

of any sort on Neogene planktonic foraminifera. The book must lie within easy reach of a specialist's microscope. And it is designed to be used—plenty of room is left to insert notes and update material. This book will be a new starting point for planktonic foraminiferal studies, and no one will be able to work in Neogene biostratigraphy, paleoceanography, paleoclimatology, biogeography, or, one hopes, evolutionary studies without it.

JERE H. LIPPS

Department of Geology,  
University of California, Davis 95616

## Fertilization

**Mechanism and Control of Animal Fertilization.** JOHN F. HARTMANN, Ed. Academic Press, New York, 1983. xii, 563 pp., illus. \$69. Cell Biology.

Several excellent reviews on various aspects of fertilization have appeared in the past decade, but this book is the most complete work on the subject since the now classic two-volume treatise, *Fertilization*, edited by Charles B. Metz and Alberto Monroy, was published in 1967.

Has much progress been made in research on the mechanism of sperm-egg interaction and early embryogenesis since 1967? The answer is definitely affirmative. During the past 16 years, and especially in the last eight years, there has been an explosive expansion of our knowledge of the biochemistry and cell biology of gamete interaction and the activation of embryonic development. Today there are more researchers working on fertilization-related problems than at any time in the past. The major underlying reasons for this expansion are the development of microanalytical techniques of biochemistry and immunology that permit analysis of the small number of eggs obtainable from mice and other mammals and the great interest in the fertilization of human eggs in vitro.

The first four chapters deal with biochemistry and macromolecular synthesis during mammalian oogenesis (P. M. Wassarman), spermatogenesis (A. R. Bellvé and D. A. O'Brien), the egg zona pellucida (B. S. Dunbar), and the capacitation reactions of sperm (E. D. Clegg).

Although most basic discoveries of the mechanisms of animal fertilization have utilized the gametes of marine invertebrates such as the sea urchin, only two chapters are devoted to invertebrate fertilization. Chapter 5 (S. S. Shen) reviews the electrobiology of sea urchin and

echinurid eggs, covering both the properties of the egg membrane and the roles of intracellular ion fluxes in the activation of embryonic development. This is a valuable contribution because the clarity of writing and organization make what some find a difficult subject easy to understand. Chapter 6 (A. C. Lopo) summarizes knowledge of sperm-egg attachment in sea urchins and other invertebrates such as decapods and ascidians. The emphasis is on the mechanism of induction of the acrosome reaction and the description of the proteins of the sperm plasma membrane, the acrosome granule, and the egg surface that mediate surface recognition between the gametes.

Chapter 7 (J. F. Hartmann) returns to mammals, describing the process of gamete interactions, especially the different types of sperm-egg adhesions observed in vitro. Although chapter 4 deals exclusively with sperm capacitation, chapters 7 and 10 go into some depth again on this subject, creating some overlap and redundancy. Chapter 8 (E. D. Schmell, B. J. Guylyas, and J. L. Hedrick) compares the surface alterations and blocks to polyspermy in eggs of sea urchins, frogs, and mammals. The roles of the structural proteins and enzymes of the egg cortical granules are considered in depth. This is an excellent comparative analysis of polyspermy prevention in these three animal groups. Chapter 9 (D. J. Wolgemuth) summarizes all available information on changes in gamete pronuclei and macromolecular syntheses known in eggs of the mouse, rat, hamster, rabbit, and human. The final two chapters, on gamete interactions in the female (H. D. M. Moore and J. M. Bedford) and sperm and egg transport in the female (J. W. Overstreet), would be the most interesting ones for clinicians entering into human in vitro fertilization.

The only negative features of the book are the dearth of illustrations in some chapters and the poor quality of reproduction of some micrographs. Two chapters on invertebrates do not go well with the nine on mammals; chapters on embryo transfer and human fertilization in vitro would have been better choices.

On balance this is a worthwhile book. The reference lists are up to date and extensive, and the index is fairly complete. The book will be an excellent reference source.

VICTOR D. VACQUIER

Marine Biology Research Division,  
Scripps Institution of Oceanography,  
University of California at San Diego,  
La Jolla 92093

## Books Received

**Aboriginal Sites, Rights and Resource Development.** Papers from a symposium, Canberra, Nov. 1981. Ronald M. Berndt, Ed. Published for the Academy of the Social Sciences in Australia by University of Western Australia Press, Perth, 1982 (U.S. distributor, ISBS, Portland, Ore.). xii, 254 pp. Paper, \$12.95.

**The Adipocyte and Obesity.** Cellular and Molecular Mechanisms. Papers from a conference, Toronto, June 1982. Aubie Angel, Charles H. Hollenberg, and Daniel A. K. Roncari, Eds. Raven, New York, 1983. xviii, 310 pp., illus. \$35.

**Biothermodynamics.** The Study of Biochemical Processes at Equilibrium. J. T. Edsall and H. Gutfreund, Wiley, New York, 1983. xiv, 248 pp., illus. \$34.95. Monographs in Molecular Biophysics and Biochemistry.

**Branching Processes.** S. Asmussen and H. Hering. Birkhäuser, Boston, 1983. x, 462 pp., illus. \$34.95. Progress in Probability, vol. 3.

**Calcium Antagonism in Heat and Smooth Muscle.** Experimental Facts and Therapeutic Prospects. Albrecht Fleckenstein. Wiley-Interscience, New York, 1983. xvi, 400 pp., illus. \$60.

**Dynamical Systems and Chaos.** Proceedings of a conference, Sitges, Barcelona, Spain, Sept. 1982. L. Garrido, Ed. Springer-Verlag, New York, 1983. xiv, 298 pp., illus. Paper, \$18. Lecture Notes in Physics, vol. 179.

**Electronic Surveying in Practice.** Simo H. Laurila. Wiley-Interscience, New York, 1983. xvi, 388 pp., illus. \$37.50.

**Growth and Maturation Factors.** Vol. 1. Gordon Guroff, Ed. Wiley-Interscience, New York, 1983. xiv, 362 pp., illus. \$54.50.

**Guide to Good Programming Practice.** B. L. Meek, P. M. Heath, and N. J. Rushby, Eds. Horwood, Chichester, England, and Halsted (Wiley), New York, ed. 2, 1983. 192 pp., illus. \$44.50. Ellis Horwood Series in Computers and Their Applications.

**Halls for Music Performance.** Two Decades of Experience: 1962-1982. Papers from a meeting, Chicago, Apr. 1982. Richard H. Talaske, Ewart A. Wetherill, and William J. Cavanaugh, Eds. Published for the Acoustical Society of America by the American Institute of Physics, New York, 1982. xvi, 176 pp., illus. Paper, \$15.

**Isozymes.** Current Topics in Biological and Medical Research. Vol. 7, Molecular Structure and Regulation. Papers from a congress, Austin, Tex., June 1982. Mario C. Rattazzi, John G. Scandalios, and Gregory S. Whitt, Eds. Liss, New York, 1983. xx, 328 pp., illus. \$68.

**Laboratory Decontamination and Destruction of Carcinogens in Laboratory Wastes.** Some Polycyclic Aromatic Hydrocarbons. M. Castegnaro and eight others, Eds. International Agency for Research on Cancer, Lyon, 1983 (U.S. distributor, WHO Publications Centre USA, Albany, N.Y.). viii, 88 pp. Paper, \$10. IARC Scientific Publication No. 49.

**The Musical Experience.** Sound, Movement, and Arrival. Leonard G. Ratner. Freeman, New York, 1983. xii, 154 pp., illus. Cloth, \$20; paper, \$10.95. Reprinted from the Portable Stanford Series.

**The New Biology and Medical Education.** Merging the Biological, Information, and Cognitive Sciences. Papers from a conference, June 1982. Charles P. Friedman and Elizabeth F. Purcell, Eds. Josiah Macy, Jr. Foundation, New York, 1983 (distributor, Independent Publishers Group, Port Washington, N.Y.). xx, 322 pp. Paper, \$15.

**The Ovary.** Giovan B. Serra, Ed. Raven, New York, 1983. xiv, 432 pp., illus. \$55. Comprehensive Endocrinology.

**Particle Size Analysis 1981.** Proceedings of a conference, Loughborough, England, Sept. 1981. N. Stanley-Wood and T. Allen, Eds. Wiley Heyden, New York, 1983. x, 462 pp., illus. \$74.95.

**Structure of Complex Turbulent Shear Flow.** Papers from a symposium, Marseille, France, Aug. 1982. R. Dumas and L. Fulachier, Eds. Springer-Verlag, New York, 1983. xx, 444 pp., illus. \$39.

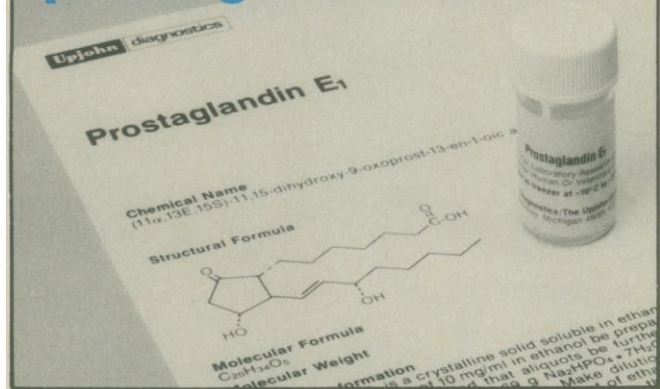
**The Successful Dragons.** A Natural History of Extinct Reptiles. Christopher McGowan. Original illustrations by Marg Sansom-Markezinis. Samuel Stevens, Toronto, 1983. viii, 264 pp. Cloth.

**Surface Polaritons.** Electromagnetic Waves at Surfaces and Interfaces. V. M. Agranovich and D. L. Mills, Eds. North-Holland, Amsterdam, 1982 (U.S. distributor, Elsevier, New York). xvi, 718 pp., illus. \$160.50. Modern Problems in Condensed Matter Sciences, vol. 1.

**Synopsis of Neuroanatomy.** Howard A. Marzke and Floyd M. Foltz. Oxford University Press, New York, ed. 4, 1983. xii, 170 pp., illus. Paper, \$8.95.

**Teratocarcinoma and Embryonic Cell Interactions.** Paper from a symposium, Kyoto, Japan, Oct. 1980. Takashi Muramatsu, Gabriel Gachelin, A. A. Moscona, and Yoji Ikawa, Eds. Japan Scientific Societies Press, Tokyo, and Academic Press, New York, 1982. xxii, 344 pp., illus. \$36.

# Trust your critical research to Upjohn Diagnostics' quality prostaglandins



As a research pioneer and leading manufacturer of quality prostaglandins, Upjohn Diagnostics brings over two decades of experience to the field with a total of eighteen different compounds, the most comprehensive selection available from a single source. Each Upjohn Diagnostics' prostaglandin is thoroughly tested, resulting in prostaglandins of exceptional purity and dependability.

Add a new pricing structure, and you have even more reason for specifying Upjohn Diagnostics' prostaglandins . . . because using the best doesn't have to cost more.

## Upjohn Diagnostics' Quality Prostaglandins

Description	Cost/10 mg
PGA <sub>1</sub> . . . . .	\$135
PGA <sub>2</sub> . . . . .	135
PGB <sub>1</sub> . . . . .	135
PGB <sub>2</sub> . . . . .	135
PGD <sub>2</sub> . . . . .	200
PGE <sub>1</sub> . . . . .	135
PGE <sub>2</sub> . . . . .	135
PGF <sub>1</sub> $\alpha$ . . . . .	135
PGF <sub>2</sub> $\alpha$ Tromethamine . . . . .	135
PGI <sub>2</sub> (Prostacyclin) Na Salt . . . . .	400
6-keto PGF <sub>1</sub> $\alpha$ . . . . .	200
13,14-diH-15-keto-PGE <sub>2</sub> . . . . .	200
13,14-diH-15-keto-PGF <sub>2</sub> $\alpha$ . . . . .	200
9,11-dideoxy-9 $\alpha$ ,11 $\alpha$ -epoxymethane-PGF <sub>2</sub> $\alpha$ . . . . .	200
9,11-dideoxy-11 $\alpha$ ,9 $\alpha$ -epoxymethane-PGF <sub>2</sub> $\alpha$ . . . . .	400
16,16-dimethyl-PGE <sub>2</sub> . . . . .	200
6,15-diketo-13,14-dihydro-PGF <sub>1</sub> $\alpha$ . . . . .	200
Thromboxane B <sub>2</sub> . . . . .	400
Thromboxane B <sub>2</sub> Antiserum (100 tube vial) . . . . .	40

## Free Reprint Available

"Prostaglandins and the arachidonic acid cascade," a detailed history and description of prostaglandins is now available. For your free copy, circle Reader Service No. 173.

For full information, write or call Upjohn Diagnostics, Kalamazoo, MI 49001, 616-385-7111.

**Upjohn diagnostics**

A Division of The Upjohn Company

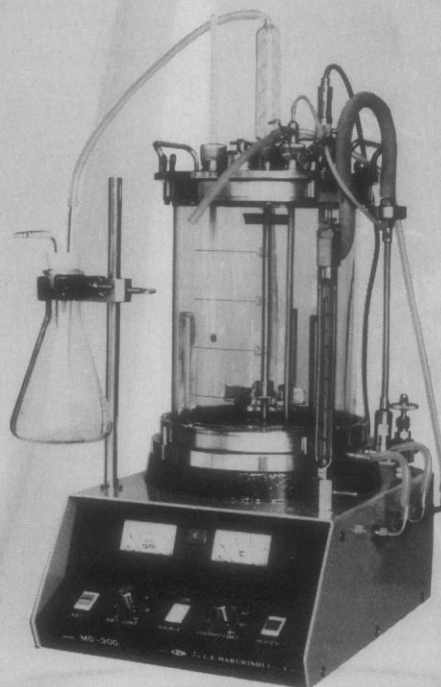
For laboratory research use only.  
Not for human or veterinary  
clinical use.  
(UD83-046) February, 1983

For literature circle reader service number 166  
For a demonstration circle reader service number 167

## Now you can get Advanced Fermentation Equipment from Japan

with U.S. sales, service  
and applications assistance

Bioengineering Associates, Inc. is introducing the L.E. Marubishi, Inc., line of fermenters so that, for the first time, the North American scientific community can have access to Japanese expertise in fermentation technology and equipment. The MD Series Bench Top unit, for example — shown below — offers elegant simplicity in combination with the most advanced automatic controls of pH, DO, antifoam and temperature. Five vessel sizes are available, from 1.2 to 10 liters.



