

During the past century, the writings of ecologists have repeatedly exhibited the resulting awkwardness of ecosystem concepts and difficulty in resolving the most fundamental issues. Nowadays most ecologists embrace the idea that system function can be understood as the sum of the behaviors of individual parts (that is, organisms and physical compartments), but the notion that ecosystems are self-regulating "superorganisms" with "individual" purpose has surfaced repeatedly in the literature. Conceptual difficulties have also spawned an unnatural dichotomy between perspectives emphasizing population processes, on the one hand, and such ecosystem functions as energy flux and nutrient cycling, on the other.

In this turbulent and murky atmosphere, any new concept that provided clarification and unity would be most welcome. Measured against this lofty expectation, *A Hierarchical Concept of Ecosystems* provides fresh insight but ultimately fails in its purpose.

O'Neill and his co-authors clearly perceive a modern trend in ecology toward regarding ecological systems as collections of entities and processes occupying a continuum of temporal and spatial scales. They then take the additional steps of suggesting that observable pattern represents organization and that each level in the hierarchy of organization has its own controls and stability. Finally, they suggest that the hierarchical structure itself is the result of system "evolution," that is, that the development of each higher level of organization depends on the dynamic stabilization of the level immediately below it.

According to O'Neill *et al.*, ecosystems are organized into hierarchies of levels, each defined by processes having similar dynamics (revealed, for example, by rate of return to an equilibrium state). Within each level, one finds subsets of processes called holons defined by the strengths of interactions among components. Although the discreteness of levels and holons is arguable, the basic concept seems a reasonable description of structure, particularly when spatial and temporal scales of processes are interrelated. The utility of such a concept will, however, depend on its ability to produce a new and more useful phenomenology of ecosystems and to generate new hypotheses or interpretations concerning the origin and maintenance of their structure.

Hierarchy is a theory, developed in the context of general systems theory, that has found application in engineering and other human endeavors. O'Neill *et al.* claim that the theory predicts the basic features of ecosystem structure and function. But unless I missed something, their presentation of "theory" appears to be a description of

structure rather than a set of premises that allow one to predict structure. That the properties of ecosystem structure are predictable is, however, asserted, primarily by analogy to engineered control systems whose relevance to ecological systems is questionable. Also, according to the authors, hierarchy theory has been formalized mathematically, but neither the mathematics nor formal predictions of the theory it represents appear in this book.

A Hierarchical Concept of Ecosystems has four parts. The first is a discussion of ambiguities in the ecosystem concept and the inadequacies of previous attempts to tackle its major issues. The second develops the hierarchical concept, whose utility would seem to be the decomposition of an intractable middle-number system, encompassing all populations and processes, into a nested hierarchy of more tractable small-number systems. The third part transforms "concept" into "theory," relying heavily on analogies to such physical phenomena as the formation of convection cells in heated fluids and evolution of the structure of atoms and molecules. Accordingly, the hierarchical organization of systems develops as externally imposed fluctuations lead to instabilities, which are dissipated (as new stabilities are inaugurated) by the development of higher-level interactions and integration. The final part of the book, Applications, shows how observations and experiments on natural systems and the results of simulations of mathematically defined systems are consistent with the hierarchy concept.

O'Neill *et al.*'s discourse fails to illuminate the control of ecosystem processes and the existence of ecological systems as nontrivial hierarchies of organization. The authors assert that ecosystems contain a natural hierarchical constraint structure and, therefore, that one cannot predict their behavior from the behaviors of their individual parts. The analogies used to support this assertion do not convince me of its validity. We are told that the grouping of trees into a forest "incorporates" (controls, or damps) short-term perturbations to which isolated trees are subjected. Does this mean that the forest exhibits a higher level of organization than the individual tree? In microcosm studies as well as in simulations, the output (system function) often exhibits signals of lower frequency than those of the input (component function), in much the same way as unlike tuning forks together produce a beat at a lower frequency than either alone. These low-frequency signals are accepted as evidence of organization within the system at a higher level than that of the individual components of which the system is made. The authors further assert that organization is

based on an asymmetry of effect between levels. Slower (higher) levels dominate and constrain faster (lower) levels, which, because they cannot affect them, follow the slower ones. Physical analogies, microcosm studies, and simulations would seem to argue otherwise, that higher-level properties follow upon lower-level ones. The beat of two tuning forks does not alter or obliterate their individual vibrations. It is a poor analogy, but if one were to filter the higher frequencies the existence of the slower beat would be inexplicable.

Whether the hierarchical organization of the ecosystem is analogous to, or exhibits properties similar to, the management hierarchy of a corporation or the cell-tissue-organ hierarchy of the organism is not made clear. The purpose of the last two is apparent only when the function of the entire unit is understood. The authors do not claim such purposeful behavior of the ecosystem. But if hierarchy theory has value in ecology, it should be able to explain why complex but nonpurposeful collections of interacting elements either resemble or do not resemble purposeful organizations. From premises concerning asymmetry of effect and constraint, the theory should predict whether or not the placing of a component into a larger system changes the underlying dynamics of the individual component or merely their expression. That is, are components subvenient to the properties of the larger system or do they determine these properties? If discrete hierarchical levels of organization, and holons within those levels, exist, do they naturally emerge as intrinsic properties of complex systems, are they trivial, statistical consequences of aggregation, or are they imposed by interaction with factors in the physical surroundings of the system that change over a wide spectrum of temporal and spatial scales? Ecologists cannot answer such questions at this time. Hierarchy provides a provocative way of organizing concepts about ecosystems, but as presented in *A Hierarchical Concept of Ecosystems* it is not a theory with clear predictive power in ecology.

ROBERT E. RICKLEFS
Department of Biology,
University of Pennsylvania,
Philadelphia, PA 19104-6018

Books Received

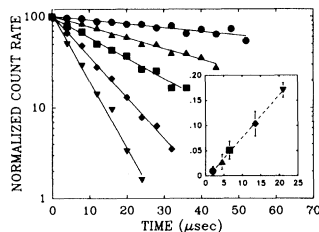
Acidification and Its Policy Implications. T. Schneider, Ed. Elsevier, New York, 1986. xii, 513 pp., illus. \$110. Studies in Environmental Science, 30. From a conference, Amsterdam, May 1986.

Adolescence. An Ethological Perspective. Ritch C. Savin-Williams. Springer-Verlag, New York, 1987. xii, 249 pp. \$42.50.

The Advancement of Science, and Its Burdens. The Jefferson Lecture and Other Essays. Gerald Holton.

PUBLICATION QUALITY CHARTS AND GRAPHS

from your IBM PC, XT, AT
and HP or compatible plotter.



SIGMA PLOT™ software — \$350.

- Error bars
- Smooth Lines
- Clean diagonals
- Movable labels
- Log/semi-log scales
- Multiple graphs per page
- Curve fitting
- Laser printer support

Load data from keyboard, ASCII or DIF files (including LOTUS 123).
Call or write for more information.

JANDEL SCIENTIFIC

MICROCOMPUTER TOOLS FOR THE SCIENTIST
2656 Bridgeway, Sausalito, CA 94965
800-874-1888 (outside CA)
415-331-3022 (inside CA)

Circle No. 216 on Readers' Service Card

PLAY WITH US



Join the not-for-profit U.S.
Chess Federation. Meet your
chess-playing neighbors.

- free chess literature
 - chess product discounts
 - monthly CHESS LIFE magazine
 - low group insurance rates
 - special rates on Visa & MasterCard
- Play winning chess. Low dues help
support U.S. Olympiad Chess Team.
HAVE FUN!

**U.S. CHESS
FEDERATION**

186 ROUTE 9W, NEW WINDSOR, NY 12550
Dept. S-20 (914) 562-8350

NAME _____

STREET ADDRESS _____

CITY, STATE, ZIP _____

Cambridge University Press, New York, 1986. xii, 351 pp., illus. \$39.50; paper, \$12.95.

Advancing Materials Research. National Academy of Engineering with the participation of the National Materials Advisory Board and the Solid State Sciences Committee, National Research Council. Peter A. Psaras and H. Dale Langford, Eds. National Academy Press, Washington, DC, 1987. xvi, 391 pp., illus. \$47.50. Based on a symposium, Washington, DC, Oct. 1985.

The Adventures of a Parapsychologist. Susan Blackmore. Prometheus, Buffalo, NY, 1986. 249 pp. \$19.95.

The Agricultural Scientific Enterprise. A System in Transition. Lawrence Busch and William B. Lacy, Eds. Westview, Boulder, CO, 1986. xxii, 348 pp., illus. Paper, \$30. Westview Special Studies in Agriculture Science and Policy. Based on a symposium, Lexington, KY, March 1985.

Air Pollution Modeling and Its Application V. C. De Wispelaere, Francis A. Schiermeier, and Noor V. Gillani, Eds. Plenum, New York, 1986. xii, 773 pp., illus. \$115. NATO Challenges of Modern Society, vol. 10. From a meeting, St. Louis, MO, April 1985.

Botanic Gardens and Germplasm Conservation. Nigel J. H. Smith. University of Hawaii Press, Honolulu, 1986. 55 pp., illus. Paper, \$8. University of Hawaii Harold L. Lyon Arboretum Lecture no. 14.

Breeding for Resistance to Diseases and Insect Pests. Dhan Pal Singh. Springer-Verlag, New York, 1986. xii, 222 pp., illus. \$79. Crop Protection Monographs.

Building Construction Before Mechanization. John Fitchen. MIT Press, Cambridge, MA, 1987. xviii, 326 pp., illus. \$25.

Butterflies of the Himalaya. M. S. Mani. Junk, Dordrecht, 1986 (U.S. distributor, Kluwer, Norwell, MA), x, 181 pp., illus., + plates. \$79.50. Series Entomologica, vol. 36.

Calcium Electrogenesis and Neuronal Functioning. U. Heinemann *et al.*, Eds. Springer-Verlag, New York, 1986. xii, 428 pp., illus. \$70.40. Experimental Brain Research Series, 14. Based on a symposium, Tegernsee, F.R.G., Jan. 1985.

Calcium in Muscle Activation. A Comparative Approach. Johann Caspar Rüegg. Springer-Verlag, New York, 1986. xiv, 300 pp., illus. \$98. Zoophysiology, vol. 19.

Hazards of Light. Myths and Realities. Eye and Skin. J. Cronly-Dillon, E. S. Rosen, and J. Marshall, Eds. Pergamon, New York, 1986. xx, 374 pp., illus. \$67.50. Vision and Visual Health Care, vol. 1. From a symposium, Manchester, U.K., July 1985.

Health Care Technology. Effectiveness, Efficiency, and Public Policy. David Feeny, Gordon Guyatt, and Peter Tugwell, Eds. Canadian Medical Association and Institute for Research on Public Policy, Montreal, 1986. xxii, 270 pp., illus. Paper, \$C20.

Health Education and The Media II. D. S. Leathar *et al.*, Eds. Pergamon, New York, 1986. xvi, 262 pp., illus. \$49.50. From a conference, Edinburgh, March 1985.

Helium Cryogenics. Steven W. Van Sciver. Plenum, New York, 1986. xxii, 429 pp., illus. \$69.50. International Cryogenics Monograph Series.

Hemocytic and Humoral Immunity in Arthropods. Ayodhya P. Gupta, Ed. Wiley-Interscience, New York, 1986. xiv, 535 pp., illus. \$59.95.

Life Pulse. Episodes from the Story of the Fossil Record. Niles Eldredge. Illustrations by Lisa C. Heilman Lomauro. Photographs by Sidney S. Horenstein. Facts on File, New York, 1987. x, 246 pp., illus. \$19.95.

Light Emission by Plants and Bacteria. Govindjee, Jan Ames, and David Charles Fork, Eds. Academic Press, Orlando, FL, 1986. xxii, 638 pp., illus. \$85. Cell Biology.

Light from the Depths of Time. Rudolf Kippenhahn. Springer-Verlag, New York, 1987. xiv, 262 pp., illus. Paper, \$19.95. Translated from the German edition (Stuttgart, 1984) by Storm Dunlop.

Linear Control Systems. A Computer-aided Approach. Mohammad Jamshidi and Manu Malek-Zavarei. Pergamon, New York, 1986. xiv, 622 pp., illus. \$60; paper, \$26.50. International Series on Systems and Control, vol. 7.

Low Energy Antimatter. David B. Cline, Ed. World Scientific, Singapore, 1986 (U.S. distributor, Taylor and Francis, Philadelphia). viii, 203 pp., illus. \$33. From a workshop, Madison, WI, Oct. 1985.

Low-Energy Electron Diffraction. Experiment, Theory and Surface Structure Determination. M. A. Van Hove, W. H. Weinberg, and C.-M. Chan. Springer-Verlag, New York, 1986. xviii, 603 pp., illus. \$69. Springer Series in Surface Sciences, vol. 6.

Mammals in Hawai'i. A Synopsis and Notational Bibliography. P. Quentin Tomich. 2nd ed. Bishop Museum Press, Honolulu, 1986. viii, 375 pp., illus. \$42.95. Bishop Museum Special Publication 76.

The Man Behind the Syndrome. Peter Beighton and Greta Beighton. Springer-Verlag, New York, 1986. xviii, 240 pp., illus. \$36. Portraits and brief biographies of persons (including seven women) for whom medical syndromes have been named.

Managing Water Resources. John Cairns, Jr. and Ruth Patrick, Eds. Praeger, New York, 1986. xvi, 128 pp., illus. \$39.95. Environmental Regeneration Series. From a convocation, New York, Feb. 1983.

A Manual of Intensional Logic. Johan van Benthem. Center for the Study of Language and Information, Stanford University, Stanford, CA, 1986 (distributor, University of Chicago Press, Chicago). iv, 74 pp., illus. Paper, \$8.95. CSLI Lecture Notes, no. 1.

Manual of Nerve Conduction Velocity and Somatosensory Evoked Potentials. Joel A. DeLisa, Keith Mackenzie, and Ernest M. Baran. 2nd ed. Raven, New York, 1987. x, 278 pp., illus. Spiral bound, \$23.

Manual of Pharmacologic Calculations. With Computer Programs. Ronald J. Tallarida and Rodney B. Murray. 2nd ed. Springer-Verlag, New York, 1987. x, 297 pp., illus. \$35.

Physiological Ecology of Animals. An Evolutionary Approach. R. M. Sible and P. Calow. Blackwell Scientific, Palo Alto, CA, 1986. x, 179 pp., illus. \$49; paper, \$24.50.

Physiological Ecology of Forest Production. J. J. Landsberg. Academic Press, Orlando, FL, 1986. xviii, 198 pp., illus. \$45. Applied Botany and Crop Science.

The Poisoned Womb. Human Reproduction in a Polluted World. John Elkington. Penguin, New York, 1986. 255 pp., illus. Paper, \$6.95. A Pelican Book. Reprint, 1985 ed.

Pollen and Spores. Form and Function. S. Blackmore and I. K. Ferguson, Eds. Academic Press, Orlando, FL, 1986. xvi, 443 pp., illus. \$92.50. Linnean Society Symposium Series, no. 12. From a symposium, London, March 1985.

Pollutants in a Multimedia Environment. Yoram Cohen, Ed. Plenum, New York, 1986. viii, 338 pp., illus. \$55. From a workshop, Santa Monica, CA, Jan. 1986.

The Polyol Paradigm and Complications of Diabetes. Margo Panush Cohen. Springer-Verlag, New York, 1987. xii, 143 pp., illus. \$39.50.

Portraits of Nature. Paintings by Robert Bateman. Stanwyn G. Shetler. Smithsonian Institution Press, Washington, DC, 1987. 160 pp. Paper, \$17.50.

The Social Ecology of Crime. James M. Byrne and Robert J. Sampson, Eds. Springer-Verlag, New York, 1986. xiv, 221 pp., illus. \$35. Research in Criminology.

Social Psychology. Attitudes, Cognition and Social Behaviour. J. Richard Eiser. Cambridge University Press, New York, 1986. xii, 400 pp., illus. \$49.50; paper, \$17.95. Revised edition of *Cognitive Social Psychology* (1980).

Social Psychology and Dysfunctional Behavior. Origins, Diagnosis, and Treatment. Mark R. Leary and Rowland S. Miller. Springer-Verlag, New York, 1986. xiv, 262 pp. \$37.50. Springer Series in Social Psychology.

Soil and Survival. Land Stewardship and the Future of American Agriculture. Joe Paddock, Nancy Paddock, and Carol Bly. Sierra Club Books, San Francisco, 1986 (distributor, Random House, New York). x, 217 pp. \$19.95.

Some Mathematical Questions in Biology. Plant Biology. American Mathematical Society, Providence, RI, 1986. xii, 267 pp., illus. Paper, \$36. Lectures on Mathematics in the Life Sciences, vol. 18. Based on a symposium, Los Angeles, May 1985.

Space Dynamics and Celestial Mechanics. K. B. Bhatnagar, Ed. Reidel, Dordrecht, 1986 (U.S. distributor, Kluwer, Norwell, MA). xxvi, 458 pp., illus. \$99. Astrophysics and Space Science Library, vol. 127. From a workshop, Delhi, India, Nov. 1985.

Tropical Rain Forests and the World Atmosphere. Ghilleen T. Prance, Ed. Westview, Boulder, CO, 1986. xxii, 105 pp., illus. Paper, \$18.50; to AAAS members, \$14.80. AAAS Selected Symposium, 101. Based on a symposium, New York, May 1984.

Urinary System. T. C. Jones, U. Mohr, and R. D. Hunt, Eds. Springer-Verlag, New York, 1986. xviii, 405 pp., illus. \$147. Monographs on Pathology of Laboratory Animals. Sponsored by the International Life Sciences Institute.

Ventricular/Vascular Coupling. Clinical, Physiological, and Engineering Aspects. Frank C. P. Yin, Ed. Springer-Verlag, New York, 1987. xii, 406 pp., illus. \$65. Based on a symposium, 1983.

Products & Materials

Incubator with Diurnal Cycle

Model 3810 is a 19-cubic-foot diurnal incubator for growing plants, insects, or small animals. A microprocessor allows the user to program the times at which the lights turn on or off and at which the temperature rises or falls. The temperature is maintained within 0.1°C of a user-chosen temperature between 5° and 50°C. A light-emitting diode display shows the temperature continuously. Alarms sound when the actual temperature deviates too far from that programmed. NAPCO Scientific. Circle 536.

Power Inverter for Electrophoresis

The PPI-100 is a microcomputer dedicated to performing field-inversion gel separations of DNA molecules with between 10,000 and 2,000,000 bases. A quartz crystal allows accurate timing of intervals as short as 0.01 second or as long as 18 minutes. Ten standard programs are provided; the user may alter seven timing parameters. Several gels may be powered at once. MJ Research. Circle 537.

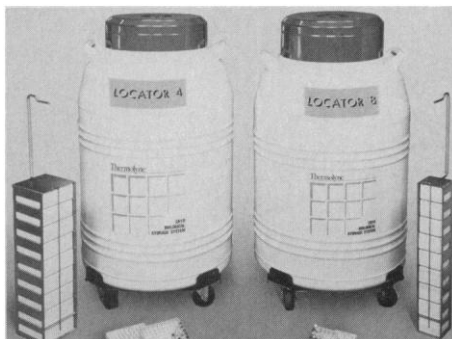
Data Management Software

BASSBase and BASSView are programs for data management and statistics on personal computers. Modeled after mainframe SAS, BASSBase contains many preprogrammed procedures, will run DOS or any DOS program as a subtask, and is substantially compatible with SAS code. BASSBase can use programming language statements with analysis procedures. BASSView is a windowing program featuring pull-down menus. The user may view as many as three files simultaneously. Together, BASSBase and BASSView require 512 kilobytes of random access memory and less than 1 megabyte of disk storage; they operate on IBM PC and compatible computers. BASS Institute. Circle 550.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card and placing it in a mailbox. Postage is free.

