience, preferably in areas of in vitro fertilization, cryopreservation, or reproductive immunology. Successful applicants will be part of a rapidly expanding clinical and basic research group in reproductive biology.

The appointment will be funded by the Alberta Heritage Foundation for Medical Research at the rank of assistant or associate professor. However, in special circumstances, consideration could be given to a senior applicant for a position as career scientist, or as a visiting scientist for a 1- to 2-year period. Substantial funding is available for establishing and equipping a new laboratory and there are ample opportunities for collaborative research.

Preference will be given to citizens and permanent residents of Canada. Applications should be sent, in confidence, prior to 30 June 1982 to:

**Dr. Melville G. Kerr, Professor and Head
Department of Obstetrics and Gynaecology
Foothills Hospital
1403 29th Street, NW
Calgary, Alberta, Canada T2N 2T9**

HARVARD UNIVERSITY

DEPARTMENT OF CHEMISTRY

Manager of Magnetic Resonance Laboratory
The Department of Chemistry seeks a **spectroscopist** to supervise the operation and maintenance of its magnetic resonance instrumentation. The Department presently has a Bruker 300 MHz multinuclear FT NMR, a JEOL 270 MHz proton/carbon FT NMR, and Varian/Nicolet XL-100, and intends to acquire additional capability in this area. A strong background in NMR spectroscopy or chemical instrumentation with a Ph.D. in chemistry or physics is desired. The position is available immediately and duties can be expanded to Head of Chemical Instrumentation Laboratory. Interested parties should send complete curriculum vitae in strictest confidence to: **Dr. D. J. Clapenelli, Director of the Chemical Laboratories, Harvard University, 12 Oxford Street, Cambridge, Mass. 02138. Harvard University is an Equal Opportunity/Affirmative Action Employer.**

Position available in **PHYSIOLOGY AND BIOCHEMISTRY STUDIES** in blood coagulation, platelet aggregation, and related topics. Experience in prostaglandin biochemistry is desirable. Ph.D. or M.D. or equivalent degree is required. Send curriculum vitae, bibliography, and three letters of recommendation to:

**Professor Panayotis G. Iatridis, M.D.
Assistant Dean and Director
Northwest Center for Medical Education
Indiana University School of Medicine
3400 Broadway
Gary, Indiana 46408**

Indiana University is an Equal Opportunity/Affirmative Action Employer.

PHYSIOLOGY—BAYLOR. Full-time faculty position at assistant professor level available immediately. Ph.D. degree (physiology/biophysics) or equivalency required. Postdoctoral research with publications and teaching activity preferred. Responsibilities include teaching in dental, dental hygiene, and graduate programs; development of neurophysiology courses at undergraduate and graduate levels; and independent research effort. Salary commensurate with qualifications. Send curriculum vitae, a brief statement of personal research objectives, and names and addresses of three references to: **Dr. Loy W. Frazier, Jr., Chairman, Department of Physiology, Baylor College of Dentistry, 3302 Gaston Avenue, Dallas, Texas 75246. Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN

INSTRUCTOR—ANATOMY/ PHYSICAL THERAPY

Applications are invited for a tenure-track joint appointment in the Departments of Anatomy and Physical Therapy, University of North Dakota School of Medicine. Applicants must hold master's degrees or equivalent and be registered physical therapists. The successful applicant must have at least 5 years of experience teaching anatomy, muscle function and/or therapeutic exercise at the undergraduate or graduate/professional level. This position is a teaching/service appointment and carries minimal research responsibilities. Therefore, applicants should be able to demonstrate excellence in teaching anatomy to undergraduate, physical therapy, and graduate students. Individuals with experience in anatomical preparation and directing whole body donation programs will be given highest priority. Send curriculum vitae, descriptions of teaching experience, and at least three letters of recommendation by 14 May 1982 to:

**Dr. Edward C. Carlson, Chairman
Department of Anatomy
Medical Science Building, Room 107
University of North Dakota
School of Medicine
Grand Forks, North Dakota 58202**

POSTDOCTORAL to study genetic recombination stimulated by DNA-cytosine methylation, UV repair. Start 1 September 1982; other dates acceptable. Background in molecular genetics and/or DNA biochemistry preferable. Opportunity for extensive interactions with molecular biologists at NIH, Johns Hopkins, Frederick Cancer Research Facility; \$16,000 to \$19,000. Curriculum vitae and names of three references to: **Dr. John Hays, Chemistry Department, University of Maryland Baltimore County, Baltimore, Md. 21228. Affirmative Action/Equal Opportunity Employer.**

TWO POSTDOCTORAL FELLOWS—Must have experience with a variety of methods needed to study cell cycle kinetics. Familiarity with the techniques of tumor biology to study the dietary response of mammary tumor growth in mice and transplantation of both hyperplastic alveolar nodules and tumors into mice. This research project will be under the direction of Samuel Abraham, Ph.D. **Children's Hospital Medical Center is an Equal Opportunity Employer.** Please contact: **Barbara Brown, CHILDREN'S HOSPITAL MEDICAL CENTER, 51st and Grove Streets, Oakland, Calif. 94609; telephone: 415-428-3640.**