The complete line of Marubishi fermenters, including models up to 90 liters capacity, is available from Bioengineering Associates. Prompt deliveries and factory trained service are offered by BEA's U.S. based sales and service organization.

Call or write today for descriptive literature, or to arrange an appointment to discuss your requirements.



**Bioengineering Associates, Inc.**

44 Mechanic Street  
Newton, Mass., 02154  
Telephone: (617) 890-0018

A BIOTECHNOLOGY DEVELOPMENT Company.

Circle No. 182 on Readers' Service Card

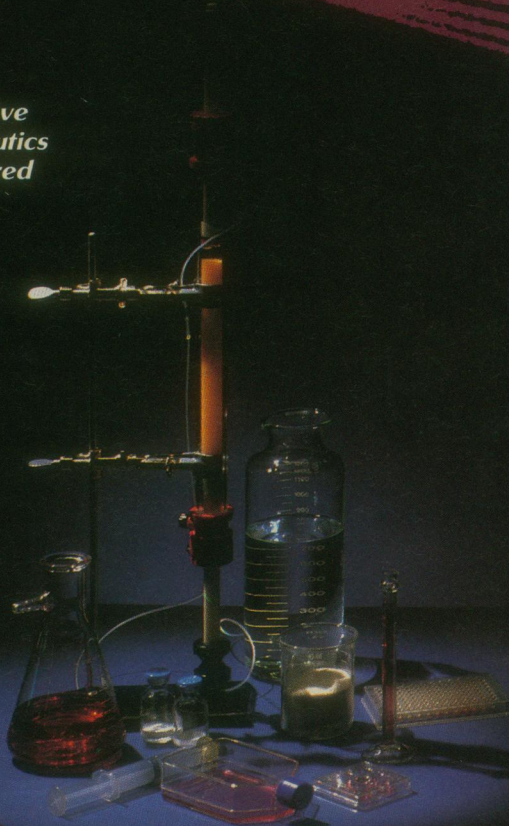
# **BOVUMINAR™ —** *quality, full line, versatile, reliable, at a competitive price.*

*Armour Pharmaceutical scientists pioneered the development of blood fractionation technology. We have been a major fractionator of human plasma for therapeutics since 1943, and since the late 1940's have manufactured bovine albumin for biochemical and diagnostic applications.*

*We have almost a century of experience as a producer of high quality biochemicals — but we are more than just a biochemical manufacturer — we are a pharmaceutical company.*

**BOVUMINAR (bovine albumins)**  
for use in . . .

- diagnostic reagents
- growth media
- bases for biochemical and metabolic research.



**Armour Pharmaceutical Company**

*Biochemicals — a commitment to the '80s*

# **BOVUMINAR™ (bovine albumins) – a wide variety of products from 30 years of blood fractionation technology.**

Although Armour Pharmaceutical Company has a long-standing tradition in the development of bovine albumins, we are not bound by tradition; our attitude is one of innovation – we have not only pioneered in albumin developments, but have become the most active in applying versatility for new uses.

An example of, and a statement about, some of our albumins . . .

## **BOVUMINAR COHN FRACTION V POWDER**

"Fraction V" has become a generic label for a variety of bovine albumin products with different basic characteristics. Originally, the designation "Fraction V" referred to the fifth precipitate obtained in a cold ethanol fractionation process developed by Dr. E.J. Cohn at Harvard University during the Second World War. Armour collaborated in that project. Most therapeutic human blood fractions are still produced by the Cohn Cold Ethanol Process. Armour BOVUMINAR Cohn Fraction V Powder continues that tradition.

Armour BOVUMINAR Cohn Fraction V Powder has two important characteristics:

- 1 - Prepared under nondenaturing conditions
- 2 - Native fatty acid profile reflecting residual endogenous lipids.

Because Armour BOVUMINAR Cohn Fraction V Powder is prepared under nondenaturing conditions – is never heated – no exogenous short chain fatty acid stabilizer is ever added. Bovine albumin products manufactured by selective thermal denaturation processes usually have fatty acid profiles dominated by residual exogenous stabilizers.

For some applications, the special preparation of bovine albumin under nondenaturing conditions with a native fatty acid profile is important. For others, it is not.

Armour BOVUMINAR Cohn Fraction V Powder is prepared under nondenaturing

conditions by the traditional Cohn Cold Ethanol Process using the same strict quality controls applied to human plasma fractions for therapeutic use.

## **BOVUMINAR POWDER STANDARD**

BOVUMINAR Powder Standard is more highly purified than our traditional Cohn Cold Ethanol Process BOVUMINAR Cohn Fractional V Powder, but manufactured by a lower cost process to give a quality product at a reasonable price. Armour's large scale processing capability permits competitive pricing despite the high cost of rigorous quality control associated with pharmaceutical operations. Because BOVUMINAR Powder Standard is a heated product, it contains 1-2mg fatty acid/g protein, about 2/3 of which is octanoic.

## **BOVUMINAR REAGENT PURE POWDER (CRG-7)**

A fatty acid free bovine albumin powder for the most discriminating research and diagnostic applications. Manufactured by a process specifically designed to give consistently low levels of residual metabolites and enzymes.

## **BOVUMINAR (BOVINE ALBUMIN) MICROBIOLOGICAL GRADE POWDER**

Armour's new BOVUMINAR Microbiological Grade Powder is specifically designed for use in the growth of Leptospire and other fastidious organisms. Each lot is tested for its ability to support rapid initiation of growth and a high cell yield of *L. interrogans* serovars pomona, canicola, icterohaemorrhagiae, hardjo, and grippityphosa.

Typical uses are:

- Culture media for growth and isolation of micro organisms
- Nutrient for tissue culture
- Media for veterinary vaccine manufacture
- Other applications in which a Fraction V type albumin would be used.

BOVUMINAR Microbiological Grade Powder has the growth enhancing characteristics of a Fraction V type bovine albumin, but is made by more economical and more modern process technology.

## **OTHER BOVUMINAR PRODUCTS:**

**BOVUMINAR Cohn  
Crystallized Powder**  
(Crystallized Bovine Albumin  
(CBA))

**BOVUMINAR Cohn Modified Powder**  
(Bovine Albumin Powder  
Type H-7)

**BOVUMINAR Standard Solution**  
(Rehavid S-30)

**BOVUMINAR High Avidity Solution**  
(Rehavid HA-30)

**BOVUMINAR Fatty Acid Free  
Standard Solution**  
(Rehavid S-30, S.F.)

**BOVUMINAR Fatty Acid Free  
High Avid Solution**  
(Rehavid HA-30, S.F.)

**BOVUMINAR Fatty Acid Free  
Ultra Avid Solution**  
(Rehavid HP-30, S.F.)

**BOVUMINAR Microbiological Solution**  
(Leptalb® 7 for *Leptospira* growth)

**BOVUMINAR Microbiological Media**  
(PLM™ 5 prepared *Leptospira*  
Medium 5x concentration)

For an interchange of technical information on Armour BOVUMINAR products, call 1-800-431-4505 or write:  
Technical Service Manager,  
Biochemicals, Armour  
Pharmaceutical Company,  
P.O. Box 511,  
Kankakee, IL 60901.



**Armour Pharmaceutical Company**

303 South Broadway, Tarrytown, NY 10591  
1-914-631-8888 • 1-800-431-4505

**Biochemicals – a commitment to the '80s**

## Put Your Instrument



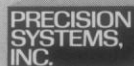
## in This Picture!

The Gilford, B & L, Coleman, P.E. . . whatever you're using, can now have digital data processing with the all new DATASETTE™ — and for less than \$1000.

- Just connect the DATASETTE to the recorder output of your instrument,
- Run standard solutions after telling DATASETTE what units you're measuring,
- DATASETTE stores standards values, select best curve function and fit,
- As you run unknowns, values are calculated and digitally displayed in your units.
- Get tabulated or graphic report for your records with optional printer.

The DATASETTE can also automatically store and record unknown data (pH for example) at preselected intervals, and handle rate reactions.

Call or write today for the complete story on how to improve accuracy, productivity and make a 1985 model out of your instrument.



60 Union Avenue, Sudbury, Mass. 01776  
Telephone: 617-443-8912

Circle No. 81 on Readers' Service Card

## ARE THE MEDIA FAIR TO SCIENCE? IS SCIENCE FAIR TO THE MEDIA?

Read *Reflections on Science and the Media*, a provocative new book by June Goodfield, author of *An Imagined World*, and decide for yourself.

### REFLECTIONS ON SCIENCE AND THE MEDIA

128 pp. 1981

ISBN: 0-87168-252-4

Paper, \$9.00/AAAS member price, \$8.00

Mail order to AAAS Sales Dept. SM6,  
1515 Massachusetts Ave., NW,  
Washington, DC 20005.

Please allow 6-8 weeks for delivery. All orders under \$10.00 must be prepaid.

## Miles-Made Undiluted hormone and drug antisera.

No more compromising. . . Miles introduces a convenient selection of undiluted hormone, drug and protein antisera. These products were formerly available *only* in high dilutions for use in RIA procedures.

Miles-made high-titer antisera offer flexibility and economy for nonisotopic immunoassay and immunohistology as well as RIA.

This listing represents a small sampling of our wide range of new products for research use.

	Host/Form	Code Number
Anti-Amikacin (RSA)	gt/lq	64-804
Anti- $\beta$ HCG. Monoclonal	mo/lq	63-401
Anti-HGH	rb/lq	65-875
Anti-Insulin, Porcine	gt/ly	65-104
Anti-Prostatic Acid Phosphatase	gt/lq	65-304
Anti-T3 (BSA)	rb/lq	65-851
Anti-T4 (BSA)	rb/lq	65-850
Anti-THC (BSA)	gt/lq	61-496
Anti-TSH	rb/lq	65-860

To place an order or obtain complete product information, call or write:

**Miles Scientific**  
Div. Miles Laboratories, Inc.  
30W475 North Aurora Road  
Naperville, IL 60566  
USA  
Tel: Toll-free 800-348-7465  
in Canada, 416-248-0771

**Miles Scientific**  
Div. Miles Laboratories, Ltd.  
Stoke Court, Stoke Poges  
Slough SL2 4LY  
United Kingdom  
Tel: Farnham Common 5151



© 1982 MILES LABORATORIES, INC.

MS-002

## FILMS IN THE SCIENCES

Reviews and Recommendations

Compiled and edited by  
Michele M. Newman and  
Madelyn A. McRae

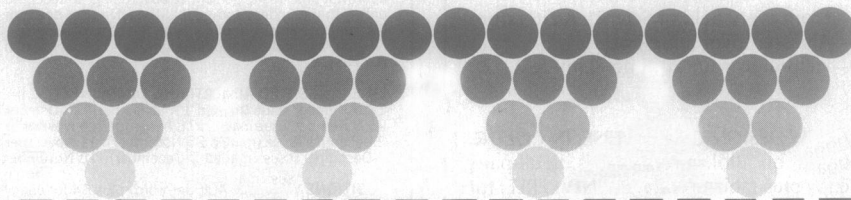
This indispensable reference reviews nearly 1,000 films from all areas of science. It provides detailed summaries, evaluations, and complete ordering information for films appropriate to students, teachers, professionals, and general audiences. The reviews are grouped by Dewey decimal category. Subject-title and film distributor indexes also make them easy to use. A must for the librarian, the science teacher, or the curious browser.

182 pages 1980  
Cloth: ISBN 87168-304-7 \$14.00

American Association for the  
Advancement of Science, Box  
FL6, 1515 Massachusetts  
Avenue, N.W., Washington, D.C.  
20005

# Platelet-Derived Growth Factor

Receptor or Tissue Culture Grade



# Growth Factors Attachment Factors

Special Orders or Bulk Orders

**SERAGEN**

SERAGEN, INC., 54 Clayton Street, Boston, MA 02122

For Free Technical Literature, call toll-free 1-800-343-1346 • In Mass. 1-617-265-6004

Circle No. 119 on Readers' Service Card

## Monoform® Precision Monoclonal Antibodies

Miles makes a selection of monoclonal antibodies to human immunoglobulins to provide specificities appropriate to different applications. Monoclonal antibodies inherently exhibit very consistent properties. Antibodies from different clones exhibit different properties even when they are directed against the same antigen. For example, Monoform® Anti-Human IgG, code no. 63-050, will form visible antigen-antibody complexes in liquid, while Monoform® Anti-Human IgG, code no. 63-051, will form precipitin complexes in agarose gel. Miles offers variety so you can select antibodies suitable to your research or manufacturing needs.

Monoform® Monoclonal Antibodies are partially purified from the ascites fluid of tumor bearing mice carrying hybridomas produced by the fusion of splenocytes from immunized mice with cells from the mouse myeloma line NS-1.

