

## Form in the Mineral Kingdom

**The Scientific Reinterpretation of Form.** NORMA E. EMERTON. Cornell University Press, Ithaca, N.Y., 1984. 319 pp., illus. \$29.95. Cornell History of Science Series.

That the organization and individuality of every species of matter were due to something other than the matter itself was a fundamental tenet of ancient philosophy. Transcendent, as with Plato, or immanent, as with Aristotle, that something was known most generally as "the form." The form was so inextricably bound up with matter in perceptible bodies that it could never be isolated except by philosophical analysis; nevertheless its independent existence was hardly questioned for two millennia. Matter was passive, and without form it could have no shape, purpose, meaning, direction, or any other specific characteristic.

The concept of form is most easily grasped in the organic realm. If we are without specialized knowledge, even now common sense still assures us that the form of the oak tree, for example, is in the acorn, just as common sense still assures us that the sun rises and sets. Emerton has wisely left most discussion of organic form aside, however, in order to focus on the somewhat simpler case of mineral form.

Even so the story is a complex one. In his *Metaphysics* Aristotle had defined form as "that by reason of which the matter is some definite thing." Aristotle strove to maintain an ontological balance between matter and form and "criticized both the materialistic atomists who ignored the form and the Platonists who overemphasized it" (p. 49). But in the long centuries of Aristotle's philosophical dominance the views he had promulgated were more often than not modified by influences external to his own system: the preeminence of light as first form from Platonizing Augustinian theology, forms as the seminal reasons (*logoi spermatikoi*) of the Stoics, form as the geometry of the world-shaping Platonic solids, form as world soul—be it conceived as Plato's Demi-Urge, as an alchemical Archeus, or as the astrological "power of the heavens." In the Lovejoy tradition of the history of ideas, Emerton's work presents a rich panorama of the uses to which the concept of form was put in the Middle Ages, Renaissance, and early modern period.

Although some philosophical variants involved a "low" view of form that associated it very closely with matter, more often the thinkers discussed by

Emerton preferred an "exalted" concept of form that associated form with divine activity. The scientific reinterpretation of form, however, which is the primary focus of the book, required that form come to be identified with particular aspects of matter itself. Of importance in this process was Aristotle's "mixture" theory (for what we would now call the formation of chemical compounds), and also the concept of "minima" associated with it. Minima were conceived as the smallest "parts" of a substance that still possessed the form of the whole—a concept not very different in some ways from that of the modern chemical molecule.

To a certain extent minima proved to be more useful in the scientific reinterpretation of form than did atoms. "Atoms were the ultimate building blocks of all matter, solid and indestructible, whereas minima were not fundamental particles but a temporary state of matter enabling change to take place, and their function was to be the vehicle of the form—a conception that was meaningless in atomistic terms" (p. 90). Given various reinterpretations from the 16th to the early 19th century in terms of corpuscles and in terms of form-bearing chemical or geometric "seeds," "spirits," and the like, minima eventually became the "integrant molecules" of the crystallographers—those smallest parts of a crystalline substance that have the "primitive form" of the whole.

Omitted from Emerton's account of the scientific reinterpretation of form, however, is any serious discussion of the long parallel evolution of the chemical concept of the element that culminated in the work of Lavoisier. The chemists had effectively destroyed the ancient concept of one common matter, the concept of matter that had required the concept of form for its differentiation in the first place. In their lists of differentiated and nontransmutable substances the chemists had already coalesced matter and form by insisting that the matter of each element was distinctive. It was then possible to coalesce the concept of minima with the concept of atoms, which is what Dalton did in describing the atoms themselves as differentiated—as the smallest form-bearing parts of the differentiated elements. But even if those aspects of late 18th- and early 19th-century chemistry should be included in a more comprehensive reconstruction of the scientific reinterpretation of form, Emerton's book offers an excellent account of the transition from philosophy to science in the development of mineral-

ogy and crystallography. Her way of conceptualizing the problems involved is significant and may well prove useful to others attempting to define the rise of modern science.

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## Books Received

**Acts of Will.** The Life and Work of Otto Rank. E. James Lieberman. Free Press (Macmillan), New York, 1985. xl, 485 pp. + plates. \$24.95.

**Adult Heart Muscle Cells.** Isolation, Properties and Applications. H. M. Piper and P. G. Spieckermann, Eds. Steinkopf, Darmstadt, Germany, and Springer-Verlag, New York, 1984. 166 pp., illus. \$24. Supplement to *Basic Research in Cardiology*, vol. 80. From a conference, March 1984.

**The Creative Explosion.** An Inquiry into the Origins of Art and Religion. John E. Pfeiffer. Cornell University Press, Ithaca, N.Y., 1985. xviii, 270 pp., illus. Paper, \$12.95. Reprint, 1982 edition.

**Critical Care in Internal Medicine.** D. Robert McCaffree, Ed. Karger, Basel, 1985. viii, 350 pp. \$57. Progress in Critical Care Medicine, vol. 2. From a course, Oklahoma City, 1984.

**Current Ornithology.** Vol. 2. Richard F. Johnston, Ed. Plenum, New York, 1985. xiv, 364 pp., illus. \$39.50.

**Curves and Singularities.** A Geometrical Introduction to Singularity Theory. J. W. Bruce and P. J. Giblin. Cambridge University Press, New York, 1985. xii, 222 pp., illus. \$39.50; paper, \$15.95.

**The Dark Abyss of Time.** The History of the Earth and the History of Nations from Hooke to Vico. Paolo Rossi. University of Chicago Press, Chicago, 1985. xvi, 338 pp. \$35. Translated from the Italian edition (Milan, 1979) by Lydia G. Cochrane.

**Decision and Control in Uncertain Resource Systems.** Marc Mangel. Academic Press, Orlando, Fla., 1984. xiv, 255 pp. \$39.50. Mathematics in Science and Engineering, vol. 172.

**Hormonal Proteins and Peptides.** Vol. 12, Growth Factors. Choh Hao Li, Ed. Academic Press, Orlando, Fla., 1984. xx, 307 pp., illus. \$65.

**Human Anatomy and Rabbit Dissection.** Bruce D. Wingerd. Illustrated by Geoffrey Stein. Johns Hopkins University Press, Baltimore, 1985. xvi, 128 pp. Paper, \$18.95.

**Human Motivation.** Bernard Weiner. Springer-Verlag, New York, 1985. x, 480 pp., illus. \$39.50.

**I Think, Therefore I Laugh.** An Alternative Approach to Philosophy. John Allen Paulos. Columbia University Press, New York, 1985. viii, 163 pp., illus. \$20; paper, \$9.95.

**Idiopathic, Food-Induced and Drug-Induced Pseudo-Allergic Reactions.** P. Dukor *et al.*, Eds. Karger, Basel, 1985. viii, 193 pp. \$72. PAR: Pseudo-Allergic Reactions, vol. 4.

**Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria.** Vol. 1. Jean F. MacFaddin, Williams and Wilkins, Baltimore, 1985. xl, 928 pp., illus. Spiral bound, \$89.95.

**Mediators in Cell Growth and Differentiation.** Richard J. Ford and Abby L. Maizel, Eds. Raven, New York, 1985. xx, 368 pp., illus. \$82. UT M.D. Anderson Symposium on Fundamental Cancer Research, vol. 37. From a symposium, Houston, March 1984.

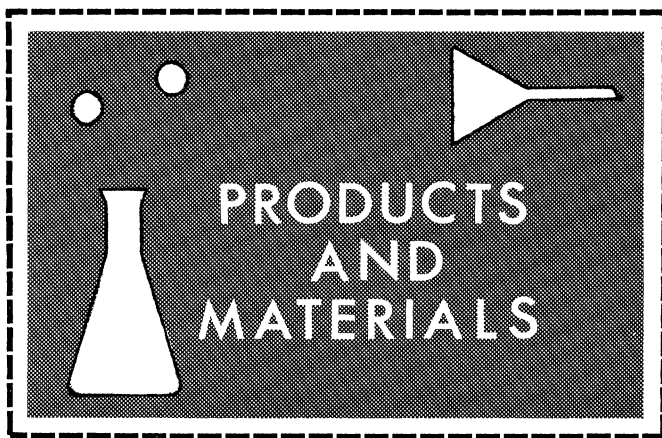
**Medical Microbiology.** Vol. 4. C. S. F. Easmon and J. Jeljaszewicz, Eds. Academic Press, Orlando, Fla., 1984. xvi, 342 pp., illus. \$65.

**The Metabolism of the Human Brain Studied with Positron Emission Tomography.** Torgny Greitz, David H. Ingvar, and Lennart Widén, Eds. Raven, New York, 1985. xxviii, 507 pp., illus. \$98. From a conference, Saltsjöbaden, Sweden, May 1983.

**Methods in Microbiology.** Vol. 17, Plasmid Technology. P. M. Bennett and J. Grinstead, Eds. Academic Press, Orlando, Fla., 1984. x, 331 pp., illus. \$35.

**Techniques in Photomorphogenesis.** Harry Smith and M. G. Holmes, Eds. Academic Press, Orlando, Fla., 1984. xii, 308 pp., illus. \$65. Biological Techniques Series.

**Text Processing.** A. Colin Day. Cambridge University Press, New York, 1984. x, 141 pp., illus. \$29.95; paper, \$12.95. Cambridge Computer Science Texts, 20.



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### Chemical Reaction Cell

The CIR reaction cell utilizes the cylindrical internal reflection technique to monitor chemical reactions in situ. It is compatible with all FTIR spectrometers. Reaction kinetics and the formation of chemical intermediates may be monitored in real time. The cell features magnetic stirring and withstands pressures to 1500 psi and temperatures to 250°C. Standard construction features stainless steel but the cell is available in other materials. Spectra-Tech. Circle 613.

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### Literature

*Megabore, the Packed Column Alternative* features a solid support with integral stationary phase for gas chromatography. J & W Scientific. Circle 599.

*Rotary Evaporation Systems* introduces the Buchi line including automatic operation via microprocessor. Brinkmann Instruments. Circle 601.