Cryobiological Storage System

The Locator is a compact cryobiological storage vessel with an inventory system. Each stainless steel rack is numbered and fits into a correspondingly numbered location. Nine indexed Nalgene boxes fit into each rack, and each box has individually numbered storage locations for 1.8-ml and small-



er ampules. Because any sample may be quickly and accurately located, exposure time to ambient temperatures for stored samples is reduced. To minimize the evaporation of nitrogen, the Locator has a narrow mouth and is superinsulated. Thermolyne. Circle 551.

Microtiter Plate Marker

The TrakWell Marker illuminates the current well of a microtiter plate. The marker's 96 light-emitting diodes align under the wells of a standard microtiter plate. Starting at the top left well, each diode lights in turn from left to right and top to bottom, controlled by a step switch or foot switch. Different patterns may be established with a mode or reverse switch. If desired, a tone sounds at each change. FMC. Circle 545.

Software for On-Line Database

GRATEFUL MED is a software program that simplifies access to the on-line databases MEDLINE and CATLINE. The user constructs the search interactively with GRATEFUL MED off-line. Then the program dials the computer, logs on with the user's code, enters the search request, runs the search, stores the references, and disconnects from the computer. Connect charges are greatly reduced because the computer conducts the search much faster than the user could. GRATEFUL MED also eliminates the need for MEDLINE users to attend classes to learn to access the database.

The program operates on IBM PC and compatible computers with a Hayes or compatible modem. National Library of Medicine. Circle 562.

Compact Microscope

The Axioskop is a compact, routine microscope that nevertheless incorporates Infinity Color-corrected System Optics and Systems-Integrated Design: all objectives have infinite image distance and deliver sharp, flat-field, glare-free images over a consistent 20-mm field of view, and components for all contrast-enhancing techniques may be integrated into the microscope stand. The equipment for incident-light fluorescence is built into the stand, and simultaneous observation may be done in transmitted light and incident-light fluorescence. The microscope may be adapted for other methods including bright-field, dark-field, phase contrast, polarizing contrast, and differential interference contrast (DIC). Ergonomically designed controls help the user resist fatigue. Carl Zeiss. Circle 561.

Liquid Chromatography Systems

The chromatography systems of the BioLC Series analyze and purify biologically important molecules and ions. Systems are available for carbohydrates, amino acids, biological ions, and proteins and nucleic acids. All components are metal-free and chemical-resistant. Each system includes a high-pressure, quaternary gradient pump for pulse-free mixing of as many as four solvents. Dionex. Circle 564.

Agarose Gel Apparatus

The Pee-Wee agarose gel apparatus quickly analyzes restriction digests and minifies and isolates restriction fragments destined for cloning. The gel table is constructed of fluorescent material that aids in sample loading by highlighting the agarose wells. The gel table is designed to keep the agarose pillow from drifting horizontally during electrophoresis and is notched at opposite ends to allow for easy placement and removal of gels. Ultrapure platinum electrodes produce a uniform electrical field for best resolution. Buffer capacity is 375 ml. The apparatus comes with retractile power leads, gel-casting tray, five microscope-gel casting slides, sliding lid, and either an analytical or a preparative comb. Universal Bio-Systems. Circle 565.

INTERNATIONAL SYMPOSIUM ON PLANT TRANSPOSABLE ELEMENTS

22 to 26 August 1987
University of Wisconsin
Madison, Wisconsin

The program (with 35 speakers) is designed to present an integrated view of plant transposable elements from the formal genetics to the most recent research. There will be an emphasis on the molecular aspects such as structure and effects on splicing of the primary transcript. The various strategies to utilize transposon tagging to identify the clones of interesting genes will be explored in detail. Posters are invited. For further information and a registration brochure which includes the program, contact:

Transposable Element Symposium
Wisconsin Center
702 Langdon Street
Madison, WI 53706
Telephone: (608) 262-5514

Registration deadline is August 1, 1987

Attendance will be limited to 200.



The International Association for Scientific Computing (IASC) presents CD\Biotech™ the world's premier optical disk-based journal and Magazine™ for the biotechnology community. CD\Biotech is the standard in CD-ROM conferencing -- allowing users to comment on products, projects, software, articles, sequence information, or simply communicate without the pressure, awkwardness, and expense of online services. IASC disks are compatible with all available CD-ROM readers.

Your resource for databases, software, and scientific communication including:

- GenBank (the NIH-sponsored Genetic Sequences Databank), the NBRF Protein Identification Resource, and European Molecular Biology Laboratory's Library
 - Timely communication including original journal articles, magazine articles and scientific conferencing.
 - Several hundred scientific and general purpose programs.
- A full year subscription to CD\Biotech (comprising at least two issues on compact disk) cost only \$495.

For more information, write: IASC, 1040E East Duane, Sunnyvale, CA 94086, USA.

Circle No. 230 on Readers' Service Card

Frontiers in Basic Sciences That Relate to
Heart, Lung, and Blood Diseases Symposium:

Angiogenesis

June 3 and 4, 1987
Masur Auditorium
National Institutes of Health
Bethesda, Maryland

Sponsored by
National Heart, Lung,
and Blood Institute

The symposium is the ninth in the series of "Frontiers in Basic Sciences That Relate to Heart, Lung, and Blood Diseases." It is the second in a commemorative series of conferences honoring the Centennial of the National Institutes of Health and the 40th Anniversary of the National Heart, Lung, and Blood Institute (NHLBI). The Frontiers in Basic Sciences symposia are conducted by the NHLBI to capitalize on and transfer the progress in basic science disciplines to clinical research problems. Leading experts in the field will present their views on the state of the science, the problems facing current understanding, and anticipated future developments in angiogenesis.

The symposium will be cochaired by Dr. Judah Folkman of the Harvard Medical School and Dr. Roger Guillemin of The Salk Institute. Presentations will be structured around the following topics, development of the vascular system, modulators of microvascular growth, angiogenesis in the cardiovascular system, new insights in tumor angiogenesis, angiogenic molecules, and control of angiogenesis. Presentations by noted experts will be followed by open discussion.

For further information and registration materials, please contact: Dr. Elliott C. Kulakowski, Senior Scientific Advisor, Office of Program Planning and Evaluation, National Heart, Lung, and Blood Institute, National Institutes of Health, Building 31, Room 5A03, Bethesda, Maryland 20892, (301) 496-6765.

Tropical Rain Forests and the World Atmosphere

Edited by Ghilleen T. Prance,
Director, Institute of Economic Botany,
New York Botanical Garden

The ongoing destruction of tropical rain forests may have profound consequences for the global atmosphere. Increasing scientific knowledge finds that the role of the tropical rain forests in maintaining the equilibrium of the atmosphere may be far greater than previously believed. Based on a AAAS symposium, this volume reports on the urgent need for preserving the tropical rain forests and includes policy recommendations. 106 pp., 1986.

\$18.50; AAAS members \$14.80 (include membership number from *Science*).

Order from: Westview Press, Dept. AAAS, 5500 Central Avenue, Boulder, CO 80301
Add \$2.50 postage and handling for the first book ordered; 75 cents for each additional book.

Published by Westview Press for AAAS

Personnel Placement

SCIENCE publishes each Friday, except the last Friday of the year. Advertising is accepted only in writing; no abbreviations. Any deadline in ad must be at least 2 weeks after date of issue in which ad appears. Also, personnel advertising is accepted only with the understanding that the advertiser does not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, handicap, or sexual preference.

LINE CLASSIFIED ADVERTISING DEADLINES:

Thursday, 2 weeks prior to issue date (mailed on issue date).

POSITIONS WANTED: 40¢ per word, plus \$4 for use of box number, per week. \$10 minimum, per week. Prepayment required. This rate is available only to individuals seeking jobs.

LINE CLASSIFIED (POSITIONS OPEN, COURSES, FELLOWSHIPS, MARKETPLACE, and so forth): \$35.00 per line; \$350 minimum, per week (minimum charge covers one inch on a single column; one inch equals 10 lines of 52 characters and spaces per line). No charge for use of box number. No agency commission for ads less than 4 inches. No cash discount. Prepayment required for all foreign ads. Purchase orders and/or cover letter including billing address required for all other advertising.

Structure ad copy on a separate page, on lines of 52 characters and spaces. Include any desired heading. Each line of heading and/or extra spaces, and all partial lines are counted as full lines. To calculate cost, multiply total lines \times \$35.00 = total cost of ad.

Send copy for all **Positions Wanted** ads and **Line Classified** ads less than 1/6 page in size (39 lines) to:

SCIENCE Classified Advertising
1333 H Street, NW, Room 940
Washington, DC 20005
Telephone: 202-326-6555

Send copy for **Fractional Display** ads, 1/6 page and larger, and all **Marketplace** ads to:

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

Blind ad replies should be addressed as follows:

Box (give number)
SCIENCE
1333 H Street, NW
Washington, DC 20005

POSITIONS WANTED

Bioengineer/Physiologist, Ph.D. Publications, patents, 30 years academic, industrial, government biomedical R&D experience, including basic and applied research, clinical investigation, teaching, product development, administration, teaching, product development, administration, patent litigation, and contract management. Desire free-lance professional assignments, long/short term. P.O. Box 9106, La Jolla, CA 92038. Telephone: 619-456-2565. 4/10, 17, 24

Cardiovascular/Computer Applications Specialist M.D., Ph.D. Scientist and physician. Academic research, clinical and industrial pharmaceutical and medical electronics applications experience. Track record of new product development, marketing, sales of equipment and medical services. Seeking part-time or more extensive association with biomedical company with high market product growth potential in allied medical fields. Box 46, SCIENCE. X

Free-lance editing, copyediting, and proofreading for technical or nontechnical science writing projects. Strong background in social sciences and natural history. Hazel Flett, Ph.D., Box 194, Bodega, CA 94922.

Renal physiologist/toxicologist. Ph.D. 1977. Eighteen years of experience in research in membrane physiopathology and cell metabolism. Three years of experience in teaching biological sciences. Broad biology background. Seeks challenging research/teaching/consulting position in university/hospital/industry. Box 45, SCIENCE. 4/10, 17

POSITIONS WANTED

Immunologist, Ph.D. Six years' industrial assay development (FIA, EIA) and monoclonal antibody experience (4 years, management). Box 22, SCIENCE. 4/10, 24

Pharmacologist/Immunologist, Ph.D. 1982. Five years of postdoctoral work. Interested in the molecular mechanisms of inflammation and immunological processes. Experienced in cell culture, immunoassays, HPLC, histology, experimental animal systems. Available immediately. Box 47, SCIENCE. X

POSITIONS OPEN

ACADEMIC PHARMACOLOGIST

The City University of New York (CUNY) Medical School is seeking a pharmacologist with a commitment to basic research and medical education to join the Pharmacological Department of the CUNY Medical School.

Applicants should possess a doctorate degree, have demonstrated research ability and have experience in teaching pharmacology. The successful applicant shall join a small faculty in the CUNY Medical School based at City College of New York. This is a 7-year integrated B.S.-M.D. program committed to increased minority enrollment in medical education. The position is in a tenure track and adequate laboratory space will be available.

Salary is commensurate with experience and qualifications. Please forward current curriculum vitae and the names of three references no later than 15 May 1987 to: Shailesh Banerjee, Ph.D., Chairman, Pharmacology Search Committee, CUNY Medical School, City College of New York, 138th Street and Convent Avenue, New York, NY 10031.

An Equal Opportunity/Affirmative Action Employer.

AGROECOLOGIST. Assistant professor, 12-month, tenure system research and teaching appointment in Department of Crop and Soil Sciences and W. K. Kellogg Biological Station of Michigan State University. Position will provide a focal point for interdisciplinary research and educational efforts involving ecological studies in agronomic systems. Research in nutrient cycling, energetics, and population and community dynamics are areas of priority interest. Provide statement of research interest, complete résumé, relevant reprints, and three letters of reference. Submit by 1 June 1987 to: Bernard D. Knezek, Chairperson, Selection Committee, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824-1325.

ANATOMISTS

The American University of the Caribbean School of Medicine located in Montserrat, British West Indies, seeks an anatomist to provide instruction to first-year medical students. Excellent salary and benefits. Send résumés to: Selection Committee(s), Medical Education Information Office, 2801 Ponce de Leon Boulevard, #800, Miami, FL 33134.

ASSISTANT MEDICAL RESEARCH PROFESSOR

The Division of Genetics and Metabolism is seeking a biomedical mass spectroscopist to enhance an active and expanding research program. The initial appointment will be a nontenured, Assistant Medical Research Professorship. Responsibilities will include operation and maintenance of a VG 70-S mass spectrometer, participation in collaborative clinical and biochemical research, maintaining and expanding a service to other departments and development of an independent research program. This is an excellent opportunity for the successful candidate, who is expected to hold a Ph.D. degree in chemistry or biochemistry and to have had at least 3 years of previous training and experience in mass spectrometry, preferably with high-resolution instrumentation. Interested candidates should apply in writing to: Dr. D.S. Millington, Box 3028, Duke University Medical Center, Durham, NC 27710 before 8 May 1987. *Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

ANATOMIST/CELL BIOLOGIST

The Department of Anatomy and Structural Biology, Albert Einstein College of Medicine, invites applications for a nontenure-track faculty position at the level of visiting assistant or associate professor. Qualified individuals should have a Ph.D. and demonstrate excellence and experience in organizing and teaching gross anatomy and histology laboratory courses for medical and graduate students. Preference will be given to candidates with postdoctoral training and/or experience with electron microscope and immunolocalization techniques.

Applicants should direct inquiries including curriculum vitae and names of three references to: Dr. Peter Satir, Chairman, Department of Anatomy and Structural Biology, Albert Einstein College of Medicine, 1300 Morris Park Avenue, Bronx, NY 10461 before 30 April 1987.

An Equal Opportunity Employer.

ASSISTANT MEMBER/IMMUNOLOGY RESEARCH PROGRAM. Position available for assistant member (assistant professor) level scientist to develop independent laboratory in human molecular immunology. Close interaction with existing programs in human immunogenetics and immunoregulation essential. We are looking for an individual who has demonstrated scientific independence, innovation, and an interest in working in an interactive environment with emphasis on the autoimmune diseases. Contact: Gerald T. Nepom, M.D., Ph.D., Director, Immunology Program, Virginia Mason Research Center (VMRC), 1000 Seneca Street, Seattle, WA 98101. VMRC is an Affirmative Action/Equal Opportunity Employer.

Environmental Resource Management (ERM): ASSISTANT PROFESSOR, 12-month, tenure-track; 60% teaching (three courses)—resource systems analysis, case studies in ecosystem management and senior seminar—student advising, 40% research in appropriate academic unit, College of Agriculture. Ph.D. in ecology or related science. Position available 1 July 1987. Applications should include letter, résumé, academic transcripts, and names and addresses of three professional references. Submit to: Dr. Herschel A. Elliott, Chairman, ERM Search Committee, The Pennsylvania State University (PSU), 213B Ferguson Building, University Park, PA 16802. Telephone: 814-865-6942. Deadline 1 May 1987 or until a suitable candidate is identified. PSU is an Affirmative Action/Equal Opportunity University.

The Department of Pediatrics, University of California, San Diego (UCSD) is recruiting for an ASSISTANT PROFESSOR IN RESIDENCE, ADJUNCT (nontenure-track), for molecular biology with either a Ph.D. or an M.D. degree to establish independent programs in molecular genetic approaches to human disease. Laboratories will be part of a new interdepartmental Center for Molecular Genetics, and clinical opportunities exist for successful candidates with clinical training. Salary commensurate with University of California policy. Candidates apply by 1 May 1987, with résumé and list of three references to: Theodore Friedmann, M.D., Human Molecular Genetics Search Committee, M-009-H, UCSD School of Medicine, La Jolla, CA 92093. *Equal Opportunity/Affirmative Action.*

BIOLOGY: A renewable position in microbiology is available for fall 1987 at the ASSISTANT PROFESSOR OR INSTRUCTOR level. For an assistant professorship (\$25,178 to \$28,956), a Ph.D. in biology is required, preferably in microbiology, molecular genetics or molecular biology. A.B.D. required for instructorship (\$20,713 to \$23,819). College will provide research funds to the successful candidate. Ph.D. preferred. We seek an excellent teacher interested in undergraduate education to join a strong, seven-person biology department in a young, liberal arts college in rural South Jersey. Expected teaching lead includes the introductory cells and molecules course, intermediate courses in microbiology and molecular genetics or biotechnology, and supervision of student research projects in these areas of biology. Screening will begin on 17 April 1987. Send a letter of application and a résumé and have three letters of recommendation sent to: Dr. Donald Plank, Chairman; Division of Natural Sciences and Mathematics; Stockton State College, Pomona, NJ 08240. *Stockton State College is an Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.*

BIOCHEMIST/ PROTEIN CHEMIST

A history of successes — with major breakthroughs in the detection of Hepatitis B, German Measles, and now, AIDS testing. That's the world leading Diagnostics Division of Abbott Laboratories — the fastest growing segment of a \$3.8 billion innovator in the health care products industry. The Biochemist/Protein Chemist we now seek will be a contributor to our on-going Diagnostic's research efforts.

The ideal candidate will have a Ph.D. in Biochemistry or related science, plus at least 0-2 years postdoctoral experience. Background should include research in protein chemistry, membrane bound proteins, protein structure — function relationships and protein purification/characterization methods. Experience with ligand binding assays helpful.

Recognized by Dun's Magazine as one of the nation's five best managed companies for 1986, Abbott is committed to excellence throughout the company. In addition to an outstanding scientific environment, we provide an excellent salary and benefits package including profit sharing and stock retirement plan. We're headquartered in an attractive suburban setting, just 30 miles north of Chicago. For confidential consideration, please send your resume with salary history to: **Peggy Taylor/Corporate Placement, Dept. SM/4-10.** Abbott is an Affirmative Action Employer.

 **ABBOTT**
ABBOTT PARK IL 60064
"HEALTH CARE WORLDWIDE"

BUILDING A NEW LAB?

LET THE SCIENCE FREE PRODUCT
INFORMATION SERVICE PUT YOU IN
TOUCH WITH THE VENDORS WHOSE
PRODUCTS YOU WILL NEED.

SIMPLY WRITE US A LETTER STATING
THE SPECIFICS ABOUT YOUR PROPOSED
LAB AND WE WILL DO THE REST.

WRITE TO:

**SCIENCE MAGAZINE
NEW LAB SERVICE DEPT.
1515 BROADWAY
NEW YORK, N.Y. 10036**

Molecular Biologists

The Molecular and Cellular Biology Group at the Agricultural Research Center of American Cyanamid has openings for highly motivated individuals with research experience in molecular biology.

At the Ph.D. level, there is a unique opportunity for an individual with demonstrated research ability in the area of eukaryotic gene expression. Candidates should have a minimum of 1-2 years post-doctoral training, a strong publication record, and broad experience in the techniques of gene cloning, analysis, and expression.

At the B.S.-M.S. level, there are opportunities for individuals with 2-5 years experience in a productive academic or industrial laboratory. Experience in the basic techniques of molecular biology (cDNA cloning, synthetic oligonucleotides, DNA sequencing, expression vectors, etc.) is required. Successful candidates will work with Senior Research Scientists to plan and perform experiments, working on specific programs with considerable independence.

American Cyanamid offers a competitive compensation and benefits package. For prompt and confidential consideration, forward your resume, an outline of research interests, career goals and the names and addresses of three references to the Employment Office.



American Cyanamid Company
Agricultural Research Division
P.O. Box 400
Princeton, New Jersey 08540
An Equal Opportunity Employer M/F/H

THE SCIENCE RECRUITMENT

"FOUR DAY CLOSE"

**NOW YOU CAN SEE YOUR AD IN SCIENCE
FOUR DAYS AFTER SUBMISSION**

Scientific Recruiters can now advertise positions almost as soon as the need arises. Instead of reserving space a month or more in advance, you can now place your ad four days before the magazine mailing date. *SCIENCE* is mailed on the cover date.

Film (right-reading, emulsion face down) or full camera ready art and insertion order must reach: *SCIENCE*, Short Close Desk, 1515 Broadway, New York, NY 10036 by NOON Mondays (except for legal holidays when material must reach New York by Noon Fridays). Because space is limited, the four-day close page will be reserved on a first-come, first-served basis, at a 15% premium. 1/4 and 1/2 page ads only.