POSTDOCTORAL POSITION (research associate) available immediately in a research group studying molecular aspects of early mammalian embryogenesis, with emphasis on the teratocarcinoma cell system. Experience in molecular or cellular biology desirable. Please send curriculum vitae and two letters of reference to: **Chi Nguyen-Huu, Ph.D., Columbia University College of Physicians and Surgeons, Departments of Microbiology and Urology, 630 West 168 Street, New York, N.Y. 10032.**

POSTDOCTORAL POSITIONS. Applications are invited for two openings in a multidisciplinary research program on bovine leukemia virus. One position requires a background in viral immunology. For the other position, experience in recombinant DNA technology is desirable. Please submit curriculum vitae and names of three references to:

**Dr. Jorge F. Ferrer
Chief, Comparative Leukemia Studies Unit
University of Pennsylvania
School of Veterinary Medicine
New Bolton Center
382 West Street Road
Kennett Square, Pa. 19348**

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

POSTDOCTORAL POSITION

Ph.D. in physiology, biochemistry, or related field for interdisciplinary research of salivary gland function in ixodid ticks. Research will center on biochemical regulation of the secretory process including cyclic AMP. Excellent laboratory and animal rearing facilities. Pleasant medium-sized community with nearness to large cities. Starting salary: \$19,200 per annum, plus fringe benefits. Two and one-half years of funding assured. Available immediately. Send résumé and names of references to: **Dr. R. C. Essenberg, Department of Biochemistry, or Dr. J. R. Sauer, Department of Entomology, Oklahoma State University, Stillwater, Okla. 74078. An Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN

POSTDOCTORAL POSITION available to study behavioral and physiological aspects of reproduction. Work will include anatomical and physiological investigations involving computer-assisted analysis of 2-deoxyglucose autoradiography. Send letter, curriculum vitae, and three names of references to: **Dr. Norman T. Adler, Department of Psychology, University of Pennsylvania, 3815 Walnut Street, Philadelphia, Pa. 19104.**

POSTDOCTORAL POSITION in research group investigating metabolism and toxicity of anesthetic drugs in animals and humans. Applicants should be interested in the development and application of analytical methods for drugs and metabolites. Experience with HPLC/capillary GC analytical methods is essential and GC-MS familiarity is desirable. Send curriculum vitae and names and addresses of three referees to: **Dr. A. J. Trevor, Department of Pharmacology, University of California School of Medicine, San Francisco, California 94143. An Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE to study the metabolism and mechanism of action of recently developed antimetastatic agents which modulate prostacyclin levels in vivo. Experience in drug metabolism with emphasis on metabolite identification desirable. Competitive salary and fringe benefits. Send curriculum vitae and three letters of recommendation to: **Professor L. J. Marnett, 435 Chemistry, Wayne State University, Detroit, Michigan 48202. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE position available 1 July 1982 for a recent Ph.D. in one of the botanical sciences. Research will be focused on interspecific cell fusions leading to the development of somatic hybrid plants. Background experience is required in plant protoplast manipulation and a knowledge of current techniques in plant protoplast fusion is highly desired. Send curriculum vitae, academic transcripts, and three letters of reference to: **James F. Shepard, Department of Plant Pathology, Kansas State University, Manhattan, Kans. 66506. Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE, neurosciences/biochemistry. Member of interdisciplinary team investigating childhood learning disorders/hyperactivity. Applicant will concentrate on biochemical area: enzyme/kinetics and membrane chemistry. Should have skills in tissue preparation and common analytical techniques. Teaching possible; independent research encouraged. Send curriculum vitae and three letters of reference to: **Dr. J. C. Flynn, Institute for Research in Childhood Learning Disorders, Baylor University, Waco, Texas 76703.**

POSTDOCTORAL RESEARCH ASSOCIATE position available for 2 to 3 years to study molecular details of wound tumor virus gene expression in vector cells, as it relates to transmission, and in the plant host, in relationship to tumor induction. An excellent opportunity for a well-trained molecular biologist/virologist to gain experience with plant systems. Send résumé, a description of research experience, and three letters of reference to: **Dr. D. L. Nuss, Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, N.Y. 12201.**

UNIVERSITY OF CALIFORNIA, IRVINE POSTDOCTORAL RESEARCH IN PSYCHOBIOLOGY

The Department of Psychobiology, University of California, Irvine (UCI), anticipates filling several postdoctoral research positions in the laboratories of the faculty with starting dates between 1 May 1982 and 1 March 1983. The current faculty and their research interests are: D. Aswad (neurochemistry); C. Cotman (synaptic growth and plasticity); R. Josephson (comparative physiology of muscles); H. Killackey (developmental neuroanatomy); M. Leon (developmental psychobiology); G. Lynch (neuroanatomy); J. Marshall (neural plasticity of catecholamines); J. McGaugh (memory storage processes); A. Starr (cognition, sensation, and evoked potential); N. Weinberger (neural mechanisms of learning); and P. Yahr (neuroendocrinology and behavior).

Candidates should address inquiries to: **Postdoctoral Research Adviser, Department of Psychobiology, University of California, Irvine, Calif. 92717.**

UCI

An Equal Opportunity/Affirmative Action Employer

KERNFORSCHUNGSANLAGE JÜLICH Gesellschaft mit beschränkter Haftung

Wir sind eine moderne Großforschungseinrichtung mit rund 4 500 Mitarbeitern. Unsere Forschungsschwerpunkte sind Hochtemperatur-Energietechnologie, künftige fossile Brennstoffe, Kernfusion, Gesundheit/Umwelt, Stoffeigenschaften und Materialforschung sowie nukleare Grundlagenforschung.