Monoform Antibodies	Code No.	Ig Class	ELISA Titer	Clone
IgE	63-058	IgG <sub>2b</sub>	5X10 <sup>3</sup>	GE-1
IgG Lppt	63-050	IgG <sub>1</sub>	1X10 <sup>4</sup>	GG-5
IgG Gppt	63-051	IgG <sub>1</sub>	1X10 <sup>4</sup>	GG-4
IgG (Fc)	63-071	IgG <sub>1</sub>	5X10 <sup>3</sup>	GG-7
IgG (Fab)	63-070	IgG <sub>1</sub>	5X10 <sup>3</sup>	GG-6
IgG <sub>1</sub> (Fab)	63-080	IgG <sub>1</sub>	1X10 <sup>3</sup>	SL-16
IgG <sub>1</sub> (Fc)	63-060	IgG <sub>1</sub>	8X10 <sup>2</sup>	SG-11

Monoform Antibodies	Code No.	Ig Class	ELISA Titer	Clone
IgG <sub>1+2</sub> (Fab)	63-065	IgG <sub>2a</sub>	7X10 <sup>3</sup>	SL-13
IgM	63-055	IgG <sub>2b</sub>	1X10 <sup>3</sup>	MB-11
λ-Chains	63-067	IgG <sub>1</sub>	1X10 <sup>4</sup>	LA-84
κ-Chains	63-068	IgG <sub>1</sub>	1X10 <sup>4</sup>	KP-53
Alkaline Phosphatase Conjugates:				
IgG	63-270	IgG <sub>1</sub>	8X10 <sup>2</sup>	GG-5
IgM	63-271	IgG <sub>2b</sub>	8X10 <sup>2</sup>	MB-11

Monoform® Monoclonal Antibodies against hormones and mouse lymphocyte markers are also available. For quality in immunochemicals, specify Miles Scientific. Call or write for more information.

**Miles Scientific**  
Div. Miles Laboratories, Inc.  
30W475 North Aurora Road  
Naperville, IL 60566  
USA  
Tel: Toll-free 800-348-7465  
In Canada, 416-248-0771

**Miles Scientific**  
Div. Miles Laboratories, Ltd.  
Stoke Court, Stoke Poges  
Slough SL2 4LY  
UNITED KINGDOM  
Tel: Farnham Common 5151

© 1982 Miles Laboratories, Inc.



**MILES**

MS-001

## BIOLOGIZING THE UNIVERSE

By B. B. Stoller, Ph.D.  
Biologist, Chemist, Inventor, Grower

### THIS BOOK IS FULL OF ORIGINAL IDEAS

- From every field of Science & Literature
- Amassed over a lifetime
- Helpful in your attitude & interest

**A NEW DESIGN OF UNIVERSE, IN COLOR,** based on Biol. prerogatives, (Full-page copy plus table of data, etc. sent FREE, for the asking).

Meaning of 'Impossible' for Creative Discovery: Evolution is Nature doing the Impossible! Now that Nature has evolved us, We overtake Nature & do the Impossible!

"Nothing is Impossible to Humans,"  
*Jesus*

"Impossible is only Seemingly Impossible!"

"Slaughter Impossible, & make what can't be done, slight work." *Shak.*

### MORE IDEAS

Laws of Nature as Transitory as Life-span. Anything done—has to be changed, improved—or a point of departure for new creations.

Life is an Essential Constant, like proton, of Univ. "Built into physical laws, given approx, conditions, it appears Life is inevitable." *J. Ferris, ed. O' of Life.*

Precise: Laws & Processes of Universe. Determined. Precarious: Existence of Life & its evolution. Undetermined.

Imagination is prophetic thinking preceding practice. Human contact with Creativeness of Universe is thru Nature. Our Goal is to discover Creativeness of Universe.

### Recently Announced:

Computers shrinking to "Molecular Computer." "If Nature can do it, why can't we?" (F. L. Carter) Yes. We overtake and surpass Nature!

Read this book for 30 days: If you do not agree this book may have a significant impact on Future of Humanity you may return it for a refund.

400 pages, Index: Paper cover, \$14.50; Hard cover, \$20.00 post paid.

**PROSPERO PUBLISHERS**  
P.O. Box 7615  
Santa Cruz, CA 95061-7615

# Personnel Placement

SCIENCE publishes each Friday, except the last Friday of the year. Advertising is accepted only in writing; no abbreviations. 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:**  
18 November issue (mailed 11 November): **28 October**  
25 November issue (mailed 18 November): **4 November**  
2 December issue (mailed 25 November): **11 November**  
9 December issue (mailed 2 December): **18 November**

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

**LINE DISPLAY (POSITIONS OPEN, COURSES, FELLOWSHIPS, MARKETPLACE, and so forth):** \$9.80 per millimeter; \$245 minimum, per insertion (minimum charge covers 25 millimeters on a single column; 25 millimeters equals 10 lines of 50 spaces per line). No charge for use of box number. No agency commission for ads less than 103 millimeters (4 inches). No cash discount. Prepayment required for all foreign ads. Purchase orders and billing information required for all other advertising.

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

**SCIENCE, Room 107**  
1515 Massachusetts Avenue, NW  
Washington, D.C. 20005  
Telephone: 202-467-4456

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

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

Blind ad replies should be addressed as follows:

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

## POSITIONS WANTED

**Biotechnology.** Ph.D. with more than 10 years of experience in industry is seeking a position to advise and/or direct a program in biotechnology. Possesses an excellent overview and is well versed in both industrial and academic sectors. Box 296, SCIENCE. X

**Electron Microscopist, B.A.,** extensive TEM/SEM/photography background; course instructor, supervisory experience, independent research; 17 years of experience. Seeks university/industrial position in South Florida or Southern California. Box 240, SCIENCE. X

**Electron Microscopist/Laboratory Manager/Research Scientist.** Ph.D. (geology), 15 years of experience with TEM, SEM, and electron microprobe. Numerous publications on EM technique. Familiarity with a wide variety of geological, nongeological, and biological specimens including human tissue and tissue culture. Seeking position in the New York City tri-state area in a research/training unit in academia, government, or industry. For résumé, write: Box 294, SCIENCE. X

**Environmental Biologist.** M.S. Experienced in field surveys, zoological and botanical sampling techniques, use of entomological controls. Strong background in organic chemistry. U.S. government experience. Seeks professional position. Theresa Koschny, 5704 Robinwood Lane, Falls Church, Virginia 22041.

**Neuroscience Program,** interested in relocating. Nationally recognized, five principal investigators plus support staff. Human, animal, and cellular multidisciplinary research: neurophysiology; psychobiology; psychophysiology; computer modeling; development; neuroimmunology. Clinical services: electroencephalography; neurosensory assessment; polysomnography; neuropsychological assessment. Request program outline. Box 283, SCIENCE. X

10/28; 11/4, 11

## POSITIONS WANTED

**Versatile Microbiologist** operating at postdoctoral level seeks research position. Interested in nutrition, motility, energy flow, ecology, mode of action of toxicants, and others. Many publications. 7225A Amherst Avenue, St. Louis, Missouri 63130. 10/28; 11/4, 11

**Molecular Biologist/Enzymologist.** Ph.D. 1981. Research experiences in molecular virology, recombinant DNA technology, enzymology, and protein purification. Seeking research position in academia or industry. Box 295, SCIENCE. X

**Ph.D. Pharmacologist.** Five years of industrial experience with expertise in cancer chemotherapy, anti-metastasis, reverse transformation, and carcinogenesis research. Desires industrial research position. Box 279, SCIENCE. X

**Physiologist/Computer Science.** Ph.D. (1982). Cardiovascular/hemodynamics. Experience: in vivo cardiovascular measurements and models, chronic and acute; 2 years of postdoctoral experience: regional alpha-adrenergic VSM control. Publications. Academic/government/hospital/industry. Box 289, SCIENCE. 10/28; 11/4

**As President/CEO I will help form or increase profits/sales** of your existing biotechnology/life science/health care company. Box 284, SCIENCE, or telephone: 617-965-6340. 10/28; 11/4, 11

**Research/Technical Liaison.** English-Japanese fluency, Ph.D. More than 10 years of academic/industrial experience in analytical/biochemical/instrumental. Chemical, pharmaceutical, instrumentation areas; will travel. Box 293, SCIENCE. 10/28; 11/11

## POSITIONS OPEN

**Assistant Director for Business Affairs**  
**Institute for Advanced Biomedical Research**  
**Oregon Health Sciences University**

The Oregon Health Sciences University will be opening a new 72,000-square-foot facility dedicated to current research in neurobiology, utilizing state-of-the-art techniques of molecular biology.

The director of the institute seeks an experienced scientific administrator to aid in the planning, oversight of construction, and occupation of the new facility, as well as ongoing general administrative oversight.

The incumbent will be responsible for supervising some administrative staff, maintaining the fiscal records of the Institute, providing liaison to university offices and other staffs, and aiding in the general management of the facility.

Administrative skills or experience in the administration of scientific research is required with such experience in a university or research laboratory being highly desirable. A minimum of a baccalaureate degree is required with advanced degrees being desirable.

Applications or nominations for the position should be sent to:

**Dr. Edward Herbert, Director (L101)**  
**Institute for Advanced Biomedical Research**  
**Oregon Health Sciences University**  
3181 S.W. Sam Jackson Park Road  
Portland, Oregon 97201

For full consideration, nominations or applications should be submitted by 1 January 1984.

*The Oregon Health Sciences University is an Equal Opportunity Employer.*

**ASSISTANT PROFESSOR—Tenure-track position** in anatomy department beginning July 1984. Candidates should have Ph.D. with postdoctoral research experience and ability to obtain or already have extramural grant support. Research interest in cell biology desired, especially in areas such as membrane structure and function. Individuals will participate in teaching in one of the areas of anatomy and ultimately will develop a graduate course in their area of expertise. Superb research facilities available in new building. Send curriculum vitae, brief statement of research interests, and names of three references by 15 December to:

**Gary E. Wise, Ph.D.**  
**Chairman, Department of Anatomy**  
**Texas College of Osteopathic Medicine**  
**Camp Bowie and Montgomery**  
**Fort Worth, Texas 76107-2690**

*An Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

### ASSISTANT/ASSOCIATE PROFESSOR

University of California, Irvine, Department of Pathology, is recruiting for a faculty position at the assistant/associate professor level. Required: M.D., must be Board-certified or -eligible in anatomic/clinical pathology and eligible for licensure in California. Duties include helping direct the morphologic hematology/coagulation/blood bank areas of the clinical laboratory. This involves teaching residents and technologists as well as medical students in the clinical pathology course. A research program will also be expected and basic or clinical research background and experience is essential. Send curriculum vitae and references to: **Henry Simpkins, M.D., Ph.D., Chief, Division of Laboratory Hematology/Blood Bank, University of California, Irvine, Department of Pathology, 101 City Drive South, Orange, California 92668**, by 28 November 1983.

*Affirmative Action Employer*

The Department of Aeronautics and Astronautics, Stanford University, seeks an outstanding person for appointment as a tenure-track **ASSISTANT PROFESSOR** in the field of **aerospace vehicle synthesis and design**, including the use of optimization methods. The successful candidate must show understanding of the complex, creative process whereby such disciplines as fluid mechanics, propulsion, structures, guidance, and control are fused into balanced, optimized design of a vehicle to meet exacting specifications on mission performance and efficiency. Candidates should be able to demonstrate clear promise of attaining excellence in both teaching and research. Experience with an industrial organization or a government laboratory is desirable.

*Stanford is an Affirmative Action Employer and welcomes applications from women and minority candidates.* Inquiries should be made to: **Professor Holt Ashley, Department of Aeronautics and Astronautics, Durand Building-Room 369, Stanford University, Stanford, California 94305**; telephone: 415-497-4136.

Baylor College of Medicine is seeking an individual with experience in **bioanalytical chemistry** for the Institute for Lipid Research and the Department of Internal Medicine at the level of **ASSISTANT PROFESSOR TO PROFESSOR** depending upon qualifications. The position will involve a commitment to independent research and offers an excellent opportunity for future advancement and career development. Candidates should have a demonstrated expertise in the use of mass spectrometry for the solution of biomedical research problems. Send curriculum vitae and request three letters of reference to: **Dr. J. R. Mitchell and Dr. E. C. Horning, Room 826E, Baylor College of Medicine, 1200 Moursund, Houston, Texas 77030**. *An Equal Opportunity/Affirmative Action Employer.*

**ASSISTANT PROFESSOR.** The Department of Medicine at the Brigham and Women's Hospital and Harvard Medical School in Boston is seeking applicants with the M.D. degree for an assistant professorship within the Renal Division. The position requires at least 5 years of postdoctoral experience in the study of renal epithelial ion transport utilizing in vitro tubule microperfusion techniques. The individual selected will be expected to conduct independent research, and supervise the training of postdoctoral research fellows. Recognized excellence in basic science and clinical teaching and a strong background in internal medicine and clinical nephrology are deemed essential. Send curriculum vitae and references to: **Dr. B. M. Brenner, Director, Renal Division, Brigham and Women's Hospital, 75 Francis Street, Boston, Massachusetts 02115**. *Women and members of minority groups are encouraged to apply.*

### ASSISTANT PROFESSOR—ANATOMY

The Section of Morphological Sciences, University of Southern California School of Dentistry, invites applications for a tenure-track appointment at the level of assistant professor available 1 July 1984. Candidates must have a Ph.D. degree in anatomical sciences; postdoctoral experience is desirable. Requirements include demonstrated research capabilities and excellence or the potential for excellence in teaching gross anatomy to dental students, dental hygiene students, and postdoctoral (D.D.S.) specialist candidates. Applicants should send their curriculum vitae, a concise statement of research achievements and goals, and the name of three references to: **Dr. William H. Crawford, Jr., Dean, School of Dentistry, University Park MC-0641, University of Southern California, Los Angeles, California 90089-0641**. The application deadline is 1 March 1984.