*Photosensitive Devices* catalogs apparatus for special purposes. Specifications and references are included. ITT Electro-Optical Products Division. Circle 602.

*Immunoperoxidase References* is a bibliography of usage of the biotin-avidin-based Vectastain ABC technique. Vector Laboratories. Circle 615.

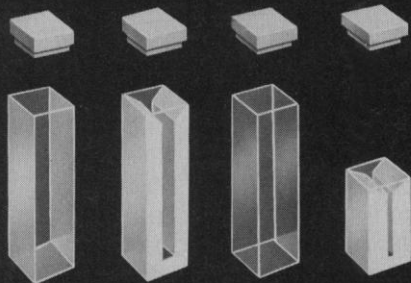
*Spectroscopy Software* comprises brochures for ultraviolet-visible and fluorescence spectroscopy applications. Perkin-Elmer, Oak Brook Instrument Dept. Circle 618.

*Restriction Enzymes* catalog also offers a method for the generation of additional DNA cleavage specificities through the use of methylases. New England Biolabs. Circle 624.

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**ACADEMIC GENERAL SURGEON** at the University of Michigan Medical Center with emphasis in **burn surgery**. Candidates should have an M.D. degree, A.B.S. certification, demonstrated skills as a clinical general surgeon, with special interest and experience in caring for burn patients, prior related research, teaching and administrative experience. Send curriculum vitae and names of three references to: **Robert H. Bartlett, M.D., Professor and Head, Section of General Surgery, The University of Michigan Hospitals, D2254 Medical Professional Building, Box 045, Ann Arbor, Michigan 48109. The University of Michigan is a nondiscriminatory, Affirmative Action Employer.** PCN 253.

Immediate opening for Ph.D. as **ASSISTANT CHAIRMAN**. Experience in neurobiology, physiology, neuropsychology, or similar. Strong administrative skills and ability to communicate effectively with other faculty, staff, and students essential. Responsibilities: interacting with University administration at all levels; overseeing departmental and research grant accounts; coordination of departmental teaching, graduate student recruiting and financial aid, and so forth. Duties are largely administrative but applicants interested in contributing to teaching or research are welcome. Application and curriculum vitae to: **Dr. Christina Enroth-Cugell, Chairman, Department of Neurobiology and Physiology, Northwestern University, Hogan Hall, Evanston, Illinois 60201. Northwestern is an Equal Opportunity Employer.**

**ASSISTANT PROFESSOR**. The Department of Biochemistry is seeking a person with significant experience in the areas of bacterial chemotaxis and neurochemistry of mammals. Strong training in chemistry, biochemistry, and microbiology are preferred. Ph.D. in molecular biology is required; postdoctoral experience for more than 3 years preferred. A candidate will be expected to conduct a research program in sensory transduction of oxygen in bacteria and carotid body and to assume normal academic responsibilities. *Only U.S. citizens may apply.* Applicants for the position should provide curriculum vitae, a short description of their research plan, and names of three references by 14 June 1985. Send applications to: **Dr. Charles Slattery, Department of Biochemistry, School of Medicine, Loma Linda University, Loma Linda, Calif. 92350.**

## Cryo-Techniques for Electron Microscopy

September 22-27, 1985

a laboratory course at the

## Duke University Marine Laboratory

Principal faculty:

John Shelburne

Peter Ingram

Ann LeFurgey

John Silcox

Attendance limited to 12

For more information contact:



Woods Hole  
Educational  
Associates

Box EM, Woods Hole, MA 02543

(617) 540-5594

## Soybean Geneticist

Immediate opening for Soybean Geneticist.

The soybean geneticist carries out basic and applied research involving the following areas: Plant genetics, Plant breeding and cytogenetics. This research impacts the quality and quantity of grain yield and production efficiency in soybeans. Responsibilities include design, interpretation and evaluation of experimental protocols and data and management of program resources. In addition, the incumbent will be asked to develop and complete testing of genetic lines, chemicals, alternate agronomic practices and modified biological systems, all of which could significantly improve soybean yields and production efficiency. These improvements will be attained by using conventional genetic and breeding techniques, as well as the results of new technology such as tissue culture and bioengineering.

This position requires a Ph.D. degree in Plant Genetics and either one year's documented postdoctoral experience in a job of the type being offered or two years' documented postdoctoral experience in soybean genetics. The two years' experience in soybean genetics must have included at least six months' documented experience in all of the following three areas, which six months' periods may have overlapped: a) soybean cytogenetics, b) soybean germplasm evaluation and c) field work which included plot design and statistical analysis.

Also required is documentation of the ability of the applicant to carry out the design of complete genetic experiments and thorough evaluation and communication of the experimental results obtained from those genetic experiments. The applicant must document that he or she has general knowledge of the techniques involved in both tissue culture and bioengineering.

The applicant must have a documented working knowledge of computer utilization. Also required is documentation that applicant possesses interpersonal skills enabling him or her to work effectively with other scientists in other biological and biochemical programs.

Salary: \$35,000 to \$43,000, commensurate with experience.

Qualified candidates should send resumes and documentation of above minimum requirements to: **June Carroll #286647; Job Service; Missouri Division of Employment Security; 505 Washington Avenue; St. Louis, Missouri 63101.** Equal Opportunity Employer M/F/H/V.

## POSITIONS OPEN

### ASSISTANT PROFESSOR

Applications are invited for a position at the level of assistant professor in the Department of Pharmacology of the Yale University School of Medicine. Applicants must have the Ph.D. degree, postdoctoral experience, and a strong commitment to develop antineoplastic agents. The position is for a bioorganic chemist or a medicinal chemist with interest and experience in the design and synthesis of cancer chemotherapeutic agents and in elucidation of the molecular mechanisms by which they express their cytotoxic actions. Interested candidates should send curriculum vitae, transcripts, reprints, description of areas of research interests, and the names of three individuals who are familiar with the candidate's abilities by 1 July 1985 to: **Dr. John P. Perkins, Department of Pharmacology, Yale University School of Medicine, New Haven, Conn. 06510.** An Equal Opportunity/Affirmative Action Employer.

### ASSISTANT PROFESSOR OF PHARMACOLOGY

Applications are being solicited for a 12-month, tenure-track position at the assistant professor level in pharmacology. The successful applicant will have an earned doctorate in pharmacology and have the potential to develop an independent research program. A significant portion of time will be spent teaching pharmacology to second year medical students. Experience in educational activities is, therefore, desirable. Interested individuals are asked to submit curriculum vitae and three letters of reference to: **Dr. Alvin S. Levine, Assistant Dean and Director, Terre Haute Center for Medical Education, Indiana University School of Medicine, 135 Holmstedt Hall, Terre Haute, Ind. 47809.** Indiana University is an Equal Opportunity/Affirmative Action Employer.

### ASSISTANT PROFESSOR—PLANT ECOLOGY

Nontenure-track, 2-year position available 1 September 1985; Ph.D. required. Successful candidate will be expected to conduct research in the vicinity of the Kellogg Biological Station. Teaching responsibilities include an undergraduate field course in plant ecology and graduate seminars. Send curriculum vitae, reprints, statement of research interests, and three letters of recommendation by 15 June to: **Search Committee, Kellogg Biological Station, Michigan State University, Hickory Corners, Michigan 49060.** An Affirmative Action/Equal Opportunity Employer.

### ASSOCIATE DEAN AND DIRECTOR

The associate dean and director is responsible for coordinating the mission of the New Mexico Agricultural Experiment Station and accepts other appropriately delegated responsibilities assigned by the dean of the College of Agriculture and Home Economics. Applicants should have an earned doctorate and administrative experience is desirable. Candidates should have substantial experience in research, plus knowledge of the teaching, research, and extension organization unique to land-grant universities. Application deadline is 1 July 1985. Send résumé plus names, addresses, and telephone numbers of five references to: **G. M. Southward, Experimental Statistics, Box 3130, New Mexico State University (NMSU), Las Cruces, N.M. 88003.** Telephone: 505-646-2937. NMSU is an Equal Opportunity/Affirmative Action Employer.

**CELL BIOLOGIST/IMMUNOLOGIST.** Assistant professor position available 1 June 1985 to study complement system of the lung and acute lung injury. Salary negotiable. Inquiries and résumé to: **Richard A. Robbins, M.D., Section of Pulmonary Medicine, Department of Internal Medicine, University of Nebraska Medical Center, 42nd and Dewey Avenue, Omaha, Neb. 68105.** Telephone: 402-559-4087.

Equal Opportunity/Affirmative Action Employer

**INTERNATIONAL RESEARCH ORGANIZATION** concentrating on family health programs (including family planning) seeks a **DEPUTY DIRECTOR** for its Clinical Trials Group. Successful candidate will be an M.D., Pharm.D. or Ph.D. in pharmacology, pharmaceuticals, or closely related field with a minimum of 3 years of experience in the planning, execution, and evaluation of clinical drug development studies. Experience in drug regulatory affairs highly desirable. Demonstrated experience in the preparation and review of research materials required. Send résumé to: **Family Health International, 1 Triangle Drive, Research Triangle Park, N.C. 27709.** An Equal Opportunity/Affirmative Action Employer, M/F/H/V.

## POSITIONS OPEN

**BIOLOGY.** Chatham College, an independent liberal arts college for women, is accepting applications for a full-time instructor or assistant professor in its Biology Department effective September 1985. The Ph.D. and teaching experience are preferred, but ABD's may be considered. The successful candidate will be expected to teach the following courses: genetics, human genetics, and microbiology; and possibly develop and teach courses in biology of disease and gerontology. In addition, the individual will be expected to advise students, supervise student research projects, and have an ability and willingness to participate in a liberal arts, interdisciplinary core curriculum. Independent research is encouraged. Send letter of application, curriculum vitae, and the names of three references to: **Dr. Conrad Hess, Chairman, Biology Department, Chatham College, Pittsburgh, Pa. 15232.** Equal Opportunity Employer.

