

Singularities

When Time Breaks Down. The Three-Dimensional Dynamics of Electrochemical Waves and Cardiac Arrhythmias. ARTHUR T. WINFREE. Princeton University Press, Princeton, NJ, 1987. xiv, 339 pp., illus. \$60; paper, \$19.95.

It is a pleasure to peer into the singular mind of Arthur Winfree, for the world of biological time wrapped around its own unexpected singularities has been better seen by Winfree than any other. *When Time Breaks Down*, his third book, continues and extends his topological view of rhythmic phenomena. The core of the book is an analysis of the vortices of rotating electrochemical activities in cardiac tissue that may underlie sudden death by fibrillation in apparently healthy hearts. But the interest extends beyond the spontaneous emergence of rotating reentrant waves in fibrillating hearts to rotating chemical reactions in petri dishes and even to cosmic strings.

The idea that cardiac fibrillation is due to a stably circulating reentrant wave of activity has long been familiar. The questions have been whether such rotors actually occur in unperforated tissue, whether such behavior stably persists, whether fibrillation is commonly due to such vortices of activity or to uncoordinated firing from a variety of isolated pacemakers, and how such vortices might be initiated in apparently normal hearts.

Winfree brings his topological perspective to these problems. Consider a typical biological rhythm, such as the circadian rhythm of eclosion in fruit flies. It is now well established, in part by Winfree's own work, that mild perturbations distort the phase of the rhythm slightly: each "old" phase is changed into a distinct "new" phase, and thus a full 2π cycle of old phase becomes a distorted but full 2π cycle of new phases. This phase transformation is called a type 1 resetting curve. The striking alternative, deduced and demonstrated by Winfree long ago, is a type 0 phase-resetting curve. Such curves result from strong perturbations. The critical feature is that the 2π cycle of old phases is changed into a subset of the possible 2π new phases. That is, under a strong stimulus, not all the 2π old phases occur as new phases.

Type 1 and type 0 resetting curves are topologically distinct. No smooth transformation takes one to the other. But more important, the existence of both types of curve in the response of a biological system as the stimulus perturbation increases implies a hidden catastrophe in which "time breaks down." More precisely, consider a two-dimensional plot, where the x -axis gives old phase, the y -axis gives stimulus intensity, and the interior of the xy -graph shows, at

each point, the new phase resulting from that combination of old phase and perturbation strength. Since only a subset of phases occurs as new phases at strong stimulus perturbations and all phases occur as new phases for mild perturbations, a topological theorem asserts that somewhere within the two-dimensional plot a point or line *singularity* must occur, across which sudden jumps in phase are encountered. In the simplest case, the singularity is a point around which all phases occur infinitely close to one another. Throughout the book there are pictures of the color wheel color-coding 2π phases. Positions of the same new phases are connected zones called "isochromes." These end on a hueless, phaseless singularity, a point therefore where "phase," or local time, has no meaning, and time breaks down.

But this picture has no spatial dimension, nor does it include the promised vortices of electrochemical activity that might underlie cardiac arrhythmias. Winfree has begun here because the existence of such a singularity in simple phase-resetting curves itself appears to promise vortices rotating about a phaseless center point in excitable media such as cardiac tissue, or the now famous Belousov-Zhabotinsky reaction. Consider next a two-dimensional "tissue" of model cardiac cells, each if triggered passing through three states, "excited," "refractory," and "quiescent but excitable." Clearly, the entire tissue might be triggered to the excited states, hence fire and contract, simultaneously. Alternatively, if one edge were triggered rhythmically, waves of excitation would sweep across the tissue, followed by waves of refractory then quiescent states. But can one obtain a reentrant, self-sustaining, *rotating* wave of activity pivoting around a central point, and if so how? Here Winfree shows that the answer is yes and that such a wave may typically arise thanks to just the kind of type 1 and type 0 phase resetting seen above. In particular, if a spatially graded stimulus is applied to the tissue and is strong enough in some regions to cause type 0 resetting and less strong in other regions, the typical consequence is the formation of pairs of counterrotating vortices of activity that persist stably and "organize" the surrounding tissue. Thus we are led to admit that presumably even normal cardiac tissue might be triggered to misbehave and fibrillate by an unfortunately timed and distributed perturbation. Further, this appears to be no mere theory, for good evidence is adduced that fibrillation often consists of just such vortices of electrochemical activity.

But Winfree's singularities proliferate. Each vortex surrounds a phaseless point. If the excitable medium is three-dimensional rather than two-, then such vortices become

more complex objects, and the phaseless point becomes a phaseless *line* about which the rhythmic reentrant activity circulates. The possible geometries of this phaseless line singularity are governed by some simple principles. Notably, in a connected medium, a singularity cannot "end" except on the boundaries, or by closing upon itself to form a ring. Consider the simplest case of a straight-line singularity in a three-dimensional medium. About it pivots a *scroll wave* of rotating activity, where each scroll surface is a surface of constant phase, or isochrome, and all 2π phases have their own scroll isochrome surfaces wound in order around the singularity, one inside the other. If the line singularity ends on a boundary at two points, say the actual surface of a three-dimensional medium in a petri plate with the Zhabotinsky reaction, then the counterrotating spiral vortices are revealed as the two ends of the scroll seen "end on." But the singularities can be even more complex, for one line singularity can form a ring, through which is threaded another closed ring of singularities. Indeed, any organization of such rings looping through one another is possible. Furthermore, in passing around one phaseless ring on which all 2π phases abut, again a topological issue arises. For the phases can match up around the ring without a twist, or with a full positive or negative twist, or more generally with any integer number of positive or negative twists. Such twisted and intertwined rings of singularities then act as organizing centers controlling the temporal and spatial distribution of activities in the rest of the three-dimensional domain. Current questions concern the stability of such complex organizing centers, their capacities to transform into one another, and the varieties of initial conditions that lead to each such topologically distinct organizing center.

This is a beautiful book. It is intellectually elegant, visually elegant with its color plates showing isochrome resetting surfaces and scroll waves in three dimensions, and scientifically elegant in the insights it affords and the experiments it presages.

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Books Received

Applied Chemistry of the Alkali Metals. Hans U. Borgstedt and Cherie K. Mathews. Plenum, New York, 1987. x, 282 pp., illus. \$49.50.

Current Mammalogy. Vol. 1, Hugh H. Genoways, Ed. Plenum, New York, 1987. xx, 519 pp., illus. \$75.

Cyclic Designs. J. A. John. Chapman and Hall (Methuen), New York, 1987. x, 232 pp. \$32.50. Monographs on Statistics and Applied Probability.

Dynamic Models in Biochemistry. A Workbook of Computer Simulations Using Electronic Spreadsheets. Daniel E. Atkinson *et al.* Benjamin/Cummings, Menlo Park, CA, in association with Barkley and Associates, 1987. xiv, 347 pp., illus. Paper, \$19.95.

The Dynamics of Colloidal Systems. William B. Russel. University of Wisconsin Press, Madison, WI, 1987. xiv, 119 pp., illus. \$25. 1984 Olaf A. Hougen Lectures.

Ecological Studies in Tropical Fish Communities. R. H. Lowe-McConnell. Cambridge University Press, New York, 1987. xiv, 382 pp., illus. \$64.50; paper, \$22.95. Cambridge Tropical Biology Series.

Electrets. G. M. Sessler, Ed. 2nd ed. Springer-Verlag, New York, 1987. xvi, 453 pp., illus. Paper, \$54.50. Topics in Applied Physics, vol. 33.

Elements, Oxides, and Silicates. High-Pressure Phases with Implications for the Earth's Interior. Lin-Gun Liu and William A. Bassett. Clarendon (Oxford University Press), New York, 1986. xii, 250 pp., illus. \$49.95. Oxford Monographs on Geology and Geophysics, 4.

Hydraulics and Hydraulic Research. A Historical Review. Gunther Garbrecht, Ed. Balkema, Accord, MA, 1987. x, 362 pp., illus. \$85. International Association for Hydraulic Research, Jubilee volume.

Illness Behavior. A Multidisciplinary Model. Sean McHugh and T. Michael Vallis, Eds. Plenum, New York, 1986. xii, 416 pp., illus. \$65. From a conference, Toronto, Canada, Aug. 1985.

Image Recovery. Theory and Application. Henry Stark, Ed. Academic Press, Orlando, FL, 1987. xx, 543 pp., illus. \$75.

Immune-Deficient Animals in Biomedical Research. J. Rygaard *et al.*, Eds. Karger, Basel, Switzerland, 1987. xvi, 420 pp., illus. \$148.50. From a workshop, Copenhagen, Denmark, Oct. 1985.

Immune Mechanisms in Invertebrate Vectors. A. M. Lackie, Ed. Published for the Zoological Society of London by Clarendon (Oxford University Press), New York, 1986. xvi, 285 pp., illus. \$75. Symposia of the Zoological Society of London, no. 56 (London, U.K., Nov. 1985).

Leaf Protein and Its By-Products in Human and Animal Nutrition. N. W. Pirie. University Press, 1987. xiv, 209 pp., illus. \$37.50. 2nd ed. of *Leaf Protein and Other Aspects of Fodder Fractionation*. Cambridge.

Lectures on Stochastic Analysis. Diffusion Theory. Daniel W. Stroock. Cambridge University Press, New York, 1987. x, 128 pp. \$34.50; paper, \$11.95. London Mathematical Society Students Texts, 6.

Lectures on Surface Science. G. R. Castro and M. Cardona, Eds. Springer-Verlag, New York, 1987. x, 329 pp., illus. Paper, \$59.90. From a symposium, Caracas, Venezuela, July 1986.

Lines to the Mountain Gods. Nazca and the Mysteries of Peru. Evan Hadingham. Random House, New York, 1987. xii, 307 pp., illus. \$22.50.

Lipoproteins and Atherosclerosis. C. L. Malmen-dier and P. Alaupovic, Eds. Plenum, New York, 1987. x, 256 pp., illus. \$49.50. Advances in Experimental Medicine and Biology, vol. 210. From a colloquium, Brussels, Belgium, March 1986.

Lymphokines. Vol. 13, Molecular Cloning and Analysis of Lymphokines. David R. Webb and David V. Goeddel, Eds. Academic Press, Orlando, FL, 1987. xiv, 319 pp., illus. \$85.

Machines in Motion. Leonard Maunder. Cambridge University Press, New York, 1987. 192 pp., illus. \$22.95.

The Marginal Self. An Existential Inquiry into Narcissism. René J. Muller. Humanities Press, Atlantic Highlands, NJ, 1987. xiv, 223 pp. \$35; paper, \$15.

Of Urfs and Orfs. A Primer on How to Analyze Derived Amino Acid Sequences. Russel F. Doolittle. University Science Books, Mill Valley, CA, 1987. viii, 103 pp., illus. Paper, \$14.

Oncogenes, Genes, and Growth Factors. Gordon Guroff, Ed. Wiley-Interscience, New York, 1987. xiv, 386 pp., illus. \$69.95.

Optical and Hybrid Computing. Harold H. Szu, Ed. Society of Photo-Optical Instrumentation Engineers, Bellingham, WA, 1987. x, 485 pp., illus. \$79; to SPIE members, \$65. SPIE, vol. 634. From an institute, Leesburg, VA, March 1986.

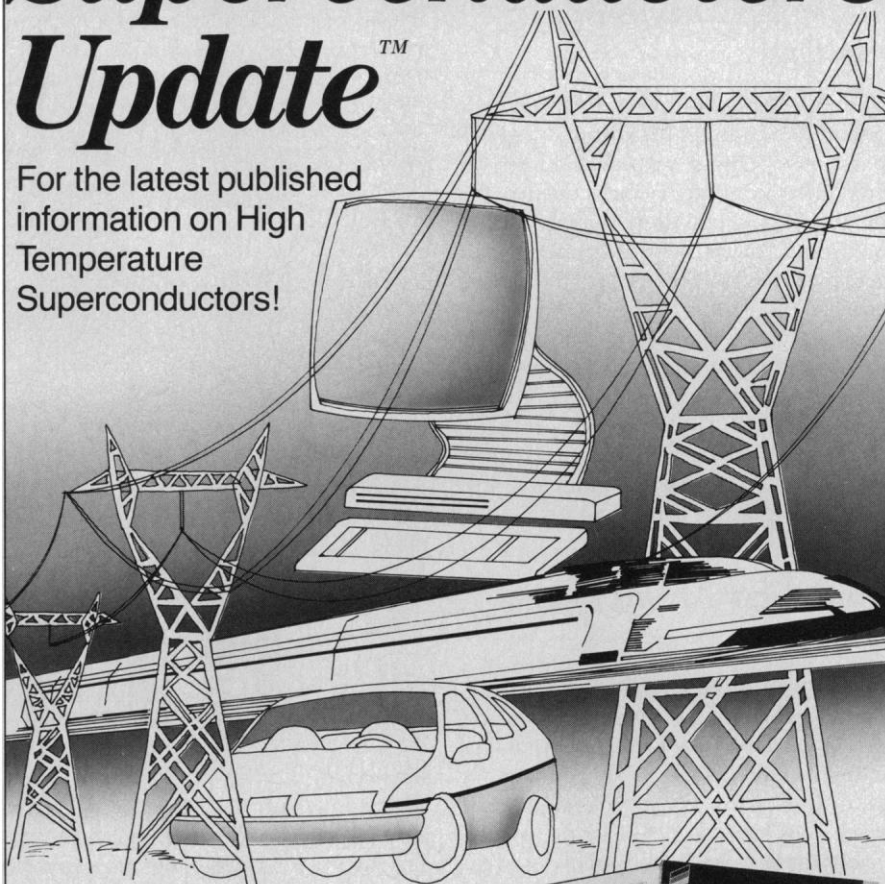
Order within Chaos. Towards a Deterministic Approach to Turbulence. Pierre Berge, Yves Pomeau, and Christian Vidal. Wiley-Interscience, New York, 1987. xvi, 329 pp., illus. \$49.95. Translated from the French edition (Paris, 1984) by Laurette Tuckerman.

Organisation and Promotion of Science in the Federal Republic of Germany. Valentin von Massow. Inter Nationes, Bonn, 1986. 129 pp. Paper. Translated from the German.

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Grant Cost Management Software

GRANT MANAGER is a software accounting program for tracking grant expenses. Budgets may be set up for an unlimited number of main and subaccounts. A password restricts access to budgets and balances but not to the ordering system. Previous orders are stored, allowing vendors, items, and quote numbers to be reused with a few key strokes. GRANT MANAGER can fill out requisition or purchase order forms. Also, the program can compare and reconcile the user's records with the university ledger. Niles & Associates. Circle 650.

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self-priming pump can deliver sample against a pressure head of 1.9 atm. Electronic speed control eliminates gear changing. The user may change the flow direction without changing or removing the tubing. Single-channel flow rate may be adjusted between 0.6 and 325 ml/hour. Bio-Rad Laboratories. Circle 646.

Antibody Test Kit

The Hybridoma/EIA Screening Kit tests supernatants of mouse hybridomas for the presence of antigen-specific immunoglobulin G-class and immunoglobulin M-class antibodies. The kit includes affinity-purified antibody labeled with the highly catalytic enzyme horseradish peroxidase and all reagents necessary for testing 4000 supernatants or forty 96-well plates. The kit's substrate, ABTS [2,2'-azino-di-(3'-ethyl-benzthiazoline)], will not cause premature color development. Beckman Instruments, Bioanalytical Systems Group. Circle 653.

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Literature

Pyrex Labware is a 16-page catalog of 600 beakers; cylinders; boiling, distilling, volumetric, and Erlenmeyer flasks; funnels; separatory funnels; pipettes; and centrifuge tubes. Corning Science Products. Circle 660.

Technical Bulletin #120 describes a procedure for separating small peptides on sodium dodecyl sulfate gels. Hoefer Scientific Instruments. Circle 662.

PM 600 Intelligent Peristaltic Pump is a brochure featuring a microprocessor-controlled pump suited for repeated dose delivery of viscous liquid agar media. Jouan. Circle 663.

C-R4A Series Chromatopac describes a chromatography data processor with a built-in high-resolution cathode-ray tube display and a thermal transfer color printer-plotter. Shimadzu Scientific Instruments. Circle 664.

Liquid Measurement is a catalog of pipettes, pipette accessories, disposable tips, disposable pipettes, stepping dispensers, bottle dispensers, hand-held dispensers, and pipette controllers. Rainin Instrument. Circle 665.

The GT Series brochure features a line of electronic top-loading precision balances with built-in software. Ohaus Scale. Circle 542.

CELSEP is a brochure about a cell separation system that produces separations in 2 to 3 hours for most heterogeneous mammalian cell suspensions. Wescor. Circle 544.

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Protein Chemistry/Immunology-Virology. Ph.D. Experience in protein isolation, purification, modification, and sequence analysis. Background in molecular biology, hybridoma technology, and monoclonal antibody production. Seeks an industrial position. Reply: 4555 Main #512, Kansas City, MO 64111.

Science Writer/Editor. Zoology/physiology Ph.D., biochemical research publications, anatomy textbooks; EPA documents editor; free-lance magazine and newspaper articles. Seeking writing/editing, ghostwriting, collaborative, consulting projects, any biomedical field. Write: Master Wordworks, Route 2 Box 332, Fulton, MO 65251. Telephone: 314-642-9749.

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Send letter of interest, curriculum vitae, three letters of reference, and transcripts (undergraduate and graduate) to: **Dr. Herbert H. Caswell, Jr., Head, Department of Biology, c/o Human Resources, Position V Zoo, P.O. Box 920, Eastern Michigan University, Ypsilanti, MI 48197.**

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ASSISTANT OR ASSOCIATE PROFESSOR IN THE RESEARCH ASSOCIATE TRACK to assume major scientific and administrative responsibility in a cellular electrophysiology laboratory studying arrhythmogenesis and the actions of antiarrhythmic drugs. Experience in single cell work, voltage clamping, ion sensitive microelectrodes, and computer programming preferable. Excellent scientific environment. Renewable term appointment with full fringe benefits. Immediate availability. Please send curriculum vitae, representative reprints, and names of three references to: **Morton F. Arnsdorf, M.D., Chief, Section of Cardiology, University of Chicago Hospitals, Box 423, 5841 South Maryland, Chicago, IL 60637.**

POSITIONS OPEN

ASSISTANT/ASSOCIATE PROFESSOR OF MICROBIOLOGY

The Department of Microbiology at The Pennsylvania State University College of Medicine, Hershey, Pennsylvania, invites applications for a tenure-track position at the assistant/associate professor level. Candidates for this position should have training and research interest in the molecular biology of retroviruses, preferably with human retrovirus. The individual is expected to participate in teaching medical and graduate students. Deadline for receipt of applications is 15 November 1987. Please send curriculum vitae, bibliography, a description of research plans, and the names and addresses of three references to: **Dr. Fred Rapp, Department of Microbiology, The Pennsylvania State University College of Medicine, P.O. Box 850, Hershey, PA 17033.** *The Pennsylvania State University is an Equal Opportunity/Affirmative Action Employer.*

Department of Animal Sciences at Cook College, Rutgers—The State University of New Jersey, invites applications for a tenure-track appointment at the rank of **ASSISTANT, ASSOCIATE, OR FULL PROFESSOR.** Candidates should have expertise in animal nutrition (ruminant or swine). An applied and/or basic research program using in vivo approaches capable of attracting grants will be developed. Teaching responsibilities will include one undergraduate course, a graduate course in specialty, and the supervision of students (undergraduate/graduate—M.S. and Ph.D.). Applicants should submit curriculum vitae and names of three references to: **Dr. James Wohlt, Chairman Search Committee, Department of Animal Sciences, Bartlett Hall, Cook College, Rutgers University, P.O. Box 231, New Brunswick, NJ 08903.** Applications will be accepted until 1 December 1987 or the position is filled. *Rutgers, the State University is an Equal Opportunity/Affirmative Action Employer.*

ASSOCIATE PROFESSOR AND DIRECTOR CURRICULUM IN INDUSTRIAL HYGIENE

Virginia Commonwealth University, School of Basic Health Sciences is seeking a tenure-track associate professor who will serve as Director of the curriculum in industrial hygiene. The successful applicant should have a Ph.D. in a physical science or engineering, experience in an academic health sciences center, experience in curriculum development and formal teaching, and experience in occupational and environmental health and safety regulations. The successful candidate must be a mature scholar who fulfills University expectations in teaching, research, and service. The successful candidate must be able to coordinate diverse groups in developing teaching programs for staff, and students, especially graduate students; in research and problem solving endeavors; and in management of activities and facilities subject to regulations.