Für unser neugegründetes Institut für Chemie der belasteten Atmosphäre (das zu unserem Department-Institut für Chemie gehört) suchen wir den

INSTITUTSDIREKTOR

Die Forschung des neu aufzubauenden Institutes soll sich auf die Chemie der belasteten Atmosphäre konzentrieren. Insbesondere sollen die physikalisch-chemischen Prozesse jener Komponenten untersucht werden, die beim Gebrauch fossiler Brennstoffe emittiert werden und schädliche oder klimatische Auswirkungen haben können so z. B. das SO₂, das NO_x, das CO₂ und Aerosole.

Vom dem künftigen Institutsdirektor wird eine enge, kollegiale Zusammenarbeit mit den Nachbarinstituten des Chemie-Departments, insbesondere mit dem Institut für Atmosphärische Chemie und den übrigen Instituten, die F+E-Vorhaben für Umweltforschung durchführen, erwartet. Bewerber sollen habilitiert sein, hervorragende Fachkenntnisse und Erfahrungen auf dem Gebiet Chemie oder physikalischer Chemie mitbringen und zur Leitung eines wissenschaftlichen Institutes befähigt sein. Es ist vorgesehen, den Institutsdirektor gemeinsam mit einer Rochschule des Landes Nordrhein-Westfalen zu berufen (C 4).

Bewerbungen mit Lebenslauf, Veröfentlichungsliste und einer Darstellung der bisherigen wissenschaftlichen Tätigkeit erbitten wir bis zum 1. Juni 1982 an den



Vorstand der
KERNFORSCHUNGSANLAGE JÜLICH GmbH
Postfach 1913
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NRL

SUPERINTENDENT

MATERIAL SCIENCE AND TECHNOLOGY DIVISION

(\$54,755 to \$58,500 per annum)

Senior Executive Service

Directs a broad program of basic and applied research, leading to the generation, applications and evaluation of new concepts, principles, and techniques, the objective of which is the development of new or improved materials to be used in Naval platforms and systems. The research emphasis is in the fields of physical and mechanical metallurgy, corrosion and environmental effects, mechanics of materials, fractography, and failure analysis. The materials investigated include metals and alloys, ceramics, composites and glasses. The Division employs approximately 125 scientists, engineers, technicians and support personnel.

Qualifications: Candidates must have an in-depth knowledge of materials science and technology as indicated by a Ph.D. or equivalent experience, and a successful record of research or research leadership.

If you have any questions, contact Steve Krumholz on (202) 767-3030. Please submit a comprehensive resume or SF-171 by 15 July 1982 to:

**Naval Research Laboratory
Civilian Personnel Office
Code: 60-002-82 (S)
4555 Overlook Avenue, S.W.
Washington, D.C. 20375**

An Equal Opportunity Employer

U.S. Citizenship is Required

POSITIONS OPEN

POSTDOCTORAL POSITION for recent Ph.D. to study peptide hormone-receptor interactions and signal transmission in cell membranes. The approach taken may be biological, biochemical, and/or biophysical depending upon the background of the candidate. Please send curriculum vitae and the names of three references to: **Dr. David B. Donner, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, N.Y. 10021. An Affirmative Action/Equal Opportunity Employer.**

VANDERBILT UNIVERSITY SCHOOL OF MEDICINE invites qualified candidates for the position of **PROFESSOR AND CHAIRMAN OF THE DEPARTMENT OF MICROBIOLOGY**. Interested individuals are requested to submit evidence of outstanding accomplishment in research, teaching, and administration and a copy of their curriculum vitae to: **Dr. Leon W. Cunningham, Chairman, Microbiology Search Committee, Vanderbilt University, Nashville, Tennessee 37232, by 31 May 1982. Vanderbilt University is an Affirmative Action/Equal Opportunity Employer.**

The Department of Neurosciences, University of California, San Diego (UCSD), has a tenured position at the **FULL PROFESSOR LEVEL**. Candidates should have a Ph.D. or M.D. degree and demonstrated ability to carry out a strong, independent research program in an area of marine neurosciences. The position requires teaching of neurosciences at the graduate and medical school levels. Opportunities exist for collaborative research with the broad, interdisciplinary Neurosciences Group at UCSD and the Scripps Institution of Oceanography. Salary will depend on qualifications of the applicant. All applications received by 2 January 1983 will receive thorough consideration. Send curriculum vitae, bibliography, and names and addresses of five references to: **Search Secretary, Department of Neurosciences, M008, University of California, San Diego, La Jolla, California 92093. The University of California is an Equal Opportunity/Affirmative Action Employer.**

NATIONAL SCIENCE FOUNDATION (NSF)