Now you don't have to wait to find the researchers you need immediately, nor must you advertise in a Sunday paper that pans a lot of sand, but not much gold. Scientific employers know that *SCIENCE* ads fill the job better. Now they fill it faster too.

You can call it "INSTANT RECRUITMENT."

For further information, telephone Ed. Keller, Recruitment Advertising Manager, or Donna Rivera, Production Manager at *SCIENCE*: 212-730-1050, or write to: *SCIENCE*, 1515 Broadway, NY, NY 10036.

CURRENT DISTRIBUTION 160,000

DEP/EOHSI

**PRE-DOCTORAL FELLOWSHIPS IN
THE ENVIRONMENTAL SCIENCES:**

1. TOXICOLOGY
2. EXPOSURE ASSESSMENT
3. RISK COMMUNICATION
4. RISK REDUCTION

The Environmental and Occupational Health Sciences Institute, a joint undertaking of Rutgers, The State University of New Jersey and the University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School, is conducting a national search for exceptional scholars who wish to earn the Ph.D. We are offering competitive fellowships plus tuition and fees to highly qualified students with strong GPA and GRE scores.

These fellowships are sponsored by the New Jersey Department of Environmental Protection as part of New Jersey's environmental health risk assessment program.

Our internationally recognized faculty will provide an opportunity to conduct research in all areas related to risk assessment, risk communication and risk reduction.

For application package please contact **Ms. V. Leyton, c/o EOSHI, UMDNJ-Robert Wood Johnson Medical School, 675 Hoes Lane, Piscataway, NJ 08854-5635. Telephone (201) 463-4828.**

THE STATE UNIVERSITY OF NEW JERSEY

RUTGERS



University of Medicine & Dentistry of New Jersey
Robert Wood Johnson Medical School

TERUMO MEDICAL CORPORATION

Leading Manufacturer of medical devices in Elkton, MD is recruiting research personnel for the Diagnostics Division. There are currently openings for the following positions:

PhD/Protein Chemist

To identify and purify plasma and membrane proteins for in-vitro diagnostics. Requires two years industrial or post doctoral experience.

Scientist/M.S./Biochemistry

3-5 years industrial experience in non-isotopic immunoassay development.

Research Associates/B.S./Biochemistry or related field

2-5 years experience in development of non-isotopic immunoassays.

In addition to liberal fringe benefits and competitive salaries we offer opportunity for growth with an expanding company. Send resume and salary history to:

**Terumo Medical Corporation
Personnel Department
P.O. Box 605
Elkton, MD 21921**

**SCIENTIST &
POSTDOCTORAL
POSITIONS**

Genentech, Inc. is a research and development company which utilizes recombinant DNA technology to produce pharmaceutical products for the treatment of a variety of human diseases.

**Scientist
Biological Chemistry**

We seek an individual with a strong background in cell biology and protein biochemistry to investigate the basic mechanisms of action growth hormone at the molecular and cellular level and to study the biochemistry of growth hormone signal transduction.

The successful candidate should have several years of post-graduate experience and extensive hands-on experience with cell culture, receptor binding techniques and experience with protein/receptor purification. (#5000)

**Postdoctoral Fellow
Protein Biochemist**

An individual with a strong background in protein biochemistry and enzymatic characterization is sought to investigate the biochemical and structural characterization of the growth factor receptors including the growth hormone receptor and the EGF receptor.

The successful candidate should have extensive hands-on experience with protein/receptor purification, receptor binding techniques and determination of enzymatic parameters. (#5001)

**Postdoctoral Fellow
Biochemical
Endocrinology**

A Postdoctoral Fellow in Biochemical Endocrinology is sought to participate in several projects including the elucidation of growth hormone, relaxin and inhibin mechanisms of action. A background in physiology or second messenger biochemistry would be helpful. (#1920SW)

Genentech, Inc. offers an excellent salary and benefits package coupled with the opportunity to make a significant contribution to our organization. Please send resume, indicating position title and number, to Human Resources Department, Genentech, Inc., 460 Point San Bruno Boulevard, South San Francisco, CA 94080. An equal opportunity employer.



Genentech, Inc.
Genentech, Inc.
Genentech, Inc.
Genentech, Inc.
Genentech, Inc.

POSITIONS OPEN

JEFFERSON MEDICAL COLLEGE ASSISTANT PROFESSOR CLINICAL PHARMACOLOGY

Applications are invited for the position of an Assistant Professor of Medicine in our expanding Division of Clinical Pharmacology. The individual selected will be expected to develop an independent basic research program in an area related to pharmacology. Send curriculum vitae, a statement of current/future research plans, and three letters of recommendation by 1 May 1987 to: **Dr. Thorir D. Bjornsson, Division of Clinical Pharmacology, Department of Medicine, Jefferson Medical College, 1100 Walnut Street, Philadelphia, PA 19107.** *The Thomas Jefferson University is an Equal Opportunity/Affirmative Action Employer.*

ASSISTANT PROFESSOR—Applicants are invited to apply for an assistant professor position in the Department of Biochemistry. Individuals with an M.D. or Ph.D. degree in biochemistry and at least 2 years of postdoctoral experience in biochemistry of hormone action are eligible. Candidates must have (i) experience in insulin and insulin-like growth factor mediated regulations of protein kinases; (ii) expertise in protein kinase purification, characterization, and state of the art instrumentation in protein microsequencing; (iii) experience in raising polyclonal and monoclonal antibodies against trace antigens. The successful candidate will be expected to develop and teach courses in regulatory biochemistry for graduate students, to develop and teach courses in medical biochemistry for medical students, and to establish and direct an externally funded independent research program in determining the biochemical basis of insulin action. Salary: \$36,500.

Send curriculum vitae, outline of research interests and the names of three references by 24 April 1987 to:

**Search Committee
Department of Biochemistry
University of Massachusetts Medical School
55 Lake Avenue North
Worcester, MA 01605**

ASSISTANT PROFESSOR PLANT MOLECULAR BIOLOGIST

Department of Biology is seeking applicants for a tenure-track plant molecular biology position. We seek an individual who will complement and strengthen existing plant biology programs. Applicants with backgrounds in the areas of plant-microbe interactions, plant virology, or photosynthesis are encouraged; however, we welcome applicants with interests in other areas of plant molecular biology or molecular genetics. The expected teaching load is about one course/quarter to consist of a mix of undergraduate and graduate courses and seminars. To apply, send application with curriculum vitae, statement of research interests, and three letters of recommendation by 15 May 1987 to: **Dr. Neal Van Alfen, Department of Biology, Utah State University, Logan, UT 84322-4500.** *Affirmative Action/Equal Opportunity Employer.*

BIOCHEMICAL ENGINEERING POSITIONS

The **University of California, Irvine** is recruiting for tenure-track faculty positions at any level in **Biochemical Engineering**. The School of Engineering is moving toward establishment of a new department to complement a range of scientific endeavors in biotechnology within the University and in the adjacent biotechnological community. The opportunity to join in the building of this new department in a growing research university in association with surrounding industry should be an exciting prospect for scholars looking for new challenges. A Ph.D. in chemical engineering or related field is required. Responsibilities will include research and teaching at the graduate level. Specific areas of research to include the following: cellular culturing systems, bioreactors, separation and purification processes, and/or analytical monitoring methods. Please forward your letter of interest, curriculum vitae, and list of references to: **Dean William A. Sirignano, Biochemical Engineering Search Committee, School of Engineering, University of California, Irvine (UCI), CA 92717.** *UCI is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

ASSISTANT PROFESSORSHIPS IN ANIMAL PHYSIOLOGY WELLESLEY COLLEGE

The Department of Biological Sciences has two positions open at the assistant professor level, beginning in September 1987. One is a 3-year position and the second is a 1-year leave replacement. Neither position is on a tenure track. Applicants should have a Ph.D. and a strong commitment to research and undergraduate teaching as well as an interest in directing independent student research. Both positions require teaching either an introductory course in human biology or general biology, and intermediate level courses in comparative anatomy and physiology and/or cellular physiology, and an advanced course in vertebrate physiology. Some of these courses are team taught.

Wellesley College, located 10 miles from Boston, is a liberal arts college for women with a student body of 2200. Wellesley has a modern Science Center complex with the facilities to carry on physiological and biochemical teaching and research comparable to those at larger institutions.

Credentials will be reviewed when complete. Please indicate your preference. Qualified individuals should send their curriculum vitae, graduate transcript, brief outline of research plans, one letter of recommendation and the names of two additional references to: **Dr. Andrew C. Webb, Chairman, Department of Biological Sciences, Wellesley College, Wellesley, MA 02181.**

Wellesley College is an Equal Opportunity/Affirmative Action Employer.

ASSOCIATE IN RESEARCH

Yale University's Department of Cell Biology has an opening for a technician to assist in research related to polarized epithelial cells. Position involves expertise in thin sectioning for transmission electron microscopy, use of the electron microscope, and familiarity with immunocytochemical procedures. Supervisory and laboratory management skills required. M.S./B.S. in biology or biochemistry. Send résumé to: **J. M. Coutts, Department of Human Resources, Yale University, Box 1404, Yale Station, 155 Whitney Avenue, New Haven, CT 06520.**

Yale is an Equal Opportunity/Affirmative Action Employer, M/F.

ASSOCIATE RESEARCHER IN COGNITIVE NEUROSCIENCE

The **Salk Institute for Biological Studies** has opening for research associate in cognitive neuroscience. Talented researcher to join a team of scientists investigating biological foundations of language, language and cognitive functions, and their representation in the brain. Strong candidates will be from neuropsychology, neurolinguistics, and cognitive science. Current research directions of laboratory involve issues in brain organization for language and cognition, computergraphic modeling, and neurodevelopmental studies. Candidates should have a Ph.D. in one of the related fields, and the capacity for interdisciplinary research and growth. Salary competitive, dependent on experience. Please send résumé, letter of interest, and names of references to: **Dr. Ursula Bellugi, The Salk Institute for Biological Studies, P.O. Box 85800, San Diego, CA 92138.** *An Affirmative Action Employer.*

BIOPHYSICIST (POSTDOCTORAL RESEARCH SCIENTIST)—Will carry out the full range of activities of research in protein crystallography. This includes the purification and crystallization of proteins on a microscale, the characterization and collection of diffraction data, phase determination and structure analysis, model building and refinement, and biochemical interpretation of the three-dimensional results. High proficiency in biochemical manipulations, mathematical analysis, computer programming and operation of automated diffractometers is essential. Must have a Ph.D. degree in biophysics. Must have 3 years of experience in the job duties or 3 years of experience as research associate with active crystallographic research. Must have either master's degree in biochemistry or 1000 course hours in biochemistry. Salary: \$25,000 per year; 40 hours per week. Applicants send résumé to: **NYS Job Service, NY8006911, 175 Remsen Street, 2nd Floor, Brooklyn, NY 11201.**

POSITIONS OPEN

ASTRONOMER

The **American Museum-Hayden Planetarium** is seeking a highly qualified professional with in-depth knowledge of astronomy and space science for a tenure-track position. Responsibilities will include program development; presentation of live shows; teaching of astronomical and space science courses; fostering contacts between the Planetarium and the astronomical academic and research communities; serving as a spokesperson on astronomical matters to the media, and participation in planetarium administration.

Qualifications include a Ph.D. in astronomy or related field and experience in some combination of astronomy and space science along with one or more of the following: science education; planetarium operations/productions/exhibitions or program writing. Demonstrated ability to communicate space science subjects to a broad age spectrum preferred.

Starting date for the position is spring 1987 or soon thereafter. Salary and rank will be determined by the candidate's qualifications. Salary requirement should be submitted along with curriculum vitae, samples of publications/writing/scripts or program tapes and the contact information for three individuals familiar with your work. Please submit to:

**Mr. Lee Vilensky
Personnel Department (S)
American Museum of Natural History
Central Park West at 79th Street
New York, NY 10024**
An Equal Opportunity Employer.

BIOLOGISTS. **Pomona College's Department of Biology** reopens its search for two 1-year, full-time sabbatical replacement positions beginning September, 1987. The successful candidates will each teach one course per semester; at least one course should be selected from among cell biology, animal development, neurobiology, developmental genetics, or microbiology. The other course may be in the candidates' area of specialty or be a non-majors biology course. Consideration of applications will begin 24 April 1987. Applicants must clearly define courses they are qualified to teach and send curriculum vitae and three letters of recommendation to: **Search Committee, Department of Biology, Pomona College, Claremont, CA 91711.** Telephone: 714-621-8000, extension 2993.

BIOLOGY

One-year appointment beginning August 1987. **PH.D.** expected, with strong background in microbiology and evolution/ecology. Teaching responsibilities to include freshman level course, "Ecology, Evolution, and Behavior," and upper level courses in microbiology and other area of specialty. Successful candidate may apply for tenure-track position of this description to be advertised next year. Submit application, placement file, and three recent letters of recommendation to: **Dean David W. Jordan, Austin College, Sherman, TX 75090** by 24 April 1987. *Equal Opportunity Employer.*

CARDIOVASCULAR ELECTROPHYSIOLOGIST AND MOLECULAR BIOLOGIST

The **Department of Physiology, University of Manitoba**, invites applications for two positions from investigators in the field of experimental cardiology to be appointed at the level of **ASSISTANT PROFESSOR** (contingent appointment) in the Division of Cardiovascular Sciences. The applicant must have a M.D. or Ph.D. degree; and have 2 years of experience. Applicants with backgrounds in electrophysiology and molecular biology are encouraged to apply. The successful candidates will be expected to compete for local and national scholarship awards (for example, MRC) and develop their independent research programs as well as collaborate with other members of the department. Teaching in a graduate program will be a requirement. Please submit a copy of your curriculum vitae including an outline of your research interests and arrange for three letters of reference to be sent to: **Dr. Henry G. Friesen, Professor and Head, Department of Physiology, Faculty of Medicine, University of Manitoba, Winnipeg, Manitoba, R3E 0W3 Canada.** Deadline for application is 30 June 1987. *Both men and women are encouraged to apply. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents of Canada.*

FACULTY POSITIONS IN PHARMACOLOGY

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE

The Department of Pharmacology has tenure-track openings for outstanding young investigators interested in basic pharmacological research and in teaching. Preference will be given to individuals with demonstrated competence in applying modern techniques of molecular biology, biochemistry or biophysics to fundamental problems in pharmacology, and whose research interests enhance the current strengths of the Department. The Department of Pharmacology is a large, well-established entity with active research thrusts in a) receptor biology and neuropharmacology; b) nucleic acid biochemistry and anti-cancer drug studies; c) hepatic drug and carcinogen metabolism; d) calcium metabolism and intracellular signalling. The departmental faculty interacts extensively with basic and clinical scientists in other departments and with academic and industrial scientists throughout the Research Triangle area. The Department possesses a strong graduate program which includes an NIH training grant.

Successful candidates will be expected to establish well-funded, independent research programs and to participate in the graduate and professional educational activities of the Department. Appointments at either the Assistant Professor or Associate Professor level are possible depending upon qualifications.

Applicants should send a curriculum vitae, a statement of research plans, and the names of three referees to R. L. Juliano, Ph.D., Professor and Chairman, Department of Pharmacology, 1108 Faculty Lab Office Building 231H, University of North Carolina, Chapel Hill, North Carolina 27514. Women and minorities are encouraged. UNC-CH is an Equal Opportunity/Affirmative Action Employer.

CHAIR

DEPARTMENT OF BIOLOGICAL SCIENCES UNIVERSITY OF PITTSBURGH

Applications and nominations are invited for the position of Chair of the Department of Biological Sciences at the University of Pittsburgh. Candidates should have a distinguished research program as well as the energy and ability to lead the Department into its next phase of development. Currently there are 30 tenure-stream faculty members. Additional appointments have been approved. Within the Department, or available to its members, are facilities for DNA synthesis, protein sequencing, cell culture and virology, hybridoma production, large scale fermentation, and electron microscopy. The Department trains 60 graduate students in addition to 350 undergraduate majors. Candidates from all areas of modern biological research are welcome. Review of applications will begin May 1, 1987. Applicants should send a curriculum vitae and the names of potential referees to:

**James M. Pipas
Chair Search Committee
Department of Biological Sciences
University of Pittsburgh
Pittsburgh, PA 15260**

The University of Pittsburgh is an EEO/AA employer.

Macromolecular Sciences

The Macromolecular Sciences Department of Smith Kline & French Laboratories, located in suburban Philadelphia, Pennsylvania, is seeking an Associate Senior Investigator to conduct research in the structural and functional analysis of proteins and ligand-receptor interactions, with particular focus on immunomodulators.

The successful candidate will:

- apply state-of-the-art protein isolation and characterization methodologies to drug discovery.
- interact with multi-disciplinary research teams.
- prepare scientific reports for oral presentation and publication.
- maintain a high degree of familiarity with relevant scientific literature.

Candidates are required to have:

- a Ph.D. in Chemistry/Biochemistry with 1-3 years of relevant postdoctoral experience.
- proficiency in protein isolation, purification and characterization, including HPLC applications.
- experience in isolation and study of membrane-bound proteins.
- knowledge of protein structure-function relationships, protein refolding and modification of proteins is highly desirable.
- a growing publication record indicative of productive, high quality research in the area of proteins.
- excellent verbal and written communication skills.

We offer an excellent compensation and benefits package and an attractive relocation policy as well as a work environment that offers considerable opportunity for personal and professional growth. For confidential consideration, send your C.V. and names of three references to: Robert F. Obst, R&D Senior Employment Consultant, SmithKline Beckman Corporation, 1570 Spring Garden Street, Philadelphia, PA 19101. We are an Equal Opportunity Employer, M/F/H/V.

SK&F
A SmithKline Beckman Company

Senior Scientist Genetic Toxicology

The LILLY RESEARCH LABORATORIES, a Division of Eli Lilly and Company, is seeking candidates for a Senior Scientist position in the Department of Genetic and Developmental Toxicology.

Applicants must have a Doctoral degree with a background in genetic toxicology, cell biology, microbiology or cytogenetics. Prior laboratory experience and a knowledge of genetic toxicology are essential.

Primary responsibilities involve the supervision of a genetic toxicology testing program that currently includes tests for bacterial mutation, mammalian cell mutation, unscheduled DNA synthesis, and *in vivo* chromosomal alteration. Objectives of this program are the screening of new drug candidates for genotoxic potential; the performance of studies to meet international regulatory requirements for product registration; and the development of new and innovative methods to predict chemical carcinogenesis. The position represents a unique challenge to a qualified scientist interested in contributing to research in the area of pharmaceutical development.

Qualified candidates should send their curriculum vitae to:



**Ms. Carol Zapapas
Personnel Representative—GS991
Eli Lilly and Company
Greenfield Laboratories
P.O. Box 708
Greenfield, Indiana 46140
Equal Opportunity Employer**

POSITIONS OPEN

CELL/MOLECULAR BIOLOGIST

A tenure-track assistant professor faculty position is available immediately for a eukaryotic molecular or cell biologist with an independent research program. Ongoing research initiatives in the anatomy department are in neural, reproductive, muscle, and developmental biology. Teaching is in the medical curriculum but prior training or teaching experience in anatomical disciplines is not required. Please send curriculum vitae and names of three references to: **Dr. Lloyd Guth, Search Committee, Department of Anatomy, University of Maryland School of Medicine, 655 West Baltimore Street, Baltimore, MD 21201.** For additional information, telephone: **Dr. Guth 301-328-3590.** *The University of Maryland at Baltimore is an Equal Opportunity/Affirmative Action Employer.*

Cornell University Medical College's major teaching affiliate **Catholic Medical Center** with research facilities in a tree-lined area 15 minutes from Manhattan seeks to expand its **CELL AND MOLECULAR GENETICS** unit/other fields also invited. Cell Sorter EM and so forth provided. Nomination to Cornell faculty. Candidates with ongoing program preferred. Reply to: **Joy Hochstadt, Ph.D., Professor, Microbiology Department, Cornell University Medical College, c/o CMC 152-11, 89 Avenue, Queens, NY 11432.** Telephone: 718-291-3300, extension 2720/2721.