## POSITIONS OPEN

**ANALYTICAL CHEMISTRY:** Seek Ph.D. holders for tenure-track assistant/associate professor position starting August 1984. Rank dependent upon qualifications. Research interest may be in any analytical chemistry area or at the interface of analytical and other areas of chemistry. Apply with complete résumé, undergraduate and graduate transcripts, a description of research plans, plus three reference letters by 15 November (or until suitable candidate located) to: **Professor Michael L. Gross, Department of Chemistry, University of Nebraska-Lincoln, Lincoln, Nebraska 68588-0304**. *Affirmative Action/Equal Opportunity Employer.*

**ASSISTANT PROFESSOR.** Applications are invited for a position at the level of assistant professor (tenure track) in the Department of Chemistry at Stanford University with primary teaching responsibility in organic chemistry. Applicants must be strongly motivated toward research and have a commitment to teaching undergraduates as well as graduates. In applying, send curriculum vitae, list of publications, a brief statement of research interests (three pages or less), and, in addition, have three letters of recommendation sent to: **Professor John Ross, Chairman, Department of Chemistry, Stanford University, Stanford, California 94305**. *Stanford is committed to Equal Opportunity through Affirmative Action in employment, and we are especially eager to identify minority persons and women with appropriate qualifications.* Applications should be received by 30 November 1983.

**FACULTY POSITION, CHEMISTRY.** Applications are invited for a tenured senior appointment in the Department of Chemistry at Stanford University with primary teaching responsibility in organic chemistry. Applicants must have outstanding research credentials and a strong commitment to teaching undergraduates as well as graduates. In applying, send curriculum vitae and bibliography to: **Professor John Ross, Chairman, Department of Chemistry, Stanford University, Stanford, California 94305**. *Stanford is committed to Equal Opportunity through Affirmative Action in employment and we are especially eager to identify women and minority persons with appropriate qualifications.* Applications should be received by 30 November 1983.

## POSITIONS OPEN

**ASSISTANT PROFESSOR.** Genetics, physiology, and/or biochemistry of plant host-pathogen interactions. Graduate teaching/research; tenure track; 12-month appointment. Ph.D. required. Available 1 July 1984. Send résumé, including statement of research and teaching interests, transcripts, and four letters of recommendation before 1 February 1984 to: **Dr. G. A. Bean, Department of Botany, University of Maryland, College Park, Md. 20742**. *Equal Opportunity/Affirmative Action Employer.*

**ASSISTANT PROFESSOR IN ANATOMY,** starting August 1984. Applicants must have Ph.D. in anatomical sciences and experience in teaching medical or dental gross anatomy and/or histology. Research that applies morphometric analysis to the study of problems of reproductive biology will be given preference. Qualified applicants send curriculum vitae and names of three references to: **Dr. Rex Montgomery, Acting Head, Department of Anatomy, BSB, University of Iowa, Iowa City, Iowa 52242**. Closing date: 31 December 1983.

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

### ASSISTANT PROFESSOR BIOCHEMISTRY OR MOLECULAR BIOLOGY

The Department of Biology at Northeastern University is seeking applicants for a tenure-track position to become available in September 1984. Candidates must have a Ph.D. or equivalent degree with post-doctoral experience and must demonstrate a high potential for developing a strong, funded research program. Although no specific research areas will be excluded from consideration, some preference will be given to candidates with a background in molecular genetics, nucleic acid biochemistry, or protein biosynthesis. The successful candidate will be expected to contribute to developing undergraduate and graduate teaching programs. Applicants should submit curriculum vitae, general statement of research plans, and names of three references by 2 December 1983 to: **Professor Phyllis Strauss, Chairperson, Biochemistry Search, Department of Biology, Northeastern University, 360 Huntington Avenue, Boston, Mass. 02115**. *Northeastern is an Equal Opportunity/Affirmative Action/Title IX University.*

## Ortho Agricultural Chemicals Division

We are seeking creative biotechnologists with proven innovative ability to expand our Biological Research effort. Career opportunities are available now; additional positions will be open in 1984. Our research facilities are in the San Francisco Bay Area with new buildings scheduled for completion soon.

Successful applicants will have a PhD in Biochemistry, Microbiology, Molecular Biology, Plant Physiology or related disciplines. Post-doctoral experience is desirable. Successful candidates will work in a multidisciplinary group including molecular biologists, biochemists, microbiologists and biophysicists. Ability to communicate with professionals in related disciplines such as chemists and plant pathologists is essential. Our research goal is to develop safe microbial or chemical products for agricultural use in improving crop productivity.

### Plant Physiologist

Substantial knowledge and experience in apoplastic and/or symplastic transport in plants, preferably in the area of xenobiotics, is desirable. Experience in xenobiotic activation/deactivation or safener/antidote biochemistry will also be considered. The successful candidate will study mechanisms toward relative pesticidal effectiveness.

### Molecular Biologist

Substantial knowledge and experience in *Bacillus* molecular biology with particular emphasis on genetic cloning is desirable. Some knowledge of plant systems is preferred. The successful candidate will establish a gram positive cloning system for biological control of plant diseases.

Send resumes to:

**C.R. Redus  
Chevron Chemical Company  
940 Hensley Street  
Richmond, CA 94804**



**Chevron Chemical Company**

**A Standard Oil Company of California Subsidiary**

**An Equal Opportunity/Affirmative Action Employer**

## POSITIONS OPEN

Department  
of  
Biology



University  
of  
Pennsylvania

Applications are invited for the position of **assistant professor of biology**. Candidates should have (i) demonstrated their potential for initiating and sustaining an excellent research program and (ii) have a serious commitment to undergraduate and graduate teaching. Although we are especially interested in scientists with research programs centered in invertebrate neurobiology, the quality of the candidate is of primary importance.

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

**Assistant Professor Search Committee**  
Office of the Chairman  
Department of Biology  
University of Pennsylvania  
Philadelphia, Pennsylvania 19104

*The University of Pennsylvania is an Equal Opportunity Employer and welcomes applications from women and members of minority groups.*

### ASSISTANT PROFESSOR OF MICROBIOLOGY

The Department of Microbiology, University of Illinois, Urbana, invites applications for a tenure-track appointment at the assistant professor level. The position is available for August 1984. Applicants must have a Ph.D. and at least 2 years of postdoctoral experience. Preference will be given to applicants with expertise in recombinant DNA technology (including DNA sequencing and in vitro mutagenesis) who plan to study contemporary problems in prokaryotic molecular genetics. Candidates working in the area of agriculturally important microorganisms are especially encouraged to apply. The appointee is expected to establish a vigorous research program, to participate in undergraduate and graduate teaching, and to supervise graduate students. Salary is commensurate with education and experience.

Applicants should send curriculum vitae, a summary of future research interests, and the names and addresses of three references to: **Dr. J. Gardner, Department of Microbiology, University of Illinois, 131 Burrill Hall, 407 South Goodwin, Urbana, Illinois 61801 (telephone: 217-333-7287)**. Applications received after 1 December 1983 may not receive full consideration. *The University of Illinois is an Equal Opportunity/Affirmative Action Employer.*

**THE DEPARTMENT OF MICROBIOLOGY, UNIVERSITY OF GUELPH**, invites applications for a tenure-track position as **ASSISTANT PROFESSOR**. This position is additional to the position recently advertised which included research interests in fermentation or ultrastructure. Applicants should have a Ph.D., be able to teach microbiology at undergraduate and graduate levels, and have research interests in immunochemistry and hybridoma technology. The department has 16 faculty members, and offers an extensive undergraduate program in microbiology, as well as M.Sc. and Ph.D. degrees in the physiology, structure, genetics, and ecology of microorganisms; virology, and microbial technology. There are particular research emphases in microbial technology, molecular biology, ultrastructure, and fish pathogens. Applicants should send curriculum vitae and the names of three references by 15 December 1983 to: **Dr. K. F. Gregory, Chairman, Department of Microbiology, College of Biological Science, University of Guelph, Guelph, Ontario, Canada N1G 2W1**. Position subject to final budgetary approval. *In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada.*

### ASSISTANT PROFESSOR—MICROBIOLOGY

The Department of Biology at Northeastern University is seeking applicants for a tenure-track position to become available in September 1984. Candidates must have a Ph.D. or equivalent degree with postdoctoral experience in an area of microbiology and must demonstrate a high potential for developing a strong, funded research program. The successful candidate will be expected to contribute to undergraduate and graduate teaching in microbiology. Applicants should submit curriculum vitae, general statement of research plans, and names of three references by 2 December 1983 to: **Professor David C. Wharton, Chairman, Department of Biology, Northeastern University, 360 Huntington Avenue, Boston, Mass. 02115**. *Northeastern is an Equal Opportunity/Affirmative Action/Title IX University.*

## POSITIONS OPEN

### ASSISTANT OR ASSOCIATE PROFESSOR OF PHARMACOLOGY

The Department of Pharmacology at the University of Vermont College of Medicine invites applications for a tenure-track position. Applicants for assistant professor level should have Ph.D. and two or more years of postdoctoral training, or the M.D. degree and equivalent research training. Candidates must demonstrate outstanding teaching ability and excellence in independent research, and have strong commitments to both activities. The successful candidate will be expected to fulfill moderate teaching responsibilities in medical, undergraduate, and graduate courses with distinction, and to establish a vigorous and productive independent research program that merits extramural support. Preference will be given to those whose research areas complement those of the existing faculty who are studying the vasculature and its innervation, and to those willing and able to teach in areas other than their specialties. *Women and minority candidates are encouraged to apply.* Letters of application, curriculum vitae, a brief description of research and career goals, and the names of three references must be received by 28 November 1983. Address to: **Chairman, Search Committee, Department of Pharmacology, University of Vermont College of Medicine, Burlington, Vt. 05405**.

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

**ASSISTANT PROFESSOR OF PHYSICAL CHEMISTRY**. A tenure-track position is available for September 1984 at the assistant professor level. The department wishes to fill this position with an experimental physical chemist. Preference will be given to candidates with research interests in the modern spectroscopy of molecules. Individuals are sought with the potential for combining excellence in teaching with an innovative research program. Applications will be accepted up to 15 December 1983. Send résumé, three letters of recommendation, and summary of research plans to: **Dr. T. P. Fehlner, Department of Chemistry, University of Notre Dame, Notre Dame, Indiana 46556**. *The University of Notre Dame is an Equal Opportunity/Affirmative Action Employer.*

### ASSISTANT RESEARCH PROFESSOR RESPIRATORY PHYSIOLOGY

Applicants are invited for an assistant research professorship (nontenured track) available commencing 1 September 1983. Applicant should have postdoctoral experience in some area of respiratory physiology. Level of salary commensurate with education and experience. Applicant should submit a letter of application, curriculum vitae, and names of three individuals to serve as references.

Reply to: **Dr. D. T. Frazier, Chairman, Department of Physiology and Biophysics, University of Kentucky, Lexington, Ky. 40536-0084**.

*The University of Kentucky is a nondiscriminatory, Affirmative Action Employer.*

**ASSOCIATE DEAN OF PRECLINICAL EDUCATION**. Applicants and nominations are invited for this 12-month administrative position. The associate dean is responsible for planning, organizing, evaluating, and directing all aspects of preclinical education including fiscal management. The position requires an individual with an earned doctorate, strong leadership and administrative skills, a commitment to academic excellence, and a distinguished record as an educator at the graduate level. Submit curriculum vitae and three references by 31 December 1983 to: **Dr. William G. Robertson, Chairman, Search Committee, The Oklahoma College of Osteopathic Medicine and Surgery, 1111 West 17 Street, P.O. Box 2280, Tulsa, Oklahoma 74101**. *An Affirmative Action/Equal Opportunity Employer.*

**BIOLOGISTS**, fall 1984, tenure-track assistant professors. Ph.D., postdoctoral, teaching experience required. Expected to establish fundable research program. (i) **PHYSIOLOGICAL PLANT ECOLOGIST**, teach M.S. courses in plant and physiological ecology, participate in general biology and ecology. (ii) **CELL PHYSIOLOGIST**, prefer specialty in cellular neuro-, muscular, or membrane physiology, teach M.S. courses in specialty, undergraduate courses in physiology. Submit curriculum vitae, names of three references, and statement of future goals by 25 November 1983 to: **Dr. J. P. Chinnici (ecologist) or Dr. J. K. Stewart (physiologist), Department of Biology, Virginia Commonwealth University, Richmond, Va. 23284**. *Equal Opportunity Employer.*

## POSITIONS OPEN

### QUEEN'S UNIVERSITY DEPARTMENT OF PHYSIOLOGY

A vacancy exists for an **assistant professor of physiology** with particular competence in endocrinology and whose research interests are directed towards neuro- or molecular endocrinology. The applicant should have the Ph.D. and/or M.D. degree with at least 2 years of postdoctoral experience, and will be expected to develop an active research programme and to participate in the undergraduate and graduate teaching of the department. The position will be available on appointment. *In accordance with Canadian immigration requirements priority will be given to Canadian citizens and permanent residents.* Applicants should submit a curriculum vitae, a brief statement of research interests and objectives, selected reprints, and the names of three referees from whom confidential assessment of research and teaching abilities may be obtained to: **Dr. D. B. Jennings, Chairman, Search Committee, Department of Physiology, Queen's University, Kingston, Ontario, Canada K7L 3N6**.