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

Applications, including names and addresses of three references, should be submitted to:

**Industrial Hygiene Search Committee
MCV Box 110**

**Virginia Commonwealth University
Richmond, VA 23298-0110**

Applications must be received no later than 5:00 p.m., 30 October 1987, or until a suitable candidate is found.

BIOCHEMIST

The Department of Biology, The University of Alabama, invites applications for a tenure-track position at the assistant professor level to begin August 1988. Postdoctoral experience is required and the successful candidate will be expected to develop an active funded research program, supervise graduate students, and participate in departmental teaching programs. Area of research specialization open. Mutual interaction will be encouraged with other biochemistry faculty whose interests include membrane biochemistry, protein and nucleic acid structure and function analysis, and gene regulation in both prokaryotic and eukaryotic systems. Salary will be competitive and generous start-up money is available. Applicants should submit curriculum vitae, statement of research interests, and three letters of reference by 1 November 1987 to: **Dr. John K. Hardman, Department of Biology, The University of Alabama, Tuscaloosa, AL 35487.** *The University is an Equal Opportunity Employer.*

POSITIONS OPEN

ASSISTANT OR ASSOCIATE PROFESSOR OF ANATOMY

Applications are invited for tenure-track positions at the assistant or associate professor level. Applicants at the assistant professor level should have a Ph.D. or equivalent, postdoctoral experience, an active research program with a high potential for attracting external support, and promise of ability as a teacher of gross anatomy and/or histology. Applicants at the associate professor level should have an ongoing externally funded research program, an established record in scholarship supported by substantial publications, experience in teaching gross anatomy and/or histology, and a record of successful direction of doctoral candidates or fellows. Specific research areas are open, although preference will be given to cell and molecular biology.

Send curriculum vitae, bibliography, a brief statement of research and teaching experience, plus names of three references to: **Chairman, Anatomy Faculty Search Committee, The University of Iowa College of Medicine, Iowa City, IA 52242.**

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

BIOLOGICAL STATION DIRECTOR: The Department of Biological Sciences, wishing to expand our strong aquatic program, invites applications for the Directorship of the Hancock Biological Station, a modern teaching and research facility on Kentucky Lake. This is a tenure-track position. Salary and rank will be commensurate with experience. The Ph.D. in biology or environmental biology is required. We are seeking an individual with biological station or related experience, demonstrated ability to work with funding agencies, and a specialty area in aquatic systems ecology or environmental toxicology. Duties will include management of the Hancock Biological Station, teaching responsibility in the Department of Biological Sciences, and direction of graduate students. The successful candidate will be expected to establish an active research program, seek outside funding for station development, and participate in programs related to a Commonwealth Center for Ecosystems Studies. Starting date is 1 August 1988. Please submit curriculum vitae, transcripts, and three letters of reference by 15 December 1987 to: **Dr. J. M. King, Chairman, Search Committee, Department of Biological Sciences, Murray State University, Murray, KY 42071.** *Murray State University is an Affirmative Action/Equal Opportunity Employer.*

CHAIRPERSON, DEPARTMENT OF PHYSIOLOGY UNIVERSITY OF COLORADO SCHOOL OF MEDICINE

The University of Colorado invites applications and nominations for the position of Chairperson, Department of Physiology. Individuals in all areas of physiology are encouraged to apply. Department interests are currently in neuroscience, membrane function, fetal-placental and cardio-respiratory physiology. Applicants should include curriculum vitae, letter of interest, names of three references and mail by 1 November 1987 to: **Dr. R. A. Deitrich, Department of Pharmacology, University of Colorado Health Sciences Center, 4200 East 9th Avenue, Denver, CO 80262.** Telephone: 303-270-7076. *Women and minority applicants are encouraged to apply. The University of Colorado is an Affirmative Action/Equal Opportunity Employer.*

CHAIRPERSON— MICROBIOLOGY/IMMUNOLOGY

The Loma Linda University, School of Medicine, invites applications and nominations for the position of Chairperson of the Department of Microbiology and Immunology.

A candidate should have either an M.D. or Ph.D. degree or both and have demonstrated leadership and productivity in teaching and research. Experience in academic administration is desirable. Loma Linda University is a private institution where education is conducted within a Christian environment. *The University is a religiously qualified, Equal Opportunity Employer.*

Nominations and applications should be sent to: **B. Lyn Behrens, Dean of School of Medicine, Loma Linda University, Loma Linda, CA 92350.** Applications should include curriculum vitae and the names of three references. Closing date for applications is 30 November 1987.

Quantitative Environmental Scientist

Battelle Memorial Institute which operates the Department of Energy's Pacific Northwest Laboratory in Richland, Washington has an opening in its Environmental Sciences Department for an individual with a Ph.D. in terrestrial or aquatic ecology, accompanied by a strong background in applied sampling theory or a minor in applied statistics, and familiarity with field designs for impact assessment. Experience or formal coursework on methods for estimating animal and plant abundance desired.

As a member of a scientific team, the successful candidate will design and evaluate terrestrial studies devoted to detecting both the impact of waste as well as construction activities on resident biota (small mammals, birds, and plants) and soils. In addition, the candidate will provide statistical interpretation of field sampling results, assess the effects of energy development activities on the environment, and provide timely input into reports as well as open literature publications.

U.S. Citizenship required.

Salary will be commensurate with academic background and experience. Send resume, recent reprints, names of references, and copies of transcripts to: Marilyn K. Merryman, Professional Employment, Battelle-Northwest, P.O. Box 999, Department 009, Richland, Washington 99352.

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Employer M/F.



Battelle

Pacific Northwest Laboratories

GROUP LEADER

Pre-clinical Safety Studies

The Sterling-Winthrop Research Institute announces an opening for a Group Leader in its Toxicology Department. This scientist will be involved in all phases of pre-clinical safety evaluations. Duties will include the preparation of protocols, supervision of studies, compilation and interpretations of data and preparations of final reports. Additional duties will include developing *in vitro* systems for identifying hazards and studying mechanisms of toxicology.

The ideal candidate will possess a Ph.D. degree in Toxicology/Pharmacology and have relevant experience in safety evaluation. A strong background in cellular and molecular toxicology is desirable. This position involves supervision of other scientific and technical staff and requires demonstrated communication and interpersonal skills.

We offer an attractive salary and benefits package with opportunity for professional growth. The Institute is located near Albany, New York which is a center for summer and winter recreational activities.

Please send curriculum vitae in confidence to:

William F. Sheldon, Employment Manager



STERLING-WINTHROP RESEARCH INSTITUTE

Sterling Research Group

A Division of Sterling Drug Inc.

Columbia Turnpike, Rensselaer, NY 12144

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Postdoctoral Associates

Explore a Position Today With The Industry Of The Future.

The Agricultural Division of CIBA-GEIGY Corporation, one of the world's foremost agricultural and specialty chemicals companies, is respected for both the quality of its research and the highly accomplished scientists it attracts. To maintain our leadership position in plant biotechnology, we currently seek two Post-doctoral Associates to join us at our Biotechnology Research Unit located in Research Triangle Park, North Carolina.

These two positions are available in the Plant Molecular Biology Department. Research interests of the department include insect resistance, nitrogen metabolism, chloroplast molecular biology, herbicide resistance, and disease resistance. Candidates will have the opportunity to propose a research project of their own choosing. Individuals with experience in molecular biology and an interest in the regulation of gene expression in plants are encouraged to apply.

Our state-of-the-art facilities in Research Triangle Park are conveniently located, with access to several outstanding universities. We offer an excellent salary and benefits package, and the opportunity to contribute to an innovative research program. For prompt and confidential consideration, forward a curriculum vitae, to: Dr. Mary-Dell Chilton, CIBA-GEIGY Biotechnology Research, P.O. Box 12257, Research Triangle Park, North Carolina 27709. An equal opportunity employer m/f/h/v.

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POSITIONS OPEN

CELLULAR NEUROBIOLOGISTS AND DEVELOPMENTAL BIOLOGISTS. The Department of Biological Sciences, Stanford University, has several openings for tenure-track faculty positions in the areas of cellular neurobiology and/or developmental biology. Applications at the assistant professor level are preferred, but the Department will also consider appropriate candidates at a more senior level for one of these positions. Applicants should send their curriculum vitae, a statement of research accomplishments and anticipated research directions, and the names of three appropriate references to: **Chairperson, Neurobiology Search Committee, Department of Biological Sciences, Stanford, CA 94305-5020.** Applications from women and minority candidates are especially welcome. *Stanford University is an Equal Opportunity Employer.*

UNIVERSITY OF LONDON CHAIR OF BIOCHEMISTRY AT QUEEN MARY COLLEGE

The Senate invite applications for the above Chair, newly established under a Special Academic Initiative, tenable in the Faculty of Science at Queen Mary College. Candidates should have research interests in a field of Molecular Biology.

Applications (11 copies) should be submitted to: **The Teachers' Section (S), University of London, Senate House, Malet Street, London WC1E 7HU,** from whom further particulars should first be obtained.

The closing date for receipt of applications is 16 October 1987.

CHAIRPERSON DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

The State University of New York Health Science Center at Syracuse, College of Medicine, a center for research, professional education, and patient care, invites applications and nominations for the position of Professor and Chairperson in the Department of Microbiology and Immunology. Candidates must have an M.D., Ph.D., or equivalent degree, a devotion to education, a distinguished record of scholarly and professional achievement, proven leadership and administrative ability and a vigorous research program. A highly competitive salary and generous fringe benefits are offered. Send nominations or letters of application (with curriculum vitae, summary of experience and three letters of reference) to:

**Dr. Charles R. Ross, Chairperson
Search Committee
Department of Pharmacology
SUNY Health Science Center at Syracuse
750 East Adams Street
Syracuse, NY 13210**

An Equal Opportunity/Affirmative Action Employer.

DEAN OF THE COLLEGE OF MEDICINE, University of South Florida. The University of South Florida is inviting applications and nominations for the position of Dean of the College of Medicine. The college is affiliated with the H. Lee Moffitt Cancer Center and Research Institute, a Shriners pediatric orthopedic hospital, psychiatric hospital (all on campus), and two Veterans Administration Hospitals, the Tampa General Hospital and All Children's Hospital, St. Petersburg. The Dean is the chief executive officer of the college. Responsibilities include leadership in academic policies and program development, development and maintenance of quality educational, clinical and research programs. Initiation and administration of budgets for education, research, clinical and faculty matters are required. This position requires a strong background in academic leadership, medical education and research, as well as some familiarity with medical center or university hospital administration. Qualified candidates must have an M.D. or M.D./Ph.D. degree. Nominations and applications received or postmarked by 31 October 1987 will receive consideration. Recruiting will continue until the position is filled. Applications should include a letter summarizing the candidate's experience, a complete curriculum vitae and names and addresses of three references. Please send all correspondence to: **H. Juergen Nord, M.D., Chairman, Search Committee, University of South Florida College of Medicine, 12901 Bruce B. Downs Boulevard, MDC Box 2, Tampa, FL 33612-4799.** *The University of South Florida is an Affirmative Action/Equal Opportunity Institution.*

POSITIONS OPEN

BIO-ORGANIC CHEMIST

Biotherapeutics Inc., a cancer research and treatment organization, has an opening for a bio-organic chemist. Qualifications include a Ph.D. in synthetic organic chemistry, protein chemistry or biochemistry, plus significant experience in the conjugation of chemotherapeutic agents and/or immunotoxins to monoclonal antibodies. The position would initially involve direct responsibility for the synthesis, purification, characterization, and analysis of these antibody-drug conjugates, with considerable opportunity for design and development of new immunoconjugates and professional growth.

Send curriculum vitae and salary history to: **Personnel Department, Biotherapeutics Inc., 357 Riverside Drive, P.O. Box 1676, Franklin, TN 37065-1676.**

CHAIRPERSON, DEPARTMENT OF ANATOMY AND CELL BIOLOGY

The Mount Sinai School of Medicine of the City University of New York seeks an outstanding leader for the Department of Anatomy and Cell Biology. The successful candidate should have a strong commitment to medical and graduate student teaching and to the development of curricula that are interactive with other basic sciences and pre-clinical sciences. In addition, we seek an individual with an active and well-recognized research program in cell biology. Please send curriculum vitae to: **Jay Unkeless, Ph.D., Box 1020, Mount Sinai Medical Center, One Gustave L. Levy Place, New York, NY 10029.** *An Equal Opportunity Employer.*

CONNECTIVE TISSUE MOLECULAR BIOLOGIST POSTDOCTORAL FELLOW

A postdoctoral fellow or research associate position is currently available for a nucleic acid molecular biologist interested in participating in studies designed to investigate the structure and regulation of human connective tissue proteoglycan core genes. Candidates should preferably have experience in procedures in recombinant DNA technology such as: DNA sequence analysis; construction and screening of genomic and cDNA libraries; eukaryotic RNA and DNA isolation; Northern, Southern and RNA dot blot analyses and tissue culture. Salary and position compatible with experience. Send curriculum vitae and names/addresses of three references to: **Dr. Kevin L. Dreher, Staff Scientist, Weis Center for Research, Geisinger Clinic, Danville, PA 17822.** *Equal Opportunity Employer M/F/H.*

DIRECTOR OF BIOMEDICAL ENGINEERING VIRGINIA COMMONWEALTH UNIVERSITY

Applications are invited for the position of Director of the Biomedical Engineering Program on the Health Sciences campus. The successful candidate must qualify for the rank of associate professor or professor and have a Ph.D. or equivalent degree in biomedical engineering or related discipline, and 2 years of postdoctoral training experience. The candidate must have a distinguished record of research in biomedical instrumentation, mechanics, or related area, including peer-reviewed publications and extramural research support. The candidate must have experience in advising predoctoral students and demonstrated capability for leadership. Experience in advising postdoctoral research trainees and health professional students is desirable. A complete job description and list of qualifications will be sent on request.

Applications, including curriculum vitae and the names of three references, should be sent to:

**Secretary, Biomedical Engineering
Director Search Committee
Virginia Commonwealth University
MCV Station—Box 110
Richmond, VA 23298-0110**

Applications must be received by 5:00 p.m. on 30 October 1987 or until a suitable candidate is identified. *Virginia Commonwealth University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

POSITIONS OPEN

DIRECTOR FELS RESEARCH INSTITUTE OF CANCER AND MOLECULAR BIOLOGY

Temple University School of Medicine invites applications and nominations for a scientific and administrative leader of the Fels Research Institute of Cancer and Molecular Biology. The Director will hold a tenured faculty appointment in the School of Medicine. The Fels Research Institute is currently a Laboratory/Basic Cancer Center of the National Cancer Institute. Temple Medical School also houses the Editorial Office for *Cancer Research*. The Fels Research Institute will be the focus for a University-wide expansion of research related to cancer and molecular biology. The Director is expected to provide leadership in molecular biological approaches to cancer research, and to foster expansion of molecular biological research at Temple University. A number of positions in addition to the Director are available for rapid expansion of the research program.

Temple University Health Sciences Center includes a new hospital with clinical research laboratories and a modern Clinical Research Center. These facilities provide opportunities for collaborations in clinical aspects of research in cancer, molecular biology, and genetics. Applicants should have a recognized program in an area of molecular biology. A relationship to cancer is desired, however, other areas will be considered. Applications or letters of nomination should be accompanied by curriculum vitae, and the names of at least three references. Send the application before 30 September 1987, to: **Gerhard Plaut, Ph.D., Chairman, Search Committee, Fels Research Institute of Cancer and Molecular Biology, Office of the Dean, Temple University School of Medicine, 3400 North Broad Street, Philadelphia, PA 19140.** *Temple University is an Affirmative Action/Equal Opportunity Employer.*

Washington State University seeks **DIRECTOR, HEALTH RESEARCH AND EDUCATION CENTER (HREC)**, located in Spokane. Appointment effective 1 January 1988. Doctorate (M.D., Ph.D., or Pharm.D.) with at least 5 years of experience in clinical research (preferably in area of clinical pharmacology); associate or full professor rank. Salary open. Complete job description available. Nomination or application letter (including names of at least three references) and curriculum vitae addressed to: **Dr. Robert V. Smith, Chair, HREC Director; Vice Provost for Research and Dean of the Graduate School; Washington State University; Pullman, WA 99164-1030.** Nomination/application deadline: 15 October 1987. *Washington State University is an Equal Opportunity/Affirmative Action Educator and Employer. Protected group members are encouraged to apply and to identify their status.*

ECOLOGIST—Applications are invited for a tenure-track position at the assistant/associate professor level beginning 1 August 1988. Ph.D. required. Successful candidate will teach ecology, environmental sciences, and related areas and will serve as director of a newly-acquired/endowed nature center. The individual will be responsible for developing the facility as an educational and research field station. Experience at a similar facility would be helpful. Send letter of application, curriculum vitae, transcripts and three letters of reference to: **Dr. Charles H. Brueske, Chairman, Department of Biology, Mount Union College, Alliance, OH 44601** by 15 December 1987. *The College is an Equal Opportunity/Affirmative Action Employer.*

EUKARYOTIC MOLECULAR BIOLOGY FACULTY POSITION

Applications and nominations are invited for a tenure-track faculty position in the Department of Biochemistry, Purdue University, West Lafayette, Indiana. We are particularly interested in individuals trained in molecular biological approaches to human, animal, or animal virus research problems. Candidates must have postdoctoral training, a strong research record, and be capable of developing and continuing a vigorous research program. For consideration, send curriculum vitae, a statement of research interests, and the names and addresses of three references to: **Eukaryotic Molecular Biology Search Committee, Department of Biochemistry, Purdue University, West Lafayette, IN 47907.** Application deadline is 2 October 1987.

Purdue University is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

UNIVERSITY OF HONG KONG DIRECTOR OF THE RADIOISOTOPE UNIT

Applications are invited for the Directorship of the Radioisotope Unit, which is tenable from as soon as possible. The Radioisotope Unit is located in the Faculty of Science, and its functions include teaching and research, as well as radiological protection, service and advice. Applicants should therefore have strong academic qualifications (preferably including Ph.D. degree) and wide experience of teaching and research, and in the areas necessary to maintain the radiological protection, service, and advisory functions of the Unit.

Annual salary (superannuable) is on the 9-point Senior Lectureship scale: HK\$292,320 to HK\$392,700 (approximately £23,390 to £31,420; sterling equivalent as at 29 July 1987). Starting salary will depend on qualifications and experience. At current rates, salaries tax will not exceed 16½% of gross income. Housing at a rental of 7½% of salary, children's education allowances, leave, and medical benefits are provided.