CELLULAR NEUROBIOLOGIST/BIOPHYSICIST: A research associate position available immediately to study the biophysical and pharmacological mechanisms of synaptic plasticity in hippocampus. Candidate should have experience with intracellular recordings and/or patch clamping. Please send curriculum vitae and names of three references to: **Dr. Daniel Johnston, Program in Neurosciences, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030.** *Equal Opportunity/Affirmative Action Employer.*

CHAIRMAN DEPARTMENT OF MICROBIOLOGY LOYOLA UNIVERSITY STRITCH SCHOOL OF MEDICINE

The Stritch School of Medicine, Loyola University of Chicago, invites applications and nominations for the position of Chairperson of the Department of Microbiology. The candidate should possess a Ph.D. or equivalent degree in microbiology, have an established and active research program, have a commitment to medical and graduate education, and have had previous administrative experience. Individuals with a strong background in molecular biological techniques are encouraged to submit their applications. With an ongoing Molecular Biology Graduate Program and a new Macromolecular Facility, the Stritch School of Medicine has a strong commitment to molecular biological research. Currently, the faculty of the department is pursuing research in: molecular biology, cellular immunology, prokaryotic and eukaryotic genetics, virology, immunochemistry, microbial physiology, pathogenic mechanisms, and mycology. Applicants should send curriculum vitae and the names of three references by 1 July 1987 to: **Dr. John X. Thomas, Jr., Chairman, Search Committee for Microbiology, Stritch School of Medicine, Loyola University of Chicago, 2160 South First Avenue, Maywood, IL 60153.** *Loyola University of Chicago, Stritch School of Medicine is an Affirmative Action/Equal Opportunity Employer.*

CONSERVATION BIOLOGY: PLANT ECOLOGIST. Training in synecology/phytosociology; know classification systems used worldwide; coordinate community classification and data gathering in Latin America. **ZOOLOGIST.** Training in animal systematics with broad taxonomic experience. **BOTANIST.** Training in vascular plant systematics, preferably on tropical family. All positions to assist activities in Latin American Conservation Data Centers; provide training; extensive travel required; fluency in Spanish or Portuguese; Ph.D. or satisfactory progress toward its completion; extensive field experience; Latin American experience preferred. Send résumé and cover letter (by 4 May 1987) to: **The Nature Conservancy, Latin American Program, 1785 Massachusetts Avenue, NW, Washington, DC 20037.** *An Equal Opportunity Employer.*

POSITIONS OPEN

CHIEF OF STAFF—The Veterans Administration Medical Center, Portland, Oregon (VAMC), is seeking a **CHIEF OF STAFF** for our three division general medicine and surgery facility. We hope to recruit an active clinician with administrative experience and a record of research accomplishments. We will occupy a new 490-bed acute care hospital and research center in 1987. A new outpatient clinic and 120-bed nursing home care unit are in full operation. Please send nominations and applications to: **James Metcalfe, M.D., Chairman, Search Committee, c/o Medical Staff Coordinator (11), VA Medical Center, P.O. Box 1034, Portland, OR 97207** by 1 June 1987. *The Veterans Administration is an Equal Opportunity Employer.*

DEAN—College of Arts and Sciences—West Chester University is accepting applications/nominations for the above position. College of 275 faculty includes 13 departments in the areas of humanities, social sciences, mathematics, and natural sciences. Position available 1 January 1988. For full details, see our ad in the *Chronicle of Higher Education*, 18 March 1987 issue, or contact: **The Personnel Department, West Chester University, West Chester, PA 19383.**

DEVELOPMENTAL OR CELL BIOLOGIST

The Department of Anatomy and Cell Biology invites applications for a tenure-track position at the assistant or associate professor level. Candidates for professor may be considered. Individuals at the assistant professor level should have postdoctoral experience and will be expected to develop a strong independent research program with external funding from national sources. At the associate professor level, candidates must be principal investigator of a nationally funded program. While the direction and focus of the prospective candidate's research is open, we are seeking individuals who are asking important questions in developmental and/or cell biology and who are using modern research tools, preferably molecular genetics, to address these questions.

The successful candidate must be committed to participating in an active graduate program, and will be expected to teach medical students in a team-taught histology course. The successful candidate need not have prior histology experience, but must be willing to learn and help teach the subject during his/her first year. Please send curriculum vitae with the names, addresses, and telephone numbers of three referees to: **Dr. Peter Stambrook, Department of Anatomy and Cell Biology, University of Cincinnati College of Medicine, 231 Bethesda Avenue, ML #521, Cincinnati, OH 45267-0521.**

DIRECTOR BIO-MEDICAL ENGINEERING CENTER THE OHIO STATE UNIVERSITY

Applications are invited for the faculty position as Director of the Bio-Medical Engineering Center. The person being sought must have demonstrated skills at building an interdisciplinary academic program which contains a strong research component.

The Bio-Medical Engineering Center at The Ohio State University currently has approximately 55 graduate students and 15 participating faculty from engineering, medicine, and other related colleges. Excellent research laboratories exist in a number of colleges and support current work in progress in functional muscle stimulation, rehabilitation, cardiovascular noninvasive diagnosis, biomechanics, orthopedics, biosignal processing, image processing, EEG and EMG analysis, Gait laboratory and physiological systems modeling among others.

Requirements include an established national record in biomedical engineering research and instruction which qualifies the applicant for full professorship with tenure in an existing engineering department. Salary for this position is negotiable, depending upon the individual's qualifications.

Interested candidates are encouraged to submit a letter, curriculum vitae, and names, addresses, and telephone numbers of four references to:

**Dr. Sunder H. Advani, Associate Dean
College of Engineering
The Ohio State University
2070 Neil Avenue
Columbus, OH 43210**

The Ohio State University is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

DIRECTOR, CLINICAL CHEMISTRY/ASSISTANT PROFESSOR: A tenure-track position available for a Board-certified Ph.D. clinical chemist in a university hospital laboratory serving 1300 beds. Experience in a leadership position and evidence of research productivity essential. Teaching duties include resident training. Salary commensurate with qualifications and experience. Candidates must submit current curriculum vitae and three letters of recommendation to: **Bogdan Nedelkoff, M.D., Chairman, Search Committee, Department of Pathology, University of Louisville School of Medicine, Louisville, KY 40292.** Application deadline is 31 May 1987.

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

The University of Michigan Medical School seeks an individual to fill the position of **Director of the UNIVERSITY OF MICHIGAN CANCER CENTER.** This position will be accompanied by a faculty appointment at an Associate to Full Professor level. The Cancer Center Director will be responsible for managing the affairs of the Center with authority and responsibility for the space, equipment, budgets and personnel assigned to the Center. This individual will have responsibility for coordinating Center research and clinical programs, and will report to the Dean of the Medical School for all academic matters and to the Executive Director of the Hospital with regards to the hospital's clinical programs. Eligible candidates will possess either the M.D. or Ph.D. degree with specialization in basic or clinical oncology. Demonstrated administrative abilities in developing and directing large research programs with basic science and clinical components, as well as demonstrated expertise in cancer research are required. Interested individuals should contact **Dr. Irwin Goldstein, Associate Dean for Research and Graduate Studies at 313-763-4086** or write: 1301 Catherine Road, M7321 Medical Science Building I, Ann Arbor, MI 48109-0010.

ENDOWED CHAIR. Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles (UCLA) School of Medicine, seeks appropriate candidates for **Della Martin Chair in Psychiatry**, endowed professorship for distinguished academic psychiatrist (English-speaking, eligible California licensure) committed to research especially on major mental illnesses of adolescents and young adults (for example, schizophrenia). Send curriculum vitae and letter discussing career goals to:

**Arnold B. Scheibel, M.D., Chairman
Della Martin Search Committee
UCLA Neuropsychiatric Institute, B8-262
760 Westwood Plaza
Los Angeles, CA 90024**

ENVIRONMENTAL CHEMISTRY AND BIOLOGY. TECHNICAL AND POSTDOCTORAL POSITIONS immediately available in analytical chemistry (PCBs), aquatic toxicology, quantitative ecology (fish, invertebrates), or related fields. Experience with freshwater streams and sediments desirable. Send résumé and three letters of reference to: **Dr. W. B. Birge, School of Biological Sciences, 101 T. H. Morgan Building, University of Kentucky, Lexington, KY 40506-0225.** Telephone: 606-257-5800. *An Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITION: MEMBRANE BIOLOGY TENURE-TRACK

A tenure-track position is available in the **Multiple Sclerosis Research Center and Department of Physiology, Rush Medical College.** We seek a scientist interested in neural membrane processes, who will enjoy interaction with his basic science colleagues while developing an independent basic research program. The Multiple Sclerosis Center's basic research focuses on excitation: the mechanisms that underly and regulate the action potential, and the biology and biophysics of ionic channels. Needed resources are available, with rank and salary being determined by the experience of the successful applicant. New research space is immediately adjacent to the Department of Physiology.

Please send curriculum vitae and the names of two colleagues familiar with your research work to: **Dr. Robert Eisenberg or Dr. Floyd Davis, Rush Medical College, 1750 West Harrison Street, Chicago, IL 60612.** *Rush Medical College is an Affirmative Action Employer.*



Cold Spring Harbor Laboratory Conference

ON

HEPATITIS B VIRUSES

September 28–October 1, 1987

Organized by:

William Mason, Fox Chase Cancer Center
Hans Will, Max-Planck Institut für Biochemie

The following topics will be covered in the meeting sessions:

*Persistence and pathogenesis of hepatitis virus infections;
Control and expression of viral genes;
Structure and function of viral gene products;
Mechanisms of viral replication;
Hepatocarcinogenesis by hepatitis B virus;
Immune response and antiviral therapies to hepatitis B virus infections;
Hepatitis delta virus*

The deadline for submitting an abstract is JULY 21.

Registration materials may be obtained by contacting:

Meetings Coordinator
COLD SPRING HARBOR LABORATORY
P.O. Box 100
Cold Spring Harbor, N.Y. 11724
(516) 367-8345

Senior Scientist Biochemical/Endocrine Toxicology

The LILLY RESEARCH LABORATORIES, a Division of Eli Lilly and Company, is seeking candidates for positions in the Department of Biochemical Toxicology.

Applicants must have a doctoral degree with a strong background in endocrinology and pharmacology.

The primary responsibilities involve establishing a research program to study the mechanisms of drug-induced alterations in endocrine function. In addition, the successful candidate will participate in research team activities directed toward the development of new therapeutic agents.

Qualified candidates should send their curriculum vitae to:



Ms. Carol Zapapas
Personnel Representative—JW992
Eli Lilly and Company
Greenfield Laboratories
P.O. Box 708
Greenfield, Indiana 46140

Equal Opportunity Employer

Dean of the Colleges

Case Western Reserve University

Case Western Reserve University is pleased to announce an unusual opportunity for innovation and institutional leadership through the newly created position of Dean of the Colleges. Applications and nominations are invited for an individual to serve as the chief academic officer of Case Institute of Technology and Western Reserve College. The Dean will report to the President of the University and will work closely with the University Provost. The Dean will administer academic policies, budgets, operations, and services of the Colleges. The Dean will be responsible for programs of undergraduate and graduate education and research conducted by the Colleges' three constituent faculties (Engineering; Mathematics and Natural Sciences; and Humanities, Arts, Social and Behavioral Sciences), each of which is headed by a dean. The Dean will work closely with University Development in fund-raising activities and will represent the interests of the Colleges to local and national constituencies. The position will be filled in Summer, 1987.

Qualifications include substantial and successful leadership experience in higher education. The successful candidate will be expected to qualify for a senior faculty appointment in his or her discipline.

Deadline for nominations and applications is April 30, 1987. Send all materials to:

Dean of the Colleges Search
Advisory Committee
c/o Richard E. Baznik
Office of the President
Case Western Reserve University
University Circle
Cleveland, Ohio 44106

In employment as in education, Case Western Reserve University is committed to equal employment and affirmative action.



CASE WESTERN RESERVE UNIVERSITY

POSITIONS OPEN

FACULTY POSITION—GENETICIST. Animal Science Department, Oklahoma State University, is seeking an assistant or associate professor (12-month, tenure-track) in molecular, cyto- or immunogenetics. Experience in teaching in genetics at undergraduate or graduate level and evidence of ability to conduct independent research desirable. Ph.D. in genetics (or closely related field) required. Application deadline is 15 May 1987. Candidates willing to relocate within a year are encouraged to apply. For application information call or write: **Dr. David Buchanan, Animal Science Department, Oklahoma State University (OSU), Stillwater, OK 74078. Telephone: 405-624-6070. OSU is an Affirmative Action/Equal Opportunity Employer.**

FISHERIES MANAGEMENT: COLLEGE FACULTY POSITION is available for fall 1987 at assistant professor or instructor level. Ph.D. in marine biology required for assistant professorship (\$23,979 to \$27,577). A.B.D. in marine biology required for Instructorship (\$19,727 to \$22,685). Ph.D. preferred. Fisheries or shellfisheries specialization expected; teaching and applied management experience preferred. This renewable position is in an undergraduate marine science program and involves teaching introductory and advanced courses, guiding student research and developing the management track. Screening will begin 9 April 1987. Send a letter of application, a résumé and three letters of reference to: **Dr. Donald Plank, Chairman, Natural Sciences and Mathematics, Stockton State College, Pomona, NJ 08240.**

Stockton State College is an Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.

FOREST ECOSYSTEMS ECOLOGIST. Assistant professor, tenure-track position with research (60%) and teaching (40%) duties. Major emphasis on development of a strong research program on some aspect of forest ecosystems ecology. Ph.D. in forest ecosystems ecology or related field is required. Send curriculum vitae, official transcripts, and arrange for four letters of recommendation to be sent by 29 April 1987 to: **Dr. J. Buongiorno, Department of Forestry, University of Wisconsin, 1630 Linden Drive, Madison, WI 53706.**

An Equal Opportunity/Affirmative Action Employer.

INVESTIGATOR POSITIONS are available in areas of medical neuroscience. The Medical Research Institute (MRI) of Pacific Presbyterian Medical Center (PPMC) of San Francisco invites applications from experienced investigators with research interests in neuromuscular disorders, CNS degenerative disorders, epilepsy, and AIDS of the nervous system. Preference will be given to currently funded scientists. PPMC is an extensive medical complex which contains resource facilities for patient care, medical education, and research activities. MRI is currently responsible for research programs with a budget exceeding \$6 million annually. Major areas of investigation include arthritis, cancer, heart disease, biomedical engineering, epidemiology, alcohol research, and amyotrophic lateral sclerosis. An interdisciplinary staff collaborates on medically related projects funded by NIH and other government agencies as well as by foundation and corporate grants and individual gifts. Send curriculum vitae, selected reprints, names and addresses of three references, and a letter describing research interests to: **Eric Denys, Director, Institute of Neurological Sciences, Medical Research Institute, 2200 Webster Street, San Francisco, CA 94115. Equal Opportunity/Affirmative Action Employer.**

MOLECULAR GENETICS

The Coriell Institute for Medical Research would like to fill a position for an experienced molecular geneticist who will develop a successful program in the area of human genetics. The candidate should have demonstrated an excellence for research in the above discipline and have the ability to develop a vigorous externally funded research program. The Institute will support part of the research. The applicant will also interact with the NIGMS Human Genetic Mutant Cell Repository. A résumé, letter of interest including research interests and accomplishments, and references should be forwarded to: **Dr. A. E. Greene at the Coriell Institute for Medical Research, Copewood Street, Camden, NJ 08103. Equal Opportunity Employer.**

POSITIONS OPEN

GLYCOPROTEIN/CARBOHYDRATE BIOCHEMIST

POSTDOCTORAL POSITION available for person trained in glycoprotein and/or carbohydrate biochemistry (particularly chromatographic methods for sugars, oligosaccharides, and glycopeptides) to participate in ongoing research concerning the role of protein glycosylation in photoreceptor membrane morphogenesis and retinal degenerations. Send curriculum vitae, recent reprints, and names of three references to: **Dr. Steven J. Fliesler, Bascom Palmer Eye Institute, University of Miami School of Medicine, P.O. Box 016880, Miami, FL 33101.**

INTEGRATIVE NEUROBIOLOGIST. The Department of Neurobiology and Physiology at Northwestern University is recruiting an assistant professor (tenure track). We seek an individual who takes an integrated systems approach to central processing of visual (including retinal), auditory, somatosensory, or chemosensory information in mammals.

Interested persons should submit curriculum vitae, a statement of research interests, and the names of three persons who can provide references to: **Dr. Lawrence Pinto, Department of Neurobiology and Physiology, 2153 Sheridan Road, Northwestern University, Evanston, IL 60201.** Applications must be received no later than 1 June 1987. *Northwestern is an Equal Opportunity Employer.*

Two-year commitment available for **JUNIOR FACULTY APPOINTMENT** for individual with expertise in transport of nuclear proteins. Must also have training in molecular biology, and be able to teach pre- and postdoctoral trainees methods in molecular biology. Contact: **Jerome Brody, M.D., Director, Pulmonary Center, Boston University Medical Center, 80 East Concord Street, Boston, MA 02118.**

The Division of Marine Sciences of Harbor Branch Oceanographic Institution (HBOI) is seeking an experienced **MARINE CHEMIST/CHEMICAL OCEANOGRAPHER** to fill a 12-month, hard money position. Applicants should have a vigorous basic research program, demonstrated ability to secure outside funding, and a desire to guide the development of a marine chemistry section within the Division. Level of appointment is negotiable depending on the qualifications of the candidate. Special consideration will be given to those applicants whose area of expertise could profit most from the unique resources available at HBOI. Interested persons should send curriculum vitae, selected reprints, and names of potential referees to:

**Dr. Richard Harbison, Director
Division of Marine Sciences
Harbor Branch Oceanographic Institution
5600 Old Dixie Highway
Fort Pierce, FL 33450**

HBOI was established primarily for research in the marine sciences and ocean engineering. The Division of Marine Sciences consists of 36 marine scientists, postdoctoral fellows, research assistants, and support staff. Ongoing investigations include interdisciplinary programs in lagoonal, shelf, and open ocean research, some of which involves shipboard and submersible operations on vessels and submersibles owned and operated by HBOI. *Equal Opportunity Employer.*

For additional information, telephone: 305-465-2400, extension 321.

MOLECULAR BIOLOGY—FISH GENETIC ENGINEERING. Four research associate positions available 1 July 1987 in the areas of molecular biology, genetic engineering, and fish reproductive physiology. Opportunity to join molecular biology groups in the Departments of Microbiology, Genetics and Cell Biology, Animal Science, and Fisheries and Wildlife collaborating on the cloning and transfer of genes into fish. Positions are for 2 years. Required: Recent Ph.D. with strong background in at least one of the following areas: (i) Molecular gene cloning, characterization, and sequencing, (ii) expression of cloned genes, (iii) eukaryotic gene transfer, (iv) fish genetics or reproductive physiology. Submit curriculum vitae, summary of research interests, and have letters from three references to: **Dr. Kevin S. Guise, University of Minnesota, 1988 Fitch Street, St. Paul, MN 55108** by 15 May 1987. *The University of Minnesota is an Equal Opportunity Educator and Employer and specifically invites and encourages applications from women and minorities.*

POSITIONS OPEN

MOLECULAR BIOLOGIST

The Department of Zoology, University of Toronto, invites applications for a tenure-track position at the associate professor level in the field of molecular biology. The applicant must have an established record of research and have demonstrated excellence in recombinant DNA technology. The applicant will be expected to initiate a vigorous and innovative research program, interact with graduate students, and participate in undergraduate teaching.

The Department is committed to fostering research activity in molecular biology which complements current areas of zoological research in the Department. Well equipped facilities and substantial start-up funds will be made available. Salary will be commensurate with experience (salary range: \$36,258 to \$65,097). Candidates should submit curriculum vitae, a statement of research goals, and should request that two letters of reference be sent to: **Professor A. M. Zimmerman, Chairman, Search Committee, Department of Zoology, University of Toronto, Toronto, Ontario M5S 1A1.**

The closing date for receipt of applications is 15 May 1987. Effective date for appointment is 1 July 1987.