### BIOLOGY INSTRUCTOR

Full-time, 9-month faculty position in a community college with an enrollment of 6000 students, located 40 miles west of Chicago. Minimum requirements: master of science degree with a major in biology or biology education. Minimum of 2 years full- or part-time teaching experience in biological science in an educational institution. Salary according to education and experience; minimum \$14,935. Liberal fringe benefit program for employee and dependents. Contact: **Personnel Department, Wau-bensee Community College, Sugar Grove, Illinois 60554, Telephone 312-466-4811, ext. 214**. Application deadline: 11 November 1983. *An Equal Opportunity Employer.*

Michigan State University invites nominations and applications for the **CHAIRPERSON** of Department of Animal Science. An earned doctorate in animal science, dairy science, poultry science, or related discipline is required. Experience in research, teaching, or extension is desired. Candidates must possess potential administrative leadership to assist in development and growth of faculty and programs of animal science. Position available 1 March 1984. Closing date for applications is 31 January 1984, or until a suitable candidate is found. A letter of application, résumé, and four letters of reference should be sent to: **Dr. H. Allen Tucker, Search Committee Chairperson, Department of Animal Science, 230 Anthony Hall, Michigan State University, East Lansing, Mich. 48824-1225**. *Michigan State University is an Equal Opportunity/Affirmative Action Employer.*

**CLINICAL IMMUNOLOGIST**. The Department of Pathology, Case Western Reserve University School of Medicine, and University Hospitals of Cleveland has an opening for a **director** of its clinical immunology laboratory. The director should foster close interactions with the clinical services, supervise the training of residents, and develop an independent program of high-quality clinical or basic research. Experience and interest in cell sorting advisable. Facilities are excellent. Salary and rank (tenure or tenure track) commensurate with experience and qualifications. The new director will later participate in the choice of a junior, tenure-track associate. In applying, send curriculum vitae, bibliography, selected reprints, names of three references, and a brief statement of experience and future research plans to: **Michael E. Lamm, M.D., Director, Institute of Pathology, Case Western Reserve University, 2085 Adelbert Road, Cleveland, Ohio 44106**. *An Equal Opportunity/Affirmative Action Employer.*

**IMMUNOLOGIST/PARASITOLOGIST**. The Department of Pathology, Case Western Reserve University School of Medicine, has a tenure-track opening for research in **AMEBIASIS**. Excellent opportunities for collaboration with immunologists and parasitologists. Background in amebiasis not necessary if the applicant has other appropriate qualifications in immunology and/or parasitology and is willing to make a major commitment in this area. Salary and rank commensurate with experience. In applying, send curriculum vitae, bibliography, selected reprints, names of three references, and a brief statement of accomplishments to: **Michael E. Lamm, M.D., Director, Institute of Pathology, Case Western Reserve University, 2085 Adelbert Road, Cleveland, Ohio 44106**. *An Equal Opportunity/Affirmative Action Employer.*

**COLLEGE OF AGRICULTURAL AND  
ENVIRONMENTAL SCIENCES  
UNIVERSITY OF CALIFORNIA, DAVIS**

Inquiries are invited from qualified applicants for **FACULTY POSITIONS** (tenure-track) available in these areas:

**ASSISTANT PROFESSOR.** Research on genetics and improvement of oilseed, fiber, or industrial crop products; teaching in crop genetics and crop production. Apply to: **J. Neil Rutger, Department of Agronomy and Range Science**, by 1 February 1984. Position available 1 June 1984.

**ASSISTANT PROFESSOR,** avian molecular geneticist. Background in somatic cell genetics, molecular biology, cell biology, or virology. Experience with avian material preferred. Apply to: **B. W. Wilson, Department of Avian Sciences**, by 15 November 1983. Position available 1 January 1984.

These positions are to be filled at the assistant professor, 11-month salary level (unless other rank is indicated above). The positions have responsibilities for teaching, advising, and research (in the Agricultural Experiment Station). Candidates should have a Ph.D. in an appropriate field and teaching and research experience. Applicants should submit résumé, transcripts (if within 5 years of graduation), statement of research and teaching experience, list and reprints of publications, and the names and addresses of at least three persons familiar with the applicant's qualifications, to individual and department as noted for position (department name), **University of California, Davis, Calif. 95616**. Please indicate the position in which you are interested. The completed application must be received by date indicated for each position. *In compliance with federal and state laws and University policy, the University of California does not discriminate on the basis of race, color, national origin, religion, sex, handicap, age, or against disabled veterans or veterans of the Vietnam era. The University of California is an Affirmative Action/Equal Opportunity Employer.*

# Cell and Molecular Biology POSTDOCTORAL POSITIONS

Funded postdoctoral positions are available from time to time in the Cell Biology Group at the Worcester Foundation for Experiment Biology, a basic research institute situated on a semi-rural campus 35 miles west of Boston. The faculty and their research interests are:

Earl Baril: Enzymology of eukaryotic DNA replication  
Edward Berger: Cell-cell interactions and differential gene expression in *Dictyostelium*  
William Crain: Structure and developmental expression of sea urchin actin genes  
Grant Fairbanks: Cation transport and molecular organization of the erythrocyte membrane  
Jay Greenberg: Messenger RNA-binding proteins and control of protein synthesis  
Thoru Pederson: Nuclear ribonucleoproteins and messenger RNA processing  
Harriet Robinson: Retroviruses, oncogenes, cell growth and differentiation

Greenfield Sluder: Timing and molecular control of mitotic events during early development  
David Steffen: Murine leukemia virus gene expression and oncogenicity  
Richard Vallee: Microtubule-associated proteins, mitosis and cytoskeleton function  
Samuel Wadsworth: Gene expression during development in *Drosophila*  
Robert Weibing: Actin and actin-associated proteins in relation to cytoskeleton organization  
George Witman: Structure, biochemistry and function of *Chlamydomonas* flagella; sperm maturation  
Paul Zamecnik: Nucleotide-enzyme interactions involved in DNA replication  
Carol Ziomek: Membrane structure and cell polarity in early mouse development

The institute is founded on a strong basic research philosophy and fosters an open, collegial environment conducive to scientific interactions.

Send curriculum vitae, these research synopsis and names of references to faculty member(s) of interest. Cell Biology Group (P2), C/O PERSONNEL OFFICE, Worcester Foundation for Experimental Biology, 222 Maple Avenue, Shrewsbury, MA 01545



an equal opportunity/affirmative action employer

## WORCESTER FOUNDATION FOR EXPERIMENTAL BIOLOGY

## DIRECTOR, DIVISION OF KIDNEY, UROLOGIC, AND HEMATOLOGIC DISEASES

and Associate Director for Kidney, Urologic, and Hematologic Diseases (dual positions)

The National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases invites nominations and applications for the position of Director, Division of Kidney, Urologic, and Hematologic Diseases (KUHD). The candidate must be internationally recognized within the scientific community as an authority in kidney diseases. In addition, the candidate should demonstrate an interest and a commitment to urologic and hematologic diseases. This Institute conducts, fosters, and supports research and research training in the prevention, management, and cure of arthritis, and related bone and skin diseases, diabetes and related endocrine and metabolic diseases; kidney, urologic and hematologic diseases, and digestive diseases. Programs encompass intramural laboratory research and extramural (grants and contracts) activities in fundamental arthritis, diabetes, digestive and kidney disorders.

The Director, serves as the primary official with responsibility for planning and executing the Institute's extramural programs in kidney, urologic, and hematologic diseases, including: basic and applied research, training fellowships and institutional training awards, multipurpose centers of research, clinical trials, technological development and application of research findings; and collection and dissemination of reliable data and information, budget development, and advising and participating with outside voluntary health organizations and the National Advisory

Council in identifying and assessing the needs and requirements for research and manpower development in categorical diseases. Additionally, the incumbent serves as principal advisor to the Institute Director on matters and policies pertaining to these areas. Also, the incumbent will conduct intramural research projects in the areas of kidney and related diseases.

This is a Civil Service position in the Senior Executive Service (SES), with a salary range from \$56,945 to \$63,800 per annum, depending on qualifications. Currently the payable salary is limited to \$63,800. Physicians may be eligible for an additional comparability allowance up to \$10,000 per year. (Alternatively, candidates may be eligible for appointment in the Commissioned Corps of the U.S. Public Health Service). Mandatory professional/technical qualifications are a medical degree, or Ph.D. degree in a health or health related science (or equivalent) and research program administration and/or clinical experience in kidney diseases. Further information on these qualifications are available by contacting Syd Carter, Personnel Management Specialist, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Building 31, Room 9A34, Bethesda, Maryland 20205, (301) 496-4231.

Mandatory managerial/executive qualifications include evidence of management of a basic or clinical research program, demonstrating ability to assume leadership

responsibilities in developing program goals; representing the program to outside groups; directing program planning, execution, and evaluation; and conducting a fair and equitable employment program, including the attainment of EEO objectives.

Candidates who meet the mandatory qualifications will be further evaluated by the Search Committee on the degree to which they exceed the mandatory managerial/executive qualifications, and on the following desirable qualifications: scientific reputation/peer recognition, training and education, leadership of a basic or clinical research or research administration program, and honors and awards.

**APPLICATIONS (PERSONAL QUALIFICATIONS STATEMENT SF-171) should be sent to Mr. Clifford Moss, Executive Secretary, Search Committee for Director, KUHD, Building 31, Room 9A34, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Bethesda, Maryland 20205, telephone (301) 496-4231. All applications must be postmarked before November 30, 1983.**

A current curriculum vitae and bibliography must accompany all applications. Applications from women and/or minority group members are especially solicited. Department of Health and Human Services Public Health Service National Institutes of Health National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases

AN EQUAL OPPORTUNITY EMPLOYER

## POSITIONS OPEN

The Department of Biochemistry, Purdue University, is seeking a **BIOCHEMIST** for a tenure-track position at the level of assistant professor. Preference will be given to individuals who are investigating the biochemistry of the cell surface, including, but not limited to, biosynthesis of cell surface components, cell-cell interactions, immunology of the cell surface, and membrane-cytoskeletal interactions. We desire an individual who will interact effectively with the ongoing research activities of investigators in this and other departments of Purdue University.

Applicants should submit curriculum vitae, the names of three people who can supply letters of reference, and a concise statement of future research plans. Evidence that the candidate has the potential to develop a vigorous, independent research program and to participate effectively in the teaching program of this department are essential. Information should be sent to: **Dr. Mark Hermodson, Head, Department of Biochemistry, Purdue University, West Lafayette, Ind. 47907. Telephone: 317-464-1637. Purdue University is an Equal Opportunity/Affirmative Action Employer.**

### CHAIRMAN, COMPUTER AND ELECTRONICS DEPARTMENT

The Armed Forces Radiobiology Research Institute is seeking an individual to serve as chairman of the Computer and Electronics Department. This Institute, a command of the Defense Nuclear Agency, is the principle radiobiology research laboratory for the Department of Defense. The chairman supervises approximately 25 employees involved in instrumentation design, software design, and biomedical and electronic equipment maintenance. The chairman is responsible for directing the design and development of electronic and computer devices which advance radiobiology research: for developing advanced equipment for the capture, conversion, and transmission of data; and for designing instrumentation systems. Mandatory qualifications include knowledge of high-level programming languages, hardware interfacing, instrumentation system design, principles of software engineering, and management experience. A desirable qualification is a Ph.D. in a physical, biological, or computer science. This Civil Service position is available immediately. Salary ranges from \$41,277 to \$53,661. Direct inquiries to: **Vince Ackermann at 202-295-1426.** Submit application, including SF-171 and curriculum vitae, by 30 November 1983 to: **The Armed Forces Radiobiology Research Institute, Civilian Personnel Office, Bethesda, Md. 20814. Reference: announcement number 43/83. An Equal Opportunity Employer.**

### FACULTY POSITIONS IN NEUROBIOLOGY

Positions are open for tenure-track or tenured faculty appointments at the University of Southern California. Candidates must have a doctoral degree and at least 2 years of postdoctoral training. Particular attention will be given to those working in neuroendocrinology and neuropharmacology, but applicants in any area of neurobiology are encouraged to apply. Cellular and molecular approaches are preferred. Candidates will be expected to establish an independent research program of their choice. Please send curriculum vitae, bibliography, names and telephone numbers of four references, and a brief description of career goals and research objectives by 30 November 1983 to:

**Chairman, Search Committee  
Section of Neurobiology  
Department of Biological Sciences  
University of Southern California  
Los Angeles, California 90089-0371**

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

**FACULTY POSITION**, physical chemistry or chemical physics. Applications or nominations are invited for an opening in the Department of Chemistry at Massachusetts Institute of Technology. Applicants should have demonstrated ability to do outstanding independent research in chemistry and show promise of excellence in teaching. Appointment will probably be at the assistant professor level, but applications and nominations for other levels will be considered. Candidates should submit curriculum vitae, a publications list, and a description of research interests, and have three letters of recommendation sent not later than 15 February 1984 to: **Professor C. T. Walsh, Room 18-390, MIT, Cambridge, Mass. 02139. MIT is an Equal Opportunity/Affirmative Action Employer.**

## POSITIONS OPEN

### RENEWED SEARCH CHAIRPERSON AND CELL BIOLOGIST

**HAMILTON COLLEGE**, a highly selective coeducational liberal arts college with 1625 students and 135 faculty, seeks a cell biologist with a solid record of research achievement, preferably in molecular genetics or a related field, to assume the chair of its eight-member Biology Department 1 July 1984. Candidates must be devoted to the teaching of talented undergraduates and expect to maintain an active research program that will involve students. A demonstrated capacity for leadership is essential since future hiring opportunities and strong institutional backing will give the new chairperson an exciting opportunity to develop an outstanding small college department. Applications and nominations should be submitted by 30 November to: **Professor Peter J. Millet, Associate Dean of the College, Hamilton College, Clinton, N.Y. 13323. Hamilton College is an Equal Opportunity Employer. Women and members of minority groups are strongly encouraged to apply.**