### CELL BIOLOGIST

Nationally recognized scientist with a strong background in one of the following areas—cellular lipid metabolism, action of growth factors, or leukocyte activation—is essential, particularly as related to the initial etiology and development of atherosclerosis. Such an investigator would participate in a multidisciplinary approach to the early detection and/or prevention of atherosclerotic vascular changes. **Box 102, SCIENCE.**

**CELL BIOLOGY/BIOCHEMISTRY OF A HORMONE RECEPTOR.** Immediate postdoctoral research associate position for work on the parathyroid hormone receptor. Possible projects include isolation and characterization, internalization and membrane cycling, monoclonal antibodies, and study of the structural basis for the hormone-receptor interaction. Excellent salary and fringe benefits; stimulating scientific environment in a basic science department; outstanding living conditions in Cleveland Heights and Shaker Heights; world class music, arts, drama, parks, sailing, and professional sports. Apply to: **Dr. James E. Zull, Department of Biology, Case Western Reserve University, Cleveland, Ohio 44106.**

### IN VITRO FERTILIZATION LABORATORY COORDINATOR

Position available for a gamete physiologist/embryologist to direct a private in vitro fertilization laboratory in Orlando, Florida. Must have experience in tissue and embryo or egg culture techniques. Salary commensurate with experience. Send letter of application and curriculum vitae to:

Gary W. DeVane, M.D.

Box J-294

Department of Obstetrics/Gynecology  
University of Florida College of Medicine  
Gainesville, Fla. 32610  
Telephone: 904-392-5680

Affirmative Action/Equal Opportunity Employer

**ENDOCRINOLOGY.** Assistant professor. One-year position, starting 15 September 1985, to teach endocrinology and general biology. Research opportunities available. Position available for recent Ph.D. or faculty on leave. Submit curriculum vitae and two letters of recommendation by 1 July 1985 to: **Dr. Frank L. Moore, Department of Zoology, Oregon State University (OSU), Corvallis, Ore. 97331.** OSU is an Affirmative Action/Equal Opportunity Employer and complies with Section 504 of the Rehabilitation Act of 1973.

### THE UNIVERSITY OF MICHIGAN COLLEGE OF PHARMACY FACULTY POSITION IN MEDICINAL CHEMISTRY

Assistant, associate, or full professor, The University of Michigan, College of Pharmacy. Candidates must have a Ph.D. in medicinal chemistry, organic chemistry, biochemistry, or a closely related discipline and an established independent research program. Position requires teaching in undergraduate and graduate medicinal chemistry. Detailed résumé, publications list, reprints of three recent publications, a list of current grant support, and three letters of recommendations should be sent to:

Dr. L. B. Townsend  
Chairman, Search Committee  
College of Pharmacy  
The University of Michigan  
Ann Arbor, Mich. 48109-1065

A nondiscriminatory, Affirmative Action Employer

## POSITIONS OPEN

### CHEMIST

An advanced technologies company is looking for a very special person to work directly with its president and founder. The candidate should have an in-depth knowledge of chemistry, be of exceptional intelligence, and be driven by scientific curiosity. The person whom we seek must have the maturity to work well with an extremely gifted and talented scientist.

Degree level and prior experience are only an aspect of what is important to fill this position.

Résumés are to be sent to: **R. D. Jacquin, Vice President, 470 Main Road, Towaco, New Jersey 07082.**

### DIRECTOR CENTER FOR ALCOHOL STUDIES

The University of North Carolina at Chapel Hill (UNC-CH) seeks a director for the Center for Alcohol Studies, an interdisciplinary center established for the purpose of conducting, coordinating, and promoting basic, clinical, and social and epidemiologic research on the causes and consequences of alcohol use and abuse. The Center is supported with stable core funding by the state of North Carolina, supplemented by research grants and contracts from federal and other sources.

The director is the chief administrative officer of the Center and reports to the dean of the School of Medicine. Candidates should have the M.D., Ph.D., or equivalent degree, a strong record of research achievement and a commitment to continue an active research program, administrative experience, and qualifications for a primary tenure-track appointment at the level of associate or full professor in a basic science or clinical department in the School of Medicine. Nominations and applications should be received prior to 31 July 1985 by: **William E. Lassiter, M.D., Chair, Search Committee for the Director of the Center for Alcohol Studies, Office of the Dean, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, N.C. 27514. UNC-CH is an Equal Opportunity/Affirmative Action Employer.**

## POSITIONS OPEN

### FACULTY POSITION—VIROLOGY

The Department of Virology and Epidemiology, Baylor College of Medicine, invites applications for a tenure-track position in a research-oriented department. We seek an innovative individual with a strong foundation in animal virology to establish an independent, high quality research program in **MOLECULAR VIROLOGY** and to contribute to the departmental graduate program. Appointment will be made at the assistant professor level; salary will be competitive. Applicants should have a Ph.D. or M.D. degree and postdoctoral training. Interested persons should reply by 15 June 1985, by sending curriculum vitae, statement of research interests, and the names of three references to: **Dr. Janet S. Butel, Search Committee, Department of Virology and Epidemiology, Baylor College of Medicine, 1 Baylor Plaza, Houston, Texas 77030. Baylor College of Medicine is an Equal Opportunity Employer.**

### UNIVERSITY OF TORONTO

The Botany Department, University of Toronto, is seeking candidates for **FACULTY POSITION(S)** at the **ASSISTANT PROFESSOR** level under the NSERC University Research Fellowship programme. Although applications are invited from suitably qualified candidates whose research interests are in the area of plant molecular biology and genetics, plant pathology, or developmental plant biology, candidates in all areas of plant sciences will be considered. Salary will be at the assistant professor level and commensurate with experience. The successful candidate(s) will be expected to conduct independent research programmes, collaborate with other faculty in the department in the development of active research groups and teach in their area of expertise. The successful applicants' appointments would start as soon as possible after 1 April 1986. Send curriculum vitae and three letters of reference to: **Dr. J. P. Williams, Chairman, Department of Botany, University of Toronto, Toronto, Ontario, Canada M5S 1A1.** Closing date for receipt of applications is 1 August 1985. *In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents.*

## POSITIONS OPEN

**MARINE BIOLOGY.** Director, Graduate Program in Marine Biology, search continued. Applications are invited for the directorship of the Charleston Higher Education Consortium Graduate Program in Marine Biology. Included in the Consortium are the College of Charleston, The Citadel, the Medical University of South Carolina, and the Marine Resources Research Institute. The appointment carries faculty status at the associate professor or professor level in the Biology Department of the College of Charleston. Appointment is for 11 months each year. Salary is negotiable and is commensurate with experience and academic rank. Approximately one-half of the work effort will be devoted to administration and one-half to teaching and research. Minimum qualifications include: (i) an earned Ph.D. in some area of marine biology, (ii) demonstrated scientific achievement as evidenced by publications and a successful record of externally funded research, and (iii) teaching experience in graduate and undergraduate programs. Preference will be given to candidates with prior administrative experience, particularly in a marine laboratory/university setting. Applicants should submit curriculum vitae, copies of recent reprints, and the names of three references to: **Dr. James W. Smiley, Chairman, Department of Biology, College of Charleston, Charleston, S.C. 29424.** Deadline for receipt of applications is 1 July 1985. *An Affirmative Action/Equal Opportunity Employer.*

### POSTDOCTORAL FELLOW IN BIOCHEMISTRY

Postdoctoral position available immediately to study the expression of oncogenes in premalignant and malignant tissue. Experiments employ recombinant DNA technology and immunological staining of fixed tissue. Experience in these areas highly desirable. Position will be offered for a 1- to 2-year period. Starting salary: \$18,000 to \$20,000, depending on experience. Submit curriculum vitae and three letters of recommendation to: **Dr. Kevin L. Dreher, Department of Biochemistry, School of Medicine, West Virginia University, Morgantown, W. Va. 26506.** Application closing date: 30 July 1985. *West Virginia University is an Affirmative Action/Equal Opportunity employer.*

## Accelerator Physics Head

### Brookhaven National Laboratory

Brookhaven National Laboratory seeks a scientist to establish and to head an Accelerator Physics Branch within High Energy Facilities. The successful candidate will be responsible for building an organization from a nucleus of accelerator physicists now on the staff. The new Branch will provide a coherent framework for theoretical and experimental studies on questions of general and long-term importance to accelerator design, as well as for answers to specific problems relating to the design of the Superconducting Super Collider (SSC), the Relativistic Heavy Ion Collider, the Alternating Gradient Synchrotron (AGS) Booster, the AGS Beam Stretcher, etc. The Head of the Accelerator Physics Branch will report to the Associate Director of High Energy Facilities.

Candidates should have a history of significant accomplishment in accelerator physics or related fields, and the demonstrated ability to organize and lead the work of experienced physicists, engineers, postdoctorals affiliated with the Accelerator Technology Fellows Program, and support staff. Applications and inquiries should be directed to: **Ernest D. Courant, Chairman, Search Committee, Building 902A, Brookhaven National Laboratory, Associated Universities, Inc., Upton, Long Island, NY 11973.** Equal opportunity employer m/f.

**BROOKHAVEN  
NATIONAL LABORATORY**  
ASSOCIATED UNIVERSITIES INC.

## CLINICAL RESEARCH PHYSICIAN

**BOEHRINGER INGELHEIM PHARMACEUTICALS**, one of the fastest growing U.S. pharmaceutical firms, (a part of one of the top 15 pharmaceutical companies in the world) is seeking an experienced Clinical Research Physician to join its expanding Headquarters staff.

The person selected will have an M.D. degree and experience in clinical medicine and in performing drug studies. The ability to design as well as to monitor clinical programs is essential. Knowledge of IND and NDA processes, and other activities involving FDA requirements would be a plus. Evidence of an ability to function in a large organization is also important, with the final goal of bringing a new drug to market.

This position is in our Ridgefield facility which is ideally located near Westchester County, New York, and Danbury, Connecticut. Our compensation package provides you with competitive salary and benefits that include medical insurance, tuition assistance, savings plan, a unique vacation program and more.