MOLECULAR VIROLOGIST

The Department of Medical Microbiology and Immunology, The Ohio State University Medical Center, invites applications for a tenure-track faculty position at the rank of assistant professor. Applicants must have strong background in molecular virology. Qualified applicants should arrange to have curriculum vitae and three letters of recommendation sent to: **Ronald Glaser, Ph.D., Professor and Chairman, Department of Medical Microbiology and Immunology, The Ohio State University, 333 West 10th Avenue, Columbus, OH 43210.** Deadline for completed applications is 8 May 1987. *The Ohio State University is an Equal Opportunity/Affirmative Action Employer.*

PHARMACOLOGY/TOXICOLOGY POSTDOCTORAL POSITION

NIH-sponsored positions (2 to 3 years) are available immediately. A recent Ph.D. in biochemistry, pharmacology, toxicology, or related fields required. Research involves development of in vitro organ culture systems for the study of the biotransformation, pharmacology, or toxicology of various agents. Salary and benefits are commensurate with experience in NIH guidelines. Applications close on 1 July 1987. Please send curriculum vitae and names of three references to: **A. Jay Gandolfi, Ph.D., Department of Pharmacology, University of Arizona, Tucson, AZ 85724.**

Equal Opportunity/Affirmative Action Employer.

PHYSIOLOGICAL/EXPERIMENTAL PSYCHOLOGIST, Ph.D. Assistant professor to conduct research and teach courses in general experimental and physiological psychology. One-year position available 1 September 1987 with possibility of continuation. Send cover letter, curriculum vitae, copies of reprints, and three letters of reference by 15 May 1987 to: **William Maki, Chair, Search Committee, Department of Psychology, North Dakota State University (NDSU), Fargo, ND 58105. NDSU is an Equal Opportunity Employer.**

POPULATION, BEHAVIORAL, OR EVOLUTIONARY ECOLOGIST.

Indiana State University, Terre Haute, IN 47809. The Department of Life Sciences invites applications for a position as assistant professor (tenure track) beginning fall 1987. Applicants must possess a Ph.D. Applicants with research interests in terrestrial studies of animals or plant-animal interactions and a strong background in ecological and evolutionary theory are encouraged to apply. All applicants must have a strong interest in teaching and research at the undergraduate and graduate levels and in directing doctoral dissertations. Applicant must be a U.S. citizen or a permanent resident. Applications received after 10 May 1987 cannot be assured of full consideration.

Send curriculum vitae and three letters of reference to:

**Dr. William J. Brett, Chairperson
Department of Life Sciences
Indiana State University
Terre Haute, IN 47809**

An Equal Opportunity/Affirmative Action Employer.

Biochemist

California Biotechnology Inc., a leading biotechnology company engaged in the development of human therapeutics has a research position available in our angiogenesis group for a Protein Biochemist.

The qualified candidate should have a Ph.D degree with experience in the study of receptor/ligand interactions and an interest in growth factors is required. Some experience with protein purification and cell biology is preferred.

We offer a stimulating work environment with a competitive compensation and benefits package. For prompt consideration, please submit your curriculum vitae and names of three references to: California Biotechnology Inc., Human Resources, Dept. MF-AP, 2450 Bayshore Parkway, Mountain View, CA 94043. An equal opportunity employer.

CAL  BIO

ADDICTION RESEARCH CENTER NATIONAL INSTITUTE ON DRUG ABUSE

RESEARCH FELLOWS/STAFF FELLOWS

The National Institute on Drug Abuse (NIDA) is seeking candidates for numerous Research Fellow opportunities at its Addiction Research Center (ARC) in Baltimore, Maryland. Openings exist for doctoral level graduates in psychology, neuroscience, and pharmacology, and for physicians completing training in psychiatry. The ARC's programs are being expanded as a result of the President's Drug Abuse Initiative. The Center conducts studies of a wide range of problems related to drug abuse. These include studies focusing on: the neuroendocrine, behavioral, neurophysiologic, and cognitive effects of drugs of abuse in animals and man; molecular sites of action of drugs of abuse; imaging sites of drug action in animals and man; biological and psychological aspects of vulnerability to drug dependence; and the development of psychopharmacological interventions for various drug abuse problems.

Research Fellows are generally appointed for an initial 2-year period which can be extended. Salaries are commensurate with experience, and generally range from \$27,172 to \$38,727 per annum; higher salaries may be approved for experienced researchers. Fellows will be eligible for other Federal employee benefits, and relocation expenses may also be paid. Most appointments should commence by July 1987.

Interested applicants should submit a curriculum vitae and references to the following address, or contact the persons named for additional information and application material:

Personnel Office
NIDA Addiction Research Center
P.O. Box 5180
Baltimore, MD 21224
Attn: Mr. Merle Grant
(301) 955-7531

Or call:
Dr. Jerome H. Jaffe
Director, ARC
(301) 955-7594

AN EQUAL OPPORTUNITY EMPLOYER

United States Department of Agriculture

Postdoctoral Research Associates

The Agricultural Research Service as the principal scientific research agency of USDA, conducts research to produce more and better food and fiber; to control insect pests and weeds safely; to get food to consumers in better condition; to improve human nutrition; to help protect soil, water, and air, and to find new uses for agricultural commodities. Much of the work is on the cutting edge of each discipline—biotechnology (including molecular biology, genetic engineering, and membrane research), application of theories of artificial intelligence to computer technology, and innovative approaches to pest control through insect neurochemistry and the use of pheromones.

ARS is currently recruiting for 100 postdoctoral positions throughout the country. Opportunities exist in the following research areas:

- Genetics
- Biochemistry
- Chemistry
- Microbiology
- Animal Science
- Entomology
- Plant Physiology
- Plant Pathology
- Agronomy
- Soil Science

 **Agricultural
Research
Service**

Successful candidates will be hired under excepted appointments up to 2 years in duration. Salary for these GS-11/12 positions (\$27,172 to \$32,567) will be based on qualifications and experience. Candidates must be U.S. citizens.

For information on positions available and application procedures, write to:

N. L. BAKES
Personnel Division (S)
USDA/ARS/BARC-W
Bldg. 003, Room 101
Beltsville, MD 20705

ARS is an Equal Opportunity Employer. Women and Minorities are Encouraged to Apply.

POSITIONS OPEN

PLANT PATHOLOGIST

The Agricultural Chemicals Division of Chevron Chemical Company is seeking a Ph.D. Plant Pathologist for the fungicide screening and research program. The successful applicant will design and direct laboratory and greenhouse research programs to identify and evaluate the intrinsic antimicrobial activity of chemicals and biologicals for use in agriculture. Research may also include mode-of-action and resistance studies.

The position is in the Inventive Research Group located at Chevron's new agricultural research facilities in Richmond, CA. It offers an exceptional opportunity to establish your own program and become a member of a multidisciplinary team in a stimulating research environment.

Interested individuals should send their résumé to:

Chevron Chemical Company
Mr. S. K. Fortune
Supervisor, Human Resources
P.O. Box 4010
Richmond, CA 94804-0010
An Equal Opportunity Employer.

POSTDOCTORAL FELLOW/RESEARCH ASSOCIATE position available July 1987, to employ molecular biological techniques to study structure-function relationships of plasma lipid transfer proteins and their role in atherosclerosis. Experience in molecular biology. Send curriculum vitae to: **Dr. Alan Tall, Department of Medicine, Columbia University, 630 West 168 Street, New York, NY 10032.**

POSTDOCTORAL POSITION—Reproductive Biology Laboratory, Case Western Reserve University. Laboratory focused upon receptor binding, protein kinases and phosphorylation in placenta, and amnion with correlation to hormone release. Also molecular biology of aromatase. Background in protein purification and molecular biology desirable. Salary: \$18,000 per year minimum. By 15 May 1987 send curriculum vitae and references to: **Dr. John J. Moore, Department of Pediatrics, Cleveland Metropolitan General Hospital, Cleveland, OH 44109.**

POSTDOCTORAL POSITION: The Dana-Farber Cancer Institute is seeking to fill one research position at the postdoctoral level to study the biochemistry and regulation of mammalian liver cytochrome P-450 enzymes active in the metabolism of both foreign compounds and steroid hormones. Experience in biochemistry, cell biology, molecular biology, or a related biological science desired. Joint appointment will be held in an appropriate department at Harvard Medical School. Start date is flexible. Send résumé, copies of representative publications and names of three references to: **Dr. David J. Waxman, Associate Professor, Department of Biological Chemistry and Division of Cancer Pharmacology, Dana-Farber Cancer Institute, 44 Binney Street, Boston, MA 02115. An Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL POSITION—A postdoctoral position is available immediately for an individual with an interest and strong background in phospholipid and eicosanoid biochemistry. Radioimmunoassay and HPLC methodologies will be employed to investigate cellular mechanisms of altered lipoxygenase and prostanoïd biosynthesis by bacterial endotoxin. Send curriculum vitae to: **Dr. James A. Cook, Department of Physiology, Medical University of South Carolina, 171 Ashley Avenue, Charleston, SC 29425. An Equal Opportunity Employer.**

POSTDOCTORAL POSITION available to study hormonal regulation of phosphoprotein phosphatases. The studies involve enzyme characterization and regulation and will utilize methods in protein/peptide chemistry, cell culture, immunochemistry, and molecular biology. Send résumé, summary of research interests/experience, and names of three references to: **Dr. Heng-chun Li, Department of Biochemistry, Mount Sinai School of Medicine, One Gustave L. Levy Place, New York, NY 10029. An Equal Opportunity Employer.**

POSITIONS OPEN

PHYSICIAN I HEALTH DEPARTMENT AND FACULTY POSITION CONNECTICUT DEPARTMENT OF HEALTH SERVICES/YALE MEDICAL SCHOOL

The Connecticut Department of Health Services is seeking a **MEDICAL EPIDEMIOLOGIST** with public health experience in the chronic disease field, the cancer/cancer control field, and/or the environmental/occupational fields, to supervise a new unit that will be responsible for development of the Department of Health Services component of a multidisciplinary, multi-institutional, statewide cancer control program. Connecticut's Department of Health Services, University of Connecticut Health Center, and Yale University Medical School are collaborating partners in this program. The position is located in Hartford at the Department of Health Services. A faculty appointment up to full professor level is available with co-terminus tenure at Yale University. A physician's license to practice in Connecticut will be required prior to appointment. Faculty rank will be commensurate with the training and experience of the successful applicant. A starting date on or before 1 September 1987 is expected. This is a civil service position. Send résumé and cover letter to:

Personnel Administrator/P
Department of Health Services
150 Washington Street
Hartford, CT 06106
An Affirmative Action Employer

POSTDOCTORAL ASSOCIATE/INSTRUCTOR. Research on nervous system regeneration. Experience in tissue culture, electron microscopy, protein analysis by gel electrophoresis or immunocytochemistry desirable. Available immediately or before 1 October 1987. Send curriculum vitae and names of references to: **Dr. Bernice Grafstein, Department of Physiology, Cornell University Medical College, New York, NY 10021. An Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL POSITION available immediately for 2 or 3 years, to study expression of erythrocyte protein antigens and blood groups. Methodologies include hybridoma and immunochemical techniques, protein purification and sequencing, and cloning of erythrocyte membrane proteins. Experience in molecular genetics preferred; knowledge of immunology and/or glycoprotein biochemistry helpful. Spring 1987 graduates acceptable. Send résumé, summary of interests, and names of three references to: **Dr. M. Telen, Division of Hematology-Oncology, Box 3387, Duke University Medical Center, Durham, NC 27710. Duke University is an Affirmative Action/Equal Opportunity Employer.**

POSTDOCTORAL POSITIONS

Postdoctoral training is available in molecular, cellular and nutritional aspects of carcinogenesis in the **Eppley Institute for Research in Cancer and Allied Diseases of The University of Nebraska Medical Center.** Research programs include for example: Chemistry of formation and metabolism of nitrosamides, nitrosamines and hydrazines; mechanisms of carcinogenesis of polycyclic hydrocarbons and other carcinogens; lymphomagenesis; cell differentiation; and growth factors; biochemical genetics particularly as relates to susceptibility and resistance to cancer development; mutagenesis and DNA repair; molecular biology of cancer; viruses and cell immortalization and transformation; toxicology of food additives; and oncogenes and cancer. The Eppley Institute is well equipped for both in vitro and in vivo work. Postdoctoral applicants should have a Ph.D. in chemistry, biochemistry, microbiology, pharmacology or related disciplines. Stipends are competitive. Please submit curriculum vitae, three letters of recommendation and summary of research interests to: **Dr. Edward Bresnick, Director, Eppley Institute for Research in Cancer and Allied Diseases, University of Nebraska Medical Center, Omaha, NE 68105. Refer to position #689 in all correspondence. An Equal Opportunity/Affirmative Action Employer.**

POSITIONS OPEN

(Anticipated) **POSTDOCTORAL POSITION—**NSF-funded—position available after 1 July 1987 for studies on the control of sodium and calcium transport in freshwater mussels. Several areas of interest include studies on cAMP, protein kinase, and protein phosphorylation as related to ion transport. Experience in enzyme assays, use of isotopes, and/or separation technique (HPLC) preferred. Send curriculum vitae and three (3) letters of recommendation by 1 May 1987 to: **Dr. Thomas Dietz, Department of Zoology and Physiology, Louisiana State University (LSU), Baton Rouge, LA 70803-1725. LSU is an Equal Opportunity Employer.**

POSTDOCTORAL POSITION

Immediate position available for Ph.D. to participate in studies involving the biochemistry and immunology of skin basement membrane and the functional interactions of normal and diseased cells within a physiologic biomatrix. Salary \$25,000 to \$30,000, dependent upon the applicant's qualifications. Send curriculum vitae and letters of reference to: **Jo-David Fine, M.D., Department of Dermatology, University of Alabama at Birmingham, Birmingham, University Station, P.O. Box 76, Birmingham, AL 35294.**

POSTDOCTORAL POSITION

A postdoctoral position has been opened at the **Lunar and Planetary Laboratory, University of Arizona, Tucson, Arizona, in April 1987.** The research is in the general area of space and planetary physics with much of the work related to Voyager EUV observations at the outer planet encounters. The program includes work in plasma physics concerned mostly with the fundamental nature of the Io plasma torus, upper atmospheric and auroral processes on Jupiter, Saturn, Titan, Uranus and Neptune, exosphere-magnetosphere modeling at Saturn, and some specialized aspects of the interstellar-interplanetary medium. The applicant should have a background in atomic and molecular physics with an interest in planetary atmospheres. Applications should contain curriculum vitae, statement of interests, names of three references, and should be submitted by 30 May 1987. Further information can be obtained by contacting: **D. E. Shemansky, Lunar and Planetary Laboratory, 927 Gould-Simpson Building, Tucson, AZ 85721. Telephone: 602-621-4304. The University of Arizona is an Equal Opportunity Employer.**

POSTDOCTORAL POSITION available immediately to work on steroid hormone receptors and chromatin nonhistone acceptor proteins. Applicant should have experience in protein biochemistry and immunological techniques. Send curriculum vitae and names of three references to: **Dr. T. S. Ruh, Department of Physiology, St. Louis University Medical School, 1402 South Grand Boulevard, St. Louis, MO 63104. Equal Opportunity Employer M/F/H/V.**

POSTDOCTORAL POSITION available to study DNA replication and cellular aging in yeast. Experience in yeast genetics and recombinant DNA techniques is desirable. Send curriculum vitae, including bibliography, and have three letters of reference sent to: **Dr. S. M. Jazwinski, Department of Biochemistry and Molecular Biology, Louisiana State University Medical Center (LSUMC), 1901 Perdido Street, New Orleans, LA 70112. LSUMC is an Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH POSITION available in the neurobiology of visual selective attention. The research involves a collaborative effort between psychologists and neurophysiologists seeking to understand the mechanisms of selective attention at the level of both individual neurons and neuronal networks in primates. Experience in neurophysiology preferred. Contact: **R. Desimone, National Institute of Mental Health, Building 9, Room 1N107, Bethesda, MD 20892.**

ANNOUNCEMENT

**AVAILABILITY OF REQUEST FOR APPLICATIONS:
RFA-PC-02-87**

**MEASUREMENT AND MONITORING METHODS FOR
SUPERFUND SITES**

U.S. ENVIRONMENTAL PROTECTION AGENCY

APPLICATION RECEIPT DATE: May 29, 1987

The Office of Exploratory Research, Office of Research and Development, U.S. Environmental Protection Agency, announces the availability of a request for applications (RFA) on the above program.

The Office invites applications from not-for-profit research organizations and educational institutions to investigate the analytical methods for use in determining contents of Superfund waste sites.

The RFA will be released on March 30, 1987. Requests for copies of the RFA should be addressed to:

**Louis Swaby, Ph.D.
Science Review Administrator
for Chemistry and Physics
Office of Exploratory Research (RD-675)
U.S. Environmental Protection Agency
401 M Street, Southwest
Washington, DC 20460
Telephone (202) 382-7445**

ADDICTION RESEARCH CENTER NATIONAL INSTITUTE ON DRUG ABUSE ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION U.S. PUBLIC HEALTH SERVICE

The National Institute on Drug Abuse (NIDA) invites applications and nominations for the following Laboratory Chief positions in its Addiction Research Center (ARC) in Baltimore, Maryland.

Chief, Laboratory of Cognitive Studies and Human Performance. This position can be filled by a psychologist, psychiatrist, or pharmacologist with research experience and publications in the area of effects of drugs of abuse on human performance and activity. Applicants should be familiar with recent developments in neurophysiological assessment of brain function and be interested in collaborations with other laboratories focusing on neuroscience, behavioral, and psychopharmacological aspects of drug use and dependence.

Chief, Laboratory of Psychology of Vulnerability. This position is appropriate for a psychologist or psychiatrist with interests and research experience in studies of risk factors (personality, delinquency, etc.) for later drug abuse. Applicants should be thoroughly familiar with studies on the role of early aggression and delinquency as risk factors for drug abuse, and be eager to collaborate with other laboratories emphasizing biological risk factors and neurophysiological assessments.

These are civil service positions to be filled at the GS-13/14 level, with a salary range of \$38,727 to \$59,488 a year (for physicians \$65,676). Candidates must meet educational and experience requirements as defined by the U.S. Office of Personnel Management. Further information may be obtained by contacting **Mr. Merle Grant, (301) 955-7531, or Dr. Jerome H. Jaffe, Director, ARC, (301) 955-7594.** Applications (including a curriculum vitae, bibliography, references, and the SF-171, Application for Federal Employment) should be submitted to: **Mr. Merle Grant, Personnel Office, ARC, P.O. Box 5180, Baltimore, MD 21224.**

*Applications should be postmarked by April 15, 1987
U.S. Citizenship Required
NIDA is an Equal Opportunity Employer*

The USDA Human Nutrition Research Center on Aging at Tufts University

EPIDEMIOLOGIST DIRECTOR, PROGRAM IN NUTRITIONAL EPIDEMIOLOGY

The HNRC is seeking a senior level scientist to develop, implement and manage a major Program in Nutritional Epidemiology. Applicants should possess an M.D.(preferred) or Ph.D. and have a demonstrated interest in nutrition and/or aging. The successful candidate must have experience in conducting major epidemiology investigations in an academic or related environment. The Director will establish, as Principal Investigator, intra-extramurally funded projects including residential and free-living human studies. The Director will develop ties with biostatistics and computing groups at the HNRC and other divisions within Tufts. The Director is expected to maximize resources and research opportunities to expand the epidemiological facets of other HNRC research programs via collaboration and consultation. The Director will be eligible for an academic appointment at Tufts University. **Send CV and names of three references or nominations to:**

**Dr. Jeffrey Blumberg, Chairman
Epidemiology Search Committee
USDA Human Nutrition Research Center
on Aging at Tufts University
711 Washington Street
Boston, MA 02111**



An Affirmative Action/
Equal Opportunity Employer

THE BOARD OF REGENTS OF THE UNIVERSITY OF NEVADA SYSTEM PRESIDENT DESERT RESEARCH INSTITUTE

The Board of Regents of the University of Nevada System invites applications and nominations for the position of President of Desert Research Institute.