Further particulars and application forms may be obtained from: The Secretary General Association of Commonwealth Universities (Appts), 36 Gordon Square, London WC1H 0PF, or from the Appointments Unit, Registry, University of Hong Kong, Hong Kong. Closes: 9 November 1987.

Dickinson College, The Environmental Studies Program invites applications for a 3-semester, non-tenure-track **FACULTY POSITION** beginning in January, 1988. We seek a candidate with a background in one or more of the natural sciences, with interdisciplinary experience and with interests including quantitative methods in policy analysis. Applicants should submit curriculum vitae by 15 October to: Dr. Candie Wilderman, Coordinator, Environmental Studies Program, Dickinson College, Carlisle, PA 17013. *Dickinson College is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS IN MOLECULAR BIOLOGY

The Department of Biochemistry, Wayne State University School of Medicine, is undergoing a major expansion in the area of molecular biology. Over the next 2 years, we are seeking five outstanding and productive researchers in prokaryotic or eukaryotic molecular biology. This represents a major commitment by Wayne State University to molecular biology, and generous start up funds and research facilities will be available. The positions are at the level of assistant professor, although outstanding individuals at more senior levels will be considered.

Wayne State University is one of three state-supported research universities in the State of Michigan. The School of Medicine is an integral part of the Detroit Medical Complex, one of the largest university-health complexes in the country, with over 1000 medical students, a vigorous graduate program, and five affiliated teaching hospitals. We invite individuals with a Ph.D. or M.D. and relevant postdoctoral experience in molecular biology to apply for this unique opportunity. A résumé, the names of at least three references, and a brief outline of future research interests should be sent to: Dr. Barry P. Rosen, Chairman, Department of Biochemistry, Wayne State University, School of Medicine, Gordon H. Scott Hall of Basic Medical Sciences, 540 East Canfield Avenue, Detroit, MI 48201.

An Equal Opportunity/Affirmative Action Employer.

MOLECULAR GENETICIST FACULTY POSITION

The Animal Sciences Department, Purdue University, is seeking an assistant professor (12-month, tenure-track) to conduct research in molecular genetics of domestic animals and teach at the graduate level. Ph.D. and postdoctoral experience in molecular genetics is required. Participation in Purdue's Biochemistry program is expected. Application deadline is 2 October 1987. Send curriculum vitae, reprints, and names and addresses of three references to: Dr. B. G. Harmon, Head, Department of Animal Sciences, Purdue University, West Lafayette, IN 47907. *Purdue University is an Affirmative Action/Equal Opportunity Employer.*

11 SEPTEMBER 1987

In Vitro Genetic Toxicologist Mobil

Mobil Oil Corporation is seeking a highly qualified Genetic Toxicologist to join its Environmental Affairs and Toxicology Department located near Princeton, New Jersey.

Responsibilities include supervision and performance of mammalian cell mutation assays, particularly the mouse lymphoma L5178Y TK + /- assay; monitoring new trends and developments in genetic toxicology testing; and design and validation of new or modified test methods useful as alternatives to animal toxicology testing.

The successful candidate will have a Ph.D. in Toxicology, Biochemistry or a related discipline and at least 2 years of relevant experience (preferably industrial). Applicants should possess excellent communication skills, a solid publication record, and an interest in continuing to publish original research work.

Interested applicants should send their curriculum vitae in confidence to: Manager, Recruiting and Employment, Department SCI, Mobil Technical Center, P.O. Box 1031, Princeton, N.J. 08540.

MOBIL OIL CORPORATION

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POST-DOCTORAL FELLOW

The Cardiac Diseases Section of Wyeth Laboratories is seeking a Post-Doctoral Fellow to join an established and highly visible laboratory in the electrophysiology study of potassium channels in nerve, cardiac and smooth muscle cells using patch and whole-cell voltage clamp techniques. Research will focus on the basic characterization of potassium channel gating, and the molecular mechanisms underlying channel block by drugs and toxins. Efforts will be aided by detailed computer modeling of drug molecules, and the use of newly synthesized novel potassium channel blockers and activators. The candidate will be expected to become an active and productive member of the research team, and to interact with other scientists both internally and in the general scientific community. Experimental findings will be presented in scientific publications and in presentations at scientific meetings.

The candidate should have a recent Ph.D. in Physiology, Pharmacology or Biophysics, with prior experience in electrophysiology and microelectrode techniques preferred. Familiarity with tissue culture and/or membrane channel/receptor isolation techniques may also be useful.

Respond immediately by forwarding your CV and salary requirements in confidence to: **Position #153, Recruitment Manager, WYETH LABORATORIES, INC., P.O. Box 8299, Philadelphia, PA 19101.** Equal Opportunity Employer, M/F/H/V responses encouraged.

Wyeth Laboratories



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POSITIONS OPEN

FACULTY POSITION MOLECULAR GENETICS

The Center for Genetics is seeking candidates for a faculty position in the area of mammalian molecular biology and genetics. The position will be at the level of assistant professor up to full professor, depending on the candidate's qualifications, and will be either tenure-track or tenured. Candidates must have a Ph.D. or its equivalent plus at least 2 years of postdoctoral experience in mammalian molecular genetics or related areas. Significant research accomplishments and/or evidence of outstanding research potential will be key considerations. Applicants should provide curriculum vitae, names and addresses of four references, and a brief statement of research interests and plans. To receive fullest consideration, applications should be received by 1 November 1987. Send applications to: **Dr. Richard L. Davidson, Director of Center for Genetics, University of Illinois College of Medicine, 808 South Wood Street, Chicago, IL 60612.** *The University of Illinois is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITION IN MOLECULAR GENETICS

The Department of Microbiology and Molecular Genetics at the University of Cincinnati College of Medicine announces a faculty opening in the area of molecular genetics of cancer or immunology. We are particularly interested in responses from individuals who have already established independent research programs. Excellent salary, laboratory space, and start up monies are available. Applicants should submit their curriculum vitae and a summary of research accomplishments and future research plans, along with the names of three scientists willing to write letters of recommendation, to: **Dr. Jerry B. Lingrel, Ph.D., Department of Microbiology and Molecular Genetics, University of Cincinnati College of Medicine, Cincinnati, OH 45267-0524.** *The University of Cincinnati is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITION IN PLANT MOLECULAR BIOLOGY

The University of Iowa invites applications for a tenure-track appointment at the level of assistant professor. We seek candidates with excellent research records who have had postdoctoral experience and/or experience as a faculty member at another university. Research activity should center on the use of modern molecular techniques to solve basic problems in plant biology. Appointees will participate in the teaching of introductory and/or advanced courses. This position is part of a Special Recruitment Program in the College of Liberal Arts; the appointment will be made jointly in the departments of biology and botany. Applications should include curriculum vitae, a statement of research interests and the names of three scientists who can comment on the academic record of the candidate. Send these materials to: **Chairman, Plant Molecular Biology Search Committee, Department of Botany, University of Iowa, Iowa City, IA 52242.** Screening of applications will begin in November, 1987, and will continue until the position is filled. *The University of Iowa is an Equal Employment Opportunity/Affirmative Action Employer.*

The University of California, San Diego, Department of Chemistry, invites applications for tenure-track **FACULTY POSITIONS IN BIOCHEMISTRY**, and in all fields of **chemistry** (inorganic, organic and physical). Appointments are available at all levels for individuals with outstanding research credentials. Candidate must have a Ph.D. and a demonstrated ability for creative research and teaching at the undergraduate and graduate levels. Salary commensurate with qualifications, and based on University of California pay scale. Candidates should send curriculum vitae, a list of publications, reprints of representative papers, a summary of research plans, and names and addresses of three references to: **Chairman (Bio-, Inorganic, Organic, Physical Chemistry) Search Committee, B-032, University of California, San Diego, La Jolla, CA 92093.** Prompt response is recommended but all applications received by 15 October 1987 will be given thorough consideration.

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

SENIOR SCIENTIST



Hoffmann-La Roche is an established leader in the pharmaceutical and health care industry, with a strong commitment to biotechnology. The Molecular Genetics Department conducts basic and applied research on prokaryotic and eukaryotic gene expression, lymphokines, cytokines, growth factors and their receptors, oncogenes and other areas with relevance to human pharmaceuticals.

We are seeking a Senior Scientist to be responsible for a research program to characterize cell surface receptors, and to apply hybridoma technology, protein characterization and cell biology techniques in support of drug development research efforts. Qualifications include a Ph.D. in Cell Biology, Biochemistry, Pharmacology or a related discipline, and a minimum of two years of postdoctoral training. Experience in characterization of cell surface receptors or related proteins and hybridoma technology would be preferred.

The Department of Molecular Genetics is located close to the Roche Institute of Molecular Biology, in a suburban setting 10 miles from New York City. We offer a very competitive compensation package, and a research environment that encourages scientific growth. Interested individuals are invited to send curriculum vitae and a letter indicating past, current and future research interests to: **Eleanor M. Malone, Professional Employment and Staffing Specialist, Dept. RC, Hoffmann-La Roche Inc., Nutley, New Jersey 07110.** We are an equal opportunity employer.



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Postdoctoral Scientist

The Drug Metabolism Department of Smith Kline & French Laboratories, located in suburban Philadelphia, Pennsylvania, is seeking a Postdoctoral Scientist to perform basic research in Drug Metabolism. This position offers the opportunity to interact with senior members of the department to facilitate professional growth. Candidates will report research results within the company and at national scientific meetings and are encouraged to publish these results in leading trade journals.

The successful candidate will:

- Perform studies directed toward an understanding of the metabolism/pharmacokinetics of therapeutic proteins.
- Investigate effects of glycosylation and carbohydrate structure on the pharmacokinetics of therapeutic proteins.
- Study factors that govern hepatic and extrahepatic metabolism of proteins.
- Develop necessary bioanalytical techniques to perform such studies.

Our postdoctoral positions are normally of two years duration.

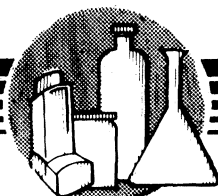
The successful candidate is required to have:

- a Ph.D. in Biochemistry, Protein Chemistry or related areas.
- Experience in enzymatic and immunoassays.
- Working knowledge of major electrophoretic techniques and HPLC techniques applicable to protein quantification.
- Experience in drug metabolism studies is preferred but not necessary.
- Excellent oral and written communication skills.
- Demonstrated ability to integrate and apply multi-disciplinary techniques.

We offer an excellent compensation, benefits and relocation package as well as opportunities for personal and professional growth. Please forward your C.V. and the names of three references to: **Mary Ann McCarr-C0046 - Smith Kline & French Laboratories, Research & Development, P.O. Box 1539, King of Prussia, PA 19406-0939.** We are an Equal Opportunity Employer, M/F/H/V.

SK&F

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*Glaxo Has The Prescription For
Career Success*

SENIOR VIROLOGIST

Glaxo Inc., located in Research Triangle Park, N.C. is one of the Top 10 ethical pharmaceutical firms in America. We are a company with tremendous growth opportunities, state-of-the-art facilities, and a commitment to producing medicines that save lives and eliminate suffering.

We're proud of our broad-based research organization which is committed to inter-disciplinary approaches to the solution of clinically important problems. Our Chemotherapy Department currently has an excellent career opportunity available for a Senior Virologist. This key position will be responsible for the initiation, implementation and coordination of research into anti-viral agents.

Qualified candidate must possess previous experience with viral infections in animals and the evaluation of anti-viral compounds. Familiarity with retroviruses and/or molecular biology is preferred, as well as previous experience in the pharmaceutical industry.

At Glaxo Inc., growth opportunities and up-to-date facilities are complemented by a location (near Raleigh/Durham) that has excellent resources in close proximity. Prestigious universities, scenic vistas, lively recreational areas, and exciting cultural opportunities are all a part of the daily life of the Glaxo professional. Further, we reward talent and creativity with an excellent salary and benefits package. Please forward your resume, including salary history, in confidence, to:

Dept. 87-062E-SC

*(No Phone Calls, Please)
No Private Agency Referrals, Please*

Glaxo Inc.

**P.O. Box 13398
Research Triangle Park, NC 27709**

An Equal Opportunity Employer M/F/V/H



EXECUTIVE DIRECTOR

Oak Ridge Associated Universities

The Board of Directors of the Oak Ridge Associated Universities invites nominations and applications for the position of Executive Director. Oak Ridge Associated Universities is a private not-for-profit association of 49 colleges and universities with a staff of more than 500 and a current operating budget of approximately \$35 million with offices in Oak Ridge, TN, and Washington, DC. It conducts research, educational and information programs in the areas of energy, health, and the environment for the U.S. Department of Energy (DOE), other private and governmental organizations, ORAU member institutions, and other colleges and universities. ORAU is a management and operating contractor for DOE. Activities include the administration of pre- and post-doctoral fellowships, basic and applied research in biomedicine and physics, policy studies, and management of major research facilities.

Responsibilities of the Executive Director include: Direction of all programs, facilities, and personnel; provision of strong leadership in pursuing new initiatives and new directions for ORAU; overall responsibility for cooperative activities and relationships with member institutions; representation of ORAU to federal agencies, corporations, foundations, universities, and other organizations; and strategic planning.

It is desirable that candidates for the position have the following qualifications: Earned doctorate in science, engineering, medicine or a related field; experience as a faculty member or familiarity with university administration, governance, etc.; research experience; familiarity with government agencies, funding procedures, and proposal preparation; management experience, including fiscal, personnel, and program/project responsibility; familiarity with private foundations and other 501(c)3 institutions; strong interpersonal skills; and ability to communicate well orally and in writing.

The position will be available on or before July 1, 1988. The Search Committee will begin its review of applications November 2, 1987. Salary and starting date are negotiable. Applications should include a letter stating an interest in the position, a complete resume, and names and addresses of at least three references. Applications will be considered confidential.

Applications and nominations should be sent to:

**Dr. Paul F. Parks
Vice President for Research
202 Samford Hall
Auburn University, AL 36849**

ORAU is an EEO/AA Employer

POSITIONS OPEN

FACULTY POSITIONS IN CARDIOVASCULAR/RENAL PHARMACOLOGY

The Department of Pharmacology, University of Tennessee, Memphis, is seeking candidates for two tenure-track positions available immediately, in cardiovascular/renal pharmacology at the ranks of associate professor or professor. Candidates should possess a Ph.D. degree in pharmacology or related discipline, or an M.D., and should have demonstrated excellence in research and commitment to teaching. Candidates will be expected to have an ongoing independent research program supported by national funding agencies. Although candidates in the area of cardiovascular-renal pharmacology will be given preference, applicants experienced in other areas of research will also be considered. Candidates for cardiovascular-renal should have a strong background in relevant physiological or biochemical studies. Other candidates should have appropriate experience in application of biochemistry, molecular biology, or immunology to pharmacology. Candidates will be expected to participate in teaching of pharmacology to professional and graduate students. *Applications from minority candidates and women are strongly encouraged.* Please submit, by 1 December 1987, curriculum vitae, the names of three references and a brief statement of future research plans to: **Murray Heimberg, M.D., Ph.D., Van Vleet Professor and Chairman, Department of Pharmacology, University of Tennessee, The Health Science Center, Memphis, TN 38163.** *The University of Tennessee is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS KING ABDULAZIZ UNIVERSITY FACULTY OF METEOROLOGY, ENVIRONMENT AND ARID LAND AGRICULTURE JEDDAH, SAUDI ARABIA

Applications are being accepted by the Faculty of Meteorology, Environment and Arid Land Agriculture, King Abdulaziz University, for the following three faculty positions:

1. HORTICULTURAL SCIENTIST
2. FLORICULTURE SCIENTIST
3. ANIMAL BREEDING SCIENTIST

Applicants should hold a Ph.D. in horticulture, floriculture, animal breeding, or a closely related field, and possess a proven record in teaching and research. Candidates should submit curriculum vitae, including a list of publications, statements of research interests and teaching experience, and three letters of reference to:

Dr. Dwayne A. Suter
Associate Dean
College of Agriculture
Texas A&M University
College Station, TX 77843

In addition to an attractive salary, King Abdulaziz University offers a generous housing and furniture allowance, end of contract gratuity, 60 days of paid summer leave each year, baggage allowance, educational allowance for school-age children, transportation allowance, and annual round-trip air fares.

Term of employment is for 1 year with opportunity for renewal.

PURDUE UNIVERSITY HEAD DEPARTMENT OF BIOLOGICAL SCIENCES

The Department of Biological Sciences, Purdue University, is seeking an established scholar with broad interests to serve as Head of the Department. The Department has about sixty faculty members and extensive teaching, research, and service responsibilities appropriate to a publicly supported university. We are looking for a person with a record of outstanding scientific achievement and commitment to higher education. Applications and nominations, including curriculum vitae, bibliography, and names of three individuals familiar with the candidate's qualifications, should be sent to **Search Committee Convener, Department of Biological Sciences, Purdue University, West Lafayette, IN 47907** by 15 October 1987. *Purdue University is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

TWO FACULTY POSITIONS IN FOOD RELATED BEHAVIOR

(1) **ASSOCIATE or FULL PROFESSOR** with doctorate in biological or behavioral science, training and experience in psycho-physiological aspects of taste and food related behavior, outstanding research achievements, and successful funding record.

(2) **RANK OPEN** for doctorate in food science (not food technology), training in experimental foods, food chemistry, food related behavior, and sensory/textural evaluation. Apply by sending letter of application, résumé, transcripts, and names of three references before 15 November 1987, to: **Dr. Eleanor Williams, Department of Food, Nutrition and Institution Administration, University of Maryland, College Park, MD 20742.** *An Equal Opportunity/Affirmative Action Employer.*

FLAVOR RESEARCH SCIENTIST: Define and develop methodology for isolation and concentration of flavor systems and components. Instrumental analysis and separation techniques using knowledge of biochemistry, membrane dialysis, and gas chromatographic techniques, Maillard reaction systems, and hands-on experience in encapsulation. Ph.D. in food science required. Ph.D. studies must include concentration in flavor chemistry and use analytical chemistry for application of analytical techniques 35 hours per week; \$35,000 per year. DOT 022 061 010. Mail résumé to: **NYS Job Service, order #8004778, 97-45 Queens Boulevard, Rego Park, NY 11374.**

FULL PROFESSORSHIP

Harvard University: The Department of Psychology seeks to fill a new professorial opening devoted to the study of criminal behavior. Candidates should be active in criminological research, with special emphasis on psychological or psychophysiological variables. Candidates should also be prepared to teach at the graduate and undergraduate level. Although the primary appointment is in the Department of Psychology, joint appointment with other Departments or Faculties may be arranged if appropriate. Applications, including the names and addresses of three referees should be sent to: **Brendan Maher, Chairman, Department of Psychology, Harvard University, Cambridge, MA 02138.** *Applications from women and minority groups are especially welcome. The closing date for applying is 15 November 1987.*

COLORADO SCHOOL OF MINES ACCEPTING APPLICATIONS AND NOMINATIONS FOR HEAD OF ENVIRONMENTAL SCIENCES DEPARTMENT

The Environmental Sciences Department at Colorado School of Mines is small but with a rapidly growing graduate and research program. Candidates should possess a doctoral degree, a distinguished academic and research record in the environmental sciences, and the demonstrated ability to provide leadership which further enhances the role of the Department in emerging national and international environmental programs.