Please send resume with salary history/requirements to: **Director, Employee Relations, BOEHRINGER INGELHEIM PHARMACEUTICALS, 90 East Ridge, P.O. Box 368, Ridgefield, Connecticut 06877.** We are an equal opportunity employer m/f/h.



**Boehringer  
Ingelheim**

## POSITIONS OPEN

### WANTED—DIRECTOR OF FERTILITY LABORATORY

Ph.D. with sperm background wanted to run private fertility laboratory and IVF program now functioning in Charleston, South Carolina. Excellent opportunity to be part of a growing center. Send curriculum vitae to: Grant W. Patton, Jr., M.D., 315 Calhoun Street, Charleston, S.C. 29401. Telephone: 803-722-3294.

The University of Michigan Medical School, Department of Anesthesiology, may have, from time to time, several positions available at the **INSTRUCTOR THROUGH PROFESSOR** level. Board-certified or -eligible anesthesiologist qualified to obtain Michigan licensure. Research, clinical, didactic experience necessary. Reply to: **Box 122, SCIENCE**. A nondiscriminatory, Affirmative Action/Equal Opportunity Employer.

## POSITIONS OPEN

Science: **NEUROSCIENCE RESEARCH POSITIONS** available for postdoctoral scientist interested in adult and/or child psychopathology. Tenure-track available for individual with established competence. Generous benefits, New York State position in Rockland suburb of New York City. Send curriculum vitae to: **Search Committee, NATHAN S. KLINE INSTITUTE FOR PSYCHIATRIC RESEARCH, Orangeburg, N.Y. 10962**. An Equal Opportunity Employer, M/F.

**POSTDOCTORAL POSITION.** Microbial and molecular mechanisms of invertebrate settlement. Experience with HPLC and eukaryotic membrane receptors desirable. Multidisciplinary approach with R. M. Weiner and R. R. Colwell, Department of Microbiology. Submit curriculum vitae and names of three referees to: **Dr. Dale B. Bonar, Department of Zoology, University of Maryland, College Park, Md. 20742**. An Equal Opportunity Employer.

## POSITIONS OPEN

### FACULTY POSITION

The Department of Biochemistry and Biophysics, University of California, Davis, invites applications for a full-time (11 months per year) ladder appointment as assistant professor of biochemistry and assistant biochemist in the Agricultural Experiment Station. A Ph.D. or equivalent degree is required in biochemistry or closely related field; postdoctoral experience of at least 2 years is preferred. Preference will be given to applications from individuals with demonstrated research competence in the general areas of molecular biology or cell and developmental biology. The principal teaching duties involve participation in graduate and undergraduate biochemistry courses, advising students, and guiding graduate students to advanced degrees in biochemistry. Applications must be received by 15 August 1985. Applicants should submit a résumé, undergraduate and graduate academic transcripts, copies of publications, outline of proposed research program, and the names and addresses of at least three referees to: **Chair, Search Committee, Department of Biochemistry and Biophysics, University of California, Davis, California 95616**.

*The University of California is an Equal Opportunity Employer and invites applications from all qualified individuals.*

### FACULTY POSITIONS IN PHYSIOLOGY

We are seeking applicants for tenure-track positions in the Department of Physiology of Meharry Medical College. In selecting candidates, we hope to complement an existing departmental strength in neuroscience and neuroendocrinology and to assign teaching responsibility for the cardiovascular sections of the medical and dental curricula. In addition to teaching and participation in the department's graduate training efforts, successful candidates will be expected to perform productive research and achieve extramural support. Applicants must have a Ph.D. degree (or equivalent) and postdoctoral experience. Send curriculum vitae, brief description of research interest, and names and addresses of three references to: **Dr. James G. Townsel, Chairman, Department of Physiology, Meharry Medical College, 1005 D. B. Todd Boulevard, Nashville, Tenn. 37208**. These positions are available 1 July 1985. An Affirmative Action/Equal Opportunity Employer.

The Department of Biology and the Rosenstiel Research Center of Brandeis University invite applications from **MOLECULAR IMMUNOLOGISTS** for a faculty position at the associate or full professor level. Applicants must have a strong record of independent research contributions in immunology that includes work in molecular genetics. Excellence in teaching is also expected. Send curriculum vitae, a short description of accomplished and planned research, and names of three references to: **Dr. Alfred Nisonoff, Rosenstiel Center, Brandeis University, Waltham, Mass. 02254**. Deadline for application is 1 August 1985. *Brandeis University is an Equal Opportunity/Affirmative Action Employer.*

**Job description: POSTDOCTORAL ASSOCIATE** to work on a project on cellular drug metabolism of anthracyclines and cell proliferation.

Duties include setting up of experiments involving biochemical analytical procedures, such as fluorometric and HPLC assays for monitoring of drugs and their metabolites in cells and body fluids. Interpretation of data and interaction within a multifaceted program.

**Qualifications:** A recent Ph.D. in chemistry/biochemistry with experience in analytical procedures such as HPLC is essential. Should be capable of working with minimal supervision in a "team effort" involving tumor cell biologists and biochemists.

Send curriculum vitae and three letters of reference to: **A. Krishan, Ph.D., Comprehensive Cancer Center (D8-4), University of Miami School of Medicine, P.O. Box 016960, Miami, Florida 33101**.

**POSTDOCTORAL POSITIONS** available in magnetic resonance. We seek qualified people with Ph.D. in chemistry, physics, or biophysics with experience in nuclear magnetic resonance spectroscopy to participate in research on biophysical dynamics, nuclear magnetic relaxation dispersion spectroscopy, magnetic imaging contrast agent development, and in vivo magnetic resonance. The laboratory is well equipped. Please send résumé by 7 June to: **Robert G. Bryant, University of Rochester School of Medicine, Box 648, 601 Elmwood Avenue, Rochester, New York 14642**. *The University of Rochester is an Equal Opportunity Employer.*

# EXECUTIVE DIRECTOR

## Program in Mathematical Sciences Education

The National Research Council (NRC), the principal operating arm of the National Academy of Sciences and the National Academy of Engineering, and a nationally prominent non-profit, non-governmental institution located in Washington, DC, invites applications for the position of Executive Director of its prospective Board on Mathematical Sciences Education. The new Board will be a major resource of expertise and analysis of issues arising in the U.S. system of education in the mathematical sciences, with initial emphasis in precollege education. Through its activities the Board will serve as a forum where educators, school officials at the state and local level, the mathematics teaching profession, mathematics associations, and others may address issues of mutual responsibility.

The Executive Director will manage the Board as one of the major program units of the NRC. Responsibilities include providing advice directly to the Chairman of the NRC, program initiation, administration and review, financial oversight, and staff recruitment and supervision.

A Ph.D. or equivalent is desirable. Candidates should have a minimum of 10 to 15 years of experience relating broadly to U.S. resources, issues and programs in mathematical sciences education. Substantial leadership experience is required in program development, policy analysis, and the formulation of workable reform ideas. Familiarity with the activities of state and local government, education and science education programs, the relevant activities of national scientific and professional organizations, and contract and grant procedures as well as teaching experience in mathematics is desirable. Salary in \$60's.

Applicants should send a résumé to the  
**Executive Officer, National Research Council,  
2101 Constitution Ave., NW, Washington, DC 20418.**

An Equal Opportunity Employer.



## POSITIONS OPEN

**HUMAN ANATOMIST/PHYSIOLOGIST.** Assistant professor position starting August 1985. Teaching responsibilities will include lecture and laboratory instruction in human anatomy and human physiology or pathology in the School of Health Sciences. A doctoral degree and teaching experience in the above areas are essential. Send curriculum vitae and the names and addresses of three references to:

**J. L. Callahan, Ph.D., Director**  
School of Health Sciences  
148 Lake Michigan Hall  
Grand Valley State College  
Allendale, Mich. 49401

Interviews will begin mid-June. Applications will be accepted until the position is filled.

**IMMUNOLOGY Ph.D.** wanted to run transplant immunology laboratory. Must have experience in cellular immunology—in vitro immune responses, cell separation and culture techniques, safe use of radioactive isotopes—and be willing to direct and assist research technicians in performance of simple and complex procedures. Some experience with UV irradiation and epidermal cell reactions preferred; 2 to 3 years of postdoctoral experience required. Applicants should submit curriculum vitae to: **Jay C. Fish, M.D., Department of Surgery, University of Texas Medical Branch (UTMB), Galveston, Texas 77550.**

*UTMB is an Affirmative Action/Equal Opportunity Employer.*

### POSTDOCTORAL POSITION IN DEVELOPMENTAL NEUROBIOLOGY AND NEUROTOXICOLOGY

An immediate opportunity for a postdoctoral research position is available in developmental neurobiology and neurotoxicology. The research includes development and differentiation of macroglial cell types, microglial cells and their reaction to injury. The laboratories are also engaged in the study of the effects of heavy metals on growth and development of the CNS. Backgrounds in immunology, immunocytochemistry isolation and characterization of proteins and biomembranes, cell cultures, and basic morphological techniques will be helpful. Send curriculum vitae and names of references to: **Dr. Ben H. Choi, Division of Neuropathology, Department of Pathology, University of California, Irvine, Irvine, California 92717.** *An Affirmative Action/Equal Opportunity Employer.* Deadline: 24 June 1985.