**DEVELOPMENTAL BIOLOGIST.** Assistant professor, tenure track. Preference will be given to candidates with postdoctoral experience investigating the cellular and/or molecular basis of animal or plant development. Applicants should forward curriculum vitae, reprints, manuscripts, a brief résumé or research plans, and should arrange to have four letters of reference sent to: **Chairman, Developmental Biology Search Committee, Department of Biology 046A, University of North Carolina, Chapel Hill, N.C. 27514.** Applications received after 1 December 1983 cannot be assured of consideration. *The University of North Carolina at Chapel Hill is an Equal Opportunity/Affirmative Action Employer.*

**ECOLOGIST.** Assistant professor, tenure track. Preference will be given to candidates with broad ecological background, expertise in ecosystem function and postdoctoral experience. Applicants should forward curriculum vitae, reprints, manuscripts, a brief résumé of research plans, and should arrange to have four letters of reference sent to: **Chairman, Ecology Search Committee, Department of Biology 010A, University of North Carolina, Chapel Hill, N.C. 27514.** Applications received after 1 December 1983 cannot be assured of consideration. *The University of North Carolina at Chapel Hill is an Equal Opportunity/Affirmative Action Employer.*

**FACULTY POSITIONS.** As part of a major development program, **THE UNIVERSITY OF PENNSYLVANIA, DEPARTMENT OF CHEMISTRY**, seeks to add two outstanding faculty members at the assistant professor (tenure probationary) level beginning September 1984. Candidates at a more senior level may also be considered. The two general areas of research interests are organic or inorganic chemistry, excluding natural product synthesis, and experimental or theoretical physical chemistry, including biophysical chemistry. Applicants should send curriculum vitae, list of publications, a brief statement of research interests, and in addition have a minimum of three letters of recommendation sent to: **J. Kent Blasie, Chairman, Department of Chemistry/D5, University of Pennsylvania, Philadelphia, Pa. 19104,** by 1 December 1983. *The University of Pennsylvania is an Affirmative Action/Equal Opportunity Employer.*

### FACULTY POSITION IN AGING RESEARCH

The Institute of Gerontology and the Department of Biological Chemistry at The University of Michigan are seeking an individual whose responsibilities will emphasize independent research and teaching. Preference will be given to those candidates whose research focuses on biochemical approaches to endocrinological problems related to gerontology. Faculty rank and salary are negotiable. Applicants must submit by 1 December 1983 the following information:

- 1) Curriculum vitae and bibliography,
- 2) Brief statement of research objectives,
- 3) Three copies of at least three representative publications,
- 4) Letters of recommendation from at least three referees, and
- 5) A detailed list of awarded grants/fellowships/contracts during the past 5 years, indicating principal investigator, funding agency, project title, dates, and annual and total budget.

All material should be forwarded to: **Dr. Richard C. Adelman, Director, Institute of Gerontology, The University of Michigan, 300 North Ingalls, Ann Arbor, Mich. 48109-2007. A nondiscriminatory, Affirmative Action Employer.**

## POSITIONS OPEN

### DEAN, COLLEGE OF OCEAN AND FISHERY SCIENCES UNIVERSITY OF WASHINGTON

Applications and nominations are invited for the position of dean, College of Ocean and Fishery Sciences. The College includes the Schools of Fisheries and Oceanography, the Institute for Marine Studies, the Applied Physics Laboratory, and the Washington Sea Grant Program. In 1982, it had an enrollment of 301 undergraduate and 306 graduate students, a faculty of 95 and a total budget of \$28 million.

Desired qualifications of the dean include an earned doctorate, an established reputation as a scientist, a strong record of research accomplishment, and competence in organizational leadership and management.

Deadline for nominations and applications: 30 November 1983.

Nominations or applications with résumés should be sent to:

**College of Ocean and  
Fishery Sciences Deanship Committee  
301 Administration Building, AH-30  
University of Washington  
Seattle, Washington 98195**

*An Equal Opportunity/Affirmative Action Employer*

### FACULTY POSITION Department of Physics Emory University

The Department of Physics, Emory University, has an opening for a tenure-track, beginning assistant professor position. The Department is searching for an outstanding experimentalist who has demonstrated excellence in both research and teaching. Candidates should have a Ph.D. degree with postdoctoral experience. Preference will be given to experimental biophysicists with specialization in spectroscopic studies of biomolecules, or in other biophysical areas of current interest. The ongoing research programs in the Department include Mössbauer, high-resolution x- and gamma ray, EPR, ENDOR, and far-infrared spectroscopy; laser optics; plasma and condensed matter theory; physics of superconductors, semiconductors, and inhomogeneous materials. A new research program in Raman spectroscopy is starting this year. Interested candidates should send curriculum vitae, a summary of future research plans, and names of three references to:

**Dr. Allen Garrison  
Chairman  
Department of Physics  
Emory University  
Atlanta, Ga. 30322**

before 1 February 1984.

*Emory University is an Equal Opportunity/Affirmative Action Employer.*

### FACULTY POSITION—PEDIATRIC ALLERGY

The Department of Pediatrics of Northwestern University Medical School is seeking applicants with three or more years of postfellowship experience for the position of head of the Division of Pediatric Allergy. Research space and funding are negotiable.

Interested applicants should send their résumé and the names of three references to:

**Lauren M. Pachman, M.D.  
Professor of Pediatrics  
Head, Division of Immunology/Rheumatology  
The Children's Memorial Hospital  
2300 Children's Plaza  
Chicago, Illinois 60614**

**FOREST BIOTECHNOLOGY**—Assistant or associate professor. Appointee shall direct an innovative and contemporary research program in gene regulation of commercial pine species. Basic research in protoplast culture, molecular biology, and biochemistry with emphasis on growth regulation, disease resistance and/or stress tolerance is desired. The University is currently strengthening a multidisciplinary program in plant improvement, providing the opportunity for cooperation with other scientists. A support person will be assigned to the position. An earned Ph.D. in genetics, microbiology, biochemistry, molecular biology, or a related field is required. Salary commensurate with qualifications. Send letter of application, curriculum vitae, college transcripts, and three letters of recommendation to: **Arnett C. Mace, Jr., Director, School of Forest Resources and Conservation, University of Florida, Gainesville, Fla. 32611. Telephone: 904-392-1791. Refer to position number 93462.** Closing date: 15 November 1983.

AFSC AFRI ARADCOM ASL DTNSRDC EPA MICOM
NMRDC NOAA NORDA NPS NRL NWC USGS WRAIR

## RESEARCH OPPORTUNITIES

Competitive visiting scholar awards for one or two years' tenure in selected federal laboratories throughout the United States. Opportunities are available for specialized experimental or theoretical research experience—free of interruptions and distractions of other duties—in the general fields of:

**ATMOSPHERIC AND EARTH SCIENCES  
ENGINEERING • LIFE AND MEDICAL SCIENCES • PHYSICS • CHEMISTRY  
ENVIRONMENTAL SCIENCES  
MATHEMATICS • SPACE SCIENCES**

Most of the 19 programs are open to U.S. and non-U.S. nationals, and most are open to experienced senior investigators as well as to recent PhDs.

Application materials with details on research opportunities and laboratory locations may be requested by letter, stating the specific area of research interest, to:

Associateship Programs (JH 608-S3)  
**NATIONAL RESEARCH COUNCIL**  
2101 Constitution Avenue  
Washington, D.C. 20418

National Academy of Sciences  
National Academy of Engineering • Institute of Medicine

NIOHS NBS NASA NADC

### Postdoctoral Training Program

#### CELLULAR AND MOLECULAR ENDOCRINOLOGY

Postdoctoral traineeships are available immediately and for 1984 in a new NIH supported program. Trainees with a Ph.D. or M.D. degree will participate in a research program with one of thirteen faculty from the Biochemistry Department and the Program in Biomedical Sciences on the campus of the University of California, Riverside. The purpose of the program is to provide for research training at the postdoctoral level in the following five major areas of focus.

- a) intracellular events in hormone action;
- b) endocrinology of vitamin D, calcium, phosphorus and bone;
- c) insulin and its action;
- d) molecular biology of hormone action;
- e) structure of hormones and their receptors.

For detailed information and application forms write to:

**Dr. Anthony W. Norman, Program Director**  
Department of Biochemistry  
University of California  
Riverside, California 92521  
(714) 787-4777

*An Affirmative Action/  
Equal Opportunity Employer*

### POSTDOCTORAL FELLOWSHIPS IN THE DEPARTMENT OF MICROBIOLOGY AND MOLECULAR GENETICS UNIVERSITY OF CALIFORNIA, IRVINE

Through the generous support of Beckman Instruments the Department of Microbiology has funds to support postdoctoral fellows. The emphasis of research in the Department is in the areas of molecular genetics, recombinant DNA technology and cell biology. Several positions for research in individual laboratories in the Department are available for candidates who have demonstrated exceptional research promise at the predoctoral or postdoctoral level. Outstanding applicants will be invited for seminar presentations. The faculty of the Department and their research interests are:

**Dr. Kevin Bertrand:** Regulatory and structural genes determining bacterial tetracycline resistance.

**Dr. Dennis Cunningham:** Cell surface receptors and the generation of biological signals.

**Dr. George Gutman:** Immunology; antibody structure and gene organization.

**Dr. G. Wesley Hatfield:** Molecular genetic characterization of: (1) attenuation in *E. coli*, (2) human genes of clinical importance.

**Dr. Harris Moyed:** Genetic control of antibiotic susceptibility.

**Dr. Kathleen Postle:** Molecular genetics of *E. coli* cell envelope, iron transport and gene regulation.

**Dr. Suzanne Sandmeyer:** Structure and function of transposable elements in yeast.

**Dr. Rozanne Sandri-Goldin:** Control of gene expression in Herpes simplex virus.

**Dr. Bert Semler:** Directed mutagenesis and expression of cloned animal virus genes.

**Dr. Stephen Sharp:** Molecular biology of eukaryotic tRNA gene expression.

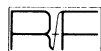
**Dr. Eric Stanbridge:** Identification and characterization of human oncogenes and oncogene suppressor sequences.

**Dr. Paul Sypherd:** Fungal morphogenesis.

Applications or inquiries for additional information should be sent to:

**Dr. G. Wesley Hatfield**  
Department of Microbiology  
University of California  
Irvine, CA 92717

*AN AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER*



Resources for the Future, Inc.

### Director Center for Energy Policy Research

Resources for the Future (RFF), a nonprofit, nonadvocacy organization for research and education, seeks a director of its Center for Energy Policy Research. Founded in 1952, RFF conducts interdisciplinary programs in energy, natural resources, and environmental quality with emphasis on economics. The Center for Energy Policy Research (CEPR) is responsible for RFF's work on energy and minerals, including the nature of interactions among energy, technology, and industry shifts.

The Director of the Center carries the title of Senior Fellow and has the following responsibilities:

- To provide leadership of approximately 20 professionals and support staff in the planning and conduct of the Center's research program;
- To cooperate with the President, Vice President, Director of Institutional Relations, and project leaders in marshalling financial resources for the conduct of the program;
- To discharge other administrative functions, such as budget and proposal preparation, financial and personnel management, and review of manuscripts;
- To undertake research and disseminate information in the context of the Center's purpose.

Requirements of the position include a Ph.D. in economics or equivalent combination of training and experience; a substantial record of imaginative and scholarly research; diverse knowledge of economic, institutional, and policy issues in the energy and minerals area; efficiency in carrying out administrative responsibilities; and excellent communication and teamwork skills.

Applicants should send a letter and resume to: **Emery N. Castle, President, Resources for the Future, Box C, 1755 Massachusetts Avenue, NW, Washington, DC, 20036.** The applicant's resume should include names, addresses, and telephone numbers of three or more references who can be contacted in support of the application. Nominations also are welcome, providing they are accompanied by a resume of the nominee. Applications and nominations must be received on or before November 23, 1983.

Resources for the Future is an equal opportunity employer. Women and minority candidates are encouraged to apply.

## ROCHE INSTITUTE OF MOLECULAR BIOLOGY

### Unique Opportunities for Independent Research

The Roche Institute of Molecular Biology has several positions available at full, associate and assistant member levels, corresponding to professorial ranks in universities. We invite applications from scientists who can bring in, or establish, independent scientific programs of the highest caliber.

The Roche Institute of Molecular Biology presents unique opportunities for outstanding scientists to carry out their research programs. The Institute is dedicated to basic research in biochemistry, genetics, virology, developmental biology, neurobiology, pharmacology and other areas of molecular biology. Staff members enjoy complete independence in their choice and pursuit of research problems. All research projects are fully funded by the Roche Institute, permitting scientists to devote full time to their research. This support includes all resources and services as well as staff salaries including those for postdoctoral fellows and technical personnel. The postdoctoral program, which is an important part of the institute's research effort, is comprised of approximately seventy fellows from the United States and abroad who are trained for independent careers in academic and other research laboratories. In addition, the Institute has a limited graduate student program in conjunction with neighboring universities.

The Roche Institute of Molecular Biology, as part of the Roche Research Center, is located at the Hoffmann-La Roche site in Nutley, New Jersey, ten miles west of New York City. Hoffmann-La Roche is an equal opportunity employer. Inquiries should be directed to Dr. Herbert Weissbach, Director, Roche Institute of Molecular Biology, Nutley, New Jersey 07110.

# MOLECULAR BIOLOGIST BIOTECHNOLOGY R&D

The Commonwealth Serum Laboratories (CSL) is seeking a senior scientist preferably with a PhD and several years of postdoctoral experience to establish and lead a recombinant DNA research and development team with the aim of applying this technology to commercial processes.

CSL is an Australian semi-Government statutory authority located in the city of Melbourne with near to 1000 staff including approximately 100 graduate scientists. We develop, produce, and market pharmaceutical products for human and veterinary use, being currently involved in the fields of vaccines, blood products, hormones, allergens and diagnostic agents.