The position requires a strong commitment to the continuing development of quality research and academic programs, faculty development, and departmental resources. Applications and nominations should be submitted, with curriculum vitae and three letters of reference, to: **Dr. Donald W. Gentry, Dean of Engineering, Colorado School of Mines, Golden, CO 80401.**

Application review will begin 1 October 1987, and continue until the appropriate candidate is identified. *The Colorado School of Mines is an Equal Opportunity/Affirmative Action Employer.*

HEMATOLOGY/MEDICAL ONCOLOGY

Rapidly expanding bone marrow transplant program has immediate need to expand full-time staff. A position is available at the level of assistant professor or senior instructor, depending on qualifications. Board eligibility or certification in hematology or medical oncology is required. Contact: **Dr. Stephen Bulova, Associate Professor, Department of Neoplastic Diseases, Hahnemann University, MS 412, Broad and Vine Streets, Philadelphia, PA 19102-1192.** *Affirmative Action Employer.*

POSITIONS OPEN

HEAD, MUSEUM RESEARCH LIBRARY. Natural History Museum of Los Angeles County invites applications for a full-time, permanent position, funded by the Museum Foundation. The Library contains over 80,000 volumes, has a total of 3,640 journal titles, and serves a research staff including 34 curators. Salary: \$24,759 to \$30,802, depending on qualifications. Duties: Responsible for organization and development of the Research Library and related collections, including the Seaver Center for Western History Research. Overall responsibility for all library services, planning, budget, and personnel (librarians, library assistants, and student assistants). Manages technical processing, collection preservation, and exchange activities. Selects and acquires books, journals, and maps, including current and antiquarian materials, in conjunction with curatorial staff. Maintains liaison with museum administration, curatorial divisions and the public. Fosters cooperation with librarians of local universities and natural history institutions in the United States and abroad. Must be willing to seek and secure funding from outside granting agencies. Qualifications: A.L.A.-accredited M.L.S. required; second master's degree in biology, geology, or history desirable. Five years of professional experience in a research library with at least 2 years of supervisory experience. Experience with bibliographic utilities such as OCLC or RLIN, and online database searching preferred. Send letter of application, résumé, and list of four references (including addresses and telephone numbers) by 15 October 1987, to: **Dr. Gordon Hendler, Chair of the Library Search Committee, Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, CA 90007.** *An Equal Opportunity/Affirmative Action Employer.*

HISTOCOMPATIBILITY LABORATORY DIRECTOR—Assistant or associate professor of pathology (tenure-track) to direct Tissue Typing Laboratory at the University of Utah Medical Center. Individual should have M.D. or Ph.D. with clinical and laboratory experience in tissue typing, paternity testing, and organ transplantation, and be fully certified to direct a tissue typing laboratory. The individual would be responsible for the administration of and technical supervision of the laboratory. The position is an academic one on the full tenure track. The individual would be expected to instruct medical students, house staff and graduate students in the principles of tissue typing and paternity testing. In addition, the individual will be expected to develop an independent research program capable of generating external grant support. In addition, they would work closely with personnel in an active cooperative organ transplant program at the University of Utah Hospital and its affiliated hospitals. Applicants should forward curriculum vitae to: **Harry R. Hill, M.D., Professor of Pathology, Head Division of Clinical Immunology, University of Utah, 50 North Medical Drive, Salt Lake City, UT 84132.** *The University of Utah is an Equal Opportunity Employer.* Closing date: 1 December 1987.

JUNIOR AND SENIOR FACULTY POSITIONS MOLECULAR BIOLOGY OF THE IMMUNE SYSTEM

The Department of Microbiology and Immunology invites applications for junior and senior level, tenure-track positions focusing on the molecular analysis of significant problems in immunology. Senior candidates should have strong records of research accomplishment with sustained program growth and development. Junior candidates will be expected to develop high quality, independent research programs with long-term growth potential. Teaching responsibilities, which emphasize quality rather than quantity, include medical, dental and graduate students. A large Center of Excellence grant has resulted in establishment of a Molecular Resource Center within the Department featuring state-of-the-art facilities for: oligonucleotide synthesis, peptide synthesis, hybridoma antibody production, amino acid analysis, protein/sequencing and flow cytometry. Funds for the initiation of research programs will be available and salaries will be highly competitive. Applications should consist of curriculum vitae, copies of several recent publications, a brief statement of future research goals and three letters of reference to be sent to: **Dr. Terrance G. Cooper, Department of Microbiology and Immunology, University of Tennessee, Memphis, 858 Madison Avenue, Memphis, TN 38163.** Applications will be received until 1 October 1987 or until the positions are filled thereafter. *The University of Tennessee is an Affirmative Action/Equal Opportunity Employer.*

BIOLOGIST

The Energy Conversion and Utilization Technologies (ECUT) Program of the Office of Energy Utilization Research in the U.S. Department of Energy (DOE) has an immediate opening for a Biologist. Experience is desired in research relevant to the energy efficient biocatalyzed conversion of feedstocks to chemicals and fuels. Applicants must possess a bachelor's or higher degree in the biological or chemical sciences pertinent to the position being filled. A Ph.D. degree is desirable in one of the biotechnology related disciplines such as Bioprocess Engineering, Fermentation Technology, Microbiology, Molecular Biology, Enzymology, Biochemistry or Quantum Biology. Applicants must also have at least three years of additional experience in some aspect of biotechnology R&D. The appointment is a permanent, full time position at the GS-14 level, \$45,763 to \$59,488 per year depending upon education and experience.

Duties: The incumbent will be responsible for planning and managing an applied biotechnology research program of national scope which includes activities such as the design of (bio)catalysts, genetic engineering of high-productivity micro-organisms and research on innovative bio-reactor/separation concepts. Program implementation is accomplished through field organizations such as government laboratories, university grants or competitively selected industrial contracts.

Interested persons should submit a Standard Form 171 "Application for Federal Employment" (available at Federal Job Information Centers or from the address below) to:

Department of Energy, Office of Personnel, MA-205.2, Attn: Vacancy Announcement 87-CE-077, 1000 Independence Ave., S.W., Washington, D.C. 20585.

For further information contact Jeffrey Dowell on 202-586-8563. Applications must be received by the above office on or before **September 30, 1987**, in order to be considered. DOE is an equal opportunity employer and qualified women and minorities are encouraged to apply. United States Citizenship is required for employment in the Federal Government.

SCIENTIFIC PROGRAM MANAGER, NEUROBIOLOGY (COMPUTATIONAL)

The Office of Naval Research (ONR) is seeking a highly qualified individual to plan and manage an external contract research program in neurobiology by leading U.S. scientists with emphasis on computational strategies. This is a Civil Service position at the GM-13, 14 or 15 grade level (\$38,727-\$69,976), depending on qualifications.

The successful candidate will conceive, organize and direct research and development programs in biological neural systems which are concerned with the organization, structural basis, and functional architectures of information processing networks in neural systems (biological intelligence). Program management responsibilities require knowledge of biological neural systems and computational analysis of neural system processing functions with expertise in at least two of the following areas: biochemical, electrical and morphological basis of synaptic plasticity; neuropharmacological and neuroanatomical characterization of defined neural pathways; parallel processing architectural analysis; and neural-behavioral relationships.

Applicants must have a Ph.D. plus a minimum of one year of experience or an equivalent combination of education and experience. To apply, please send a resume, list of publications and a Standard Form 171, Application for Federal Employment, to:

OFFICE OF THE CHIEF OF NAVAL RESEARCH

Personnel Operations, Code 01242P

Attn: Announcement #87-77(S)

800 North Quincy Street, Arlington, VA 22217-5000

Applications must be received by 30 October 1987. For further information and supplemental forms, please call (202) 696-4705. An Equal Opportunity Employer, U.S. Citizenship required.

WORLD-RENOWNED RESEARCH

SCIENTIFIC LEADERSHIP

HEAD OF IMMUNOLOGY

Merck Sharp & Dohme Research Laboratories, with an unparalleled record of scientific achievement of more than 50 years, continues to invest in the people and facilities needed to surpass that record.

We are now inviting applications for a position which offers wide scope in the scientific leadership and direction of its established basic research programs in immunology as well as the creation and implementation of major new initiatives. The successful applicant will lead a large group and collaborate with multi-disciplinary teams in the pharmaceutical research and development of new therapeutic compounds.

Requirements include an M.D. or Ph.D. degree, considerable research experience and a national reputation in molecular immunology evidenced by both research achievements and publication record. Commitment to scientific excellence and innovation in drug discovery is essential.

This position, based at our headquarters in Rahway, New Jersey offers excellent compensation and benefits and exceptional potential for growth and development. Please send a full curriculum vitae and salary history to: **Mr. Fred Allen, Director, MSDRL Personnel Relations, (SC), Merck Sharp & Dohme Research Laboratories, P.O. Box 2000, R80M-TL2, Rahway, NJ 07065.**

Equal Opportunity Employer



MERCK & CO., INC.

IMMUNOLOGISTS/IMMUNOCHEMISTS/ TUMOR AND CELL BIOLOGISTS

CENTER FOR MOLECULAR MEDICINE AND IMMUNOLOGY

The **CENTER FOR MOLECULAR MEDICINE AND IMMUNOLOGY**, a specialized cancer research and treatment center, is recruiting for **senior** and **junior researchers**. The Center is devoted to basic and applied multidisciplinary research aimed at improving the management and control of cancer and allied diseases. Potential candidates should be experienced in biochemical, genetic, and molecular biological techniques to study problems in the areas of molecular immunology, immunobiology, and molecular genetics. Special consideration will be given to those individuals with interest in tumor immunity, immunochemistry, tumor imaging and therapy, tumor biology, and tumor genetics. Excellent laboratory facilities are available to successful candidates expected to develop independent and vigorous research programs. Applicants must hold a Ph.D. or M.D. degree and have demonstrated excellence in research. The levels of appointment and salary are commensurate with qualifications and experience. Junior research candidates will be expected to indicate evidence of their potential by a publication record appropriate to their experience, as well as letters of recommendation. Senior research candidates must show evidence of a strong research accomplishment and grant support. **Postdoctoral candidates** are invited to apply.

The Center is located on the Newark campus of the University of Medicine and Dentistry of New Jersey (UMDNJ) and is closely affiliated with several of UMDNJ's clinical research and educational programs. In close proximity are excellent opportunities for educational, research, and cultural exchange among the many outstanding institutions within the greater New Jersey-New York Metropolitan area. Ample housing exists in several adjacent communities and within short commuting distances of both the Center and New York City.

Applications, to include curriculum vitae, bibliography, a statement of career and research goals and the names of three references should be sent to:

David M. Goldenberg, Sc.D., M.D.
President

Center for Molecular Medicine and Immunology
1 Bruce Street, Newark, New Jersey 07103

An Equal Opportunity Employer

BONE CELL BIOLOGIST, Ph.D

As a result of our continuing commitment to bone metabolism research, **Ayerst Laboratories**, a division of Fortune 100 American Home Products Corporation, is seeking a motivated entry-level Ph.D scientist to join our Immunology Department.

The successful candidate will establish a research program in bone cell biology, and will have demonstrated the ability to investigate the physiology of bone cells. Experience with *in-vitro* and *ex-vivo* models of bone metabolism is required; experience with animal models of bone physiology is a plus.

Ayerst offers competitive salaries, excellent benefits and opportunities for career growth. Our ultra-modern research laboratories are conveniently located in South Brunswick, just minutes north of Princeton.

Interested candidates should forward their curriculum vitae with salary history/requirements to:

Personnel Manager, Dept. MH

Ayerst

**AYERST
LABORATORIES
RESEARCH, INC.**

CN 8000

Princeton, NJ 08543-8000

Equal Opportunity Employer M/F/H

Process Development Scientists

Seragen, Inc. is a rapidly growing biotechnology company committed to basic and applied research and development of therapeutic drugs.

We are seeking two scientific professionals who have several years of proven experience in the field of process development and scale-up, preferably with recombinant proteins. The successful candidates should have a BS/MS in Biochemistry, or related fields, and be effective communicators both orally and written. In addition, the individuals must be highly motivated, flexible, and willing to assume responsibility for making a valuable scientific contribution as part of a team effort.

Seragen, Inc. offers a highly competitive base salary and benefits program, including stock options and a 401(k) plan. Qualified candidates should send their resume and salary requirements to: **Director of Human Resources, Seragen, Inc., 97 South Street, Hopkinton, MA 01748.**

—An Equal Opportunity Employer—

SERAGEN

Environmental Microbiologist

The Environmental Sciences Center of Monsanto Company in St. Louis, Missouri is searching for a Ph.D. microbiologist to join our interdisciplinary team. A major area of specialization for this person will have been in biochemistry. The primary thrusts of the position will be to assist our program in microbial degradation of industrial chemicals and to develop a program of bioanalytical support of the environmental aspects of Monsanto's new biotechnology-based processes.

In addition to having experience with genetic engineering, computers, and waste treatment, we are also seeking a person who is visionary, broad-minded, enjoys solving problems, has very good communications skills, and can provide leadership. The successful candidate will be able to interact well with our team of chemists, biologists, and engineers, to teach us as well as learn from us. We offer an excellent salary and benefit package and a scientific challenge in an environment where advancement is tied solely to performance and results. Forward your resume and salary history to: **Personnel Director; MONSANTO COMPANY; 800 N. Lindbergh Blvd.; Mail Zone A2NE; St. Louis, MO 63167.**
An Equal Opportunity Employer M/F/H/V.

Monsanto



Public Service Commission
of Canada

Commission de la Fonction
publique du Canada

Research Scientist, Genetic Engineering (Transgenic Salmon)

**Fisheries and Oceans Canada
Biological Sciences Branch
West Vancouver Laboratory
West Vancouver, British Columbia**

We require a scientist to develop a research program whose primary goal is the production of transgenic salmonids. Research will also be undertaken on the production of DNA probes for the identification of specific characteristics within individual salmon or salmon stocks. Topics of interest in salmon culture include growth acceleration, sex identification and determination, flesh quality, disease resistance, seawater adaptation and the ability to utilize specific dietary components.

You require graduation with a doctoral degree from a recognized university, or a lesser degree with evidence of research experience and productivity equivalent to that of a doctoral degree in biological, medical or agricultural science with specialization in recombinant DNA techniques. You should possess practical experience and theoretical knowledge of several of the following areas: gene libraries, gene cloning, DNA probes, recombinant DNA techniques, vectors, techniques for gene insertion in vertebrate eggs/embryos, methods for screening of offspring, the evaluation of gene incorporation and expression. Knowledge of English is essential.

We offer a salary ranging from \$30,521 to \$56,770 commensurate with your qualifications and experience.

Please forward your résumé and/or application form, quoting reference number S-87-31-5712-47JG-G35, to:
Joan Girling (613) 996-8054
Public Service Commission of Canada
Ottawa, Ontario K1A 0M7

Closing date: 16 October, 1987

Personal information you may provide is protected under the Privacy Act. It will be held in Personal Information Bank PSC/P-PU-040, Personnel Selection Files.

The Public Service of Canada is
an equal opportunity employer

Canada

RESEARCH & DEVELOPMENT OPPORTUNITIES

Fisher Scientific and Instrumentation Laboratory, recognized leaders in the diagnostic industry, are now part of Fisher Scientific Company. As a result of sustained growth and a firm commitment to the future, we are currently seeking talented, hardworking professionals to fill highly-visible positions offering great career potential.

BIOCHEMIST/Immunochemistry

Several Senior Scientist/Group Leader positions are available in our Immunoassay Reagent Development Group. Positions require MS/Ph.D. in Biochemistry (or related field) with a proven track record in immunodiagnostic product development. Experience with latex a plus.

IMMUNOCHEMIST/Infectious Diseases

Positions require MS/Ph.D. in Biochemistry, Immunology, Microbiology or Virology. Opportunities to develop Hepatitis and AIDS assays. Tissue culture, protein purification and conjugation as well as immunoassay development are all a plus.

The above positions are based at our laboratories in

ORANGEBURG, NEW YORK,

located on the west side of the Hudson River
within 30 minutes of New York City.

R&D REAGENTS

Senior Scientist/Principal Scientist to develop advanced reagents for clinical instrumentation. Requirements include Ph.D. in Chemistry/Biochemistry with background in enzymology; experience in reagent development or enzyme stabilization helpful, but not essential.

APPLIED RESEARCH GROUP

Principal Scientist to develop new chemical methodologies for clinical instrumentation. Requirements include Ph.D. in Chemistry/Biochemistry and 3 years experience in diagnostics R&D, or MS and 7 years experience. Exposure to electrochemistry, optical detection methods, chemical immobilization and enzymes essential.

These positions are based at our
Instrumentation Laboratory, located in
LEXINGTON, MASSACHUSETTS,
just 15 miles west of Boston.

Qualified candidates are requested to rush detailed resume including salary history and requirements, **INDICATING AREA OF INTEREST AND EXPERTISE**, in strict confidence, to: **Personnel Manager, Fisher Scientific Company, Instrumentation Laboratory Division, 526 Route 303, Orangeburg, New York 10962.** An equal opportunity employer m/f/h.

**Fisher Scientific
Company**

Instrumentation Laboratory Division

POSITIONS OPEN

HUMAN GENETICS

Bruce L. Evatt, M.D., Director, the Division of Host Factors, Center for Infectious Diseases, Centers for Disease Control (CDC), invites applications for a **RESEARCH SCIENTIST** in molecular genetics. Individuals with research interests in hematopoiesis or stem cell differentiation are particularly encouraged to apply. Responsibilities include the development and execution of program plans in coordination with the Division Director. A fully equipped laboratory and technical staff are provided. Prefer candidates with a Ph.D. and/or M.D. and a minimum of 2 years of postdoctoral experience in molecular genetics. Salary ranges from \$38,000 to \$72,000 depending on qualifications and personnel systems. Applications including curriculum vitae, a statement of future research interests, and the names with addresses of three references should be sent to: **Sharlyn L. Wilkinson, Personnel Management Specialist, CDC, Building 1, Room 1058, Atlanta, GA 30333.** CDC is an Equal Opportunity Employer and has a smoke-free work environment.

Applications must be received by 15 December 1987 to receive consideration.

INSTRUCTOR/ASSISTANT PROFESSOR IN ANATOMY. Applications are invited from qualified individuals possessing the Ph.D. or M.D. degree for two faculty positions: A postdoctoral instructorship, and an assistant professorship requiring a minimum of 2 years of postdoctoral studies. The responsibilities of the positions include participation in the microscopic and neuroanatomy courses taught to medical and graduate students, and demonstration of an active, productive research program.

Applications, including curriculum vitae and names of three references, should be sent before 1 March 1988.

**Anthony J. Schmidt, Ph.D.
Professor and Chairman
Department of Anatomy
Rush Medical College
600 South Paulina Street
Chicago, IL 60612**

Rush University is an Equal Opportunity/Affirmative Action Employer.

INVERTEBRATE PALEONTOLOGIST SMITHSONIAN INSTITUTION NATIONAL MUSEUM OF NATURAL HISTORY

The Department of Paleobiology seeks an associate curator with a research specialty in one of four fields: Echinodermata, Foraminiferida, Mollusca (excluding Bivalvia), or Radiolaria. Candidates should have a Ph.D. or equivalent experience, and should show evidence of a strong and innovative program of independent research that uses data obtained from specimens to approach questions of broad paleobiologic significance. In addition to research, duties will include oversight of the improvement and expansion of collections and participation in museum activities including exhibits and education. Salary range is from GS-11 (\$27,172) to GS-13 (\$38,727) depending on qualifications.