**POSTDOCTORAL POSITION** in natural product chemistry/phytochemistry to work on isolation and identification of plant chemicals involved in host selection by insects. Applicants should be experienced in all chromatographic and spectroscopic techniques. Mass spectrometry experience and interest in FAB desirable. Salary: \$19,000. Send curriculum vitae and names of three references to: **Dr. Alan Renwick, Boyce Thompson Institute at Cornell University, Ithaca, N.Y. 14853.**

*An Affirmative Action/Equal Opportunity Employer.*

**POSTDOCTORAL POSITION** available immediately for study of molecular genetics and biochemistry of Tn1000 transposition. Background in biochemistry, genetics, or molecular biology required. Send curriculum vitae and names of three references to: **Dr. Richard C. Deonier, Molecular Biology, ACBR 406-mc 1481, University of Southern California, Los Angeles, Calif. 90089-1481.** *An Equal Opportunity Employer.*

**POSTDOCTORAL POSITIONS** to study genes involved in tumor progression, metastasis, and resistance to chemotherapeutic drugs. Techniques to be utilized include recombinant DNA methodology, in-gel DNA renaturation, orthogonal field electrophoresis, and cell culture. Background in molecular biology and biochemistry is desirable. Salary competitive and commensurate with experience. Please send résumé and three letters of reference to: **Dr. Igor Roninson, Center for Genetics, University of Illinois at Chicago, 808 South Wood Street, Chicago, Ill. 60612.** *The University of Illinois is an Affirmative Action/Equal Opportunity Employer.*

**POSTDOCTORAL POSITION** available immediately to participate in ongoing studies on the molecular biology of cytomegaloviruses. Minimum qualifications are a Ph.D. in biochemistry, molecular biology, or microbiology. Experience in virology, genetics, protein or nucleic acid chemistry is desirable. Send curriculum vitae and names of three references to: **Dr. Mark F. Stinski, Department of Microbiology, University of Iowa School of Medicine, Iowa City, Iowa 52242.**

## POSITIONS OPEN

### POSTDOCTORAL POSITION IN NEUROENDOCRINOLOGY

Is available immediately to study catecholamine interactions with hypothalamic and pituitary hormones. A number of projects are available for selection by the candidate. These include: (i) electrical recordings and function of ion channels, (ii) catecholamine biosynthesis and turnover, and (iii) regulation of hormone secretion by hypothalamic fragments and cultured pituitary cells. Candidates should have a strong background in either neurobiology, endocrinology, electrophysiology, or biochemistry. Experience with enzyme assays, receptors, HPLC, electrical recordings, or tissue culture is desirable. Send curriculum vitae and names of three references to: **Dr. Nira Ben-Jonathan, Department of Physiology and Biophysics, Indiana University School of Medicine, 635 Barnhill Drive, Indianapolis, Indiana 46223.**

*An Equal Opportunity/Affirmative Action Employer*

## POSITIONS OPEN

**POSTDOCTORAL POSITION**, available after 1 October. Cell biology–physiology–biochemistry laboratory studying isolated cardiac membrane channel proteins seeks immunologist for immunofluorescence and immunoelectron microscopic investigations. Applicant should have doctorate and experience with poly- and monoclonal antibody techniques. Send curriculum vitae, description of research interests, and references to: **Dr. Ernest Page, Department of Medicine, BH Box 137, The University of Chicago, 5841 South Maryland Avenue, Chicago, Illinois 60637.** *Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL POSITIONS** (Ph.D. or M.D.) available in developmental genetics and molecular biology. Candidates must be U.S. citizens. Send résumé and names of three references to: **Dr. Dorothea Bennett, Sloan-Kettering Institute for Cancer Research, 1275 York Avenue, New York, N.Y., 10021.**

# IMMUNOLOGIST

## Research Fellow/Principal Scientist

**Make a significant contribution  
to immunopharmacology research.**

McNeil Pharmaceutical, a Johnson & Johnson Company with modern, state-of-the-art research laboratories in Spring House, Pennsylvania, has need of an individual in our Immunopharmacology section to perform basic goal-oriented immunological research with application to the discovery of unique chemical entities for the treatment of arthritis and autoimmune diseases.

The ideal candidate will possess a Ph.D. in Immunology or related field and a minimum of 7-8 years' experience in immunological research with a history of publications. A thorough knowledge of all aspects of contemporary immunological research is necessary with experience in drug research beneficial.

Your responsibilities will include providing novel concepts for approach to the treatment of autoimmune disease and collaboration with a multi-disciplinary team of highly qualified investigators to develop an antiarthritic program of drug discovery based on immunological principles.

McNeil, a recognized leader in the ethical pharmaceutical community and a member of the Johnson & Johnson Family of Companies, offers excellent opportunities for professional advancement, a highly competitive salary, a superior benefits program and a convenient and attractive suburban Philadelphia location. Qualified applicants are invited to submit CV or resume with salary history and requirements, in confidence, to: **Ms. Debi Thaler, McNeil Pharmaceutical, Spring House, PA 19477.**

 **MCNEIL  
PHARMACEUTICAL**

*"Leadership Beyond Compliance"*  
An equal opportunity employer m/f/h/v.

*A Johnson & Johnson Company*

## POSITIONS OPEN

**POSTDOCTORAL POSITION IN EVOLUTIONARY MOLECULAR BIOLOGY**, available summer 1985. Two projects: (i) Gene structure in archaeobacteria—transposable element behavior, development of in vitro transcription/translation systems, and transformation systems. (ii) Multigene family evolution—dispersed and clustered eukaryotic 5S genes. **Dr. W. Ford Doolittle, Department of Biochemistry, Dalhousie University, Halifax, Nova Scotia, Canada, B3H 4H7. Telephone: 902-424-3569.**

Children's Hospital—Harvard Medical School. **POSTDOCTORAL RESEARCH** on the isolation and purification of an inhibitor of tumor neovascularization derived from cartilage. The research may also involve the development of biological assays. Background in biochemistry, biology, or chemistry desirable. Send résumé to: **Dr. Robert Langer, Children's Hospital, Department of Surgery, 300 Longwood Avenue, Boston, Mass. 02115.**

## POSITIONS OPEN

**POSTDOCTORAL POSITION** in immunology. Available 1 July 1985 for Ph.D. to study structure/function of B cell surface molecules. Early events in activation of immunodeficient versus normal B cells. Prefer experience with cellular immunologic and/or immunochemical techniques. Please send curriculum vitae and the names of three references to: **Dr. Edward Clark, Department of Microbiology and Immunology, SC-42, University of Washington, Seattle, Wash. 98195. The University of Washington is an Equal Opportunity/Affirmative Action Employer.**

**POSTDOCTORAL RESEARCH, PLANT MOLECULAR BIOLOGY.** Postdoctoral positions in regulation of gene expression in higher plants. Send curriculum vitae and three letters to:

**Dr. Thomas W. Okita  
Institute of Biological Chemistry  
Washington State University  
Pullman, Wash. 99164-6340**

## POSITIONS OPEN

**POSTDOCTORAL POSITION** available immediately for 2 years to work on neurotoxins which affect retinal dopaminergic neurons and their mechanisms of action. The project requires extensive HPLC with electrochemical detection of catecholamines and indoleamines with enzyme assays utilizing UV or fluorescence spectroscopy. Recent Ph.D. with experience in HPLC/EC strongly preferred. Curriculum vitae and three references to: **Dr. C. G. Wong, University of Southern California School of Medicine, Department of Ophthalmology, 1355 San Pablo Street, Los Angeles, Calif. 90033. Telephone: 213-224-7918.**

**POSTDOCTORAL POSITION**—Available for recent Ph.D. in microbiology or biochemistry. Studies of bacterial cell walls, cell surface, and secreted polymers. Program involves use of microbiological, biochemical, genetic, and immunological (monoclonal antibody) techniques. Ability to work independently is important. Send curriculum vitae and names of three references to: **G. D. Shockman, Ph.D., Department of Microbiology and Immunology, Temple University Medical School, 3400 North Broad Street, Philadelphia, Pa. 19140. An Equal Opportunity/Affirmative Action Employer.**

**POSTDOCTORAL POSITION** available immediately to study mechanisms for the suppression of carcinogenesis. Studies will employ cell and molecular biological approaches and focus on the analysis of cultured human epithelial and murine mesenchymal stem cells. Preference will be given to individuals who have experience in both tissue culture and molecular biology methodologies. Please send curriculum vitae and three letters of recommendation to: **Robert E. Scott, M.D., Head, Section of Experimental Pathology, Mayo Clinic and Foundation, Rochester, Minn. 55905. An Equal Opportunity/Affirmative Action Institution.**

**POSTDOCTORAL POSITION** available immediately, to participate in ongoing studies of the neurobiological, pharmacological, and behavioral interaction of abused substances. Strong background in either behavioral pharmacology, behavioral neuroscience, or the experimental analysis of behavior is desirable. Send curriculum vitae and three letters of recommendation to: **Dr. James E. Smith, Department of Psychiatry, Louisiana State University School of Medicine, P.O. Box 33932, Shreveport, La. 71130. An Equal Opportunity/Affirmative Action Employer**

**POSTDOCTORAL RESEARCH ASSOCIATE** to conduct research in physiology of hypothalamic neurohormones at the Laboratories for Molecular Neuroendocrinology and Diabetes (LMNED), Tulane University Medical Center, New Orleans, Louisiana. Ph.D. in related field required. Expertise in molecular biology, peptides purification, radioimmunoassays, HPLC, and FPLC. Support at NIH stipend level provided, starting 1 June 1985. Challenging position with research team forming the United States-Japan Cooperative Biomedical Research Laboratories in newly established facilities. Development of independent research related to neuroendocrinology is encouraged. Send curriculum vitae and three letters of reference to: **Dr. Akira Arimura, Director, LMNED, Hebert Research Center, Tulane University, Belle Chasse, La. 70037.**

**POSTDOCTORAL RESEARCH ASSOCIATE** position available immediately to work on biochemical and genetic aspects of bioprotein biosynthetic pathway. Scope of research opportunities will range from characterization of PKU cofactor variant mutations in man to comparative biochemical studies in rats, *Drosophila*, and lower organisms. Experience with HPLC and enzymatic methodologies essential. Opportunities available for collaboration with recombinant DNA group and large *Drosophila* genetic group. Salary range: \$18,000 to \$20,000. Send résumé and letters of reference to: **Dr. Edwin W. Naylor, Department of Reproductive Genetics, Magee-Womens Hospital, Pittsburgh, Pa. 15213.**

## PROFESSOR OF NEUROBIOLOGY

Applications desired for senior level, tenured position in neurobiology, beginning 1 September 1986 in the Department of Biology, University of Virginia. Curriculum vitae, statement of research and teaching goals, and names of five references should be sent by 30 June 1985 to: **Professor Oscar L. Miller, Jr., Chairman, Neurobiology Search Committee, Department of Biology, Gilmer Hall, University of Virginia, Charlottesville, Va. 22901. An Equal Opportunity/Affirmative Action Employer.**

# EXECUTIVE DIRECTOR

## Commission on Engineering and Technical Systems

The National Research Council (NRC), the principal operating arm of the National Academy of Sciences and the National Academy of Engineering, a nationally prominent non-profit, non-governmental institution located in Washington, DC, invites applications for the position of Executive Director of the Commission on Engineering and Technical Systems. The Commission is a major resource of expertise and analysis of issues and problems arising in engineering and technical systems. The Commission's activities include twelve major boards that carry out studies spanning: engineering manpower; manufacturing technology; advanced science and technology in such important areas as materials; natural hazards engineering, hazards prediction and reduction; building research; marine engineering, energy engineering aeronautics research and development; and space engineering, among others.