NSF, Division of Physiology, Cellular and Molecular Biology, Molecular and Genetic Biosciences Section, is seeking candidates to fill a 1- to 2-year rotational assignment as **PROGRAM DIRECTOR FOR THE BIOCHEMISTRY PROGRAM**. The position is excepted from the competitive civil service at the EC-14/EP-15 grade range (equivalent to GS-14/15), \$39,689 to \$60,689 (limited by statute to \$57,500) per annum. The program supports research aimed at understanding the molecular basis of life and covers areas including the mechanism of enzyme action; biosynthesis of macromolecules; structure and function of biomolecules; generation, storage, and transduction of energy; organization of function of cell walls and membranes; and the physicochemical properties of contractile proteins. Candidates should have a Ph.D. and at least 6 to 8 years of research experience beyond the Ph.D. and a broad understanding of current research in biochemistry. Resumes should be submitted to: **National Science Foundation, Personnel Administration Branch, 1800 G Street, NW, Washington, D.C. 20550, attention: E. Paul Broglio, EX 82-23. For further information, telephone: Dr. R. Newburgh, Section Head, 202-357-7904. NSF is an Equal Opportunity Employer.**

NATIONAL SCIENCE FOUNDATION (NSF)

NSF, Division of Physiology, Cellular and Molecular Biology, is seeking qualified candidates to fill 1- to 2-year rotational assignments as **PROGRAM DIRECTORS FOR THE CELL BIOLOGY PROGRAM AND THE CELLULAR PHYSIOLOGY PROGRAM**. These positions are excepted from the competitive civil service at the EC-14/EP-15 grade range (equivalent to GS-14/15), \$39,689 to \$60,689 (limited by statute to \$57,500) per annum. The position in cell biology will become available in September 1982 and the cellular physiology position in July 1982. Applicants should have a Ph.D. or equivalent experience and a minimum of 6 years of independent research experience and a broad understanding of current research in the areas represented in each of the programs. Some administrative experience is desirable. Candidates should submit resume or SF-171, Personal Qualifications Statement, to: **National Science Foundation, Personnel Administration Branch, 1800 G Street, NW, Room 212, Washington, D.C., attention: E. Paul Broglio, EX 82-21. For details concerning the positions, telephone: Dr. Antonie W. Blackler, Division Director, Physiology, Cellular and Molecular Biology, 202-357-9400. NSF is an Equal Opportunity Employer.**

POSITIONS OPEN

NATIONAL SCIENCE FOUNDATION (NSF)

NSF, Division of Physiology, Cellular and Molecular Biology, is seeking candidates to fill a 1- to 2-year rotational assignment as **PROGRAM DIRECTOR FOR THE BIOLOGICAL INSTRUMENTATION PROGRAM**. Candidates should have a Ph.D. or equivalent experience and 6 to 8 years of experience beyond the Ph.D., significant research and administrative experience, and a broad understanding of instrumentation and its application in the biological sciences. The position is excepted from the competitive civil service at the EC-14/EP-15 (equivalent to GS-14/15), \$39,689 to \$60,689 (limited by statute to \$57,500) per annum. Send resumes to: **National Science Foundation, Personnel Administration Branch, 1800 G Street, NW, Room 212, Washington, D.C. 20550, attention: E. Paul Broglio, EX 82-24. For further information, telephone: Dr. Antonie W. Blackler, Division Director, 202-357-9400. NSF is an Equal Opportunity Employer.**

NATIONAL SCIENCE FOUNDATION (NSF)

NSF, Division of Earth Sciences, is seeking qualified candidates for the position of **PROGRAM DIRECTOR, EXPERIMENTAL AND THEORETICAL GEOPHYSICS PROGRAM**. The position is excepted from the competitive civil service and will be filled on a permanent or 2-year rotational assignment at grade EC-14 (equivalent to GS-14), \$39,689 to \$51,596 per annum. This program supports research concerned with the physical properties of the solid earth including the earth's dimensions, its magnetic, electrical and gravitational fields, its dynamic processes, and the physical behavior of materials under the conditions of temperature and pressure encountered in its interior. Candidates should submit SF-171, Personal Qualifications Statement, or resume to: **National Science Foundation, Personnel Administration Branch, 1800 G Street, NW, Room 212, Washington, D.C. 20550, attention: E. Paul Broglio, EX 82-27. NSF is an Equal Opportunity Employer.**

UNIVERSITY OF MARYLAND Department of Physics and Astronomy Research Associate in Observational Astrophysics

The Department of Physics and Astronomy of the University of Maryland invites applications for the position of research associate within the Amplitude Interferometry Program. This research area involves the application of modern electro-optical techniques to develop unique instrumentation for the support of our astrometric and astrophysical observational programs. The research includes developing, fabricating, and testing several new approaches in high accuracy astrometry. These instruments will then be used in observing programs, both at the University of Maryland in conjunction with the U.S. Naval Observatory. A second area of study is amplitude interferometry, a technique for obtaining extremely high angular resolution through the earth's atmosphere. This is primarily directed to stellar diameter and surface features. The applicant should have significant experience in some of the areas of optical systems, photoelectric detectors, interferometry, and computer programming. The position will be a 2-year appointment with a third year renewal expected. Salary will be appropriate to the experience of the appointee. Resume and bibliography should be sent as soon as possible to: **Professor Douglas G. Currie, Department of Physics and Astronomy, University of Maryland, College Park, Maryland 20742. The University of Maryland is an Equal Opportunity/Affirmative Action Employer.**