This autonomous, statewide division of the University system conducts research programs in Atmospheric Sciences, Water Resources, Energy & Environmental Engineering, Social Sciences and Biological Sciences, funded by both governmental and private sources. Established in 1959, the Institute has a current annual budget of \$12 million dollars and a faculty of 100 professionals. There is a close association between institute research and university graduate programs. The president reports through the chancellor to the Board of Regents; the position is equivalent to presidents of the other university campuses.

The president is responsible for management of a diverse but coordinated research institute, for relationships with the research sponsors, the University System, the Board of Regents, the legislative and executive branches of the federal and state government, and should be prepared to play an active role in assisting economic diversification efforts in the State of Nevada.

Qualifications include demonstrated management and leadership abilities, a distinguished record of achievement in scientific or engineering research, a broad background in the funding and conduct of research, and proven effectiveness in the areas of governmental, university and community relations. A record of successful and substantial institutional fund-raising is important.

The Committee will begin a review of applications with vitae, including a list of publications and summary of career research and support, on May 1, 1987.

To apply, or for further information, contact:

**DRI Presidential Search Committee
University of Nevada System
405 Marsh Avenue
Reno, Nevada 89509**

AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER

POSITIONS OPEN

POSTDOCTORAL POSITION available summer 1987 for well-established studies of cellular morphology and function in the hippocampal formation following long-term ethanol exposure. Laboratory utilizes an interdisciplinary approach involving morphological, physiological, and biochemical techniques. Preference will be accorded applicants with a Ph.D. in neurosciences and a strong background in neuroanatomy or neurophysiology. Curriculum vitae and names of three references should be sent to: **Drs. Don W. Walker/Bruce E. Hunter, Department of Neuroscience, JHMC Box J-244, University of Florida, Gainesville, FL 32610.** *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION. Applications are invited from individuals interested in studying the structure and function of visual cerebral cortex. Experience in, or interest in learning, one of the following approaches would be valuable: intracellular filling in vivo or in tissue slice preparation; tissue culture and monoclonal antibody productions; single unit recording; theoretical modeling. Interested individuals should send curriculum vitae, a statement of research interests, and the names of three referees to: **Dr. Jennifer Lund, University of Pittsburgh, School of Medicine, 336C Scaife Hall, Pittsburgh, PA 15261.** Telephone: 412-648-9887.

POSTDOCTORAL POSITION available for Ph.D. to study enzymatic mechanisms of biological/immunological processes. Experience in protein purification or recombinant DNA desirable. Send curriculum vitae and three references by 30 June 1987 to: **Dr. Ben Liu, Chemistry Department, University of Minnesota, Minneapolis, MN 55455.** *The University of Minnesota is an Equal Opportunity Educator and Employer and specifically invites and encourages applications from women and minorities.*

POSTDOCTORAL POSITION

Applications are invited from individuals (M.D. or Ph.D.) with an interest in study of regulation, assembly, and nearest neighbors of proteins in the spectrin-based membrane skeleton in brain and other tissues. The position will be with the Howard Hughes Medical Institute and will be available 1 July 1987. Applicants should send curriculum vitae, recent publications, and names of three references to: **Dr. Vann Bennett, c/o Howard Hughes Medical Institute, Duke University Medical Center, Durham, NC 27710.**

POSTDOCTORAL POSITION IN COMPUTATIONAL NEUROSCIENCE is available 1 July 1987, to join a group pursuing combined experimental and theoretical studies of the functional organization of cortical dendrites and microcircuits. Backgrounds in molecular neurobiology or neurophysiology, and experience with computational methods, are preferred. Send curriculum vitae and three letters of reference to: **Dr. Gordon M. Shepherd, Yale University, School of Medicine, Section of Neuroanatomy, 333 Cedar Street, New Haven, CT 06510.** *Yale University is an Equal Opportunity/Affirmative Action Employer.*

The Research Department of Central Institute for the Deaf (CID) seeks a beginning **POSTDOCTORAL RESEARCH SCIENTIST** to study the acoustic correlates of speech sounds in a well-equipped computerized laboratory. This position is part of a continuing project, but will involve an initial emphasis on diphthongs and stops. As work continues, other categories of speech sounds will be considered including those of other languages. A knowledge of and/or interest in several of the following areas is desirable: phonetics, signal processing, and mathematics, simple quantitative modelling, and/or perceptual experimentation. This is an annual position to start on or after 1 September 1987 and will be renewable for approximately 3 years. Applicants should promptly submit résumés, a statement of research interests, and the names and addresses of four references to: **Dr. James D. Miller, Central Institute for the Deaf (CID), 818 South Euclid Avenue, St. Louis, MO 63110.** *CID is an Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITION available beginning immediately with new assured support for 3 years to study mechanisms of pulmonary injury (adult respiratory distress syndrome) and strategies for prevention. In vitro endothelial permeability studies along with rodent models will be used to evaluate antitumor necrosis factor and anti-C5a antibodies along with newer reagents. Send curriculum vitae and three letters to: **Thomas A. Raffin, M.D., Division of Respiratory Medicine, Stanford University School of Medicine, Stanford, CA 94305.** Telephone: 415-723-6381.

POSTDOCTORAL POSITION available for a **BIOCHEMIST/MOLECULAR BIOLOGIST** to investigate molecular events in lymphocyte growth and differentiation. Specific areas include the role of (proto)oncogenes in these events and the differential regulation of genes encoding lymphocyte cell surface antigens. Candidates should have Ph.D. degree and experience in genetic engineering and protein and nucleic acid biochemistry. Send curriculum vitae, one letter of reference, and the names of two additional references to: **Dr. William C. Raschke, La Jolla Cancer Research Center, 10901 North Torrey Pines Road, La Jolla, CA 92037.**

POSTDOCTORAL POSITION IN BIOPHYSICS

A 2-year position to continue work on the novel technique of **differential polarization microscopy** in the areas of (i) long-range organization of mammalian **chromosomes**, (ii) linear and circular dichroism and birefringence imaging studies in **cytoskeleton** is available.

The candidate will need a Ph.D. degree in biology and some training in optical biophysical chemistry and microscopy. Preference will be given to the applicant who has demonstrated ability in **subcellular isolation techniques, specific staining methods** (including immunofluorescence), and has a practical knowledge in **computer instrument interfacing**.

Please send curriculum vitae, a letter of intent, and one letter of recommendation to: **Professor Carlos Bustamante, Chemistry Department, The University of New Mexico, Albuquerque, NM 87131.**

POSTDOCTORAL POSITION MOLECULAR BIOLOGY

To study the regulation of expression of cellular oncogenes and the mechanism of oncogenesis of papillomaviruses. The position will be within the basic research group of MicroProbe Corporation, a biotechnology company located near Seattle. Prior experience with recombinant DNA techniques is preferred. Send curriculum vitae and the names of three references to:

**Dr. Diana Sheiness
MicroProbe Corporation
1725 220th Street SE, #104
Bothell, WA 98021**

POSTDOCTORAL POSITIONS immediately available for recent (within the past 36 months) doctoral degree recipients to investigate cellular and molecular mechanisms of respiratory epithelial cell proliferation, differentiation, carcinogenesis, and oncogenesis using in vitro and in vivo approaches. First year annual stipend of \$20,000 plus health insurance and relocation allowance. U.S. citizenship or permanent residency required. Contact: **Personnel Unit, Lovelace Inhalation Toxicology Research Institute, P.O. Box 5890, Albuquerque, NM 87185** or telephone: 505-844-9431 for application materials. *We are an Equal Opportunity Employer.*

SENIOR RESEARCH ASSISTANT/ASSOCIATE IN CELL BIOLOGY

A position is available 1 July 1987 for an individual with experience in tissue culture/monoclonal antibody production and some exposure to electron microscopy, fluorescence microscopy, and preparation of frozen sections of tissues. Activities will involve interaction with biochemists involved in purification and characterization of new membrane structural proteins from brain, and can include authorship of publications. The position will be within the Howard Hughes Medical Institute at Duke Medical Center, and will have competitive salary and benefits. Applicants should send curriculum vitae and names of three references to: **Dr. Vann Bennett, c/o Howard Hughes Medical Institute, Duke University Medical Center, Durham, NC 27710.**

POSITIONS OPEN

POSTDOCTORAL POSITION (Pharmacology/Neurotoxicology): to study the neuromuscular mechanisms of trialkytin toxicity. Ph.D. (or equivalent) to be conferred during 1987 and experience in the biochemistry of energy metabolism, neurohistology, and/or membrane electrophysiology required. Send curriculum vitae and names/addresses of three references to: **Dr. George Bierkamper, Department of Pharmacology, University of Nevada School of Medicine, Reno, NV 89557.** *Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS MULTIPLE DRUG RESISTANCE

Two postdoctoral positions to study the cellular and molecular biology of both "classic" and "atypical" multidrug resistance are available in the pharmacology laboratories of **St. Jude Children's Research Hospital.** The training environment is that of a large, multidisciplinary biomedical research center with many opportunities for scientific interactions. Annual salaries are commensurate with experience, and begin at \$20,000. Preference will be given to applicants with some training in molecular biology or membrane/receptor biochemistry. Send curriculum vitae, description of research activities, and the names of three references to:

**William T. Beck, Ph.D.
Department of Biochemical Pharmacology
St. Jude Children's Research Hospital
332 North Lauderdale
Memphis, TN 38101**

St. Jude Children's Research Hospital is an Equal Opportunity Employer.

POSTDOCTORAL POSITION AVAILABLE for multidisciplinary studies concerning (i) structure and function of neuronal nicotinic acetylcholine receptors, or (ii) mechanisms of neuronal differentiation. Investigations are to encompass biochemical, immunological, pharmacological, and molecular genetic approaches with model cell culture systems in a unique and dynamic institution. Send curriculum vitae, names and addresses of three references, and brief statement of research experience and objectives to: **R. J. Lukas, Division of Neurobiology, Barrow Neurological Institute, 350 West Thomas Road, Phoenix, AZ 85013.** *Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS available to study roots and water relations of desert plants. Experience with simulation modeling and gas exchange/water potential measurements necessary. Please send curriculum vitae and names of three references to: **Dr. Park S. Nobel, Department of Biology, University of California, Los Angeles, CA 90024.** *An Affirmative Action Employer.*

POSTDOCTORAL POSITION AVAILABLE IMMEDIATELY: In cellular, subcellular, and molecular physiology and biophysics, including cardiovascular, vascular smooth muscle, endothelial cells, electrophysiology, neurophysiology, contractile mechanisms, renal, transport, thrombosis mechanisms, reproductive endocrinology. Applicants must be U.S. citizens or permanent residents.

Send résumé to:

**Dr. Nicholas Sperelakis, Chairman
Department of Physiology and Biophysics
College of Medicine
University of Cincinnati
Cincinnati, OH 45267-0576**

POSTDOCTORAL OR RESEARCH POSITION AVAILABLE IN MOLECULAR-CELLULAR IMMUNOLOGY FOR Ph.D. OR M.D.

Studies deal with human lymphokine regulation and cell and gene cloning as part of a major program on the induction of transplant tolerance. Salary range from \$24,000 to \$34,000, depending on prior experience.

Send curriculum vitae together with names of three references to: **Marvin R. Garovoy, M.D., Director, Immunogenetics and Transplantation Laboratory, HSE-520, University of California, San Francisco, Third and Parnassus Avenues, San Francisco, CA 94143.**

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

EDITOR/ SENIOR EDITOR

Academic Press, Inc., an international scientific and technical publisher, currently seeks two experienced Scientific Editors.

We are seeking trained professional life and physical science editors to participate in acquiring and developing a significant book and journal publishing program. The positions will be located in San Diego. Both positions require travel. Candidate must be familiar with scientific publishing as a result of graduate training or previous publishing experience. Five or more years of publishing experience required. A graduate level degree in science is preferred. This position requires an enthusiastic, creative individual, and offers a role in shaping the future of commercial scholarly publishing.

We offer an excellent starting salary and comprehensive benefit package. Please forward your resume with salary requirements to:



Academic Press
Orlando, FL 32887
Attn: Employment Dept. SD-D
Equal Opportunity Employer

The International Laboratory for Research on Animal Diseases POSITIONS AVAILABLE

The International Laboratory for Research on Animal Diseases (ILRAD), Nairobi Kenya is an internationally funded institution with the mandate of developing improved methods of control for important diseases of livestock. At present the diseases under study are trypanosomiasis and theileriosis. The multidisciplinary research program includes biochemistry, molecular biology, immunology, cell biology, pathology, parasitology, electron microscopy and entomology with appropriate supporting units. Applications are invited for the following positions:

SCIENTIST—Research Liaison (Ref SC/87/1)

A position to strengthen the training and outreach program through collaborative research between scientists at ILRAD and those in countries affected by trypanosomiasis and theileriosis. Applicants should be fluent in both French and English. They should preferably have a degree in veterinary medicine, teaching experience and post graduate research qualifications relevant to livestock diseases, especially trypanosomiasis and theileriosis. Familiarity with livestock disease research programs in African universities, government research institutions and field laboratories, and work experience with an international agency in developing countries would be additional advantages.

SCIENTIST—Parasitologist/Pharmacologist (Ref SC/87/2)

A position to work on development of improved techniques for the use of chemical compounds for treatment and prevention of tsetse transmitted trypanosomiasis in livestock. Applicants should have a degree in veterinary medicine or an honours degree in science and post graduate qualifications in an appropriate area of biological research. Research experience in the management and use of therapeutic drugs in farm animals, aspects of drug metabolism, and estimations of drug and metabolite levels in blood and tissue fluids will be advantageous.

SCIENTIST—Tick Research (Ref SC/87/3)

A position to manage the Tick Vector Unit which provides an essential service to the *Theileria* research program. The work entails maintenance and supervision of tick colonies, production of infected ticks, sporozoites and theilerial stabulates, supervision and screening of infected cattle and research activities related to immunization of cattle against East Coast fever. Candidates must have had experience with ticks and tick-borne diseases. Preference will be given to applicants with a first degree in veterinary medicine and a doctorate in a relevant area of parasitology.

These positions are international staff positions and the salaries will be paid in US Dollars. The appointments may be made at postdoctoral or scientist grade depending on experience and qualifications of successful applicants. Successful candidates are expected to participate in the ILRAD training program. Moving, housing, commutation, and education allowances are paid, and there are medical and retirement benefits. Applications should include a current *curriculum vitae* and the names and addresses of three referees. Applications, citing the position reference number should be sent by April 30th, 1987 to:

**Chief Personnel Officer
ILRAD
P.O. Box 30709
NAIROBI**

Mammalian Virologist

The Monsanto Biological Sciences Department, located at the Life Sciences Research Center in suburban St. Louis, has an immediate opening in its Molecular Genetics and Mammalian Biology Group for a Mammalian Virologist.

We are looking for a scientist with excellent skills in mammalian virology to support our basic and applied research program in human health care.

This challenging position will initially focus on the development of expression systems for the production of proteins in mammalian cells.

The ideal candidate will have a Ph.D or M.D./Ph.D degree, post doctoral experience and a publication record in molecular virology. Experience in recombinant DNA technology and mammalian cell culture is required.

Interested candidates should send their resume and three letters of reference before May 1, 1987 to: **John Bussen; MONSANTO COMPANY; BB5B-GK; 700 Chesterfield Village Parkway; Chesterfield, MO 63198.** An Equal Opportunity Employer M/F/H/V.

Monsanto

Sandoz Ltd., a leading Swiss-based international company with a strong commitment to pharmaceutical research, is offering a

POSTDOCTORAL POSITION

in their newly created Biotechnology department. The successful candidate will be an ambitious Ph.D. in molecular biology with interest in the regulation of eukaryotic transcription.

The position is available immediately for a period of two years.

Applications with curriculum vitae should be sent to:

**Sandoz Ltd., Personnel Department, Ref. 7801
Attn: Mr. R. Zbinden, P.B.
CH-4002 Basle/Switzerland**



POSITIONS OPEN

POSTDOCTORAL RESEARCH ASSOCIATE POSITION available June or July 1987 to study the genetic regulation of ganglioside metabolism in normal and mutant mouse embryos. Experience with glycosyl-transferases is desirable. Send curriculum vitae and the names of three references to: **Dr. Thomas N. Seyfried, Department of Biology, Boston College, Chestnut Hill, MA 02167.**

POSTDOCTORAL RESEARCH ASSOCIATE position available to study prostaglandin metabolism in experimental diabetes. Experience in metabolism and biochemistry of arachidonic acid needed. Two years of postdoctoral experience highly desirable. Submit curriculum vitae and two letters of recommendation to: **Gareth J. Parry, M.D., Department of Neurology—MS 423, Hahnemann University School of Medicine, Broad and Vine Streets, Philadelphia, PA 19102.**

POSTDOCTORAL/RESEARCH ASSOCIATE to work on the immunogenetics of the acute leukemias in rapidly expanding Medical Center. Project involves some knowledge of Clg and Raji cell assays, agarose block electrophoresis, SDS-polyacrylamide gel electrophoresis, and electroblotting (Western blot). Experience with monoclonal antibodies desired. Work would involve close collaboration with molecular biologist and hematologist. Send curriculum vitae, and three letters of reference to: **Dr. Harold R. Schumacher, Department of Pathology, 2160 South First Avenue, Loyola University Medical Center, Maywood, IL 60153. Loyola University is an Equal Opportunity Employer.**

LABORATORY/HEMATOLOGY FELLOWSHIP. **Loyola University Medical Center of Chicago** is establishing a new program in laboratory hematology for pathologists Board-certified in AP and CP. Internists and pediatricians with comparable Boards interested in more in-depth training in hematology will be considered. The program will be broad based and directed toward subspecialty Board certification with training in coagulation, peripheral blood analysis, and bone marrow pathology during the first year. The second year will be devoted primarily to research. Interested candidates should send a curriculum vitae and names of references to: **Dr. Harold Schumacher, Professor and Chief of Hematology, Department of Pathology, Loyola University Medical Center, 2160 South First Avenue, Maywood, IL 60153. Loyola University is an Equal Opportunity Employer.**

POSTDOCTORAL RESEARCH ASSOCIATE: effective 1 July 1987. Applications are invited from cell physiologists or biophysicists to study epithelial ion transport across the frog's olfactory mucosa; also, to investigate the role of adenylate cyclase, G proteins, and associated compounds in olfactory transduction and cellular mechanisms of secretion. Experience in epithelial transport studies employing Ussing Chamber-type tissue preparations is required. Salary dependent on experience. Send cover letter stating research experience, curriculum vitae and three references to: **Dr. John DeSimone, Department of Physiology and Biophysics, Medical College of Virginia, Richmond, VA 23298, or Dr. Thomas Getchell, Department of Anatomy and Cell Biology, Wayne State University School of Medicine, Detroit, MI 48201.**

POSTDOCTORAL RESEARCH ASSOCIATE Three positions available immediately for molecular study of neuronal proteins in human brain with special emphasis on those abnormally expressed in Alzheimer's disease. Investigations are to encompass protein biochemical, immunological, cell culture, molecular biological, histological, and morphometric approaches (\$22,380). Send curriculum vitae, names of three references and a brief statement of research experience and objectives to: **Dr. Tsunao Saitoh, University of California, San Diego, La Jolla, CA 92093. Telephone: 619-534-2545. The University of California is an Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL OR RESEARCH ASSOCIATE position available immediately to study biochemical basis for antiviral activity of novel nucleoside analogs. Experience in enzymology, nucleic acid biochemistry, and cell culture is desirable. Send résumé and three letters of reference to: **Dr. W. Prusoff, Department of Pharmacology, Yale University School of Medicine, New Haven, CT 06510. An Equal Opportunity/Affirmative Action Employer.**

UNIVERSITY OF QUEENSLAND

Equal Opportunity in Employment is University Policy

LECTURER/SENIOR LECTURER—ANATOMY

The appointee will contribute to the teaching of topographical anatomy to medical and paramedical students. Applicants should have demonstrated a research capability in an area of health sciences or biology. Preference will be given to medical graduates with teaching competency in neuroanatomy.