The Executive Director manages the Commission as one of eight major program units of the NRC. Responsibilities include providing advice to the Chairman of the NRC, program initiation, administration and review, development of funding and budgets, and supervision of staff.

A Ph.D. or equivalent is desirable with a broad background in engineering and the physical sciences. Candidates should have a minimum of 10 to 15 years of experience relating broadly to national engineering. Substantial leadership experience is required in program development, policy analysis, and policy formulation supervision of projects, staff and quality of reports and advice from the work of the Commission. Familiarity with activities of government research and development agencies, and contract and grant procedures and with industry and institutions of higher education is essential.

Applicants should send résumé to **Executive Officer, National Research Council, 2101 Constitution Ave., N.W., Washington, DC 20418.**

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# SCIENCE

## Posters

The following posters of *Science* covers are available:

30 March 1979, Tropical flowering tree;

23 February 1983, Landsat photo of Detroit, Michigan;

29 July 1983, Cheetah;

2 December 1983, Snowshoe hare;

23 December 1983, Cathedral window/DNA molecule.

Combination of space covers in scroll format: 1 June 1979, 23 November 1979, 10 April 1981.

Price is \$5 each (prepaid).

Write to AAAS, Department POST, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005.

## ANNOUNCEMENT Special Workshop on SHORT-TERM GENOTOXIC MONITORING IN VIVO 14 to 16 October 1985

at

Environmental Health Research and Testing, Inc.  
Research Triangle Park, North Carolina

Jointly organized by the Department of Radiation Genetics and Chemical Mutagenesis of the State University of Leiden, The Netherlands, The United States Environmental Protection Agency, and the National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina.

An International Workshop on new methodologies for rapidly monitoring the presence and persistence of genotoxic factors in animals will be held at Environmental Health Research and Testing, Inc., Research Triangle Park, North Carolina. The workshop is directed toward scientists with active interests in the genotoxic effects of environmental contaminants. Techniques and procedures for performing the DNA repair host-mediated assay will be presented, in which differential DNA repair in bacteria is used for quantifying genotoxic factors simultaneously in stomach, intestine, colon, liver, spleen, lungs, kidneys, testes, and blood of chemically exposed mice. In addition, some recent developments in genotoxic monitoring using various techniques in vivo and in vitro will be demonstrated. Introductory lectures will be given by specialists in the field; a substantial part of the course will be devoted to demonstrations and practical exercises.

The number of participants is limited to 20 and the participants will be asked to defray the expenses for lecturers, technical help, laboratory facilities, and living costs. Further information may be obtained from: Dr. G. R. Mohn, Department of Radiation Genetics and Chemical Mutagenesis, State University of Leiden, Wassenaarseweg 72, NL-2333 AL Leiden, The Netherlands; or from: Dr. B. C. Casto, Research Director, Environmental Health Research and Testing, P.O. Box 12199, Research Triangle Park, North Carolina, 27709.

## INTERNATIONAL SOCIETY OF DEVELOPMENTAL BIOLOGISTS (ISDB) announces the TENTH INTERNATIONAL CONGRESS OF ISDB "NEW DISCOVERIES AND TECHNOLOGIES" 4 to 9 AUGUST 1985 The Bonaventure Hotel Los Angeles, California

### Participants

Peter Albersheim, Merton Bernfield, Hans Bode, James Bonner, Jeremy Brockes, Donald Brown, Arnold Caplan, Pierre Chambon, Thomas Cline, Jonathan Cooke, Gerald Edelman, Robert Edwards, Judah Folkman, Scott Fraser, Vernon French, Richard Gardner, Walter Gehring, Benjamin Geiger, Norton Gilula, Paul Green, Suresh Goel, Clifford Grobstein, Elizabeth Hay, Ross Hodgetts, Ernest Jaworski, Howard Jones, Jr., Yoshihiro Kato, Klaus Kratochwil, Elias Lazarides, Nicole Le Dourain, Edward Lewis, Anne McLaren, Alberto Monroy, Aron Moscona, Drew Noden, Christiane Nüsslein-Volhard, Daphne Osborne, Masukichi Okada, Richard Palmiter, Martin Raff, William Rutter, Kenneth Ryan, Gordon Sato, Lauri Saxén, Jozef St. Schell, Robert Schimke, Howard Schneiderman, David Schubert, Yinghsien Shih, Allan Spradling, Timothy Stewart, Masatoshi Takeichi, Jean Paul Thiery, Robert Trelstad, Victor Vacquier, Sergei Vassetzky, Stephen Wachtel, Lewis Wolpert, Savio Woo, and Carl Wood.

### SPECIAL LECTURE BY:

DR. STEPHEN J. GOULD

"WHAT DEVELOPMENT CAN TEACH US  
ABOUT EVOLUTION"

Official address for registration:

Harold C. Slavkin, Chairperson  
1985 ISDB Organizing Committee  
University of Southern California  
University Park, GER 314—MC 0191  
Los Angeles, California 90089-0191  
Telephone: 213-743-6095 or 743-6585

## RESEARCH SCIENTIST

An opportunity exists for a motivated scientist to conduct innovative exploratory experimentation on adipose cell metabolism within the framework of a multidisciplinary research team working in the area of domestic livestock growth and development. With a strong molecular understanding of lipid metabolism, the applicant will be expected to draw from the fields of neurobiology, peptide biology, endocrinology and cell biology to establish a basic research program in adipose cell differentiation, metabolism, nutrient flux/energetics or a related area.

The minimum qualifications include a Ph.D. and two years of post doctoral or related experience in biochemistry, cell biology or nutrition. Demonstrated ability in enzymology, protein/lipid purification, tissue culture, cell fractionation and radio ligand preparation is highly desirable. Familiarity with large animals will be helpful.

Kalamazoo is a medium-sized Southwestern Michigan community with immediate access to a mix of excellent cultural, educational and recreational pursuits including numerous lakes and four-season climate. Upjohn offers an excellent salary, commensurate with experience and an outstanding benefits program.

For confidential consideration, please call inside Michigan, COLLECT 616-323-6767 or from outside Michigan, TOLL FREE 1-800-253-8600, ext. 3-6767, to request an employment application sent to you immediately. Please refer to Ad Number 17479-A when calling.

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## AUSTRALIAN TELECOMMUNICATIONS AND ELECTRONICS RESEARCH BOARD (formerly Radio Research Board)

### POSTDOCTORAL FELLOWSHIP IN TELECOMMUNICATIONS

### CALL FOR APPLICATIONS

The Australian Telecommunications and Electronics Research Board invites scientists or engineers, keen to undertake research in telecommunications, to apply for its postdoctoral fellowship.

The Board is looking for high-calibre applicants with a demonstrated capacity for original work, and ability to develop and pursue a research project in an area of telecommunications which the Board sees as particularly relevant to its interests. (Further information on the areas of interest to the Board is provided with the application material.)

The fellowship is offered for 2 years and provides for a stipend based on that of the QEII Fellowships (currently A\$25,447; A\$27,628 over 28 years of age; stipend is subject to income tax), appropriate allowances, and a grant of \$20,000 over the term of the fellowship towards research costs such as maintenance and equipment.

Subject to the approval of the Board, the fellowship may be taken up at an Australian tertiary institution, approved research institute, or industrial laboratory. The Board, if required, will assist with the location of the successful candidate at an appropriate institution willing to accept the fellow as a guest worker. The fellow is not employed by the Board.

Applicants must have a Ph.D. degree or equivalent qualification in a pertinent discipline and, preferably, be under 30 years of age. There are no nationality restrictions; it is hoped the fellow will remain in Australia for several years after completion of the fellowship.

Applications close on 20 September 1985 and notification of decisions may be expected in December 1985.