RESEARCH ASSOCIATE IN DEVELOPMENTAL BIOLOGY/MOLECULAR VIROLOGY. Participates in research aimed at developing methods of infecting chicken germ-line cells with retroviruses. Temporary, 1-year position with U.S. Department of Agriculture at Regional Poultry Research Laboratory in East Lansing, Michigan. Salary: \$23,566 to \$36,723, depending on qualifications. For applications, contact: **Marie Bishop, USDA-ARS-NCRC-C1, 2000 West Pioneer Parkway, Peoria, Ill. 61615. Telephone: 309-671-7134. Equal Opportunity Employer.**

RESEARCH ASSOCIATE

SEEKING: Ph.D. in Enzymology/Membrane Biology. Research will entail studies on the enzymes regulating endogenous oxalate production and/or the uptake of oxalate by intestinal brush border membranes. Salary: \$17,500 to \$18,500 per year. Two-year appointment. Send curriculum vitae and letters of references to: **Dr. Mani Menon, Division of Urology, Washington University Medical Center, St. Louis, Mo. 63110. An Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN

The University of California, Irvine, College of Medicine, is seeking applicants for a **RESEARCH ASSOCIATE, Ph.D.** position at the assistant professor level, to direct study of clinical uses of evoked potentials in neurological disorders with particular attention to electrophysiological correlation of cognitive disorders. Knowledge of digital computer use and programming, and prior experience in human evoked potentials required. *An Equal Opportunity/Affirmative Action Employer.* Send curriculum vitae and request three letters of reference to be sent to: **Arnold Starr, M.D., Department of Neurology, University of California, Irvine, Calif. 92717. Appointment is for 3 years duration, contingent on grant funding. Position available 1 July 1982.**

RESEARCH ASSOCIATES, with Ph.D. in biochemistry, cell, or molecular biology. Positions are available immediately to study the role of cyclic AMP-dependent phosphorylation in hormonal regulation of gluconeogenesis and transport in kidney. These processes will be examined with purified enzymes and isolated epithelial cells. Other positions are available to study the biosynthesis and secretion of cell surface antigens in tumor cells and acidic mucin glycoproteins in respiratory tissue. These studies will involve carbohydrate structural analysis and gene regulation in isolated cell systems using current DNA technology. Salary: \$16,000.

Send resume and references to:

**Dr. Joseph Mendicino
Department of Biochemistry
University of Georgia
Athens, Ga. 30602**

RESEARCH ASSOCIATE position available after 1 September 1982 for studies of regional oxygen supply and demand during hypoxia. Recent Ph.D. with interests in respiration and circulation and especially in problems relating to oxygen transport to tissues would be suitable. Salary follows NIH guidelines for postdoctoral fellowships. Send curriculum vitae and two letters of reference to: **Dr. Stephen M. Cain, Department of Physiology and Biophysics, 401 Volker Hall, University of Alabama in Birmingham, University Station, Birmingham, Alabama 35294.**

The University of Alabama in Birmingham is an Equal Opportunity/Affirmative Action Employer.

RESEARCH ASSOCIATE POSITION (postdoctoral) in studying the stimulus-secretion coupling mechanism in salivary gland cells, specifically the regulatory role of calcium, cyclic AMP, and cyclic GMP in salivary gland secretion. Previous studies were directed toward the development of a dispersed cell system [PNAS 76, 2789-2793 (1979)] and the characterization of the secretory response of the dispersed cells [Am. J. Physiol. 238, C90-C98 and C99-C106 (1980)]. Our more recent studies involve the evaluation of the role of cyclic AMP and cellular calcium in the regulation of rat submandibular mucous secretion [Am. J. Physiol. 241, C76-C85 (1981)]. Currently, we are investigating the role of cyclic nucleotide phosphorylation in rat submandibular gland secretion [Fed. Proc. 40, (b) Abstr. No. 446 (1981) and Fed. Proc. Abstr., 1982 meetings]. Experience in enzyme purification, subcellular fractionation, radioimmunoassay, or gel electrophoresis desirable. Salary commensurate with experience. Please send curriculum vitae and two letters of reference to: **Dr. David Quissell, Department of Biochemistry, Biophysics and Genetics, University of Colorado Health Sciences Center, 4200 East 9 Avenue, B-126, Denver, Colo. 80262.**

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

RESEARCH OFFICER-LIGHTING

The National Research Council Canada, Division of Building Research, is seeking a research officer with experience in scientific or engineering research to work in its lighting research unit. The incumbent will be expected to conduct original research to augment the current program designed to provide fundamental data for internationally recommended lighting practice. Candidates with strong backgrounds in vision, ergonomics, and experimental design are preferred. Candidates should also be graduates at the master's or Ph.D. levels. Salary of up to \$34,025 per annum will depend upon qualifications. Relocation allowance is available where applicable. Apply in writing to: **Employment Officer, National Research Council Canada, Ottawa, Ontario, Canada K1A 0H6. In reply, please quote BH-82-04-S.**