Salary per annum:

Lecturer: \$A27859–\$36600

Senior Lecturer: \$A37381–\$43568

Applications close 7 May 1987. Reference No. 06787

Additional information and applications forms are available from the Director, Personnel Services, University of Queensland, St. Lucia, 4067.



Agricultural Research Service

United States Department of Agriculture

AGRICULTURAL RESEARCH SERVICE is seeking innovative scientists for challenging positions in biochemistry research at the Northern Regional Research Center. Three positions will be available this Fall as part of an expanding team investigating microbial and enzymatic interactions with carbohydrate polymers from plants:

1. **POLYSACCHARIDE BIOCHEMIST** (GS-11/12) to study novel enzymatic approaches for introducing unusual functionalities into complex carbohydrate polymers. (Position No. 1W2560);

2. **ENZYMOLOGIST** (GS-11) to study carbohydrate modifying enzymes from microbial sources. (Position No. 1W2561); and

3. **BIOCHEMIST (MICROBIOLOGY)** (GS-11) to study substrate recognition and attachment phenomena between microorganisms and insoluble substrates. (Position No. 1W2562).

Position (1) is a permanent position. Positions (2) and (3) are Research Associates with a maximum appointment of 4 years. PhD or equivalent required for each position. Salaries: GS-11, \$27,172; GS-12, \$32,567. The Northern Regional Research Center is a large, well-equipped major research facility of the USDA, housing more than 320 scientists and support personnel. To apply send resume and names of three references before June 1, 1987 to: **Dr. J. Michael Gould, USDA/ARS Northern Regional Research Center, 1815 N. University Street, Peoria, IL 61604.** Applications in response to this ad must be marked 7N005. Please specify clearly the position for which you are applying. The USDA/ARS is an Equal Opportunity Employer.

CLINICAL RESEARCH SCIENTIST Human Pharmacology

The Squibb Institute for Medical Research has a challenging opportunity available for a Medical Scientist to participate in our new drug development programs for antimicrobial, antiviral, and anti-inflammatory drugs. The facilities of a 24-bed clinical pharmacology unit and analytical laboratory are available at a local medical center for the conduct of human investigation. This position also affords the opportunity to work closely with preclinical scientists at all levels.

Primary responsibilities involve the design, conduct, and reporting of Phase I and early Phase II clinical studies. Interest and experience in clinical pharmacokinetics and pharmacodynamics are desirable. Candidates should have an MD degree with 2 years or more of research experience or a PhD with 2 years or more experience in human investigation. A strong record of achievement, including publications, should be evident.

In addition to an excellent salary and comprehensive benefits package, The Squibb Institute for Medical Research offers the opportunity for exceptional scientists to pursue stimulating careers. This position is based at our Corporate Headquarters, a pleasant semi-rural setting in Princeton, NJ convenient to both New York City and Philadelphia. Interested candidates should submit their C.V. in confidence to **The Squibb Institute for Medical Research, Human Resources Dept. #481, P.O. Box 4000, Princeton, NJ 08543-4000.** An equal opportunity employer.



SQUIBB

Where science comes to life.

SYNCHROTRON RADIATION RESEARCH IN BIOPHYSICS AT CHESS

A substantial expansion of the synchrotron radiation facilities at CHESS, the Cornell High Energy Synchrotron Source, will shortly occur, through the construction of new undulator, wiggler and bending magnet beam lines. Three senior positions funded by MacCHESS, the NIH Biomedical Technology Program at CHESS, are open in the general area of diffraction from biological macromolecules. We are particularly interested in the development of Laue diffraction techniques and time-resolved crystallography (see *Science* 223, 1423-1425 (1984); *Nucl. Instr. Meth.* 222, 245-251 (1984); *Nucl. Instr. Meth.* 246, 627-635 (1986)).

SENIOR RESEARCH ASSOCIATE: Overall responsibility for the design, construction and testing of synchrotron radiation instrumentation—x-ray optics, cameras, sample handling devices, detectors—together with associated software for data acquisition and reduction. Applicants must hold a Ph.D. in a physical or chemical science, and have at least four years experience in the design and construction of advanced diffraction instrumentation, preferably at a synchrotron x-ray source, with supervisory experience. Further experience in biophysical chemistry or biochemistry is highly desirable.

RESEARCH ASSOCIATE: Together with the Senior Research Associate, responsible for aspects of the development and use of novel diffraction instrumentation, particularly in the area of Laue diffraction from single crystals of macromolecules. Applicants must hold a Ph.D. in a physical, chemical or biological science, and have at least two years experience in diffraction instrumentation or software, macromolecular crystallography, or related fields.

POSTDOCTORAL ASSOCIATE: Together with the senior staff, responsible for the development of enzyme or other macromolecular systems suitable for time-resolved crystallography, using Laue diffraction techniques. Applicants must hold a Ph.D. in a chemical or biological science, with a background in enzymology or macromolecular crystallography.

All three positions will assist outside users of MacCHESS in the collection of accurate diffraction data. Salary depends on experience; starting salaries will be at least \$30,000 for the Senior Research Associate, \$25,000 for the Research Associate, and \$20,000 for the Post-doctoral Associate.

Applicants should send a CV, list of publications, and the names of three referees before May 8 to **Professor Keith Moffat, Director of MacCHESS, 252 Clark Hall, Cornell University, Ithaca, New York 14853, U.S.A.** Further information may be obtained from him, or from **Professor Boris Batterman, Director of CHESS, Wilson Laboratory, Cornell University.**

Cornell is an Affirmative Action/Equal Opportunity Employer.

NMR FACILITY CO-ORDINATOR UNIVERSITY NMR CENTRE RESEARCH SCHOOL OF CHEMISTRY THE AUSTRALIAN NATIONAL UNIVERSITY

The University has established a Research Service facility in high field Nuclear Magnetic Resonance Spectroscopy under the direction of Dr. L.R. Brown in the Research School of Chemistry. The Facility serves scientific research projects in chemistry, biology, medicine and physics. Current equipment includes 500MHZ, 300MHZ (wide bore) and two 200MHZ spectrometers.

The Facility Co-Ordinator will be responsible for overseeing day-to-day operations of the facility, supervision of four technical staff, and for advice on NMR techniques and methodology for the research projects of staff and students. The Facility Co-Ordinator will also have the opportunity to participate as a full collaborator in appropriate NMR research projects.

Candidates should be thoroughly familiar with advanced NMR techniques, have a sound working knowledge of modern NMR spectrometers, and have substantial experience in research or developments in this area.

An appropriate degree in a relevant scientific discipline is essential and a background in Electronics and Computing is desirable.

The appointment will be for three years in the first instance. Salary according to qualifications and experience will be within the range:

Facility Co-Ordinator Level 1: A\$33382-A\$36921 p.a.
Facility Co-Ordinator Level 2: A\$38655-A\$41087 p.a.

Selection Criteria and Duty Statement are available from Dr. L.R. Brown, Research School of Chemistry, Australian National University, G.P.O. Box 4, CANBERRA ACT 2601, Australia. Phone (062) 49 3771. Fax (062) 487817.

Reasonable travel and removal expenses will be paid and assistance with accommodation will be provided to the successful applicant if appointed from outside Canberra. The appointee will be required to undergo a medical examination.

Written applications, quoting Reference Number G870566 should be forwarded to: **The Secretary, The Australian National University, G.P.O. Box 4, CANBERRA ACT 2601**, with whom applications close on 31 May 1987. Receipt of application will not be acknowledged unless requested.

THE UNIVERSITY IS AN EQUAL OPPORTUNITY EMPLOYER

Chief Executive Biotechnology

Thermophilic enzymes development
New company New Zealand

This is a rare opportunity to head up the new joint-venture company, Pacific Enzymes Ltd, which has recently been formed by Shell Enzymes NZ Ltd (a wholly-owned subsidiary of Shell NZ Holding Co Ltd) and New Zealand Enzymes Ltd (a wholly-owned subsidiary of the Development Finance Corporation of NZ, which is the country's largest venture-capital firm). Pacific Enzymes has exclusive rights to the extreme thermophile technology of the universities of Waikato and Auckland, whose research leads the world in the development of a full range of enzymes with unequalled thermostability and general robustness. This success stems from New Zealand's extensive geothermal hot pools which contain the largest variety of thermophilic and extreme thermophilic micro organisms in the world, many of which appear unique.

The appointee will lead Pacific Enzymes in the commercial exploitation of this resource, there being several directions in which the joint venture is likely to develop and grow as it breaks

new ground. The initial focus will be on developing proprietary products, marketing the technology, negotiating R&D contracts, monitoring their performance and related activities. As the markets are primarily in North America and Europe, quite regular travel will be required from the New Zealand head office.

Candidates must be senior executives with appropriate degree(s), relevant technical experience (minimum 10 years), entrepreneurial outlook and a superior record of commercial achievement in a closely-allied field.

The compensation and comprehensive benefits package (including performance-based incentive plan) will recognise the critical importance of the position and the international standing of the Chief Executive.

Relocation expenses will be reimbursed.

Initial interviews will be conducted in your locality. Please send resume and other pertinent details, in strict confidence, to E R Harrison, **Ref: 1699/S.**

PA

PA Personnel Services

**PO Box 4178, Auckland 1, New Zealand.
Telephone: Auckland 396 721.**

POSITIONS OPEN

POSTDOCTORAL RESEARCH ASSOCIATE. Positions are now available to join a multidisciplinary group studying the structure and regulation of the genes for the catecholamine neurotransmitter biosynthetic enzymes. Applicants should have a strong background in either recombinant DNA technology or neurochemistry/neuropharmacology. Send curriculum vitae, statement of research interest, and the names of three references to: **Dr. Barry B. Kaplan, Molecular Neurobiology Program, Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, Pittsburgh, PA 15213.**

UNIVERSITY OF UTAH SCHOOL OF MEDICINE DEPARTMENT OF RADIOLOGY POSTDOCTORAL RESEARCH ASSOCIATE

Position is available immediately for 2 to 3 years to study the molecular and cellular mechanisms of ionizing radiation in heterogeneous murine carcinoma cells. Research involves flow cytometric analysis, DNA damage induction and repair by alkaline and neutral filter elution and sucrose gradient sedimentation, analysis of chromatin structure and function, thiol metabolism and poly(ADP-ribosyl)ation. Stipend negotiable. U.S. citizenship or permanent visa required. Applications along with curriculum vitae and three references should be sent to: **Dr. Lyle A. Dethlefsen, Department of Radiology, University of Utah Health Sciences Center, Salt Lake City, UT 84132. Telephone: 801-581-5271. Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH MEMBRANE PROTEIN STRUCTURE/FUNCTION; MOLECULAR NEUROBIOLOGY UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT DALLAS

We are interested in the mechanisms by which cells respond to extracellular signals, and especially in the interaction of the extracellular and cytoplasmic domains of transmembrane proteins/receptors in the generation of the appropriate cellular response to the ligand. Two positions are available immediately in a laboratory fully equipped for a multidisciplinary analysis (molecular genetics, biochemistry, cell biology, cytology) of the two experimental systems employed: (i) the insulin receptor [*Cell* 40, 747-758 (1985); *Cell* 45, 721-732 (1986)] and (ii) the nerve growth cone particle, which we utilize to identify and characterize membrane proteins expressed on sprouting neurons [*Cell* 35, 573-584 (1983); *J. Cell Biol.* 101, 1977-1989 (1985)]. Applicants should submit a current curriculum vitae and three letters of recommendation to: **Leland Ellis, Howard Hughes Medical Institute and Department of Biochemistry, University of Texas Health Science Center, 5323 Harry Hines Boulevard, Dallas, TX 75235-9050.**

POSTDOCTORAL RESEARCH POSITION Cardiovascular Research Institute, Cystic Fibrosis Research Center. Cell biologist/biophysicist to study abnormal regulation of cell membrane transport and secondary messengers in cystic fibrosis. Approaches include new fluorescent probe techniques, tissue culture, and protein biochemistry. Reply to: **J. Nadel, Box 0130, University of California, San Francisco, CA 94143. Equal Opportunity/Affirmative Action Employer.**

COLUMBIA UNIVERSITY DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOPHYSICS

A POSTDOCTORAL RESEARCH SCIENTIST position is available from July 1987 for studies on the ionic regulation of Na,K-ATPase. The applicant should have a background in biochemistry or molecular biology. The work will involve cell biological and enzymatic techniques as well as molecular biological approaches in studies on the mechanism of genomic regulation of Na,K-ATPase subunits. Application, including curriculum vitae and the names of two references, should be sent to:

**Dr. F. Ismail-Beigi
Department of Biochemistry and
Molecular Biophysics
Columbia University
630 West 168 Street
New York, NY 10032**

Columbia University is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

The Department of Neurosciences, School of Medicine, University of California, San Diego, is seeking qualified candidates (Ph.D. in biochemistry or molecular biology) for one **POSTGRADUATE RESEARCH** position to work in a laboratory of human biochemical genetics, available in the fall of 1987. Position requires background in (i) enzymology and protein chemistry, or (ii) molecular biology. Salary is based upon published University of California pay schedule. Send curriculum vitae and names of three referees to: **John S. O'Brien, M.D., Department of Neurosciences, University of California, San Diego, La Jolla, CA 92093. Applications will be accepted through 30 June 1987. The University of California is an Equal Opportunity/Affirmative Action Employer.**

POSTDOCTORAL RESEARCH POSITIONS

One or possibly two postdoctoral positions will be available in summer, 1987 to study the structure of lens proteins. Applicants should have a Ph.D. in biochemistry with experience in either enzymology or protein chemistry. The research will include studies on the activation mechanisms of endogenous lens proteases both in vitro and during cataract formation and structural analysis of lens protease inhibitors. The second project will focus on the chemistry of glycation of lens proteins, sites of glycation and the formation of covalent crosslinks. Submit curriculum vitae and the names of three references to: **Dr. Beryl J. Ortwerth, Mason Institute of Ophthalmology, University of Missouri Health Sciences Center, Columbia, MO 65212. UMC is an Equal Opportunity/Affirmative Action Employer.**

RESEARCH ASSISTANT

Research assistant in cardiovascular animal research. Perform experiments and interpret hemodynamic and ventriculographic results in the assessment of both open and closed chested models of experimental myocardial infarction. Responsible for the performance, interpretation, and reporting of exercise stress tests with metabolic measurements. Requirements: master's degree in biology, physiology, or related field, plus 1 year's experience. Background in arterial and venous percutaneous catheterization. Must have understanding of the pathophysiology of the circulatory system and the ability to interpret electrical activity of the heart. Background in statistical analysis. Proven ability to publish research results. Salary \$19,500 per year; work 40 hours per week. *Ad placed by an Equal Opportunity Employer.* To apply, contact or send résumé to: **The Arkansas Employment Security Division, P.O. Box 34047, 1223 West Seventh Street, Little Rock, AR 72203. Telephone: 501-371-2310. Job Order No. 417608.**

RESEARCH ASSOCIATE DEPARTMENT OF UROLOGY

Brooklyn-based teaching hospital seeks a research associate interested in clinical and basic research. Must be able to communicate well with clinicians and carry on independent research. Ph.D. in biological sciences preferred. We offer a good starting salary and benefits package. Please send résumés to: **Ciril J. Godec, M.D., Director, Department of Urology.**

**The Long Island
College Hospital
Brooklyn, NY 11201
Equal Opportunity Employer M/F/H.**



SCIENTIFIC DIRECTOR— RESEARCH INSTITUTE

The Mary Imogene Bassett Hospital, a 189-bed rural referral center and major teaching affiliate of Columbia University, is seeking a **SCIENTIFIC DIRECTOR** for the newly created Mary Imogene Bassett Hospital Research Institute. Five full-time investigators, supplemented by clinical researchers, embody the professional staff of the institution. General support for research exists through the Stephen C. Clark Endowment Fund. Cooperstown, on scenic Otsego Lake, is a four-season resort village with fine schools and outstanding recreational facilities. The scientific director is responsible for managing the Research Institute and fostering coordination of research efforts. Please write or call: **Walter A. Franck, M.D., Search Committee Chairman, The Mary Imogene Bassett Hospital, Cooperstown, NY 13326. Telephone: 607-547-3110.**

POSITIONS OPEN

RESEARCH ASSOCIATE POSITION: To study mechanisms of action of anticancer drugs with particular emphasis on antimetabolites and their interaction with DNA-reactive agents. Candidate should be a recent Ph.D. with training in biochemical pharmacology and must have utilized molecular biological techniques. Appointment will be for a minimum of 1 year. Salary is negotiable. Send curriculum vitae and letter of recommendation to: **Dr. Y. Rustum, Grace Cancer Drug Center, Roswell Park Memorial Institute, 666 Elm Street, Buffalo, NY 14263. Roswell Park Memorial Institute is an Equal Opportunity Employer.**

RESEARCH ASSOCIATE OR POSTDOCTORAL position available immediately for 2 to 3 years to participate in studies involving anti-idiotypic antibodies. Requires Ph.D. in immunology with at least 2 years of postdoctoral experience in immunochemistry, ELISA, immunoblotting, monoclonal antibody preparation, and electrofocusing. Candidates should send description of research experience, and three letters of recommendation to: **Dr. Naomi Rothfield, Division of Rheumatic Diseases, University of Connecticut School of Medicine, Farmington, CT 06032. An Affirmative Action/Equal Opportunity Employer M/W/H.**

SCIENCE AND TECHNOLOGY DEVELOPMENT ADVISOR THAILAND

A national private, nonprofit institution dedicated to the furtherance of science and engineering for the public welfare, is seeking a development advisor to serve a 48-month term in Bangkok beginning about 1 May 1987, advising Government of Thailand officials on planning and implementing a major science and technology program. The program aims at greater industrial development in specific technical areas. Requires a Ph.D. in science; more than 5 years of postdoctoral teaching and research experience plus 10 years of senior level research management experience. Developing country experience highly desirable. Familiarity with national scientific infrastructure policies including development of applied technology transfer programs important. Must be adaptable to conditions of living abroad in nongovernmental status. U.S. citizenship preferred. Salary level dependent upon experience, overseas allowances paid similar to current USG guidelines for Thailand. Please submit résumé including salary history to: **Position #220.000S, National Research Council, 2101 Constitution Avenue, NW, Washington, DC 20418. An Equal Opportunity Employer.**

SENIOR RESEARCH SPECIALIST—Full-time. Ph.D. or near in psychology, sociology, nursing, neuroscience, or related field for funded long-term research project in narcolepsy. Must have familiarity with mainframe computer and major statistical packages. Send curriculum vitae to: **Dr. Felissa Cohen, University of Illinois at Chicago, College of Nursing, Department of Medicine—Surgery Nursing, 845 South Damen Avenue, Chicago, IL 60612. For further information telephone: 312-996-7900. The University of Illinois at Chicago is an Equal Opportunity/Affirmative Action Employer and encourages applications from members of minority groups and men.**

TENURE-TRACK FACULTY POSITION UNIVERSITY OF CALIFORNIA, IRVINE

The Department of Microbiology and Molecular Genetics, College of Medicine, University of California, Irvine, has an opening for an **ASSISTANT PROFESSOR** in the tenure-track series for individuals with interests and experience in research on the control of gene expression. We especially invite applications from individuals conducting research in human molecular genetics; however, those investigating gene expression in other eukaryotic or prokaryotic systems, including bacterial pathogens, will also be considered. Candidates must have demonstrated excellence in independent research. The successful candidate would join a faculty active in molecular genetic research. Teaching duties would include courses to graduate and medical students. Send curriculum vitae and three letters of reference to: **Chairman, Faculty Search Committee, Department of Microbiology and Molecular Genetics, University of California, Irvine, CA 92717. An Affirmative Action/Equal Opportunity Employer.**

Research Scientists

A Responsive Research Environment

Pioneer new applications in Biotechnology, Pathology and Pharmacology for Cardiovascular & CNS Research.

As a research-driven company, Schering-Plough can offer you the project responsibility, support and recognition to stimulate your best ideas. Joining us in one of these new positions, you'll be part of an expanding group of bold thinkers. At the forefront of some of today's most significant breakthroughs in cardiovascular and CNS research.