Application forms and further information may be obtained from:

The Secretary  
Australian Telecommunications and Electronics Research Board  
P.O. Box 225  
Dickson, ACT 2602  
Australia

## POSITIONS OPEN

**POSTDOCTORAL POSITIONS** available 1 July 1985. One position will involve studies on the molecular basis of the genetic deficiency of pyrimidine pathway enzymes and possible associated immunodeficiency in hereditary orotic aciduria; the other position will focus on the mechanisms of DNA amplification associated with cellular resistance to chemotherapeutic agents. Both projects require the use of molecular biology techniques. Experience in genomic library construction, DNA sequencing, and expression vectors will be advantageous but not required. Starting salary of \$20,000 per year. Send curriculum vitae, a summary of research experience and future interests, and names, addresses, and telephone numbers of three references to: **Dr. D. Parker Suttle, Division of Biochemical and Clinical Pharmacology, St. Jude Children's Research Hospital, 332 North Lauderdale, P.O. Box 318, Memphis, Tenn. 38101.** *An Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

**POSTDOCTORAL POSITION** available during 1985/1986 in the **Developmental Biology Center, University of California, Irvine, California 92717.** Recent Ph.D. required, preferably in cell, molecular, or developmental biology, neurobiology, or genetics. Positions are for research with **Dr. Scott Fraser** (patterning of neural development; cell communication through gap junctions); **Dr. Susan Bryant** (limb development and regeneration in amphibians and mammals); **Dr. Hans Bode** (stem cell differentiation, pattern formation); or **Dr. J. Lawrence Marsh** (molecular genetics of *Drosophila*). U.S. citizenship or permanent residency status required. For more information, contact the individuals above. To apply, submit résumé and description of research interests and experience, and have three letters of recommendation sent to: **The Director, Developmental Biology Center (address above).** Deadline for applications: 1 August 1985. *The University of California is an Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

### POSTDOCTORAL RESEARCH ASSOCIATE

Postdoctoral research position available for summer or fall 1985 to study the induction of cytochrome P-450 isozymes by the alcohol dehydrogenase inhibitors, pyrazole, and 4-methylpyrazole. Experience in protein purification and characterization will be necessary. Appointment for 2 or 3 years. Salary negotiable. Please send résumé, brief summary of research experiences, and three letters of recommendation to: **Dr. Arthur I. Cederbaum, Department of Biochemistry, MOUNT SINAI SCHOOL OF MEDICINE, One Gustave L. Levy Place, New York, N.Y. 10029.** *An Equal Opportunity Employer.*

**POSTDOCTORAL/RESEARCH ASSOCIATE** position available immediately for studies of nuclear structures and functions. One project involves primary transcripts, heterogeneous nuclear RNA, and small nuclear RNA. The other deals with the identification and characterization of the genes of the blood group antigens. Background in biochemistry, molecular biology, and DNA recombinant technology is essential. Applicant will join in active research program in recombinant DNA technology. Job security with opportunity for advancement, competitive salary, excellent benefits. Send curriculum vitae and letters of reference to: **Dr. Oscar Pogo, Head, Department of Cell Biology, Kimball Research Institute, New York Blood Center, 310 East 67 Street, New York, N.Y. 10021.** *Equal Opportunity Employer.*

### PROFESSOR AND HEAD Biological Sciences Carnegie-Mellon University

The Department of Biological Sciences invites applications from highly qualified individuals to serve as professor and chairperson. We seek an individual with an established reputation in any field of biological research, and an ability to provide leadership in the continuing growth of this department. We expect to appoint the successful candidate by 30 June 1986 or before. Applications or inquiries should be sent to:

**Professor W. R. McClure  
Chairman, Search Committee  
Carnegie-Mellon University  
4400 Fifth Avenue  
Pittsburgh, Pa. 15213**

*Carnegie-Mellon University is an Equal Opportunity/Affirmative Action Employer.*

### RESEARCH ADMINISTRATOR IPM SPECIALIST

To head a research program on pests and diseases of potato and tomato in Bolivia, sponsored by the Agency for International Development (AID). Spanish capability, strong background in IPM, and experience in research administration required. Position is for 1 year, possibly beginning July 1985, on a Personal Services Contract with AID. Address inquiries and résumés to: **Agi Kiss, AID/ST/AGR, Room 413, SA-18, Washington, D.C. 20523; telephone: 703-235-8886.** *AID is an Equal Opportunity Employer.*

### RESEARCH ASSISTANT PROFESSOR, ELECTROPHYSIOLOGY

Research faculty position available at the University of Arizona College of Medicine. Major responsibilities will be development of a research program in myocardial electrophysiology. Candidate will work closely with clinical electrophysiologists. Will have joint appointment in the Department of Medicine and Physiology and have opportunity to teach in the Department of Physiology. Ph.D. degree and postdoctoral training are prerequisite. Send summary of research plans, curriculum vitae, and names of three references to: **Dr. Frank I. Marcus, Cardiology Section, University of Arizona Health Sciences Center, Tucson, Ariz. 85724,** by 15 July 1985. *The University of Arizona is an Equal Opportunity/Affirmative Action Employer.*

**RESEARCH BIOCHEMIST**—Federal service. The Letterman Army Institute of Research, San Francisco, California, is seeking a Ph.D.-level biochemist to conduct independent research in protein biochemistry. Areas of investigation include protein structure, modification, purification, and separation; hemoglobin structure and function; and plasma fractionation and storage. Must be U.S. citizen. Salary: \$37,599 to \$48,876. Send résumé and publications list to: **C. Swift, SGRD-ULZ-RM, Letterman Army Institute of Research, Presidio of San Francisco, Calif. 94129.** *An Equal Opportunity Employer.*

# PRESIDENT

## THE AMERICAN MUSEUM OF NATURAL HISTORY

The trustees of The American Museum of Natural History invite applications for the position of President and Chief Executive Officer of the Museum. The President is responsible for the effective governance of this prestigious museum and related entities.

Reporting to the President are the Director, the Deputy Director for Research (9 curatorial departments), Deputy Director for Administration, Assistant Director for Financial Affairs, Department of Development and Public Affairs, Department of Library Services, Department of Exhibition and Graphics, Department of Education, *Natural History* Membership, and the Planetarium.

The annual operating budget of the Museum is \$35 million, there are 800 employees, 23 buildings, a \$95 million endowment, and 2.5 million visitors a year.

Candidates should have the following qualifications:

- Demonstrated imaginative leadership and an ability to work with diverse constituencies.
- A strong interest in the natural sciences and appreciation of scholarly work. A Ph.D. in the Natural Sciences would be highly desirable.
- Proven administrative and financial skills in the administration of large organizations.
- Experience in major fund raising.

Letters of nomination or application, coupled with resume/vitae and information on current compensation should be submitted in confidence no later than July 1, 1985 to:

## BOX 112, SCIENCE

Resumes will neither be acknowledged nor returned.

*The American Museum of Natural History is an equal opportunity employer.*

# SCIENCE

News Department Reprint Series

## Artificial Intelligence

This collection of articles from *Science* by M. Mitchell Waldrop explores the newly emerging field of artificial intelligence, AI. What AI has really accomplished, where might it plausibly be expected to go, and what are its limits? In particular, the articles focus on the foundations of AI—the effort to understand the phenomenon of intelligence. Included are such topics as expert systems, natural language understanding, computer vision, and parallel processing. This series is available now.

Single copies \$2.00; twenty or more \$1.00 each.  
Orders must be prepaid.

Write to AAAS, Dept. AI, 1515 Massachusetts Ave., N.W., Washington, D.C. 20005.

## THE FIRST WORD IN... NEW PRODUCT DEVELOPMENT

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## CARDIOVASCULAR PHARMACOLOGIST

Leading a highly-trained research team, this key position assumes primary responsibility for evaluating the cardiovascular-renal effects of drug candidates being considered for product development. The selected candidate will have a Ph.D. in Pharmacology and a minimum of 5 years experience in cardiovascular pharmacology including in-vitro and in-vivo techniques. Strong writing and interpersonal skills also required.

Abbott Laboratories is a \$3.1 billion industry leader headquartered in an attractive suburban community on the Lake Michigan shoreline, just 30 miles north of Chicago. We provide excellent salaries and full benefits including profit sharing and stock retirement plan. For prompt consideration, send a resume with salary history in confidence to: **Christopher George/Corporate Placement. Abbott is an Affirmative Action Employer.**

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# SCIENCE

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## POSITIONS OPEN

**RESEARCH ASSISTANT or ASSOCIATE PROFESSOR** to join multidisciplinary team investigating new approaches to brain tumor therapy. Individual should have laboratory (animal) background in brain research, pharmacology, tumor biology, or related field. Position available immediately. Send curriculum vitae, list of publications, salary requirements, and names and addresses of three references to: **Dr. R. A. Morantz, Brain Tumor Institute, 2316 East Meyer Boulevard, Kansas City, Mo. 64132.**

**Position:** RESEARCH ASSISTANT PROFESSOR. This position is part of a horse blood typing program.

**Location:** Department of Veterinary Science, University of Kentucky, Lexington, Ky. 40546-0076.

**Qualifications:** Applicants must have a Ph.D. degree in genetics, biochemistry, or in a closely related field. Experience with polyacrylamide gel electrophoresis and isoelectric focusing will benefit the applicant.

**Job description:** The appointee will be responsible to develop and maintain a program to test horses for genetically determined biochemical polymorphisms for use in identification and parentage analyses. Currently four different gels are used to test for eight genetic systems. This program should also include research to uncover additional polymorphic loci, to determine the nature of genetic variants, and to determine the significance of genetic variation in horses. The program of testing for biochemical polymorphisms will operate as part of a larger testing program which includes testing for blood group markers, lymphocyte markers, and biochemical polymorphisms.

**Salary:** Commensurate with qualifications and experience. This is a nontenure-track position.

**Availability:** The position is presently open for applicants and will remain so until filled. Those interested may apply in writing, enclosing curriculum vitae and the names of three persons who might provide a letter of recommendation to:

**Dr. Ernest Bailey**  
Department of Veterinary Science  
University of Kentucky  
Lexington, Ky. 40546-0076  
Telephone: 606-257-3656

**RESEARCH MANAGER—CARDIOVASCULAR DISEASES.** To lead a biological research group responsible for the discovery of novel therapeutic agents for cardiovascular diseases. The candidate must have an M.D. or a Ph.D. in pharmacology. A strong background in synthetic organic chemistry is preferred. At least 10 years of academic or industrial experience in cardiovascular pharmacology is required. The applicant must have experience in the central control of hypertension and peripheral mechanisms with heavy emphasis on the alpha 2 adrenoceptor and angiotension cascade. Experience with in vitro procedures and various bindings for enzymes and receptor sites involved in the control of blood pressure as well as general biochemical techniques is required. A strong background in cardiodonics is preferred. Salary: \$5100 per month. Send résumé, including a list of publications, to: **R. J. Shiels, Delaware State Department of Labor, P.O. Box 9029, Newark, Delaware 19714-9029.** Job reference number 600314.

**Position:** RESEARCH SPECIALIST. The work is in a horse blood typing laboratory.

**Location:** Department of Veterinary Science, University of Kentucky, Lexington, Ky. 40546-0076.

**Qualifications:** Applicants must have a minimum M.S. degree in a biological science with a strong background in immunology and genetics. Previous laboratory experience is desirable.

**Job description:** The appointee will expand and maintain an existing program of testing horses for blood group antigens for identification and parentage analyses. Duties will include production of reagents by alloimmunization of horses, conducting routine blood group tests, and supervising technicians in connection with those responsibilities.