APPLICATION OF BIOLOGICAL MARKERS TO CARCINOGEN TESTING

16 to 19 November 1982

at the
Holiday Inn
8120 Wisconsin Avenue
Bethesda, Maryland 20814

Sponsored by the U.S. Environmental Protection Agency

This symposium will bring together experts to discuss the current status of biochemical and immunological markers to carcinogenicity as they relate to the detection of cancer in experimental animals. The symposium has three main objectives: (i) to review and update specific markers; (ii) to identify data gaps; and (iii) to recommend research goals. Sessions will encompass in vivo and in vitro antibodies, viruses, and DNA-adducts. Poster sessions will also be scheduled. **DEADLINE FOR POSTER ABSTRACT SUBMISSION IS 15 OCTOBER 1982.**

REGISTRATION FEE: \$200 includes the attendance to all sessions, abstract booklet, one banquet, the reception, continental breakfasts (6 to 8 a.m.), coffee breaks, and proceedings volume. Full-time students with valid I.D. pay \$100. **DEADLINE FOR REGISTRATION IS 31 OCTOBER 1982.**

ORGANIZING COMMITTEE: D. Balinsky, Iowa State University; T. M. Chu, Roswell Park Memorial Institute; A. Hollaender, Associated Universities, Inc.; K. R. McIntire, National Cancer Institute; H. A. Milman (project coordinator), Environmental Protection Agency; R. Reisfeld, Scripps Clinic and Research Foundation; S. Sell (chairman), University of California, San Diego; R. Tice, Brookhaven National Laboratory; A. C. Upton, New York University Medical Center; and E. K. Weisburger, National Cancer Institute.

FOR DETAILS, CONTACT:

Associated Universities, Inc.
1717 Massachusetts Avenue, NW, Suite 603
Washington, D.C. 20036
Telephone: 202-462-4475
Attention: Claire M. Wilson

RESEARCH INVESTIGATOR

Biological Research

G.D. Searle's Research & Development Division has an excellent career opportunity available in the Gastrointestinal Pharmacology Section for an entry level scientist. The successful candidate will have a Ph.D. and postdoctoral training, preferably in GI Pharmacology/Physiology. Primary responsibilities include planning, supervising and conducting preclinical research to evaluate gastric anti-secretory agents. He/She will also become involved in other areas of GI pathophysiology, working as part of our team effort in developing therapeutic agents for other gastrointestinal diseases.

We are located in north suburban Chicago and offer excellent compensation, comprehensive benefits and relocation assistance. For prompt consideration, send your detailed resume in confidence to:

Barbara Gardner
#81166-017

Research & Development Division

G.D. Searle & Co.
Box 5110/Chicago, IL 60680

Equal Opportunity M/F/H...A Practice, Not Just A Policy



DIRECTOR OF PROGRAMS AND SCIENTIFIC ADVISOR

Bureau of Medicine and Surgery

NAVAL MEDICAL RESEARCH AND
DEVELOPMENT COMMAND (NMRDC)

Bethesda, Maryland

Senior Executive Position —
\$54,755 - \$64,600 per annum
(Current pay cap limits salary to \$58,500)

The Director of Programs and Scientific Advisor provides technical program direction for a broad multidisciplinary research, development, test and evaluation (RDT&E) effort directed toward assuring the health, safety and readiness of Navy and Marine Corps personnel worldwide. The incumbent is responsible to the Commanding Officer for the planning, reviewing, directing and technical management of the following highly diversified research programs: Submarine and Diving Medicine, Aviation Medicine, Human Performance, Fleet Health Care Systems, Infectious Diseases, Fleet Occupational Health, Oral and Dental Health, and Electromagnetic Radiation.

To be considered minimally qualified, the incumbent must have a Bachelor's Degree (Ph.D. or M.D. preferred) from an accredited college or university with major study in an academic field relating to the health sciences, or allied sciences pertinent to the research program areas of this position. Total experience must provide evidence that all of the managerial and technical requirements of the position are met. Experience, education, accomplishments, and/or potential must indicate competence to provide leadership for the following: **Managerial Elements:** (1) Integration of Internal and External Program/Policy Issues; (2) Organizational Representation and Liaison; (3) Direction and Guidance of Programs, Projects, or Policy Development; (4) Resource Acquisition and Administration; (5) Utilization of Human Resources; (6) Review and analysis of Implementation and Results. **Technical Elements:** (1) Knowledge of biomedical research as indicated by extensive background as a researcher, or research manager; (2) Ability to direct the formulation, planning, review, implementation and documentation of a diversified medical research and development program; (3) Knowledge of medical RDT&E performed both in private and government sectors; (4) Ability to manage the technical aspects of comprehensive medical research and development programs executed by Navy and contract organizations.

Candidates who meet the basic qualifications will be evaluated by an ADHOC panel on the following factors: scientific reputation/peer recognition; training and education; and honors and awards, and the degree to which they exceed the minimally qualified level of the mandatory professional/technical and managerial/executive qualifications. Additional information may be obtained from Mrs. Ruth Hladchuk, Personnel Staffing Specialist, (202) 295-1420.

Applications (Personal Qualifications Statement, SF-171) are to be sent to:

Consolidated Civilian Personnel Office
Northwest, National Naval Medical Center
Bethesda, Maryland 20814.

Announcement No. NMRDC-40-82 (S)

Applications must be postmarked no later than May 17, 1982.