Applications must include form SF171 (personal qualifications statement), curriculum vitae, description of research and career goals, list of publications, names of three references (letters and reprints are not requested at this time) and must be received by 4 January 1988 at: **Office of Personnel Administration, 900 Jefferson Drive SW, Room 1410, Washington, DC 20560.** Indicate announcement number 87-380-F. *The Smithsonian Institution is an Equal Opportunity Employer.*

The Medical College of Wisconsin, Midwest Children's Cancer Center, Department of Pediatrics, seeks **TWO INVESTIGATORS.** One position will focus on molecular biology. Demonstrated ability to attract extramural grant support required. Interaction with existing programs in transplantation immunology, membrane biology, and coagulation desirable. Faculty level and salary appropriate to training and experience. Research space and substantial support for supplies, technicians, and ancillary positions available. Located at large children's hospital. New clinical science research center will open in 1988. Limited clinical and teaching responsibilities. Send curriculum vitae to: **Bruce M. Camita, M.D., Director, Midwest Children's Cancer Center, 1700 West Wisconsin Avenue, P.O. Box 1997, Milwaukee, WI 53201. Telephone: 414-345-1770.** *Equal Opportunity Employer M/F/H.*

POSITIONS OPEN

INSTRUCTOR OR POSTDOCTORAL

Position available immediately to study the expression and regulation of thiamin pyrophosphate-dependent enzymes in brain, and the molecular basis of enzymatic abnormalities in neurologic disorders. Strong background in molecular biology or neurobiochemistry with experience in molecular biology is required. Send curriculum vitae, statement of research interest, and names of references to: **Dr. Kwan-Fu Rex Sheu, Cornell University Medical College/Burke Rehabilitation Center, 785 Mamaroneck Avenue, White Plains, NY 10605.** *Equal Opportunity Employer M/F.*

The Center for Environmental Health, Centers for Disease Control (CDC), Atlanta, Georgia is seeking to recruit a **MEDICAL OFFICER** to direct studies relating to birth defects and genetic epidemiology. Applicants must have a degree in medicine (M.D. or equivalent). In addition to the M.D., a doctoral degree in epidemiology is preferred. Also, candidates must have specialized training in genetic epidemiology and pediatric medicine. Other requirements include a minimum of 2 years of experience in design and analysis of genetic epidemiologic studies of birth defects as evidenced by a significant number of publications in peer-review journals. Salary range \$38,000 to \$46,000. For technical information related to this announcement, contact: **Mr. Lee M. James, telephone: 404-454-4737.** Send résumé to: **Jenny P. Garner, PMO, CDC, 1600 Clifton Road, N.E., Atlanta, GA 30333.** Applications must be submitted within 3 weeks of this announcement. *CDC is an Equal Opportunity Employer and provides a smoke-free work environment.*

MOLECULAR BIOLOGIST

Postdoctoral fellow/research associate, Ph.D. or M.D., with experience in nucleic acid biochemistry, recombinant DNA, and tissue culture. Project concerns structure, regulated expression, gene transfer and analysis of disease-causing mutations in genes for steroidogenic enzymes. Send curriculum vitae and letters of reference to: **Dr. Walter L. Miller, Laboratory of Molecular Biology, Room 677-Science, University of California, San Francisco, CA 94143.**

MOLECULAR BIOLOGIST UNIVERSITY OF DENVER

The Department of Biological Sciences, University of Denver, seeks applicants for a tenure-track position at the assistant professor level. Preference will be given to applicants with research interests in eukaryotic molecular genetics. The applicant will be expected to establish a high quality program of research and teaching at the undergraduate and graduate level. A productive research program, characterized by extramural support and the direction of graduate students at the M.S. and Ph.D. level is expected. Teaching responsibilities will include an undergraduate course in molecular genetics, and other courses dependent on research interests but consistent with conducting a strong research program. Postdoctoral experience preferred. Forward curriculum vitae, a statement of research plans, and three letters of reference by 1 December 1987 to: **Dr. Robert Dores, Department of Biological Sciences, University of Denver, Denver, CO 80208-0178.** *Qualified women and minorities are encouraged to apply. An Equal Opportunity/Affirmative Action Employer.*

MOLECULAR VIROLOGIST

The Department of Epidemiology, University of Michigan School of Public Health seeks candidates for a tenure-track position as assistant professor. The successful candidate will be expected to develop an independent competitively funded research program focusing on molecular approaches to vaccine development or the study of the pathogenesis of RNA viruses in infectious diseases and to teach graduate students. Preference will be given to those with research interests in orthomyxoviruses and paramyxoviruses. Applicants should have an earned doctorate in virology and postdoctoral training. Applications including curriculum vitae, summary of research interests, and names and addresses of three references should be sent by 15 January 1988 to: **Gene I. Higashi, M.D., Sc.D., Department of Epidemiology, University of Michigan School of Public Health, 109 Observatory Street, Ann Arbor, MI 48109.**

The University of Michigan is an Equal Opportunity/Affirmative Action Employer. Minority and women candidates are encouraged to apply.

POSITIONS OPEN

MOLECULAR BIOLOGIST: ATHEROSCLEROSIS

New full-time research faculty position (UCLA) to study genetic control of cell growth, growth factors, RNA/DNA probes. Applicants need 2 years of post-Ph.D. experience in cell/molecular biology, ability to develop new programs and supervise personnel. Send résumé to: **Dr. James Forrester, Cardiology Division, Cedars-Sinai Medical Center, 8700 Beverly Boulevard, Los Angeles, CA 90048.**

NEUROBIOLOGIST: A position is available in the Department of Neurobiology and Behavior, State University of New York at Stony Brook, for a postdoctoral fellow to collaborate in studies of retinal neurons, including photoreceptors, using patch-clamp techniques. Send curriculum vitae and a brief statement of research experience and interests to: **Dr. Gary G. Matthews, Abteilung Membranbiophysik, Max-Planck-Institut für biophysikalische Chemie, Postfach 2841, D-3400 Göttingen, Federal Republic of Germany.** *SUNY Stony Brook is an Affirmative Action/Equal Opportunity Educator and Employer. AK#183.*

NEUROSCIENCE POSTDOCTORAL POSITION available immediately in broad-based Psychoneuroendocrinology program studying mechanisms of stress and alcoholism throughout development. Experience with radioimmunoassays of peptides and steroids required. Expertise in *in vitro* systems including superfusion desirable. Send curriculum vitae and names of three references to: **Dr. Anna N. Taylor, Department of Anatomy and Cell Biology, UCLA School of Medicine, Los Angeles, CA 90024.**

PHARMACOLOGIST. Applications are invited for a tenure-track faculty position in the Department of Pharmacology, University of South Carolina School of Medicine. Ph.D. and/or M.D. degree and postdoctoral experience required. The successful candidate will be expected to develop an independent research program which merits extramural support and to teach medical/graduate students. Individuals should submit curriculum vitae, statement of professional goals, and the names of three references to: **Dr. D. O. Allen, Chairman, Department of Pharmacology, University of South Carolina School of Medicine, Columbia, SC 29208.** *The University of South Carolina is an Equal Opportunity/Affirmative Action Employer.*

PLANT BIOLOGIST

Assistant professor, tenure-track position in the evolutionary ecology or physiology of plants, beginning in July 1988. The candidate is expected to supervise senior research projects and to teach approximately one and one half courses per semester, which includes co-teaching in Introduction to Biology and Ecology. Ph.D. required and postdoctoral experience preferable. Send curriculum vitae, statement of research and teaching interests and three letters of evaluation to: **William F. Zimmerman, Chairman, Webster Center for Biological Sciences, Amherst College, Amherst, MA 01002.** *Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL FELLOW position available immediately to study the regulation of gene expression (immunogenetics) in hematopoietic cell lineages. Research will include serology, cellular immunology, biochemistry of cell surface molecules, and molecular biology (recombinant DNA technology). Send applications to:

**Dr. Fung-Win Shen
Department of Molecular Genetics
Showa University Research Institute
10900 Roosevelt Boulevard
St. Petersburg, FL 33716**

A not-for-profit organization/Equal Opportunity Employer.

POSTDOCTORAL POSITION: Immediately available to examine the biochemical mechanism(s) of glucagon action in normal and diabetic liver. Synthesis and use of novel glucagon antagonist and somatostatin analogues. Experience in hormone or neurotransmitter transduction mechanisms, membrane biochemistry, and/or metabolism desirable. Send résumé and three letters of recommendation to: **Dr. Victor J. Hruby, Department of Chemistry, University of Arizona, Tucson, AZ 85721.** Closing date: 30 September 1987.

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

POSITIONS OPEN

PHYSICAL OCEANOGRAPHER UNIVERSITY OF SOUTH FLORIDA

The Marine Science Department, University of South Florida, invites applications for a 9-month academic year tenure-track faculty position in physical oceanography with emphasis on the dynamics of the ocean circulation. Areas of expertise to be considered included ocean-going experimentation, numerical modeling, and satellite remote sensing. The position will be available August 1988 with salary and grade according to experience. Please send a résumé, statement of research interests and teaching experience, and names and addresses of three references by 12 October 1987 to: **Chairman, Search Committee, Department of Marine Science, University of South Florida, 140 Seventh Avenue South, St. Petersburg, FL 33701.** *The University of South Florida is an Equal Opportunity Employer.*

PHYTOPLANKTON ECOLOGIST. The University of Texas Marine Science Institute is reopening its search for an individual to fill a state-funded (75%), nontenure track **RESEARCH SCIENTIST** position. Preference will be given to candidates competent in the use of modern field and laboratory techniques to study phytoplankton and primary production in coastal waters and estuarine environments. Successful applicants are expected to obtain extramural funding to develop an independent research program and to cooperate in development of field-oriented multidisciplinary projects. Candidates must have a Ph.D. and record of research accomplishments. Postdoctoral experience preferred.

Send letter of application, statement of research interest, curriculum vitae, and names of three references before 2 November 1987 to: **Dr. Robert S. Jones, Director, Marine Science Institute, The University of Texas at Austin, Port Aransas, TX 78373.**

The University of Texas at Austin is an Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL FELLOW—Henry Ford Hospital announces an immediate opening for the position of postdoctoral fellow in its Molecular Biology Research Laboratory. The individual selected will study the role of chromatin structure in eukaryotic gene expression [see, e.g., *Cell* 48, 289–295 (1987)]. Experience in biochemistry/molecular biology and mammalian cell culture is preferred. Competitive salary and outstanding benefits are available. For consideration send curriculum vitae and the names of three references to: **Dr. L. C. Lutter, c/o Deloris Hunt, Henry Ford Hospital, Employment Center, 2921 West Grand Boulevard, Detroit, MI 48202.** *Equal Opportunity Employer.*

POSTDOCTORAL FELLOW OR RESEARCH ASSOCIATE to investigate axonal growth in the adult mammalian CNS. Training and experience in biochemical, anatomical or in vitro methods desirable. Send curriculum vitae and letters of reference to: **Dr. K. A. Crutcher, Department of Neurosurgery, University of Cincinnati Medical Center, 231 Bethesda Avenue, Cincinnati, OH 45267–0515.** *The University of Cincinnati is an Affirmative Action/Equal Employment Opportunity Employer.*

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

POSTDOCTORAL POSITION exists to direct a clinical molecular genetic testing laboratory. The incumbent will perform testing directly and supervise laboratory personnel, conduct molecular diagnosis and participate in research projects. Functions independently with a clinical emphasis in testing and will be active in the clinical genetics setting. Uses technical expertise in such areas as RNA isolation and Northern blots, DNA sequencing, use of oligonucleotide probes and field inversion, or pulsed-field electrophoresis. Ph.D. in biochemistry or genetics with 3 to 5 years of postdoctoral experience. Must have experience in molecular genetic techniques and with linkage studies; linkage programs. Requires knowledge of relevant issues, such as disease risk calculations using linked markers. Qualified candidates please forward your résumé to: **Human Resources Department, Children's Hospital—Oakland, 747-52nd Street, Oakland, CA 94609.** *An Equal Opportunity Employer.*

AUSTRALIA

CSIRO

INSTITUTE DIRECTORS

The Board of CSIRO has approved a major restructuring of Australia's largest scientific research organisation to align the Institutes and Divisions more closely with the client industries. The goal is to maintain CSIRO as a leading scientific organisation, but improve the application of research results for economic and social benefit.

The Board now wishes to appoint to the key positions of Institute Directors persons with outstanding leadership qualities, significant backgrounds in science and technology and considerable experience in the management of research and development at a senior level.

The six Institutes in which the Organisation's research will be carried out by the Divisions are—

- Information and Communication Technologies
- Industrial Technologies
- Minerals, Energy and Construction
- Animal Production and Processing
- Plant Production and Processing
- Natural Resources and Environment

A Director of an Institute will be responsible to the Chief Executive for the strategic management of the Institute, setting strategic directions, allocating resources to the constituent Divisions and developing relationships with industry, government and the community to promote the Institute's research and the transfer of research results to industry and other users.

An attractive salary and conditions package will be offered.

Further information can be obtained from the Chief Executive, Dr Keith Boardman, FRS.

Expressions of interest should be addressed to:

**The Chief Executive
CSIRO
PO Box 225
DICKSON ACT 2602
AUSTRALIA**

To be received no later than October 8, 1987.

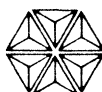
COMMONWEALTH SCIENTIFIC INDUSTRIAL RESEARCH ORGANISATION

Biotechnologists Mammalian Tissue Culture

The Bristol-Myers Industrial Division has immediate openings for Tissue Culture Biotechnologists in its new Biotechnology Development Laboratories. The selected candidates will perform tissue culture research and development for the scale-up of promising hybridoma cell lines. Candidates will interact closely with monoclonal antibody specialists and molecular biologists at Bristol's recently acquired Oncogen/Genetic Systems Laboratories in Seattle, Washington.

To qualify, you should have a Ph.D. in Tissue Culture/Cell Biology/Mammalian Cell Engineering with publications, and at least 2 or more years experience, preferably in an industrial tissue culture laboratory. Academicians with strong applied interests will also be considered. A strong background in molecular biology and mammalian genetics is a plus.

We offer a competitive salary, strong interaction with molecular biologists and scale-up engineers, excellent benefits and a professional upstate New York environment conducive to growth in a large, stable \$5 billion pharmaceutical company. For prompt, confidential consideration, forward your resume with salary history and requirements, to: **MANAGER OF EMPLOYMENT**



BRISTOL-MYERS COMPANY INDUSTRIAL DIVISION

Biotechnology Center

P.O. Box 4755, Syracuse, New York 13221-4755

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*Public Health Service
Alcohol, Drug Abuse, and Mental Health
Administration*

National Institute of Mental Health

**HEALTH AND BEHAVIOR RESEARCH BRANCH
Psychoimmunology Program**

Position Title: Chief, Psychoimmunology Program

Grade and Salary: GM 13-14; \$38,727-59,000. Candidates may be eligible for appointment in the Commissioned Corps of the U.S. Public Health Service.

Location: National Institute of Mental Health, 5600 Fishers Lane, Rockville, MD.

Qualifications: Experience in the management of health and behavior research programs with significant research experience, training and publications in immunology, biochemistry, neuroendocrinology and behavior. Research in the area of psychosocial and psychoneuroimmunological aspects of AIDS is of particular relevance. Ability to organize scientific workshops, conferences, and symposia and some knowledge of federal research support mechanisms is desirable.

Responsibilities: As Chief, Psychoimmunology Program, incumbent plans, develops, and administers a program of support in basic human and animal research on the interactions among environmental events, psychological states, central nervous system activity and neuroendocrine and immune functions. The program funds major research activities on the psychosocial and psychoneuroimmunological aspects of AIDS.

Further Information on Program or Position: Dr. Leonard Mitnick, NIMH
5600 Fishers Lane, Room 11C-06
Rockville, MD 20857 (301) 443-4337

Further Information on Application Procedures/or Submit SF-171 to: J. Harris, Personnel Specialist
5600 Fishers Lane, Room 15C-12
Rockville, MD 20857
(301) 443-5437

NIMH IS AN EQUAL OPPORTUNITY EMPLOYER

Molecular Biologist

Bio-Rad Laboratories, a world leader in clinical diagnostics, chemical separations and analytical instrumentation, currently has this opportunity for a Molecular Biologist for our Chemical Division.

Participating in an exciting new program to automate DNA sequence film reading, you will develop new DNA sequencing (dideoxy) and other molecular biology products. While this is primarily a laboratory position, you will also work on new applications, conduct sequencing workshops and provide sales/customer training.

Position requires a BS or MS and one year of sequencing experience, along with technical writing and communication skills. Familiarity with microcomputers is desirable.

Please send your resume to Bio-Rad Laboratories, Human Resources, Dept. #167-S0911, 1414 Harbour Way South, Richmond, CA 94804. EOE.

BIO-RAD Bio-Rad Laboratories

PHARMACEUTICAL

Regional Medical Associate

Pharmaceutical Marketing

Currently we have openings in the Midwest and Memphis Regions for a Regional Medical Associate to combine both scientific expertise and marketing skills. The selected candidate will report directly to the Regional Vice President and will be headquartered in Memphis, Oklahoma City, or Tulsa. Responsibilities are to establish effective relationships within key medical institutions, providing scientific liaison and indepth information essential to appropriate use of SK&F's products. Will also have training responsibility at the Representative, Medical Staff and Pharmacy levels.

Qualifications include PharmD or PhD in Pharmacology, Biochemistry, Microbiology or other Life Sciences. Must possess initiative, strong communication skills, and interest in Marketing.

In addition to an independent work environment where personal and professional growth are a way of life, we offer an outstanding compensation/benefits package geared to today's market. Please send resume and current earnings to:

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SCIENCE

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DIRECTOR OF MATHEMATICAL AND INFORMATION SCIENCES

(#86-452)

The Air Force Office of Scientific Research, Air Force Systems Command, located at Bolling Air Force Base in Washington DC, invites applications from individuals with background in Government, university and industrial mathematical or information sciences research. An earned Bachelor's degree with 24 semester hours of math is required. An earned Master's degree is desirable, and a PhD (or equivalent) in the mathematical sciences is highly desired. The Director is responsible for the management of the Air Force Basic research program in mathematical and information sciences under contract to universities and in Air Force Laboratories. A strong background and publication record in one or more of the mathematical or information sciences fields of control theory in information science, computational mathematics, applied analysis, probability and statistics, optimization, and discrete mathematics is required. Experience should include technical, program supervision, planning and budgeting. The position is Senior Executive Service (General) with a salary range of \$64,700 to \$73,400. No prior Government service is required. Send Standard Form 171, "Application for Federal Employment", as well as narrative statements addressing: (1) technical qualifications; and (2) managerial qualifications, including a list of publications to:

**Civilian Personnel Office
1776 MSSQ/DPCA-86-
ATTN: Mrs. Davis
Andrews AFB, MD 20331-5964**

Include Announcement # 86-452 on your application.
Application must be received by 30 Sept 1987.

AN EQUAL OPPORTUNITY EMPLOYER

Biotechnology Research and Development

Pandex, a division of Baxter Healthcare Corporation, is developing state of the art products for medical diagnostics.

We are expanding our R&D group and offer unique opportunities for creative Ph.D. level Scientists interested in positions that offer challenging opportunities for professional career growth.

We are seeking the following key individuals:

Nucleic Acid Chemist - Ph.D. with 0-3 years postdoctoral experience in DNA/RNA synthesis.