This new post requires a scientist with significant training in recombinant DNA technology and in the expression of recombinant molecules in prokaryote and, preferably also, eukaryote systems. The successful candidate will be responsible for the molecular cloning and expression of genes coding for products of pharmaceutical interest, and will be required to establish an R&D laboratory and to recruit an R&D team.

Appointment will be for a 4-5 year renewable term and the salary will be commensurate with experience and qualifications.

**Applications in writing detailing academic qualifications, experience, personal details, and the names of three referees should be made to the Personnel Director, 45 Poplar Road, Parkville, Victoria, 3052, Australia by Saturday November 19th, 1983.**

**CSL** COMMONWEALTH  
SERUM  
LABORATORIES

## Senior Investigator Atherosclerosis and Platelet Pharmacology

Smith Kline & French Laboratories, a leader in pharmaceutical research is seeking an outstanding scientist to assist in developing and directing a research program in thrombo-embolic disorders and atherosclerosis.

The successful candidate will:

- apply state-of-the-art technology and create new methodologies applicable to the discovery of agents to treat thrombo-embolic disorders and atherosclerosis.
- prepare scientific reports for oral presentation and publication.
- train, supervise and evaluate laboratory personnel.

Candidates are required to have:

- a PhD in Pharmacology/Physiology with 3 or more years postdoctoral experience in the design and performance of experiments in the area of platelet dysfunction, endothelium-platelet interactions or atherosclerosis.
- excellent written and oral communication skills.

Preference will be given to those candidates who also have:

- biochemical experience in the areas of endothelial cell-platelet interactions and atherosclerosis.
- a demonstrated record of bibliographic excellence and the ability to interact with an interdisciplinary team of scientists.
- supervisory experience.

SmithKline Beckman offers an excellent benefits and compensation program including an attractive relocation package. For confidential consideration, send your C.V. and names of three references to: Mr. Walter B. Flagg, Smith Kline & French Laboratories, a division of, SMITHKLINE BECKMAN CORPORATION, 1574 Spring Garden Street, Philadelphia, PA 19101. We are an equal opportunity employer, M/F/H/V.

**SK&F**  
A SmithKline Beckman Company

## POSITIONS OPEN

The Division of Nutritional Sciences in the School of Public Health is seeking a **SENIOR FACULTY MEMBER** for a tenured position. The person selected will be a strong candidate to become head of the division perhaps during the 1984-1985 academic year. Candidates for this position should hold the Ph.D., Dr.P.H., or M.D. degree with advanced training and accomplishments in nutrition, biochemistry, or other areas related to nutrition. The individual selected would be expected to have demonstrated competence in teaching and research and will be expected to assume leadership for the overall nutrition program which includes both the laboratory and applied aspects of human nutrition.

Salary and rank are commensurate with the training and experience of the candidate. *The University of California at Los Angeles is an Equal Opportunity Employer and encourages applications from women and minority representatives.*

Send résumé to: **R. B. Alfin-Slater, Ph.D., Professor of Nutrition, School of Public Health, University of California, Los Angeles, Calif. 90024.**

**FACULTY POSITION:** A tenure-track position at the assistant or associate professor rank will be open in the Department of Mechanical Engineering, Aeronautical Engineering and Mechanics at **RENSSELAER POLYTECHNIC INSTITUTE**. Applicants should have strong background in experimental mechanics with specific research interest in **BIOMECHANICS**. Duties include undergraduate and graduate teaching, research in collaboration with the existing biomechanics program, development of external funding for research projects, supervision of graduate students, and other normal faculty responsibilities. Ph.D. is required; salary is highly competitive and commensurate with qualifications and experience. Address all inquiries to: **Dr. Van C. Mow, Jonsson Engineering Center, Rensselaer Polytechnic Institute, Troy, N.Y. 12181. RPI is an Affirmative Action/Equal Opportunity Employer.**

**GENETICIST.** Tenure-track position beginning fall 1984. Ph.D. required. Teaching responsibilities and supervision of undergraduate research will be in the areas of genetics and one or more of the following: cell biology, immunology, or developmental biology. Send résumé, transcripts, and three letters of recommendation to: **Chairman, Search Committee, Department of Biology, Nazareth College, Rochester, N.Y. 14610. An Equal Opportunity Employer.**

## HEAD, DEPARTMENT OF POULTRY SCIENCE

The College of Agriculture at The Pennsylvania State University invites applications and nominations for the position of professor of poultry science and head, Department of Poultry Science, beginning 1 April 1984. Applicants should possess a Ph.D. or equivalent academic degree in poultry science or closely related field. We seek an individual with a significant period of professional or academic experience in poultry science with an understanding of the Land-Grant University system. Applicants are invited to submit a complete résumé with documentation of teaching, research, extension, administrative, and program leadership experience. Résumé and names of five suggested references should be submitted by 30 November 1983 to:

**Dr. Roland M. Leach, Jr.,  
Professor of Poultry Science  
Chairman, Search Committee  
205 Henning Building—Box A  
The Pennsylvania State University  
University Park, Pa. 16802**

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

## HYDROLOGIST

The Wyoming Water Research Center, a state-funded division of the University of Wyoming with responsibilities for research, service, teaching, and extension in water resources, is seeking a hydrologist to: participate in the Center's overall programs; develop and implement an active, fundable research program; and teach and direct graduate research in the Graduate Water Resources Curriculum. Field experience required; arid lands or montane hydrology experience preferred. The position is a tenure-track appointment with joint assignment to an appropriate academic department. Faculty rank and salary commensurate with experience. Send letter of application with teaching and research interests, résumé, representative reprints, and three letters of recommendation by 15 December 1983 to: **Dr. Harold Bergman, Search Chairman, Wyoming Water Research Center, Box 3067, University Station, Laramie, WY. 82071.**

*An Equal Opportunity/Affirmative Action Employer*

## POSITIONS OPEN

**GASTROENTEROLOGY, DIVISION DIRECTOR**—Applications are invited for the position of director, Division of Gastroenterology-Hepatology in the Department of Medicine. The division which currently numbers ten full-time faculty and five fellows has had a long history of excellence in teaching, patient care, and research, and a number of the members are nationally and internationally recognized leaders in their field. Candidates should have an outstanding record in academic gastroenterology and be dedicated to providing leadership in teaching, specialized patient care, and research. Applications will be received until the position is filled and should be sent to: **F. M. Abboud, M.D., Head, Department of Internal Medicine, The University of Iowa College of Medicine, The University of Iowa Hospitals and Clinics, Iowa City, Iowa 52242.** *The University of Iowa is an Equal Opportunity/Affirmative Action Employer.*

## IMMUNOCHEMIST/ CLINICAL CHEMIST

Cooper Diagnostics, a division of CooperBiomedical, a leading manufacturer of diagnostic products, has an immediate opening for an innovative scientist to develop assays for the clinical laboratory. The candidate should have experience with immunoassays development and be familiar with non-isotopic methodologies. Some background in the isolation and characterization of viruses and other infectious agents is desirable. A Ph.D. degree or equivalent work experience is desired.

Cooper Diagnostics offers competitive salaries and an excellent benefits package. Please submit curriculum vitae in confidence to:

**LEON KRAUS  
DIRECTOR OF BIOCHEMISTRY  
CooperBiomedical, Inc.  
DIAGNOSTICS DIVISION  
1 Technology Court  
Malvern, Pa. 19355**

## INSTRUCTOR TO ASSOCIATE PROFESSOR

University of Michigan Medical School, Department of Surgery, has a position available at the rank of **INSTRUCTOR THROUGH ASSOCIATE PROFESSOR**. Individual will work full-time in patient care, teaching, and research related to burn surgery. Applicants should be graduates of an American or Canadian medical school, Board-certified by the American Board of Surgery or equivalent board, have training and experience in the management of burn patients and in biomedical research related to burn surgery, and have documented record of contributing to scholarly activity in burn surgery. We are desirous of an individual who has been director of an investigative laboratory with a record of attracting external peer-reviewed funding and who has at least 20 publications in peer-reviewed literature. Reply to: **Dr. Irving Feller, Chief, Division of Burn Surgery, 200 North Ingalls, Ann Arbor, Mich. 48104.** *The University of Michigan is a nondiscriminatory, Affirmative Action Employer. PCN 52.*

## MARINE SCIENTIST III

A professional research staff position is available at the University of Delaware College of Marine Studies, at Lewes, Delaware. Responsibilities include: planning, directing, coordinating, and controlling research in the field of wave dynamics, air-sea interaction, sediment transport, and nearshore processes; participating and interfacing with investigators at other institutions involved in similar or related projects; initiating, designing, preparing, and presenting grant proposals; preparing progress and final reports and technical papers; and counseling and advising faculty, staff, and graduate student investigators in similar or related research. Must be capable of performing both theoretical and experimental studies on wave dynamics, nearshore processes, sediment transport, and air-sea interaction. Extensive experience with computer data acquisition systems, numerical simulations, and instruments such as laser doppler anemometer, hot-film anemometer, and temperature and humidity probes is required. A doctoral degree with 1 to 2 years of experience is necessary. Send résumé to: **Richard W. Schneider, Executive Officer, College of Marine Studies, University of Delaware, Newark, Delaware 19711.**

# M.D. ONCOLOGY

Excellent career opportunity with industry leader. New Columbus based position. Responsible to plan and implement the clinical studies for Phases I, II and III investigations of developmental drug compounds. Also will have liaison responsibility with regional Oncology groups and NCI. Opportunity to maintain limited patient contact.

Total compensation package including base salary, bonus, life, medical, dental, pension and savings plans including deferred salary provisions. Relocation assistance. Requirements: M.D. Board Certified in Internal Medicine and Medical Oncology preferred.

Please send resume to Professional Employment or call

**(614) 764-8103**

## ADRIA LABORATORIES INC.

P.O. Box 16529  
Columbus, Ohio 43216

(NO AGENCIES PLEASE)  
An Equal Opportunity Employer M/F

# Vascular Pharmacology Opportunity

NEWLY FORMED VASCULAR PHARMACOLOGY SECTION seeks Pharmacologist/Physiologist to lead a group of scientists in the study of vascular action of cardiovascular drugs. The successful candidate must demonstrate experience in in vivo and/or in vitro techniques and must have a Ph.D. degree with at least two years of relevant postdoctoral experience. Industrial experience in vascular pharmacology of vasodilators/antianginals is preferred.

Rank and salary are commensurate with experience. We offer a complete all company paid benefit package that is designed to reward the high achiever. Interested candidates are invited to send resume complete with salary history to: **P. M. Griffoul, Personnel Administrator, Berlex Laboratories, Inc., 110 East Hanover Ave., Cedar Knolls, New Jersey 07927.** An equal opportunity employer M/F.

# BERLEX

Laboratories Inc.

## POSITIONS OPEN

### INSTRUCTOR IN SURGERY

Applications are invited to fill a full time tenure-track position in the Surgical Research Laboratory, Harvard Medical School, Boston. Outstanding candidates are sought holding M.D. or Ph.D. degree with postgraduate research experience as evidenced by good publication record and participation in appropriate forums at the national and international level with respect to transplantation. The broadly trained appointee is expected to have a strong background in transplantation immunobiology, cellular immunology, and microsurgery. Particular areas of preference include radioactive tracer studies of lymphoid cells; extensive experience with the use of immunosuppressive modalities in animal models after transplantation of organ allografts is desirable. Responsibilities of the position include participation in departmental teaching of medical students. Send curriculum vitae, statement of research interests, and the names of three referees to: **Dr. Nicholas L. Tilney, Director, Surgical Research Laboratory, Harvard Medical School, 75 Francis Street, Boston, Mass. 02115**, by 1 December 1983. *Harvard University is an Affirmative Action/Equal Opportunity Employer.*

**LECTURER** position available. Teaching duties in upper-division undergraduate cell/molecular biology courses. Research opportunity available in laboratory, concentrating on bunyaviruses and persistent infection. Applicant should have a Ph.D. in biochemistry, molecular biology, or a related discipline. In addition, expertise in animal virology is required. Interested applicants should send curriculum vitae and references to: **Dr. Martinez J. Hewlett, Associate Professor, Department of Cellular and Developmental Biology, Biosciences West, Room 308, University of Arizona, Tucson, Ariz. 85721**. Position available 12 January 1984. Application closing date is 30 November 1983.

*Equal Opportunity/Affirmative Action Employer*

### NEUROPEPTIDE PHYSIOLOGIST THE DEPARTMENT OF PHYSIOLOGY-ANATOMY UNIVERSITY OF CALIFORNIA BERKELEY

Invites applications to fill a tenure-track position in physiology, effective fall 1984, at the assistant professor level, pending final budgetary approval. Individuals with exceptional qualifications and experience who currently hold nontenured positions may be considered for an associate professorship with tenure. Responsibilities will include teaching in undergraduate cellular physiology and advanced courses in the candidate's area of research expertise. In addition to demonstrating excellence in teaching, candidates should be thoroughly involved in an active research project and be successful contributors to that area. Research emphasis should be on physiological problems at the cellular, or molecular level in areas of neuroendocrine and neurotransmitter receptors and modulators, with particular emphasis on neuropeptides. Interested individuals should write a letter explaining their qualifications for the particular position and enclose current curriculum vitae and a list of three or more persons who could act as referees to: **Physiology Search Committee, Department of Physiology/Anatomy, 2549 Life Sciences Building, University of California, Berkeley, Calif. 94720**. Applications must be received by 31 December 1983. *The University of California is an Equal Opportunity/Affirmative Action Employer.*

### PHARMACOLOGISTS

Two tenure-track faculty positions (12-month appointments) are available at the assistant and/or associate professor level. The research interests of the department are in the areas of autonomic cardiovascular pharmacology, biochemical pharmacology, and neuropsychopharmacology. **Assistant Professor:** Candidates must have 2 to 3 years postdoctoral experience in a research area which would complement the existing research programs within the department. **Associate Professor:** Candidates must have 5 to 7 years' experience beyond the doctorate level and an established, externally funded research program. Both positions require participation in teaching at the professional and graduate level in addition to carrying out high-quality independent research. Interested individuals should send a letter of application indicating the position desired, curriculum vitae, and names of three references to: **Dr. Mustafa F. Lokhandwala, Chairman, Department of Pharmacology, College of Pharmacy, University of Houston, Houston, Texas 77004**. The deadline for application is 15 December 1983. *Equal Opportunity Employer.*

## POSITIONS OPEN

**MEDICAL RESEARCHER.** Job order number: 416739. Must devise, conduct, and direct research into the functions and disorders of the kidneys such as nephritis, nephrosis, glomerulonephritis, nephrosclerosis, nephrolithiasis, uremia and pyelonephritis, to determine the cause and an effective means of treatment of such disorders. Must plan, design, organize, and direct experiment for research purposes. Must supervise chemical, microscopic, serologic, hematologic test to gather data for treatment research. M.D. degree; 40 hours per week, flexible hours; \$14,400 per year. Contact: **Louisiana Department of Employment Security, 3232 Veterans Highway, Metairie, Louisiana 70002**.