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POSITIONS OPEN

NEUROBIOLOGY RESEARCH CENTRE THE UNIVERSITY OF SYDNEY Research in Developmental Neurobiology

The Australian Government has established this Centre under the directorship of Dr. M. R. Bennett, F.A.A. Research projects are aimed at elucidating the mechanisms which govern the development of motor and sensory neurons, together with their synaptic connections. Applicants are now invited for several positions in neuroimmunology and electrophysiology at the research fellow and postdoctoral fellow levels.

Neuroimmunologists should have expertise in one or more of the techniques of monoclonal antibodies, cell separation (FACS), cytochemistry, and tissue culture. Electrophysiologists should have expertise in one or more of the techniques of intracellular recording from embryonic or cultured cells, intracellular staining of cells by iontophoresis, power spectral analysis, and the patch-clamp. Research fellows may be joined in their project(s) by postgraduate students. Excellent facilities are provided together with supporting technical staff.

Salary range for research fellows is A\$20,963 to A\$27,539 and for postdoctoral fellows, A\$18,068 to A\$20,171. Appointments in first instance is from 3 to 6 years.

Applications should include detailed curriculum vitae, bibliography (and three selected recent reprints), together with the names and addresses of three referees. These should be sent by 15 May to: Dr. M. R. Bennett, Neurobiology Research Centre, The University of Sydney, N.S.W. 2006, Australia.

STAFF POSITION. We are seeking an outstanding research investigator whose program involves the **ROLE OF MEMBRANES IN DIFFERENTIATION**. The department's research efforts are focused around membranes and membrane-related phenomena. Salary is competitive. Send curriculum vitae, bibliography, references, and a brief outline of research program to: Dr. Martin Morrison, Department of Biochemistry, St. Jude Children's Research Hospital, P.O. Box 318, Memphis, Tennessee 38101.

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VERTEBRATE PALEONTOLOGY—Curator in vertebrate paleontology and instructor in biology; first semester temporary appointment starting September 1982. Must have a master's degree and at least 2 years of work toward a doctoral degree. Must be familiar with Idaho Pleistocene paleontology, have experience in mounting skeletons of medium to large fossil vertebrates, and be able to teach vertebrate paleontology. Applicants should send curriculum vitae and names, addresses, and telephone numbers of three references to: Michael Perry, Idaho Museum of Natural History, Idaho State University, Pocatello, Idaho 83209. *An Equal Opportunity Employer.*

VIROLOGIST/VETERINARY VIROLOGIST. Conducts basic and applied research on avian tumors and viral diseases. Team-oriented, multidisciplinary program utilizes basic/molecular approaches to solve practical problems. Ph.D. or D.V.M. desirable. Career position with U.S. Department of Agriculture at Regional Poultry Research Laboratory in East Lansing, Mich. Minimum salary: \$28,245. For applications, contact: Marie Bishop, USDA-NCRO-W1, 2000 West Pioneer Parkway, Peoria, Ill. 61615. Telephone: 309-671-7134. *Equal Opportunity Employer.*

FELLOWSHIPS

Saint Mary's University, Halifax, Nova Scotia POSTDOCTORAL FELLOWSHIP

Synthesis of analogs of the antitumor drug DTIC and application of triazenes in heterocyclic synthesis. Stipend at current NSERC rates (maximum: \$16,380 per annum).

Curriculum vitae and two letters of recommendation to be sent to:

Professor Keith Vaughan
Department of Chemistry
Saint Mary's University
Halifax, Nova Scotia, Canada B3H 3C3

FELLOWSHIPS

POSTDOCTORAL RESEARCH ASSOCIATES

Postdoctoral fellowships are available in the following areas: (i) The immunobiology of aging, (ii) the influence of nutrition on immune function, aging, and vascular disease, and (iii) the influence of prostaglandins on immune function and vascular disease. Interested applicants should send curriculum vitae to: Dr. Marc Weksler, Cornell University Medical College, 1300 York Avenue, New York, N.Y. 10021.

The University of California, Irvine, College of Medicine, offers a **POSTDOCTORAL FELLOWSHIP IN NEUROPHYSIOLOGY** to work on neuronal mechanisms of alcohol in the CNS. The research primarily involves using extracellular and intracellular recording techniques and a background in electrophysiology is required. *An Equal Opportunity/Affirmative Action Employer.* Interested persons please send curriculum vitae to and request three letters of reference to be sent to: Nal-Shin Chu, M.D., Ph.D., Department of Neurology, College of Medicine, University of California, Irvine, Calif. 92717. Salary range: \$1328 to \$1654 per month. Position available 1 July 1982.

SURGICAL RESEARCH FELLOWSHIP. Candidates (M.D.'s or Ph.D.'s) with strong interest in cardiovascular physiology will be considered, especially with experience in animal surgery. Ongoing studies in cardiodynamics, cardiovascular prosthesis, and training in advanced research methodology. Send curriculum vitae, statement of research interests, and letters of recommendation to: Dr. J. Yasha Kresh, Director of Research, Division of Cardiothoracic Surgery, Jefferson Medical College, 1025 Walnut Street, Philadelphia, Pa. 19107.