Molecular Biologist - Ph.D. with 2-3 years postdoctoral experience in DNA cloning and synthesis of DNA probes.

Assay Development Scientists - Ph.D. with 3-5 years postdoctoral or industrial experience in immunology, virology or microbiology with knowledge of immunoassay techniques.

Virologist - Ph.D. with 0-3 years postdoctoral experience or equivalent in retrovirology.

Microbiologist - Ph.D. with 0-3 years postdoctoral experience in the area of STD's.

As a division of a multi-billion dollar leader in the healthcare industry with research facilities located 30 miles north of Chicago, we offer a competitive starting salary and an excellent benefits program.

If you would like to be considered, please send your resume in confidence to: Anne McNicholl, Personnel Director, Baxter Healthcare Corporation, Pandex Division, 909 Orchard Street, Mundelein, IL 60060. We are an equal opportunity employer.

Pandex Division

Baxter

Research Scientists

Synergen, a leading biotechnology company in Boulder, Colorado, offers the opportunity to build scientific careers in a stimulating intellectual environment. We seek recent Ph.D.'s with postdoctoral experience, technicians, and more senior people interested in becoming part of a rapidly expanding company. There are currently openings for the following persons:

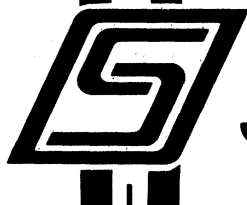
Molecular Biologists to study the expression of eukaryotic genes encoding growth factors, neurotrophic factors, and proteins that modulate inflammatory processes. We also seek molecular biologists interested in developing high level expression systems in eukaryotes.

Protein Chemists to participate in the isolation and characterization of proteins involved in tissue breakdown and repair, or in isolating and characterizing specific cell receptors.

Cell Biologists to develop cell-based models of pathophysiological processes, to aid in the development of *in vitro* assays for bioactive proteins, and to study endothelial cell biology.

Biochemists to define the mechanism of action of proteins interacting with membrane receptors and involved in signal transduction.

Synergen offers competitive salaries, generous benefits, and the financial stability required for future development. Please send a **CV, bibliography, and references** to:



SYNERGEN

Recruitment Director
1885 33rd Street
Boulder, CO 80301

PhDs • PHARMACOLOGY • PHYSIOLOGY

**Your scientific expertise is the foundation
for a strong future**

Hoechst-Roussel Pharmaceuticals Inc., fast-growing subsidiary of Hoechst Celanese Corporation, a \$4.6 billion division of one of the world's leading producers of chemicals and pharmaceuticals, has several newly created opportunities for published Pharmacologists or Physiologists. Primary responsibilities will entail developing contacts within medical institutions, universities, teaching hospitals and government research groups. In addition, you will prepare auxiliary technical materials and deliver technical updates/training to field sales personnel.

Ideal candidates will possess a BS in Pharmacy, a PhD in Physiology or Pharmacology, and 2-3 years teaching experience at the university level.

These highly visible positions will provide direct contact with prominent figures in the medical field and pharmaceutical industry.

We offer a superb compensation package, including an excellent salary plus expense account, a company car and outstanding company benefits. Positions are available in the South, Southeast and Midwest.

Send curriculum vitae with current earnings to Mr. Gary Kowalski, Hoechst-Roussel Pharmaceuticals Inc., Route 202-206 North, Somerville, New Jersey 08876. An affirmative action employer M/F/H.

Hoechst



PLANT MOLECULAR BIOLOGIST BIOLOGY

The Department of Biology, Utah State University, Logan is seeking applicants for a tenure-track plant molecular biology position.

The research emphasis of the individual should be the molecular responses of plants to biotic stress (e.g., microbial, insect, etc.) or abiotic stress (e.g., water, salt, etc.). The teaching responsibility will be an undergraduate cell biology course for majors and a graduate course in the area of interest of the applicant.

Utah State University has strong graduate programs in the biological sciences. There is an existing program in plant-microbe interactions within the Department of Biology to provide colleagues for the individual filling this position.

Logan is located in one of the most beautiful valleys of the Rocky Mountains and is near unsurpassed outdoor recreational opportunities. Send application with curriculum vita, statement of research interests, and three letters of recommendation by November 1, 1987 to:

Dr. Neal Van Alfen
Department of Biology
Utah State University
Logan, Utah 84322-4500

USU is an AA/EO and IRCA Employer

Faculty Positions Department of Applied Biological Sciences

The Department of Applied Biological Sciences invites applications for tenure-track faculty positions at the Assistant Professor or non-tenured Associate Professor levels. Candidates should have doctoral education in chemistry, biochemistry, or biology together with postdoctoral experience and potential for independent research. Research interests should be in development of basic approaches to topics with potential long-term application in areas broadly complementary to, and interactive with, current programs. These have the objective of integrating principles of basic science with those of engineering and technology, and to apply these principles to important practical problems. Examples of current programs include: applied biochemistry/biomaterials (e.g., enzyme stabilization; drug delivery systems), microbiology/genetics, (e.g., genetics of industrial microorganisms; biopolymers) and health sciences (e.g., carcinogenesis/mutagenesis; mechanisms of pathogenesis).

Applicants should send curriculum vitae, brief description of research interests and names of references to: Gerald N. Wogan, Head, Department of Applied Biological Sciences, Massachusetts Institute of Technology, 77 Massachusetts Avenue (Room 16-333), Cambridge, MA 02139.

MIT is an
equal opportunity/
affirmative action
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MIT

PROTEIN BIOCHEMIST

Merck Sharp & Dohme Research Laboratories are currently seeking an experienced biochemist who would be independently involved in developing approaches for the purifications of oncogene-related proteins. This challenging position requires a highly motivated individual possessing an M.S. degree or the equivalent and two years experience in protein purifications. Experience in membrane proteins and biophysical characterizations are desirable.

The selected candidate will receive excellent salary and benefits and work in a modern and stimulating laboratory environment located 25 miles north-west of Philadelphia.

Please send resume with
salary requirements to:

Manager,
Research Personnel,
W42-2

**Merck Sharp & Dohme
Research Laboratories**
West Point, PA 19486

EEO/AA/VH/EMPLOYER



Merck & Co., Inc.

Product Safety Scientist

The Clorox Company, a billion-dollar diversified consumer products manufacturer, has a unique opportunity at its Technical Center located in the greater San Francisco Bay Area, for a Product Safety Scientist to work in the Product Safety and Regulatory Compliance Department. This senior level position provides new product support in evaluating toxicity and regulatory compliance issues including EPA registration activities. Additional important tasks include tracking and assessing the impact of upcoming regulations and developing technologies in the context of product safety.

The successful candidate will have a Masters or PhD in toxicology or a related biomedical field as well as a demonstrated knowledge of the consumer products industry. Excellent written and oral communication skills and problem solving capabilities are essential. A strong background in general toxicology and risk assessment with a special emphasis in dermatology, immunology, environmental toxicology, product liability and regulatory aspects are desirable.

We offer a challenging work environment, professional growth opportunity, competitive salary and a comprehensive benefits package. For prompt, confidential consideration, please send your resume to: The Clorox Technical Center, Human Resources, Dept. 106, P.O. Box 493, Pleasanton, CA 94566. An Equal Opportunity Employer.



Research Scientists

Discover Schering-Plough's Responsive Research Environment

Contribute to today's most significant breakthroughs in biological research at Schering-Plough. We can offer you project responsibility, support and recognition to stimulate your best ideas and an opportunity to join an expanding group of bold thinkers.

■ Virology

Schering has an ongoing pharmaceutically-oriented research effort to understand mechanisms of genetic regulation at the molecular level. Expertise in either RNA, DNA or Retro-virology is needed with skills in molecular biology using *in vitro* and *in vivo* systems.

Opportunities are available to Senior Scientists (Ph.D. plus at least 1 year's experience), Associate Scientists (M.S. with 3 years' experience or B.S. plus 3 years' experience) and Assistant Scientists (B.S. with 1 year's experience or M.S.)

■ Cellular Pharmacology

These B.S., M.S., and Ph.D. level scientists will design enzyme and receptor-binding assays to be performed by a natural products screening group. The Senior Principal Scientist will provide scientific research leadership to the group and lead scientific research in projects related to cellular receptor/effector pharmacology. A Ph.D. and 3 years' experience are required.

■ Cardiovascular Pharmacology

Section Leader—This position, created as a result of research expansion, can be an important addition to your 5–10 years' post-doctoral experience in cardiovascular pharmacology/physiology. You must have established investigative, organizational and communication skills, a strong publication record and the ability to contribute to the research of and direct a large, multidisciplinary group of scientists. In addition, at least 2 years of your experience should be in an industry related to pharmaceuticals.

■ Biotechnology

Senior Immunologist—You will be responsible for developing and supervising immunochemical and biological assays for new lymphokines/cytokines. A Ph.D. and at least one year's experience are required. Expertise in lymphokines, cytokines or growth factors and assay development and application along with cell culture experience are important.

In all areas, demonstration of superior original research initiative is required along with excellent written and communication skills.

We offer a competitive salary and excellent benefits. For immediate, confidential consideration, forward detailed resume, indicating position of interest, to: Lou DeMartino, Schering-Research, 60 Orange Street, Bloomfield, NJ 07003. We are an equal opportunity employer.



Schering-Plough

CNS Electrophysiologist

Pfizer's expanding commitment to neuroscience research has created a new career opportunity at the level of research scientist. You will contribute to a multidisciplinary effort targeting the discovery of novel psychotherapeutic drugs. This position requires a PhD and at least two years of postdoctoral research experience with CNS electrophysiology. The exact area of your scientific expertise is less important than a demonstrated ability to carry out innovative research. However, you are particularly well suited for this opening if you have experience conducting *in vitro* electrophysiological investigations and are versed in intracellular recording and patch clamp techniques. Practical application of these research skills to the field of neuropharmacology is highly desirable.

This position offers a stimulating professional environment with potential for career growth. We are located in an attractive southeastern Connecticut shore location and offer a competitive salary/benefits package with relocation assistance. Qualified applicants should submit their resume, description of research experience and references to: Jerry K. Larson, PhD, Manager of Employment, Pfizer Central Research, Eastern Point Road, Groton, Connecticut 06340.



An equal opportunity employer

RESEARCH SCIENTISTS

Wyeth Laboratories has immediate opportunities available in our vaccine and antiviral programs for Research Scientists with a PhD in Microbiology or Biochemistry and a minimum of 2 years postdoctoral experience. Your experience must be in virology, biochemistry and immunology.

You will enjoy working in our modern, well-equipped facilities in Philadelphia's prestigious Main Line suburban area. Besides an environment which fosters discovery, we offer a competitive salary, excellent benefits, and superior career opportunities.

Respond immediately by forwarding your CV and salary requirements, in confidence, to: **Position #38, Recruitment Manager, Wyeth Laboratories, Inc., P.O. Box 8200, Philadelphia, PA 19101.** Equal Opportunity Employer, M/F/H/V responses encouraged.

Wyeth Laboratories



Senior Microbiologist Infectious Diseases Research

The Squibb Institute for Medical Research is recognized internationally as a leader in developing novel therapeutic agents for the treatment of infectious diseases. We are currently seeking an experienced microbiologist who will be responsible for the microbiological evaluation *in vitro* of new antibacterial and antifungal agents.

Qualified individuals should have a Ph.D. in Microbiology and 2 years relevant postdoctoral experience. Proficiency in clinical microbiology is desirable.

A familiarity with current antibiotic test procedures is necessary as well as an ability to introduce novel evaluation systems. The individual will participate in both the research and clinical microbiology phases of our program interacting with medicinal chemists, biochemists, experimental chemotherapists and physicians.

Squibb is located in Princeton, NJ a pleasant semi-rural setting convenient to both New York City and Philadelphia. In addition to an excellent salary and comprehensive benefits package, we can offer the opportunity for exceptional scientists to pursue stimulating careers.

For consideration, please submit your curriculum vitae to: **The Squibb Institute for Medical Research, Human Resources Department 507, P.O. Box 4000, Princeton, NJ 08543-4000.** An equal opportunity employer.



SQUIBB

Where science comes to life.

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OFFICE OF HEALTH AND
ENVIRONMENTAL RESEARCH

Alexander Hollaender DISTINGUISHED Postdoctoral Fellowship Program

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in Energy-Related
Life, Biomedical, and
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- Research in OHER-sponsored programs
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- Information and applications

Hollaender Postdoctoral Fellowships
University Programs Division



Oak Ridge Associated Universities
P.O. Box 117
Oak Ridge, TN 37831-0117
(615) 576-3190

Deadline January 19, 1988

POSITIONS OPEN

POSTDOCTORAL POSITION available to study nephrotoxicity (induced by *E. coli*, cyclosporine, gentamicin, etc.) in cultured human kidney cells, using biochemical and ultrastructural approaches. The project involves isolation and culture of renal cells, and characterization of injury. Background in culture technique, drug metabolism and biochemical assays desirable. Send curriculum vitae and names of three references to: **Dr. Anna Trifillis, Department of Pathology, University of Maryland School of Medicine, 10 South Pine Street, Baltimore, MD 21201.**

POSTDOCTORAL POSITION—Available immediately for a cell biologist with interests in cytoplasmic signaling, cell growth, and motility. Experience in fluorescence microscope and/or image analysis techniques preferred but not required. Please send curriculum vitae and names of three references to: **Dr. Paul L. McNeil, Department of Anatomy and Cellular Biology, Harvard Medical School, 220 Longwood Avenue, Boston, MA 02115.**

POSITIONS OPEN

POSTDOCTORAL POSITION available October 1987 to study the formation of reactive sulfate esters catalyzed by a purified aryl sulfotransferase. Studies on model compounds will be directed toward mechanisms of chemical carcinogenesis. Experience in enzyme purification and kinetics is required. Salary: \$20,000 plus fringe benefits. Send curriculum vitae and two letters of reference to: **Dr. Michael W. Duffel, Division of Medicinal and Natural Products Chemistry, College of Pharmacy, University of Iowa, Iowa City, IA 52242.**

An Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL POSITION available immediately to study the effects of certain neurotoxicants on spinal cord and peripheral nerve function. Electrophysiological experience necessary. Send curriculum vitae and the names of three references to: **Dr. Barry D. Goldstein, Department of Pharmacology and Toxicology, Medical College of Georgia, Augusta, GA 30912-3368. Equal Opportunity Employer/Affirmative Action Program.**

POSITIONS OPEN

POSTDOCTORAL POSITION is available fall 1987 to study lymphokine- and oncogene-induced protein phosphorylation in macrophage activation. Experimental approach will include: cell culture, assays of macrophage activation and growth, isolation and characterization of protein kinases and their substrates, and studies of oncogene expression. A recent Ph.D. with experience in molecular biology and/or protein chemistry is preferred. Support is available for up to 5 years. Salary is commensurate with NIH postdoctoral level. Send curriculum vitae, summary of research experience, and names and addresses of three references to: **David L. Coleman, M.D., Infectious Disease Research Laboratory (111-I), Yale University School of Medicine, VA Medical Center, West Haven, CT 06516. Equal Opportunity Employer.**

POSTDOCTORAL POSITION available for a recent graduate with a Ph.D. in an area of oculomotor-vision research. Candidates with a background in motion perception who want experience in an established human oculomotor research laboratory are encouraged to apply. This is a Stanford University position located at the Santa Clara Valley Medical Center, where the graduate would work with an M.D. neurologist and Ph.D. biomedical engineer. Send résumé and three letters of recommendation to: **John R. Hotson, M.D., Department of Neurology, Santa Clara Valley Medical Center, 751 South Bascom Avenue, San Jose, CA 95128. Stanford University is an Equal Opportunity Employer.**

POSTDOCTORAL POSITION in pulmonary biology, physiology and toxicology available immediately to conduct NIH-funded research on neonatal oxygen toxicity. Multidisciplinary research approaches combine biophysical, biochemical, and cell biological techniques to investigate the mechanisms of acute and chronic hyperoxic lung injury. Candidates with a Ph.D. in biochemistry, physiology, or toxicology and a strong background in fields related to either lipid metabolism, respiratory physiology, or cell biology are invited to send curriculum vitae, reprints and names of references to: **Drs. J. N. Finkelstein or R. H. Notter, Department of Pediatrics, University of Rochester School of Medicine, Box 777, 601 Elmwood Avenue, Rochester, NY 14642. Affirmative Action/Equal Employment Opportunity.**

POSTDOCTORAL POSITION IN BIOMEDICAL ENGINEERING RESEARCH. Available for Ph.D. in biomedical engineering, chemical engineering, or applied chemistry/biochemistry to work on an exciting NIH funded project involving the innovative use of immobilized compounds for extracorporeal blood detoxification. Send résumé and names of three references to: **Dr. Victor C. Yang, College of Pharmacy, The University of Michigan, Ann Arbor, MI 48109. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITIONS IN CARDIOVASCULAR RESEARCH. Two positions are available immediately to study the mechanisms of myocardial ischemic and reperfusion injury. The areas of research are (i) the mechanisms of membrane phospholipid breakdown and role of calcium and inositol phospholipids in signal transduction; (ii) the mechanisms of free radical generation in ischemic-perfused heart. Appropriate areas of expertise for these projects include lipid chemistry, free radical research, and cellular physiology. Applicants should send a summary of research interests, curriculum vitae, and the names of three referees to either: **Dr. Dipak K. Das or Dr. Richard M. Engelman at the University of Connecticut School of Medicine, Farmington, CT 06032.**

POSTDOCTORAL POSITION IN IMMUNOLOGY

Multiyear NIH-funded position available 1 December 1987 to study human phagocytic cell membrane receptors. Research will focus on receptor isolation and characterization, elucidation of signal transduction mechanisms, and development of antireceptor antibodies. Recent Ph.D. in immunology, biochemistry, or related discipline required. Experience in receptor isolation desirable. Salary negotiable. Send curriculum vitae, names of three references, and summary of research experiences to: **Dr. Janice M. Zeller, Department of Immunology/Microbiology, Rush-Presbyterian-St. Luke's Medical Center, 1653 West Congress Parkway, Chicago, IL 60612. Rush is an Affirmative Action/Equal Opportunity Employer.**

BIOTECHNOLOGY— OPPORTUNITIES—

Molecular Therapeutics, Inc., and Molecular Diagnostics, Inc. are biotechnology research groups affiliated with Bayer AG of West Germany and its American subsidiary, Miles Inc. The companies function as basic research institutes, guided by internationally recognized Scientific Boards. Their objectives include development of therapeutics and diagnostics, respectively, based on fundamental understandings of the molecular bases of Human Disease. Integrated teams of scientists with expertise in genetics, immunology, microbiology and structural biochemistry comprise the companies' staffs. We are expanding our scientific staff, and offer outstanding opportunities for Scientists and Technicians with appropriate qualifications.

SENIOR SCIENTISTS

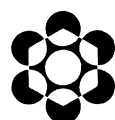
Candidates are expected to have a PhD and 2 or more years of postdoctoral training. Experience in protein biochemistry, molecular biology or molecular genetics is preferred. Senior Scientists are expected to work independently on projects which may involve gene cloning and sequencing, gene transfer, analysis of gene expression, or protein structure/function studies.

RESEARCH ASSOCIATES

Applicants must have BS or MS degree and 1 year or more experience. Proficiency in recombinant DNA techniques, protein biochemistry, nucleic acid hybridization, or diagnostic assay development are desirable. We are also seeking persons proficient in lymphoid cell tissue culture methodology.