□ Cardiovascular Pharmacology

SR. BIOCHEMIST—Your background must include experience with growth factor receptor binding methods and cell proliferation as well as familiarity with tissue culture and related atherosclerosis research techniques.

SR. BIOCHEMIST—Experience in the regulation and measurement of lipoproteins and cholesterol in serum and tissues is required, as is understanding of the latest information on lipoprotein metabolism.

SR. EXPERIMENTAL PATHOLOGIST—Requires expertise in histological evaluation of the blood vessel wall in atherosclerosis.

SR. VASCULAR BIOLOGIST—You must have a strong background in the cellular physiology of the blood vessel wall in atherosclerosis and thorough familiarity with vascular cell culture techniques.

SR. PHARMACOLOGIST/PHYSIOLOGIST—Your expertise must encompass experimental animal

models of atherosclerosis and evaluation of drug effects on atherosclerotic processes in vivo.

□ CNS Pharmacology

SR. CNS BIOCHEMIST—You must have comprehensive knowledge of the application of fundamental methods to new drug discovery. Preference will be given to candidates with a background in any of the following: radioreceptor binding assays, HPLC and RIA assays for neurotransmitters and second messengers (cAMP and PI), enzyme kinetic techniques, and central dopaminergic and cholinergic pharmacological systems.

Candidates for all positions must have a Ph.D., or equivalent, and 0–5 years' experience within the area of interest. The ability to communicate and produce results in an interdisciplinary environment is essential.

ASSISTANT/ASSOCIATE PHARMACOLOGISTS (9 positions)—In addition to the above positions, Schering-Plough is accepting resumes for Assistant/Associate Scientists, to complement the Senior positions listed above. For these positions, interviews will not begin until June or July of this year.

We offer a competitive salary and outstanding benefits. Please send detailed resume, indicating position of interest, to: Louis DeMartino, Schering-Research, 60 Orange Street, Bloomfield, NJ 07003. We are an equal opportunity employer.



Schering-Plough

POSITIONS OPEN

RESEARCH BIOLOGIST. VA Medical Center, St. Louis, Missouri, requires professional background in microbiology, biochemistry, and veterinary medicine and experience in purification techniques and eukaryote DNA cloning. Salary: \$27,172 per annum. To apply contact: Ms. Blair, (05-JB) VA Medical Center, St. Louis, MO 63125. Telephone: 314-894-4676. *Equal Opportunity Employer.*

SENIOR RESEARCH SCIENTIST

The University of Rochester Cancer Center has an immediate opening for a Senior Research Scientist with 3 to 5 years of postdoctoral experience in the area of biology of differentiation and growth control. The candidate is expected to have experience in protein purification and recombinant DNA techniques pertaining to oncogenes. Knowledge of cell culture and gene transfer assays is required. Salary negotiable. Please send curriculum vitae and names of three references to: Sayeeda B. Zain, Ph.D., University of Rochester Cancer Center, Basic Science Division, Box 704, 601 Elmwood Avenue, Rochester, NY 14642. *The University of Rochester is an Equal Opportunity/Affirmative Action Employer.*

TERRESTRIAL PLANT ECOPHYSIOLOGY MOLECULAR EVOLUTION SMITHSONIAN TROPICAL RESEARCH INSTITUTE

Two permanent research positions are anticipated contingent on appropriation of funds at the Smithsonian Tropical Research Institute, a bureau of the Smithsonian Institution located in the Republic of Panama.

TERRESTRIAL PLANT ECOPHYSIOLOGIST. Including but not limited to plant-soil interactions, carbon and water balance, and photobiology.

MOLECULAR EVOLUTION. Including use of molecular techniques in the study of evolutionary biology (including population genetics). We are particularly interested in candidates who wish to develop research programs to take advantage of Panama's unique geographical position as a land bridge between continents and a barrier between oceans.

Successful candidates will be expected to establish independent research programs, and to interact with a large, active group of field-oriented ecologists, behaviorists, and evolutionists. STRI operated the biological reserve on Barro Colorado Island and a variety of marine facilities along the Pacific and Caribbean Coasts of Panama. Annual salary from \$27,000 to \$53,800 depending on experience plus housing allowance. Substantial set-up funds and research support. Position can begin between 1 January and 1 July 1988. Screening will begin 15 May 1987 and continue until positions are filled. Applications including curriculum vitae; reprints; names, addresses, and telephone numbers of five references; and statement of research interests should be sent to: **Molecular Evolution Search Committee, or Plant Ecophysiology Search Committee, Smithsonian Tropical Research Institute, APO, Miami, FL 34002-0011.** *The Smithsonian Institution is an Equal Opportunity/Affirmative Action Employer, and appointment can be made without regard to nationality.*

WASSERMAN PROFESSOR OF OPHTHALMOLOGY

The Department of Ophthalmology and the Jules Stein Eye Institute, University of California, Los Angeles (UCLA), School of Medicine, are seeking applicants for the Wasserman Professorship of Ophthalmology. Individuals dedicated to a career in vision research, teaching, and ophthalmic patient care are encouraged to apply. The Search Committee is seeking a clinically qualified ophthalmologist with special interest in cornea-external ocular disease and uveitis. Candidates need strong background in clinical and laboratory research, particularly related to immunologic, inflammatory, and infectious diseases of the eye.

Applications including curriculum vitae, bibliography, and a letter discussing career goals should be sent to:

Robert S. Hepler, M.D., Chair
Wasserman Search Committee
Jules Stein Eye Institute
UCLA School of Medicine
Los Angeles, CA 90024

All applications and inquiries will be treated in strict confidence. *Candidates are encouraged to apply regardless of gender or ethnic origin. UCLA is an Equal Opportunity/Affirmative Action Employer.*

GRANTS

RESEARCH INQUIRIES INVITED

The Smokeless Tobacco Research Council, Inc. invites inquiries regarding grant applications.

The Council sponsors independent research into questions of smokeless tobacco and health. Research support is through a program of grants-in-aid.

Grant applications are evaluated by the Scientific Advisory Board to the Council and will be judged solely on the basis of scientific merit and relevance.

Deadlines for submission of grant applications are 31 December for July 1st funding and 30 June for January 1st funding. Address inquiries or requests for applications to: **The Smokeless Tobacco Research Council, Inc., 420 Lexington Avenue, New York, NY 10170** Telephone: 212-697-3485.

GRADUATE PROGRAM

CAREER CHANGE OPPORTUNITY

This unique program offers the candidate with a doctorate-level degree in science the opportunity to earn the doctor of optometry (O.D.) degree in two calendar years. Employment opportunities exist in private practice, industry, education, and research. Contact: **Dr. D. M. Chauncey, Ph.D.-O.D. Program Director, The New England College of Optometry, 424 Beacon Street, Boston, MA 02115; telephone: 617-266-2030, extension 147.**

WORKSHOP

WORKSHOP FIRST CODATA WORKSHOP ON NUCLEIC ACID AND PROTEIN SEQUENCING DATA

This Workshop will be held at the National Bureau of Standards, Gaithersburg, MD, on 4, 5, and 6 May 1987. It will bring together experts in the management of data essential to molecular biology and biotechnology to discuss coordination of database development and problems of data access, exchange, and use. Contact: **Mrs. Kathy C. Stang, A345 Physics Building, National Bureau of Standards, Gaithersburg, MD 20899. Telephone: 301-975-4513.**

FELLOWSHIPS

Charles H. Revson Foundation and Norman and Rosita Winston Foundation FELLOWSHIPS in basic biomedical research are available at Cornell University Medical College in the following areas: (i) To study regulation of gene expression in DNA tumor viruses. Training will involve molecular biology, molecular virology, and protein characterization in the laboratories of the Department of Microbiology under the direction of Dr. Erik Falck-Pederson or Dr. Kenneth I. Berns. (ii) Advanced research training/experience in problems concerning mechanisms of brain cell death due to anoxia or metabolic disturbance, in the laboratories of the Department of Neurology under the direction of Drs. Fred Plum and William Pulsinelli. Holders of M.D. or Ph.D. degrees are invited to apply for 2-year fellowships with competitive salaries. Applicants should generally have no more than 3 years of basic or clinical experience beyond the doctorate. Send curriculum vitae, three letters of reference, and indicate your area of interest, to: **The Office of Research and Sponsored Programs, Cornell University Medical College, 1300 York Avenue, Room A-131, New York, NY 10021.**

PREDOCTORAL FELLOWSHIPS IN IMMUNOLOGY AND MICROBIOLOGY

The Department of Microbiology and Immunology is accepting applications for predoctoral training in eukaryotic and prokaryotic molecular biology, microbial pathogenicity, cellular and molecular immunology, or cancer biology. The Department has an active research program supported by 19 faculty with over \$2 million yearly in extramural research funding. Annual stipends of \$10,000 plus tuition and fees are available to qualified students. For information write or call collect: **Dr. Alan Kaplan, Chairman, Department of Microbiology and Immunology—MS409, College of Medicine, University of Kentucky, Lexington, KY 40536. Telephone 606-233-5256.**

FELLOWSHIPS

MARINE MOLECULAR BIOLOGY

PREDOCTORAL AND POSTDOCTORAL FELLOWSHIPS for training in the molecular biology and molecular genetics of marine prokaryotic and eukaryotic organisms are available through the Center of Marine Biotechnology (COMB) at the University of Maryland.

COMB is located in the Inner Harbor section of Baltimore, Maryland, and provides a state-of-the-art environment for research in marine molecular biology.

Ongoing research programs at COMB include the molecular biology of reproduction, growth, and development of finfish and shellfish, the molecular basis of marine symbiotic relationships and other important ecological processes such as biofouling, and the molecular biology and molecular genetics of marine bacteria.

Graduate students must be admitted through appropriate departments at the University of Maryland or the Johns Hopkins University.

For further information and application materials contact: **Dr. Fred Singleton, Acting Director, Center of Marine Biotechnology, University of Maryland, 600 East Lombard Street, Baltimore, MD 21202. Telephone: 301-783-4800.**

The California Institute of Technology, Division of Engineering and Applied Science, invites applications for postdoctoral fellowships, including:

**THE DR. CHAIM WEIZMANN
POSTDOCTORATE FELLOWSHIP
FOR SCIENTIFIC RESEARCH**
(Restricted to U.S. citizens)

**THE MYRON A. BANTRELL
POSTDOCTORATE FELLOWSHIP
FOR SCIENTIFIC AND
ENGINEERING RESEARCH**
(Restricted to U.S. citizens)

IBM RESEARCH FELLOWSHIP
(No citizenship restrictions)

Caltech's Division of Engineering and Applied Science will award a limited number of postdoctoral fellowships for research in Engineering and Applied Science. The fellowships will have a 1- to 2-year duration, beginning in the fall or winter of 1987. The program is intended for those who have just completed their Ph.D.

Inquiries should be addressed to: **Professor Paul C. Jennings, Chairman, Division of Engineering and Applied Science, California Institute of Technology, Pasadena, CA 91125.** The deadline for completed applications is 31 July 1987.

The Institute is an Equal Opportunity/Affirmative Action Employer and welcomes applications from women and minorities.

POSTDOCTORAL FELLOWSHIPS IN BIOSOCIAL ASPECTS OF HUMAN REPRODUCTION:

Advanced training and research opportunities on the interaction of biological and social processes affecting human reproduction and sex-related behavior. Inquiries invited from researchers trained in biological and/or social sciences. Send curriculum vitae and description of research interests to: **J. Richard Udry, Director, Carolina Population Center, University of North Carolina, 123 West Franklin Street, Chapel Hill, NC 27514-3997.** *Minority applications encouraged. Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL FELLOWSHIP IN GLYCOCONJUGATE/MUCIN BIOCHEMISTRY

is available immediately at the University of California at San Francisco. Candidates should have Ph.D. in biochemistry, and training in mucin/glycoprotein structural techniques such as chemical radiolabeling procedures, HPLC, methylation analysis, and gas chromatography. Additional training in mass spectrometry and NMR would also benefit. The successful candidate will study the epithelial cell surface and secreted glycoconjugates in the respiratory tract. Projects include the structural characterization of carbohydrate epitopes recognized by monoclonal antibodies, and the isolation and characterization of epithelial cell surface glycoconjugates involved in bacterial adhesion. Excellent facilities in a multidisciplinary setting. Send résumé, names and addresses of three references, and a brief statement of research experience and objectives to: **Dr. Jay A. Nadel, Cardiovascular Research Institute, 1327 Moffitt Hospital, University of California, San Francisco, CA 94143.** *Affirmative Action/Equal Opportunity Employer.*

ASYSTANT.

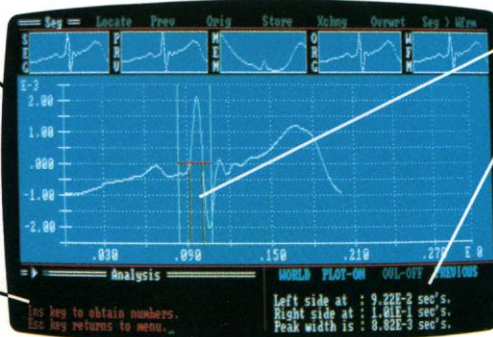
Menu-driven software designed exclusively for scientific applications.

Fully integrated analysis, graphics, and processing functions operate directly on large datasets.

Unique features give you flexibility not found in most menu-driven packages.

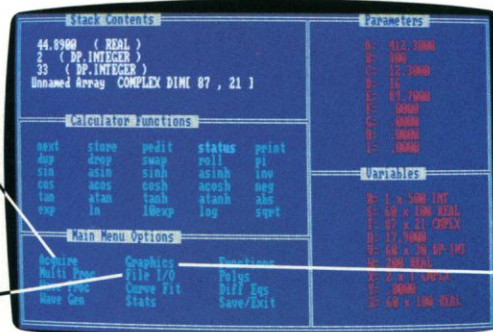
ASYSTANT + data acquisition provides real-time display, interactive control, and continuous throughput to disk.

A single keystroke lets you import data from spreadsheet and other data file formats.



Lets you interact visually with your data. Just scroll, select curve segments, and watch your results appear.

On-line help is always available by typing "?".



Gives you more power for the price than any other software for the IBM PC.

Presentation-quality scientific graphics easily output to plotters.

Data analysis, acquisition, and graphics for your PC. Without programming.

Why settle for "business spreadsheets" or shuffling programs? With ASYSTANT Ready-to-Run Scientific Software™ you get the analytical power of ASYST (the leading programmable scientific software)—in a stand-alone, affordable menu-driven package.

Easy to learn and use, whatever your computer background, ASYSTANT is a fully integrated analysis and graphics package. It provides an extensive set of scientific functions, and flexible macro capabilities, to help you tackle your toughest applications.

Optional data acquisition with ASYSTANT+. Get all the features of the ASYSTANT package, *plus* one-touch data acquisition, with ASYSTANT+. No tedious prompt lists. No tedious set-up. Just choose the "metaphor" of the collection instrument you wish to simulate—such as XY or strip chart recorder, data logger, or signal averager—and you're ready to go.

Built-in functions designed for scientists. Both packages include such features as FFT, smoothing, integration, differentiation, curve fitting, statistics, differential equations, and matrix and polynomial operations. And all analysis functions are fully linked to powerful graphics capabilities.

Free technical support. Take advantage of 60 days of experienced technical support—cost free—to help you design, set up, and fine-tune the perfect system.

30-Day No-Risk Offer.
CALL 1-800-348-0033

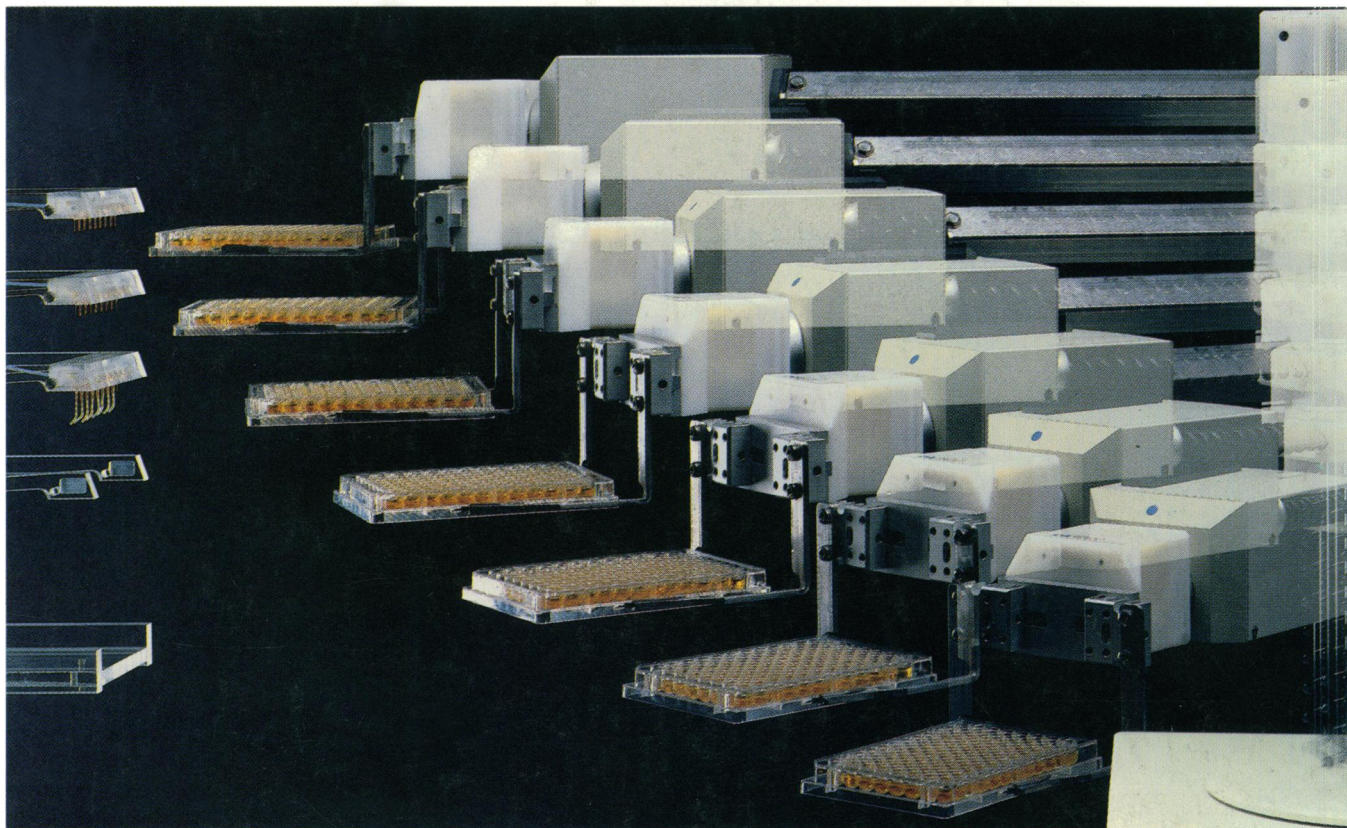
In New York state, (212) 702-3241.
Ask for technical literature.

Macmillan Software Co.

An affiliate of Macmillan Publishing Company
630 Third Avenue, New York, NY 10017

ASYSTANT Ready-to-Run Scientific Software and ASYSTare trademarks of Macmillan Software Co.
ASYST and ASYSTANT were developed by Adaptable Laboratory Software, P.O. Box 18448, Rochester, NY 14618

No hands.



Now you can fully automate your microassays from sample prep to analysis to data handling.

Finally, there's a way to eliminate the tedium and human error from your ELISA methods. The HP Microassay System not only gives you fully automated, unattended operation but also increases your reliability, repeatability, and throughput.

What's more, you can clone your assay methods and transfer them intact to the production or quality-control lab. It all adds up to increased productivity. And reduced labor intensity.

The entire system is flexible. It's also modular with a wide choice of options, so you buy only what

you need and easily adapt to changing methodologies.

And all the modules come from a single source, so everything interfaces perfectly. And you have a single point of contact for application support and service.

For more information, call the HP office listed in your telephone directory white pages and ask for an analytical product representative. Or write to Hewlett-Packard, Dept. BIO, 1601 California Ave., Palo Alto, CA 94304.