NEW ZEALAND SENIOR AND POSTDOCTORAL RESEARCH FELLOWSHIPS

The New Zealand National Research Advisory Council invites applications for 12 senior and postdoctoral research fellowships to be taken up in 1983. The awards will be for scientific research in government departments. A good working knowledge of English is required. Successful candidates must meet the requirements of the New Zealand immigration authorities.

Return economy class air fares and reasonable traveling expenses incurred in connection with the research work in New Zealand will be paid.

All emoluments are taxable.

Senior research fellowships—Applicants should have distinguished record of scientific research and/or administration and possess expertise in a field of particular interest to New Zealand.

Postdoctoral research fellowships—Applicants should possess a Ph.D. or equivalent degree and have some research experience since graduation.

Application forms and further particulars may be obtained from:

National Research Advisory Council
Box 12240
Wellington, New Zealand

or any New Zealand diplomatic post overseas.

Applications should reach the Council's office by 1 September 1982. Late or incomplete applications will not be accepted.

IMPERIAL CANCER RESEARCH FUND RESEARCH FELLOWSHIP

Applications are invited for a 3-year postdoctoral appointment to work with Dr. Ian Kerr on the biochemistry of interferon action, the regulation of the interferon response, and the role of the 2-5A system in relation to its wider possible significance in the control of cell growth and development. Experience with proteins and nucleic acids or genetic engineering techniques or membrane biochemistry and some familiarity with handling cells in tissue culture are desirable.

The position is available immediately and candidates should be free to take up the appointment by October 1982. Salary range: £8,787 to £10,837 (inclusive of London Allowance), with entry according to qualifications and experience.

For further information, contact: Dr. Ian Kerr, telephone: 01 242 0200, extension 337. Applications with full curriculum vitae and the names and addresses of two referees should be sent to: Secretary, Imperial Cancer Research Fund, Lincoln's Inn Fields, London WC2, England, by 31 May 1982, if possible quoting reference 45/82.

FELLOWSHIPS

NRSA POSTDOCTORAL FELLOWSHIP in immunogenetics of blood coagulation proteins available 1 July 1982. Hybridoma experience desirable. *Female and minority applicants encouraged.* Send curriculum vitae and names of at least three references to: Dr. Howard Reisner, Department of Pathology, School of Medicine, University of North Carolina, Chapel Hill, N.C. 27514. *An Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL FELLOWSHIP IN NEURAL CONTROL OF THE CARDIOVASCULAR SYSTEM. A limited number of fellowship positions are available funded by an NIH training grant. Clinical and basic scientists participate in the program with major emphasis on neural pathways, hypertension, cardiovascular pharmacology, exercise, alcoholic heart muscle disease and exercise, electrophysiology, cardiac biochemistry, and biofeedback. The positions are open to U.S. citizens and permanent residents who have Ph.D., M.D., or equivalent degrees in a basic biomedical discipline.

Applicants should send curriculum vitae with three references and specific area of interest to: Dr. H. Lowell Stone, Department of Physiology and Biophysics, University of Oklahoma Health Sciences Center, P.O. Box 26901, Oklahoma City, Oklahoma 73190.

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QUERY

ESTABLISHMENT OF A FUTURE NEUROBIOLOGY INSTITUTE. Prominent developmental neurobiologist is exploring possibility of establishing an Interdisciplinary Brain Research Institute in United States or abroad to study both basic and clinical aspects of child mental disabilities. Scientists interested in considering and discussing such an endeavor may contact: Box 119, SCIENCE, for more information.

SYMPOSIUM

CELLULAR AGING IN THE VASCULAR SYSTEM: IN VIVO AND IN VITRO APPROACHES

16 to 18 August 1982

W. ALTON JONES CELL SCIENCE CENTER
LAKE PLACID, N.Y.

Co-Directors:

George M. Martin
University of Washington
Seattle, Washington

James R. Smith

W. Alton Jones Cell Science Center
Lake Placid, New York

Topics to be covered include in vivo and in vitro investigations related to normal structure and function, characteristics of senescence, and pathology of the major cells which comprise the vascular system. This 2½-day meeting will consist of a 2-day series of formal presentations by invited speakers, a half-day session of short submitted and invited papers, and a poster session.

For information contact:

Dr. James R. Smith
W. Alton Jones Cell Science Center
Lake Placid, New York 12946

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Candidates for this senior scientist position should have a research background and an interest in renal pharmacology. A minimum of three years of post-doctoral experience and a demonstrated ability to pursue independent creative research are prerequisites for this position.

The successful candidate will assume responsibility for a program designed to develop novel antihypertensive therapy.

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Reply to: Dr. Robert A. Schlenker
Chairman, Search Committee
Box ALD
Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL, 60439



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PhD Microbiologists

American Cyanamid's Consumer Products Research Division is adding staff to our newly established DISCOVERY RESEARCH DEPARTMENT.

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Successful candidates will be skilled in the classical techniques of Microbiology and be capable of adapting biochemical, enzymological and immunological assays to microbial systems. Interaction with scientific staffs at the company's Medical, Chemical and Agricultural Research labs is expected.

These positions offer long-term professional growth in a challenging and rewarding environment with competitive salary and fringe benefits. Send resume and salary history to: G. J. Stein, American Cyanamid Company, Consumer Products Research Division, 697 Route 46, Clifton, NJ 07015



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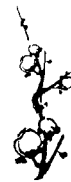
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