The companies are located in a new research facility near New Haven and Yale University, and midway between Boston and New York City. They offer competitive salaries, excellent benefits, and a stimulating and challenging work environment.

Applicants should forward a curriculum vitae along with a statement of research interest and capabilities in confidence to: **Research Director, Molecular Therapeutics, Inc./Molecular Diagnostics, Inc., 400 Morgan Lane, West Haven, CT 06516.**



**Molecular
Therapeutics Inc**

*molecular
diagnostics, inc*



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Bioanalytics/Metabolism

Syntex, a leading pharmaceutical research and manufacturing organization, currently has the following positions available:

Research Section Leader (Enzymeimmunoassay)

Direct the development and application of enzyme-immunological methods for the quantification of analytes in biological fluids.

PhD in one of the chemical or biological sciences, 5-8 years of relevant experience, proven ability to manage a large group of scientific professionals and excellent communication skills.

Staff Researcher/Senior Staff Researcher (Drug Metabolism)

Direct the design and implementation of metabolic studies, both pre-clinical and clinical, in support of IND and NDA submissions to the FDA.

PhD in one of the chemical or biological sciences, 3-5 years of relevant experience, preferably in the pharmaceutical industry, proven ability to manage a group of scientific professionals and excellent communication skills.

Post-Doctoral Fellow (Laser Fluorescence Spectroscopy)

Develop and apply methods based on laser fluorescence spectroscopy in conjunction with microbore HPLC for bioanalytical quantifications. Suitable equipment for this project already is available. If the project is successful, it is very likely that this post-doctoral position will lead to a permanent staff appointment.

PhD with 1-3 years of relevant experience.

Other positions currently available for BS/MS
Biologists/Biochemists/Chemists.

Please send your resume and salary history to Syntex, Professional Employment, Dept. PS/SCI, 3401 Hillview Ave., Palo Alto, CA 94304. An equal opportunity employer.



Post Doctoral Fellow

Seeking a postdoctoral fellow to participate in the mutagenesis and mammalian cell expression of the envelope glycoprotein of the HIV-1 retrovirus within an ongoing collaborative project between Dr. Phillip Berman of Genentech, Inc., and Dr. Don Wiley of Harvard University. Competence in recombinant DNA technology and an interest in protein structure is essential. Experience in protein chemistry and/or immunology is desirable. This grant funded position will be available in late 1987—early 1988. It is anticipated that the great majority of time will be spent at Genentech, Inc. in South San Francisco with an opportunity to also spend time at Harvard University in Cambridge. Please send a resume of educational background, experience and publications with the names of three references to: Dr. Phillip Berman, Department of Molecular Biology and Immunology, Genentech, Inc., 460 Point San Bruno Boulevard, South San Francisco, CA 94080. An equal opportunity employer.

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ENVIRONMENTAL COMPLIANCE NUCLEAR WASTE MANAGEMENT

Battelle's Office of Nuclear Waste Isolation has immediate needs for senior level Environmental Managers for our Salt Repository Project being conducted for the U.S. Department of Energy. Experience in the nuclear industry or the state of Texas is desirable but not required. All positions are in the Texas panhandle. Typical openings include:

• COMPLIANCE SPECIALIST

MS and minimum of 10 years' in developing strategies for NEPA/NWPA compliance, obtaining permits or specifying/documenting the environmental, socioeconomic, and transportation assessment needed to meet state (Texas) and federal regulations.

• SAFETY ANALYSIS ENGINEER

MS in Health Physics or equivalent and 5 years' in computer modeling of worker exposure/risk in a nuclear environment.

• RADIOLOGICAL ENGINEER

MS and 5 years' experience in NRC licensing and regulatory compliance and design/operation of nuclear power plants.

• TRANSPORTATION SPECIALIST

MS and 5 years' experience with regulations concerning transportation and handling nuclear materials.

• NUCLEAR ENGINEER

MS and 5 years' experience conducting risk/safety assessment methodologies and experience with siting and NRC licensing/documentations.

• SYSTEMS ANALYST

MS and 3 years' experience in verification and utilization of computerized predictive models.

• ENVIRONMENTAL SCIENTISTS

BS/MS and 5 years' experience in planning, integration, and implementation of plans.

• ENVIRONMENTAL HYDROLOGIST

MS/PhD and 9 years' experience in planning, integration, and implementation of water portion of plan.

• ATTORNEY

J.D. and 10 years' experience in environmental law.

• SOCIOECONOMIC MANAGER

MS/PhD and 15 years' experience of applied socioeconomic impact assessment/mitigation and community planning.

• SOCIAL/SOCIOECONOMIC SCIENTIST

BS/MS and 5 years' in applied impact and assessment/mitigation and community planning.

Battelle is a world leader in R&D and we offer a comprehensive benefits program and a salary commensurate with your background. Send a resume in confidence to:



Battelle

Project Management Division

ONWI • Attention: Stu Pike
P.O. Box 2360 • Hereford, Texas 79045

An Equal Opportunity/Affirmative Action Employer M/F/H

Expect more from Syntex

Syntex, an international leader in the pharmaceutical and health care industry has two outstanding opportunities for Biologists.

Flow Cytometrist

In this position, you will use your flow cytometry expertise to instruct others as well as insure the quality and integrity of data acquisition and interpretation. You must have a complete understanding of this technology as you will be developing new techniques to support all areas of cell biology research and particularly in immunology. Requires a BS in Biology plus 3-5 years of experience in flow cytometry and general biology lab procedures, and sterile cell culture.

Cancer & Development Biologist

You will perform in vivo tumor experiments which will include maintaining tumor cell lines in culture, injecting tumor cells and dosing models with potential anti-tumor agents. Requires a BS/MS in Biology or related field

with 3 to 5+ years of experience with tumor models and tissue culture experience.



SYNTEX

To apply, send your resume to Syntex, Professional Employment, Dept. KH, 3401 Hillview Ave., Palo Alto, CA 94304. An equal opportunity employer.

SENIOR STATISTICIAN SAFETY ASSESSMENT

G.D. Searle, a world wide leader in the pharmaceutical industry, has an outstanding opportunity for a qualified senior statistician to join our Preclinical Statistics Department in our R&D division.

Primary responsibilities include consulting with scientists in Product Safety Assessment in such areas as toxicology, teratology, and pathology. Client interactions will include defining specific problems, developing methods, analyzing data, interpreting results, preparing reports, and training clients in statistical methods. The statistician will also consult with clients in other areas of preclinical research and development.

Ideal candidates will possess a Ph.D. in biostatistics, or equivalent, and a minimum of two years of statistical consulting experience in toxicology, teratology, pathology or related area, preferably in the pharmaceutical industry. An applicant with an M.S. degree and comparable training and experience will also be considered. Experience with computer packages such as SAS or BMDP is highly desirable. Excellent oral and written communication skills are required.

This position offers an excellent salary and benefits package. Searle is located in the northern suburbs adjacent to Chicago, close to a variety of cultural, recreational, and educational attractions. Qualified candidates may respond in strict confidence to: **G.D. Searle & Co., 4901 Searle Parkway, Dept. DB, Skokie, IL 60077.** An Equal Opportunity Employer.

SEARLE

POSITIONS OPEN

POSTDOCTORAL POSITION IN NEUROBIOLOGY. This NIH-funded project will use single electrode voltage-clamp recordings from neurons within intact autonomic ganglia to study the role of neuroactive peptides in avian oculomotor neurotransmission. The applicant must have a strong background in intracellular electrophysiological techniques, and experience with voltage-clamp is preferred. Send curriculum vitae along with names of three references to: **Vincent A. Chiappinelli, Ph.D., St. Louis University Medical School, Department of Pharmacology, 1402 South Grand Boulevard, St. Louis, MO 63104. St. Louis University is an Equal Opportunity Employer, M/F/V/H.**

POSTDOCTORAL POSITION in pharmacology/physiology available 1 January 1988 for research into the mechanisms of G protein coupling to ion channels. Candidates should be interested in learning or applying techniques in both protein biochemistry and patch clamp electrophysiology. Send curriculum vitae and names of three references to: **Dr. David Clapham, Pharmacology Department, Mayo Foundation, Rochester, MN 55905. An Equal Opportunity/Affirmative Action Institution.**

POSTDOCTORAL POSITION—POLYMER SCIENCE. Research on swelling and transport properties of polyelectrolyte gel membranes. Experience in polymer synthesis and inclination towards both experimental and theoretical aspects of polymer science are desired. Send curriculum vitae and names, addresses, and telephone numbers of three references to: **Ronald A. Siegel, School of Pharmacy S-926, University of California, San Francisco, CA 94143. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITIONS. University of California San Diego, Departments of Pharmacology and Medicine. NIH Training Grant stipends for 1 to 3 years of postdoctoral training in the following frontiers of research related to hypertension. (i) Influence of neural and humoral factors on renal microcirculation and glomerular filtration (**Roland Blantz, Professor of Medicine**). (ii) Actions, identification, localization, and purification of diuretic receptors (**Darrell Fanestil, Professor of Medicine**). (iii) Actions, regulation, purification, and cloning of adrenergic receptors (**Paul Insel, Professor of Medicine and Pharmacology**). (iv) Structure, regulation, and functions of chromaffin granule proteins, studied by molecular cloning, point mutation, and antisense transfection (**Daniel O'Connor, Associate Professor of Medicine**). (v) Role and regulation of CNS peptidergic systems in cardiovascular control (**Morton Printz, Professor of Pharmacology**). (vi) Regulation, significance, and metabolism of catecholamines and ANP in hypo- and hypertensive states (**Michael Ziegler, Associate Professor of Medicine**). Send curriculum vitae and names of three references to: **Darrell D. Fanestil, M.D., Professor of Medicine, and Head, Division of Nephrology/Hypertension, M-023B, University of California, San Diego, La Jolla, CA 92093. An Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL POSITIONS

Postdoctoral positions available immediately to study (i) 8-cell polarity induction or (ii) alkaline phosphatase expression in preimplantation mouse embryos. Experience with immunofluorescence or molecular biology desirable. Send curriculum vitae and list of references to: **Dr. Carol Ziomek, c/o Personnel Office, Worcester Foundation for Experimental Biology, 222 Maple Avenue, Shrewsbury, MA 01545. An Equal Opportunity/Affirmative Action Employer M/F/H.**

POSTDOCTORAL POSITIONS are available to work on the molecular biology of adrenergic receptors: Cloning, expression, gene structure, site-directed mutagenesis. Applicants should have a strong background in recombinant DNA technology. Send curriculum vitae and two to three letters of reference to:

Dr. Robert J. Lefkowitz and Dr. Marc G. Caron
Howard Hughes Medical Institute
Box 3821
Department of Medicine
Duke University Medical Center
Durham, NC 27710

POSITIONS OPEN

POSTDOCTORAL POSITIONS: ECOLOGISTS. One position (available immediately) in plant ecology to study vegetation history and disturbance regimes; one position in wetland/aquatic ecology (funding pending) to develop water quality and wetland monitoring/research for coastal barrier islands. Salary range \$18,000 to \$21,000. Send curriculum vitae and three references by November 1987 to: **Dr. Susan Bratton, Institute of Ecology, University of Georgia, Athens, GA 30602. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE: Ph.D. in biochemistry with 0 to 3 years of experience. Background in cell separation and cell biology. Salary commensurate with experience and training. Send résumé with letters of recommendation to: **Dr. Wayne L. Ryan, University of Nebraska Medical Center, Department of Obstetrics and Gynecology, 42nd and Dewey Avenue, Omaha, NE 68105. Application deadline 1 November 1987. Equal Employment Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE: Position open immediately for research on molecular basis of mutagenesis and gene regulation in mammalian cells, involving shuttle vectors, somatic cell genetics, DNA sequencing, etc. Candidates should have a Ph.D. in biochemistry, genetics, molecular or cellular biology, and research experience with recombinant DNA technology. For fullest consideration, applications should be received by 1 November 1987. Submit curriculum vitae and names of three references to: **Dr. Richard Davidson, Center for Genetics, University of Illinois College of Medicine at Chicago, 808 South Wood Street, Chicago, IL 60612. The University is an Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE

Ph.D. in biochemistry, neurochemistry, or equivalent, 2 to 3 years of experience in phospholipid and acetylcholine metabolism; experience in isolation and purification of membrane bound enzymes. The orientation of this laboratory is the effect of modification of the polar portions of membrane phospholipids by endogenous enzymes on membrane function. Familiarity with the scientific literature pertaining to this research is useful.

Both women and men are encouraged to apply. In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents of Canada.

Salary negotiable. Starting date as soon as possible. Contact: **Dr. J. N. Kanfer, Department of Biochemistry, University of Manitoba, 770 Bannatyne Avenue, Winnipeg, Manitoba R3E 0W3. Telephone: 204-788-6500.**

TWO POSTDOCTORAL RESEARCH ASSOCIATE POSITIONS PLANT MOLECULAR BIOLOGY

The Ohio State University
Biotechnology Center
Columbus, OH

There are immediate openings for two postdoctoral research associates to work in my new laboratory at The Ohio State University Biotechnology Center. Research activities will focus on the regulation of expression of soybean genes coding for glutamine synthase, sucrose synthase (nodulin-100), uricase (nodulin-35), and leghemoglobin in transgenic legumes and non-legume plants. Training and experience in the area of molecular biology, microbiology, or biochemistry, as well as knowledge of plant tissue culture is desirable. Salary will be commensurate with experience. Please contact: **Professor D. P. S. Verma at the Biotechnology Center, Rightmire Hall, 1060 Carmack Road, Columbus, OH 43210-1002, (Telephone: 614-292-5670; or before 1 October 1987 telephone: 514-398-6472). An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL TRAINEESHIP to study a unique metal-binding peptide of the microorganism *Euclena gracilis* and possibly freshwater fish metallo-thioneins. Experience in protein chemistry or inorganic biochemistry is required. Salary: \$16,000. Send résumé and three letters of recommendation to: **Dr. C. Frank Shaw III, c/o Department of Chemistry, University of Wisconsin-Milwaukee, P.O. Box 413, Milwaukee, WI 53201. UW-Milwaukee is an Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN

Applicants are being accepted from candidates with a Ph.D. in Biochemistry with at least 8 years of postdoctoral experience in neurochemistry and neuropharmacology. Experience must include analytical methods, including HPLC and GC/MS, receptor biochemistry in primary tissue cultures including molecular mechanisms of signal transduction, and versatility in behavioral testing and neurosurgery.

The position is located at Georgetown University Medical School (FGIN), it is a faculty appointment as a **RESEARCH ASSISTANT PROFESSOR** (not tenure track) in the Department of Biochemistry, with a salary of \$32,000 per year.

If interested, please send résumé to: **Director, FGIN, 3900 Reservoir Road, N.W., Washington, DC 20007.**

REPRODUCTIVE BIOLOGIST. Faculty or postdoctoral position available in the In Vitro Fertilization Program of the Brigham and Women's Hospital, Harvard Medical School. Experience with embryos and/or embryo freezing desirable. Opportunities exist for research in early embryo development, retrovirus expression in male and female reproductive tracts and ovarian and sperm physiology. Send curriculum vitae, statement of research interests, and names and addresses of three references to: **Dr. Patricia M. McShane, Department of Obstetrics and Gynecology, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115.**

RESEARCH ASSOCIATES MOLECULAR BIOLOGY AND VIROLOGY

Cornell University Medical College invites applications for two postdoctoral positions in a multidisciplinary research laboratory studying alterations in lymphocyte receptors and differential gene activation following infection of human cells with retroviruses, including HIV. The ideal candidates will be experienced in cDNA library construction and cloning, and will collaborate with two other Ph.D.'s with experience in protein chemistry and RNA biology. Applicants must have a Ph.D. Initial appointment is for 2 years, with the possibility of renewal and advancement. Send résumé and names of two references to: **Dr. Jeffrey Laurence, Division of Hematology-Oncology, The New York Hospital-Cornell Medical Center, 525 East 68th Street, New York, NY 10021.**

RESEARCH ASSOCIATE

Outstanding career opportunity currently exists in research laboratories (in existence since 1941) located in a teaching hospital setting in a private research institute interested in heart research.

Will be required to perform analytical tests on various experimental animal models in various aspects of cardiovascular research.

Requirements include an M.S. in biology or biochemistry, or a B.S. in the above with a minimum of 2 years of experience in a heart research setting. Must be familiar with isolated rat heart perfusion techniques from hemodynamics and metabolic aspects, and have experience with biochemical and basic lab techniques in chemistry. For consideration please submit résumé to: **Mr. Roger D. Brown, Director of Personnel, Charlotte Memorial Hospital and Medical Center, P.O. Box 32861, Charlotte, NC 28232.**

Equal Opportunity Employer.

RESEARCH POSITION. Research associate professor at University of Southern California (USC) Institute of Physics. Lab research will focus on development of new x-ray detection concepts and the development of arrays of x-ray detectors based on HgI₂ single-crystal technology developed by the Institute. Responsibilities include proposal writing, management of specific research projects, submission of reports, and management of lab engineers and technicians, according to the requirements of sponsored research grants. Work will involve collaboration with other research institutions, including synchrotron radiation facilities. Requirements include Ph.D. in physics, strong theoretical background, and experience with ionization radiation detection problems. Experience in electronics and computer programming would be advantageous. Salary range is \$55,000 to \$62,000. Send résumé to: **Dr. Iwanczyk, USC Institute of Physics, 4676 Admiralty #932, Marina del Rey, CA 90292.**

POSITIONS OPEN

RESEARCH ASSOCIATE

Perform microsurgery and vascular surgery on rats and pigs to perfect methods of organ transplant, methods of microvascular surgery, and to determine effects of drugs. Perform small bowel transplants. Required: M.D. degree or bachelor's in medicine and surgery. Three years of training (1 year of internship and 2 years of residency in surgery), 6 months of experience; 40 hours per week, 5 days. \$31,200 per year. Send résumé. No phone calls: NYS Job Service, JO#8026986, DOT Code 070101094. 247 West 54th Street, 4th floor, New York, NY 10019.

RESEARCH PROJECT DIRECTOR. Dynamic non-profit environmental agency seeks a skilled researcher for study of state hazardous waste reduction programs.

Duties include organizing research, conducting interviews, data collection. Skills sought include knowledge of chemistry and the ability to write and speak in clear, concise prose.

This is an opportunity to make a major contribution to reducing industrial hazardous waste. Excellent salary and benefits.

Send résumés and letters to

INFORM
Personnel Department
381 Park Avenue South, 12th Floor
New York, NY 10016

RESEARCH ASSOCIATE TUMOR BIOLOGY

An established laboratory moving to a new basic research institute seeks Ph.D./M.D., postdoctoral scientist to investigate new approaches to brain tumor therapy based on selective inhibition of lipogenic enzymes. Experience in experimental pathology, pharmacology or in vivo tumor biology would be most helpful. Position is available in October 1987 or later, and features competitive salary, benefits and excellent facilities in an attractive rural setting. Send curriculum vitae and names of three references to: William Maltese, Ph.D., The Weis Center for Research, Geisinger Clinic, Danville, PA 17822. *Equal Opportunity Employer, M/F/H.*

POSITIONS OPEN

RESEARCH AND DEVELOPMENT SENIOR SCIENTIST

Position available immediately for work in a multi-disciplinary team on the biochemical and physiological responses of insect parasitic nematodes to treatments which enhance stress tolerance. Must have a Ph.D. in biochemistry or related field, and experience in the biochemical aspects of stress tolerance or developmental biochemistry. Send résumé and names of three references to: Dr. Irene Popiel, c/o Biosis, 1057 East Meadow Circle, Palo Alto, CA 94303.