**Salary:** Commensurate with qualifications and experience. This is a nontenure-track position.

**Availability:** The position is presently open and will remain so until filled. Those interested may apply in writing, enclosing curriculum vitae and the names of three persons who might provide a letter of recommendation to:

**Dr. Ernest Bailey**  
Department of Veterinary Science  
University of Kentucky  
Lexington, Ky. 40546-0076  
Telephone: 606-257-3656

## POSITIONS OPEN

**RESEARCH ASSOCIATE** position available now for M.D., Ph.D., or M.D./Ph.D. Current graduate or with postdoctoral experience. Current emphasis in the laboratory is on molecular mechanisms that regulate gene expression in terminal differentiation of neurons and related endocrine cells. Send résumé and brief handwritten statement of research interests to: **Gerhard Heinrich, M.D., Howard Hughes Medical Institute, Harvard Medical School and Massachusetts General Hospital, Wellman Research Building, Boston, Mass. 02114.**

### RESEARCH ASSOCIATE

To perform research involving the molecular mechanism of eukaryotic chromatin assembly. Duties include the design and execution of experiments, communication of information and results, and supervision of research technician and graduate students. The position requires an M.S. in life sciences (biochemistry, zoology, biology, microbiology, or physiology), at least 2 years of research experience in biochemistry, and a demonstrated knowledge of affinity chromatography, mammalian cell culture, and eukaryotic chromatin structure as evidenced by publication of original research. Forty hours per week; \$16,000 per year. Résumés to: **Ben Loomis, Wisconsin Job Service, 819 North 6 Street, Milwaukee, Wis. 53203.** Equal Opportunity Employer. Employer paid ad.

**RESEARCH ASSOCIATE POSITIONS.** Areas of research include metabolism of polynuclear and azapolyaromatic aromatic hydrocarbons, isolation and characterization of metabolites and their interaction with DNA in mammals and fish. Ph.D. in biochemistry or biochemical pharmacology required; related experience preferable. Candidates will work in collaboration with organic chemists involved in the synthesis of potential metabolites of the carcinogens. Positions provide opportunity for developing program of candidate's interest. Send résumé and three references to: **Director, Great Lakes Laboratory, State University of New York College at Buffalo, 1300 Elmwood Avenue, Buffalo, N.Y. 14222.** Telephone: 716-878-5422.

**RESEARCH BIOCHEMIST** with U.S. Department of Agriculture (USDA), Bacteriology Research Laboratory, Agricultural Research Service. Position located at National Animal Disease Center, Ames, Iowa. Projects include isolation and chemical characterization of intestinal epithelial cell receptors for pili of enterotoxigenic *Escherichia coli*; isolate, chemically characterize, and develop assay systems for antigens and toxins of bacteria, viruses, or Protozoa that cause intestinal diseases in animals; collaborate in studies to clone and sequence the genes responsible for the virulence of bacteria and Protozoa. Salary: GS/M-11/14 (\$26,381 to \$57,759), based on qualifications and experience. Closing date for receipt of required federal application forms is 30 June 1985. For applications, contact: **Diana Gamble, USDA, ARS, NCR, POB, Building 003, Room 318-H, BARC-West, Beltsville, Md. 20705.** Telephone: 301-344-4567. Candidates must be U.S. citizens. An Equal Opportunity Employer.

### RESEARCH SCIENTISTS IN ORGANIC CHEMISTRY

The Dana-Farber Cancer Institute, affiliated with Harvard Medical School, announces openings for Ph.D. scientists in organic chemistry with a background in synthesis. Some experience in biochemistry would be desirable. Appointees will join a team involved in research and development of immunotoxins as reagents for treatment of human cancers. Appointments will be at either postdoctoral or more senior levels depending on experience. Applicants should arrange for curriculum vitae and three letters of recommendation to be sent to: **Dr. Walter A. Blattler, Division of Tumor Immunology, Dana-Farber Cancer Institute, 44 Binney Street, Boston, Mass. 02115.** An Affirmative Action/Equal Opportunity Employer.

### TECHNICAL POSITIONS BIOTECHNOLOGY

NPI, a firmly established plant research and product company, is seeking applicants for **technical positions (M.S. or B.S.) in molecular biology.** The position requires experience in recombinant DNA techniques.

Please send curriculum vitae, including names of three references, to:

**Dr. R. K. Prakash**  
NPI  
417 Wakara Way  
Salt Lake City, Utah 84108

## POSITIONS OPEN

**RESEARCH PROGRAM MANAGER.** Research scientists and engineers with experience in proposal evaluation and grant management are invited to apply for a new position responsible for implementing a new state-funded basic and applied research program. A Ph.D. is required, and knowledge of technology transfer is desirable. The position pays \$25,870 and is available after 1 July. Send curriculum vitae and three references by 10 June to: **Alice Smith, Arkansas Science & Technology Authority, 200 Main Street, Suite 210, Little Rock, Ark. 72201.** An Equal Opportunity/Affirmative Action Employer.

The Department of Chemistry at Purdue University solicits applications for a **SENIOR FACULTY POSITION** in physical chemistry, effective August 1986. Applicants must have established a clear international stature in research. Curriculum vitae, a summary of planned research, and three letters of recommendation should be sent by 15 July 1985 to: **Professor Hary L. Pardue, Head, Department of Chemistry, Purdue University, West Lafayette, Indiana 47907.** Purdue is an Equal Opportunity/Affirmative Action Employer.

### TECHNICAL DIRECTOR ELECTRON MICROSCOPY LABORATORY

The University of Texas Health Science Center at San Antonio is currently recruiting for a director, Electron Microscopy Facility. Individual to head EM Facility, TEM, SEM, and freeze-etch experience; negative staining, and enzyme localization procedures also required. Must be able to use Siemens and Philips, TEM, and JEOL SEMs.

Interested applicants should submit résumé to: **The University of Texas Health Science Center at San Antonio, Personnel Office, 7703 Floyd Curl Drive, San Antonio, Texas 78284.**

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## FELLOWSHIPS

### MEDICAL ONCOLOGY RESEARCH FELLOWSHIP

Positions available July 1985 for a 3-year fellowship at the Fox Chase Cancer Center. The first year provides extensive clinical management and research experience. The subsequent years are devoted to laboratory research with minimal clinical duties. Laboratory opportunities are available throughout the Center, including the Institute for Cancer Research. General areas of interest include developmental and tumor biology, molecular genetics, viral and clinical carcinogenesis, basic immunology, pharmacology, and MRI spectroscopy. Individuals Board-eligible or -certified in internal medicine who are interested in an academic oncology career should contact: **Robert L. Comis, M.D., Medical Director, Fox Chase Cancer Center, Philadelphia, Pa. 19111.**

**POSTDOCTORAL FELLOWSHIP**, summer 1985. Research on musculoskeletal disorders, including growth plate dynamics, osteoporosis, and electrical osteogenesis. Requires knowledge of biomechanics, bone morphometry, and histochemistry. Salary: \$16,000 to \$18,000, depending on experience. Send curriculum vitae to: **Dr. Louis Lippeli, Department of Orthopaedic Surgery, University of Nebraska Medical Center, 42nd and Dewey Avenue, Omaha, Neb. 68105.** An Equal Opportunity/Affirmative Action Employer.

**POSTDOCTORAL FELLOWSHIP** available 1 September 1985 to engage in an active research program on aspects of the development of the mammalian ovarian follicle in vivo, in vitro, under normal and experimental conditions. Familiarity with cell biological techniques including tissue culture, electron microscopy, radioimmunoassay, and immunofluorescence would be desirable. Send curriculum vitae and three letters of recommendation to: **Dr. Everett Anderson, Department of Anatomy and Cellular Biology, and the Laboratory of Human Reproduction and Reproductive Biology, Harvard Medical School, 45 Shattuck Street, Boston, Mass. 02115.**

**POSTDOCTORAL FELLOWSHIP TO STUDY MOLECULAR BIOLOGY OF GLOBIN GENE EXPRESSION IN HUMANS.** Opening in Division of Pediatric Hematology, University of Pennsylvania School of Medicine, to be filled immediately by M.D. or Ph.D. with experience in nucleic acids. Position funded by NIH training grant; applicants must be U.S. citizens or permanent residents. Send résumé to: **Dr. Saul Surrey, The Children's Hospital of Philadelphia, 34th Street and Civic Center Boulevard, Philadelphia, Pa. 19104.** An Affirmative Action/Equal Opportunity Employer.

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## VETERINARY PATHOLOGIST

The Upjohn Company, a research oriented pharmaceutical company, has a position open in its Pathology and Toxicology Research Unit for a Veterinary Pathologist. The incumbent will design, conduct, and evaluate toxicology studies on human and animal health pharmaceuticals under development. He/she will participate on an interdisciplinary research team such as Infectious, Central Nervous System, or Cardiovascular Diseases, etc., and will also conduct research in toxicologic pathology and mechanisms of toxicity.

Requirements for the position include:

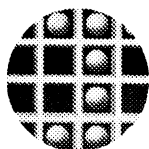
- 1) a **DVM or equivalent**
- 2) **advanced training in veterinary pathology (Board Certification by American College of Veterinary Pathologists preferred)**
- 3) **demonstrated research ability (Ph.D. Veterinary Pathology preferred)**
- 4) **excellent oral and written communicative skills**

For confidential consideration, please call from outside Michigan TOLL FREE 1/800/253-8600 and ask for extension 3-6767; or call from Michigan COLLECT 616/323-6767 to request an employment application be sent to you immediately. Please refer to ad number 17732-H when calling.

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**Personnel Director**

**INVITRON**

8000 Maryland Ave. Suite 860  
Clayton, Mo. 63105

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It is important that the candidate have excellent communication and coordination skills to interact with other parts of the organization in the planning and executing of biotechnology process activities. In addition supervisory and management skills should have been demonstrated.

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Barbara Gardner  
#7DZ-12  
Searle Research and Development  
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