RESEARCH ASSOCIATE POSTDOCTORAL FELLOW

M.D. or Ph.D. in hyperthermia, radiation, physiology, biomedical engineering, or related studies to participate on clinical project investigating effects of hyperthermia on human tumor blood flow and determining distribution and modification of pH in human tumors. Salary commensurate with experience. Send curriculum vitae and two letters of recommendation to: Dennis B. Leeper, Ph.D., Department of Radiation Therapy and Nuclear Medicine, Thomas Jefferson University Hospital, Philadelphia, PA 19107. *Equal Opportunity/Affirmative Action Employer.*

SENIOR POSITION at the Full or Advanced Associate Professor level in **COGNITIVE PSYCHOLOGY**. Persons applying must have a record of significant research accomplishments and a history of extramural funding. The applicant will be expected to provide a leadership role in the graduate program in cognitive psychology. All applicants should send curriculum vitae, representative reprints, record of extramural funding and at least three letters of reference to: Irwin L. Goldstein, Professor and Chair, Department of Psychology, University of Maryland, College Park, MD 20742. **Attention: Cognitive Search Committee.** *Women and minorities are encouraged to apply.* Telephone calls to discuss this position are welcome. Please call: Professor Goldstein, 301-454-6103. *The University of Maryland actively subscribes to a policy of Equal Educational and Employment opportunities.* For best consideration, application materials should be received by 1 November 1987.

POSITIONS OPEN

RESEARCH ASSOCIATE—With at least B.S. in science to work part time (20 hours per week) at salary of \$8000 a year in epilepsy at Buffalo, New York. Will work alone under supervision. Should have experience with small animals, know how to set up for microelectrode recordings, record results of experiments and have some experience in writing grant applications. If desired, other half of time, may work in same laboratory on own research project if related to epilepsy or abnormal movements. Write: Box 133, SCIENCE.

SOILBORNE FUNGAL DISEASE PATHOLOGIST

Twelve-month tenure-track assistant/associate professorship available 1 July 1988. Responsibilities include research in the area of soilborne fungal ecology/physiology with application to disease situations. Limited teaching in the area of expertise is expected. Ph.D. required in biological science relevant to area of research; postdoctoral experience preferred. Submit curriculum vitae, a short presentation of prospective research program, and names and addresses of three references by 15 November 1987 to: Dr. James Steadman, Chairman, Search Committee, University of Nebraska-Lincoln, Department of Plant Pathology, Lincoln, NE 68583-0722. *Affirmative Action/Equal Opportunity Employer.*

VACCINES AND AUTOIMMUNITY

The Immune Response Corporation, a newly formed San Diego-based biotechnology company, is recruiting **SCIENTISTS** at the Ph.D. level. Successful candidates will conduct innovative research in viral and bacterial vaccines and immunoregulation with special emphasis on anti-idiotypes. Current openings exist for individuals with experience in virology, microbiology, cell biology, cellular immunology, immunochemistry, protein chemistry, and organic chemistry.

Interested candidates should submit their curriculum vitae to:

Chief Scientific Officer
The Immune Response Corporation
8950 Villa La Jolla Drive, Suite 1200
La Jolla, CA 92037

BIOMEDICAL SPECTROSCOPY Postdoctoral Positions

Battelle's Columbus Division, a world leader in professional research and development services, has two postdoctoral positions currently available in the biomedical spectroscopy area. Both positions provide the opportunity to work in our challenging multidisciplinary environment.

Positions require a PhD in biochemistry, physical chemistry, or spectroscopy. Involves the application of infrared spectroscopy to: problems of molecular structure and function, development of new infrared techniques for studying biological molecules, study of various surfaces for their absorption of biological molecules, and study of biomaterials. Positions are located in Battelle operated, NIH funded National Center for Biomedical Infrared Spectroscopy.

Positions are one year appointments. Individuals interested in these challenging opportunities should send resumes and three letters of reference to: Richard Shaw, Employment Department F-3, Battelle Columbus Division, 505 King Avenue, Columbus, Ohio 43201-2693. An Equal Opportunity/Affirmative Action Employer M/F/H.



Battelle

Columbus Division

Product Line Manager DNA Products

Beckman Instruments, a recognized leader in bioanalytical and diagnostic products, is seeking a dynamic marketing professional experienced in molecular biology to develop and execute the annual product/marketing plan for DNA sequencing. This will include defining new products and new applications for existing products, product line profit management, and supporting the sales force in achieving sales targets. Qualifications include an MS in molecular biology and excellent written and presentation skills.

Beckman offers an excellent benefits program and competitive salaries. Qualified candidates should send their resumes to Fred Krueger, Personnel Supervisor, Beckman Instruments, Inc., 1050 Page Mill Road, Palo Alto, CA 94304. An equal opportunity employer.

BECKMAN

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POSITIONS OPEN

JET PROPULSION LABORATORY/NASA VISITING SENIOR SCIENTIST LIFE SCIENCES FLIGHT RESEARCH

The Jet Propulsion Laboratory invites applications to the Visiting Senior Scientist Program in the area of Life Sciences Research. The position requires a Ph.D. or equivalent research experience in Life Sciences; a record of research publications in the refereed literature; a demonstrated ability to work with other scientists, and to synthesize advisory information and strong communication skills. Tenured faculty members familiar with NASA's Life Science Program with experience in program management are the preferred choice. Responsibilities include aiding in the planning and implementation of Life Sciences Flight Experiments Program within the Life Sciences Division at NASA Headquarters. Duties include continuing, extensive contacts with the research community, conducting peer reviews of research proposals, recommending selection of investigations, as well as assisting in the maintenance of a balanced and productive program within the available budgetary resources. The appointee is expected to work closely with Managers and Project Scientists at several NASA centers and to advise potential investigators from NASA centers and the university community how their plans relate to the NASA program as well as to assure that research and analysis activities are supportive of current and planned Life Sciences flight missions. The incumbent will also work closely with the Headquarters Program Scientist and individual Mission Scientists. Frequent travel and residence near NASA Headquarters (in the Washington, D.C. area) will be required. Appointee must be a U.S. citizen or Permanent Resident, and is expected to return to his/her home institution following this NASA assignment. Please send curriculum vitae, bibliography, and the names of four references to: **Dr. Harry Ashkenas, 180-900, Department U16, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109. Telephone: 818-354-8251. An Equal Opportunity Employer.**

JET PROPULSION LABORATORY/NASA VISITING SENIOR SCIENTIST SPACE BIOMEDICAL RESEARCH NEUROVESTIBULAR EMPHASIS

The Jet Propulsion Laboratory invites applications to the Visiting Senior Scientist Program in the area of Space Biomedical Research. The position requires a Ph.D. or equivalent degree along with research experience in the neurovestibular area, a record of research publications in the refereed literature, and strong communication skills. Although any qualified person may apply, tenured faculty members with experience in NASA's Biomedical Research Program in the area of neurovestibular physiology are the preferred choice. Responsibilities include aiding in the planning and implementation of the Biomedical Research Program within the Life Sciences Division at NASA Headquarters. Duties include extensive contacts with the research community, conducting peer reviews of research proposals, recommending selection of investigations as well as assisting in the maintenance of a balanced and productive program within budgetary resources. The appointee is expected to work closely with managers at several NASA centers, and to advise potential investigators from the university community how their plans relate to the NASA Biomedical Program. Frequent travel and residence near NASA Headquarters (in the Washington, D.C. area) will be required. Appointee must be a U.S. citizen or Permanent Resident, and is expected to return to his/her home institution following this NASA assignment. Please send curriculum vitae, bibliography, and the names of four references to: **Dr. Harry Ashkenas, 180-900, Department U19, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109. Telephone: 818-354-8251. An Equal Opportunity Employer M/F.**

CONFERENCES

RADIONUCLIDES IN THE FOOD CHAIN, a conference cosponsored by ILSI and ILSA will be held 2-5 November 1987, in Laxenburg, Austria. The scientific and policy perspectives discussed will contribute to the worldwide harmonization of exposure standards for radionuclides in food. Contact: **Lili Merritt, ILSI, 1126 16th Street, N.W., Washington, DC 20036; or call 202-659-0074.**

POSITIONS OPEN



Wayne State University

VISITING PROFESSOR PHARMACEUTICAL SCIENCES

Position available fall, 1987 for visiting professor in the Pharmaceutical Sciences Department. Minimum qualifications: Ph.D., in one of the pharmaceutical sciences with a substantive record of research productivity. Successful candidate will be expected to conduct research, provide guest lectures in area of research expertise. Send curriculum vitae and three reference letters to: **R. T. Louis-Ferdinand, Ph.D., Professor of Pharmacology, Department of Pharmaceutical Sciences, Wayne State University, Detroit, MI 48202. Affirmative Action/Equal Opportunity Employer.**

REQUEST FOR PROPOSALS

New York City Department of Health, Laboratories is accepting proposals to provide for the **Development and Preparation of Examinations for Certification** as technicians, technologists, and supervisors in clinical labs and blood banks.

Copies of the RFP will be available on Friday, 18 September 1987, upon application to: **New York City Department of Health, Laboratories, 455 First Avenue, Room 1266, New York, NY 10016.**

A Pre-RFP conference will be held on: 1 October 1987 at 10:00 a.m.: 12th floor, conference room, 455 First Avenue, New York City. Submission Deadline: 13 November 1987 5:00 p.m.

FELLOWSHIPS

THE BLAUSTEIN INTERNATIONAL CENTER FOR DESERT STUDIES

Postdoctoral fellowships available for basic or applied research in the life, physical and social sciences in arid zones. Deadline for application is 15 December of each year. Send curriculum vitae, letter describing research interests, and three references to: **Chairman, Postdoctoral Fellowship Committee, The Jacob Blaustein Institute for Desert Research, Ben-Gurion University of the Negev, Sede Boqer Campus, 84 993 Israel.**

POSTDOCTORAL FELLOWSHIP

Position to study relationship of thermotolerance, protein synthesis, and stepdown heating in mammalian cells. Requires background in radiation, hyperthermia, biochemistry, or molecular biology. Experience with tissue culture required. Annual starting salary: \$20,000. Please send curriculum vitae and two letters of recommendation to: **Dennis B. Leeper, Ph.D., Department of Radiation Therapy and Nuclear Medicine, Thomas Jefferson University, Philadelphia, PA 19107.** Due to federal government requirements, this position is limited to U.S. citizens or permanent residents. Applications from minority and women candidates are particularly encouraged.

FELLOWSHIP THORACIC ONCOLOGY

A position is available (starting January 1988) in the Department of Thoracic Surgery and Oncology at the Roswell Park Memorial Institute, Buffalo, NY.

The core of the training will be centered around diagnosis, treatment, and research in the intrathoracic malignancies, especially lung cancer. Areas of interest include chemotherapy, immunotherapy, research in lung cancer immunology, and lung transplantation.

The fellow must have had at least 3 years of approved residency training in the U.S.

Interested candidate should contact: **H. Takita, M.D., D.Sc., F.A.C.S., Chief, Department of Thoracic Surgery and Oncology, Roswell Park Memorial Institute, 666 Elm Street, Buffalo, NY 14263; Telephone: 716-845-2300.**

FELLOWSHIPS

NEUROBIOLOGY POSTDOCTORAL FELLOWSHIP available immediately to study functional and structural neuroplasticity during regeneration and aging using neurochemical, immunocytochemical, and molecular genetic techniques. Send curriculum vitae, names and addresses of three references to: **Gad Gilad, Head, Department of Neurobiology, Coriell Institute for Medical Research, Copewood Street, Camden, NJ 08103. Equal Opportunity Employment and Affirmative Action.**

POSTDOCTORAL FELLOWSHIP GLOBAL CHANGE

Applications are invited for a 2-year postdoctoral fellowship to work with the ICSU International Geosphere-Biosphere Programme (IGBP) at the Royal Swedish Academy of Sciences, Stockholm. The fellow will work at the IGBP secretariat and help develop specific plans for the newly initiated international research programme on "Global Change." The fellow will work with the IGBP Executive Director and workgroups in developing specific plans for the research period of IGBP. The topic of the workgroup(s) with which the fellow will work is dependent on his/her scientific background.

Applicants should have a recent Ph.D. in a topic of relevance to questions of environmental changes in our global environment in terrestrial, marine or atmospheric sciences. Although based in Sweden, the fellow will be expected to travel to other countries as part of his/her duties. U.S. citizenship required.

Résumé and three letters of reference should be received before 15 October 1987 and be submitted to:

**Professor Thomas Rosswall
Executive Director, IGBP
Royal Swedish Academy of Sciences
Box 50005
S-104 05 Stockholm, Sweden**

MARKETPLACE

SCANNING ELECTRON MICROSCOPE

Jeol JSM T 300 Scanning Electron Microscope with solid state backscattered electron detector and custom made antivibration table. 5 years old, well maintained and kept on factory service contract. Asking price... \$25,000.

Contact: **Dr. Peter J. Bugelski
Assistant Director, Experimental Pathology
Smith Kline & French Laboratories
P.O. Box 1539
King of Prussia, PA 19406-0939
215-270-7409**

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Barnes-Hind, Inc., is a manufacturer of contact lenses, contact lens solutions, ophthalmic pharmaceuticals and related products. We invite you to take a look at the following exciting opportunities for advanced degreed Professionals to help build our growing Research and Development Department.

Director of Biology

You will manage the biological research and development of ophthalmic therapeutics and surgical adjuncts as well as provide safety and ADME support to contact lens and IOL R&D efforts. You must have a PhD in a biomedical science plus 8-10 years of experience in biological pharmaceutical R&D with special expertise in efficacy and safety of ophthalmic or topical pharmaceuticals. You should have proven management of R&D projects through the IND/IDE and NDA/PMA process. Technological management skills and substantial experience with applications of the new biology to pharmaceutical research are also necessary.

Director of Lens Development

If you have excellent management skills and substantial experience with contact lenses, this is a great opportunity to manage the research and development of novel contact lenses, ocular drug delivery systems, and IOLs (and related devices). You must have a PhD in Polymer Chemistry, Biomaterials, or BioEngineering, and 8-10 years of industrial pharmaceutical/medical device experience. We also require experience in the direction of R&D projects through the IDE/PMA process.

Polymer Chemist

Working in our Lens Development Department, you will evaluate and develop polymer applications for novel contact lenses, ocular drug delivery systems, and IOLs (and related devices). You will also coordinate with pharmaceutical development to characterize drug/polymer interactions. We require a PhD in Polymer or Physical Organic Chemistry with up to 2 years' experience, or an MS and 3-5 years' experience, or a BS and over 5 years of industrial pharmaceutical/medical devices experience.

Biomaterials Engineer

You will discover, research and develop novel contact lenses, ocular drug delivery systems, and IOLs (and related devices). You must have an MS in BioMaterials

or Chemical Engineering and 1-2 years' experience, or a BS and 3-5 years of industrial medical device experience, including contact lens development.

Manager of Ophthalmic Pharmaceutical Development

You will manage the pharmaceutical development (formulation, package and process) of new ophthalmic therapeutic and surgical adjunct products and the improvement of existing products. You must have either a PhD in Pharmaceuticals/Pharmaceutical Chemistry and 3-5 years of experience, or an MS and 5-8 years of industrial pharmaceutical experience, including formula screening, stability set-up specification and shelf-life setting, and IND/NDA preparation.

Pharmacist III

You will work in our Ophthalmic Pharmaceutical Development Department to research and develop the formulation, package, and process of new ophthalmic therapeutic and surgical adjunct products. You'll also maintain and improve existing products. You should have an MS in Pharmaceuticals/Pharmaceutical Chemistry and 3-5 years' experience, or a BS in Pharmacy or Chemistry and 5-8 years of industrial pharmaceutical experience, including dosage form selection, formulation techniques and screening, package evaluation, stability set-up and monitoring, and specification setting.

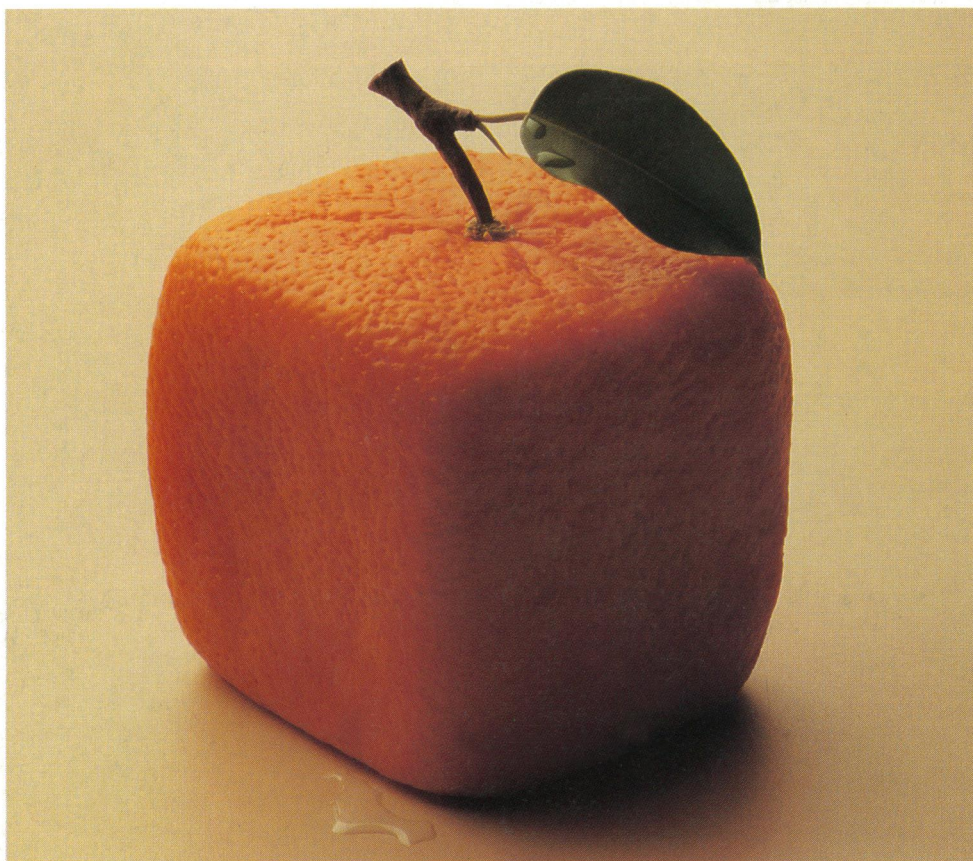
Pharmacist I

Working in our Ophthalmic Pharmaceutical Development Department, you will manufacture and manage clinical supplies. You will also provide technical support and conduct pharmaceutical development (formulation, package, and process) of new ophthalmic therapeutic and surgical adjunct, and to improve existing products. We require a recent MS in Pharmaceuticals/Pharmaceutical Chemistry, or a BS in Pharmacy or Chemistry with 2-3 years of industrial pharmaceutical experience. This experience should include clinical supply manufacturing and control, formulation screening, package evaluation, and stability set-up and monitoring.

Barnes-Hind will reward your performance with an attractive salary and benefits package. Qualified candidates may submit a resume to Human Resources Department, Barnes-Hind Inc., MS-CEN, 895 Kifer Road, Sunnyvale, CA 94086. An EEO/Affirmative Action Employer. M/F/H/V.

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