### MICROBIAL GENETICIST TEXAS TECH UNIVERSITY

Tenure-track faculty position. Applicants should be capable of establishing a strong research program utilizing molecular biology-recombinant DNA technologies. Teaching duties in introductory microbiology and microbial genetics with graduate teaching in field of expertise. Curriculum vitae, recent reprints, statement of research goals, and names of three references should be sent to: **Dr. Caryl E. Heintz, Chairman, Search Committee, Department of Biological Sciences, Texas Tech University, Lubbock, Texas 79409**. *Texas Tech, An Affirmative Action/Equal Opportunity Employer*, is one of four major comprehensive universities in Texas and has an enrollment of approximately 24,000 students.

Columbia University seeks a **MOLECULAR BIOLOGIST** to participate in project to identify gene for disease of known enzymatic defect and to coordinate molecular approaches to other hereditary neurologic diseases. Must have demonstrated ability for independent research in molecular genetics and commitment to study human disease in clinical department. Rank up to assistant professor and salary to be negotiated. *Columbia University is an Equal Opportunity Employer*. Applicants should send curriculum vitae to: **Timothy A. Pedley, M.D., Neurological Institute, 710 West 168 Street, New York, N.Y. 10032**.

**MOLECULAR GENETICIST/BIOLOGIST.** Assistant or associate professor. Research up to 66 percent on molecular genetics or biomembrane antigens, and immunogens of pathogens, particularly *Brucella abortus*: teaching (at least 34 percent) molecular biology of microbial disease. Ph.D. required. Rank and salary commensurate with experience. Send résumé, copy of transcript, addresses of three references, and a statement of research interests to: **Dr. I. R. Tizard, Department of Veterinary Microbiology and Parasitology, Texas A & M University College Station, Texas 77843; telephone: 409-845-5941**.

*An Equal Opportunity through  
Affirmative Action Employer*

**NEUROLOGIST**—Assistant/associate professor, Emory University School of Medicine. The Department of Neurology is seeking candidates for academic positions. Preference given to candidates with clinical and research experience in a subspecialty area such as neuromuscular disease, epilepsy, movement disorders, motor control, genetics, the rehabilitation aspects of neurology. Excellent opportunities available for collaboration with neuroscientists in the basic science departments. *The University is an Equal Opportunity/Affirmative Action Employer*. Reply to: **Robert F. Kibler, M.D., Chairman, Department of Neurology, Emory University School of Medicine, 401 Woodruff Memorial Building, Atlanta, Georgia 30322**. Telephone: 404-329-5804.

**PHARMACOLOGIST**, GS-405-13. Applicants must have a doctor's degree with major study in a field of the biological, medical, or physical sciences, including at least 12 hours in pharmacology; 2 years of professional postdoctoral experience is required. Application deadline: 18 November 1983. For more information, contact: **CCPO-NW, Naval Medical Command, National Capitol Region, Building 1, Tower 12, 8901 Wisconsin Avenue, Bethesda, Maryland 20814; telephone: 202-295-1420**.

**IMMEDIATE OPENING.** Neurobiology Research Unit seeks **POSTDOCTORAL FELLOW** with Ph.D. or M.D. degree interested in research on the role of neuropeptides in central nervous system injury. Previous research experience in spinal cord injury, experimental stroke, or neuropeptides preferred. Send curriculum vitae and three letters of reference to: **Civilian Personnel Office, attention: A. I. Faden, M.D., Uniformed Services University of the Health Sciences, 4301 Jones Bridge Road, Bethesda, Md. 20814**. *Equal Opportunity Employer.*

## POSITIONS OPEN

### PHYSIOLOGY AND BIOPHYSICS

**Postdoctoral position** available now to join ongoing research on the regulation of biosynthesis of Na<sup>+</sup>-ATPase using cell and molecular biological approaches. Recent Ph.D. or M.D. with research experience in membrane proteins is desirable. Salary will be commensurate with training and experience. Send description of research experience, curriculum vitae, and names of three references to: **Dr. Alicia McDonough, Department of Physiology and Biophysics, University of Southern California School of Medicine, Los Angeles, Calif. 90033**.

**POSTDOCTORAL ASSOCIATE.** Department of Pharmacology. Research focuses on the cytotoxic interactions of chemotherapeutic agents with cell surface and membrane functions, and the mechanisms of drug resistance at the cellular level. Applicants must have Ph.D. in microbiology or pharmacology as well as proven experience in cell surface and membrane biochemistry, including hormone binding and transport assays, use of synthetic liposomes as model membranes, culture of normal and transformed cells, and genetic study of expression and regulation of cell surface functions. Familiarity with the use of computers for data handling and word processing is also required. Full-time position with annual salary of \$16,100. Interested applicants should send their résumés to: **Job Service Technical Unit, State Labor Department, Wethersfield, Conn. 06109**, and refer to job order number 357864.

### POSTDOCTORAL AWARDS IN OCEAN SCIENCE AND ENGINEERING

Woods Hole Oceanographic Institution invites applications for 1-year postdoctoral scholar awards from new and recent doctorates in fields of biology, chemistry, engineering, geology, geophysics, mathematics, meteorology, and physics, as well as oceanography. Recipients of awards are selected on a competitive basis, with primary emphasis placed on research promise.

Fellowship stipend is \$22,600. Appointees are eligible for group health insurance and a modest research budget. Recipients are encouraged to pursue their own research interests independently or in association with resident staff. Completed applications must be received by 1 January 1984 for 1984-1985 awards. Awards will be announced by 1 March. Write for application forms to: **Dean of Graduate Studies, P.O. Box S, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543**.

*Equal Opportunity/Affirmative Action Institution*

### EVOKED POTENTIAL LABORATORIES UNIVERSITY OF CALIFORNIA, IRVINE

The University of California, Irvine, has two positions available to study mechanisms of auditory and cognitive evoked potentials in experimental animals. Knowledge of single unit techniques, field potential recordings, and computer programming required. One opening is for a **POSTDOCTORAL FELLOW** to study cognitive evoked potentials in behaving animals. The other opening is for either a **POSTDOCTORAL FELLOW** or **ASSISTANT RESEARCHER** to study the generators of auditory brainstem responses.

Positions available 1 January 1984. *An Equal Opportunity/Affirmative Action Employer*. Send résumés and three letters of recommendation to: **Dr. Arnold Starr, University of California, Irvine, Neurology Department, Room 154/Med Surg I, Irvine, Calif. 92717**.

**POSTDOCTORAL FELLOW.** Available immediately. Cardiovascular physiology. Neural control of the circulation. Work with chronically instrumented animals. Send curriculum vitae and names of three references to:

**Dr. Irving H. Zucker  
Department of Physiology and Biophysics  
University of Nebraska College of Medicine  
42nd and Dewey  
Omaha, Neb. 68105**

**POSTDOCTORAL FELLOW.** One position in environmental engineering available immediately. The initial appointment is for 1 year, and an additional 1-year appointment is anticipated. The salary range is \$20,000 to \$22,000. Tasks: develop mathematical models for particle-associated substances in sediments and do experimental work relating to radio-tracers and pollutants in sediment cores. Key words: advection-diffusion equation, Fourier transforms, radionuclides (Pb-210, Th-228/232, and so forth), heavy metals, PCB's. Send curriculum vitae and the names of three references to: **Dr. Erik R. Christensen, Department of Civil Engineering, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin 53201**.



## FACULTY POSITION AVAILABLE IMMEDIATELY

### University of Massachusetts Medical School

The Departments of Anesthesiology and Pharmacology seek to make a joint appointment at the level of Assistant or Associate Professor. The candidate must have the Ph.D. or equivalent, the equivalent of at least two years' postdoctoral research experience and demonstrated ability to execute an independent research program. The responsibilities will be primarily in research. Specifically, the appointee will be expected: (1) to initiate and maintain an independent research program, and (2) to assist in the co-ordination of selected research programs of the Department of Anesthesiology. Research facilities and support commensurate with these responsibilities will be provided.

The research interests of the appointee should lie generally in the disciplines of Physiology and/or Pharmacology and specifically in one or more of the following areas: cardiovascular system; respiration-respiratory drive; drug metabolism and/or pharmacokinetics, and the CNS—preferably in an area involving central conduction and pain processing, the action or disposition of analgesic and local/general anesthetic agents, the mechanisms and treatment of pain, or the application and function of endorphins and related substances.

The level of appointment and salary will be commensurate with experience. Applications should include a **curriculum vitae** and the names and addresses of three references.

Applications should be forwarded before January 1, 1984 to:

Dr. Gary Welch, Chairman  
Department of Anesthesiology  
University of Massachusetts  
Medical School  
Worcester, MA 01605

Further information may be obtained from either Dr. Welch at (617) 856-3266 or Dr. Neal C. Brown, Chairman, Dept. of Pharmacology at (617) 856-2151. The University of Massachusetts Medical School is an equal opportunity employer.

## EXECUTIVE DIRECTOR

### Computer Sciences Research Network

Applications are invited for the position of Project Director for the Computer Sciences Research Network (CSNET), managed by the University Corporation for Atmospheric Research (UCAR) in Boulder, Colorado. The Project Director, who must possess a combination of strong leadership and technical computer skills, knowledge and experience, will be responsible for:

- planning the future developments, services, and growth of the Network;
- interacting with relevant academic, international, government, and industrial groups;
- organizing the Project's governance structure;
- overseeing the ongoing operation of the Network;
- marketing CSNET to potential users and members; and
- ensuring that user needs are being met by CSNET.

The CSNET project is currently guaranteed funding for at least two years and is intended to continue on a self-supporting basis thereafter. Salary will be negotiable, depending on experience and qualifications.

The successful candidate should have:

- a Ph.D., or equivalent, in computer science or a closely-related field;
- substantial experience in computer system research and development;
- experience in computer communications and networking; and
- at least two years successful project management experience.

Resumes and relevant materials should be sent to:  
CSNET Project Director Search Committee, UCAR,  
P.O. Box 3000, Boulder, Colorado 80307

# EDITOR SCIENCE

The American Association for the Advancement of Science (AAAS), publisher of *Science*, is initiating a search for **Editor**. The journal is published weekly with worldwide circulation to members of the AAAS and institutional subscribers, including libraries. *Science* serves as a forum for the presentation and discussion of important issues relating to the advancement of science, with particular emphasis on the interactions among science, technology, government, and society. It includes reviews and reports of research having interdisciplinary impact.

In selecting an editor, the Board of Directors will attach special weight to evidence of significant achievement in scientific research, editorial experience and creativity, awareness of leading trends in the scientific disciplines, and managerial abilities.

Applications or nominations should be accompanied by complete curriculum vitae, including refereed publications, and should be sent to: **Catherine Borrás, Secretary, Search Committee, Executive Office, AAAS, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036**. Salary is negotiable based on qualifications and experience. Application materials should be sent by 31 December 1983.

*The AAAS is an Equal Opportunity Employer.*

## POSITIONS OPEN

**POSTDOCTORAL—MEMBRANE BIOCHEMISTRY.** Position available now to study electron transport proteins in peroxisomal membranes, mitochondria, and endoplasmic reticulum. The purpose is to identify membrane flavoproteins and cytochromes which accept electrons from fatty acids oxidized in peroxisomes. Send résumé and names of three references to: **Dr. R. P. Donaldson, Department of Biological Sciences, George Washington University, Washington, D.C. 20052.**

**POSTDOCTORAL POSITION AVAILABLE IMMEDIATELY** to study the molecular mechanism of mutagenesis during DNA replication and repair. The annual salary is \$18,500. The project will utilize in vitro systems in which bacteriophage T7 DNA subjected to potentially mutagenic conditions can be replicated or repaired in vitro and the genetic consequences of these manipulations monitored by encapsulating the DNA into phage heads. Send curriculum vitae, statement of research interests and experience, and the names of two references to: **Dr. Warren Masker, Biology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830.**

*An Equal Opportunity/Affirmative Action Employer*

**POSTDOCTORAL POSITION** available immediately to examine the interactions of hyperthermia and porphyrin photoradiation. Background in tumor biology and hyperthermia applications is desired. Send curriculum vitae and names of two references to: **Dr. Charles J. Gomer, Departments of Pediatrics and Ophthalmology, University of Southern California School of Medicine, Clayton Ocular Oncology Center, Childrens Hospital of Los Angeles, 4650 Sunset Boulevard, Los Angeles, California 90027.**

*An Affirmative Action/Equal Opportunity Employer*

**POSTDOCTORAL POSITION** available for M.D. or Ph.D. with strong interest in the regulation of proliferation and differentiation of hematopoietic stem cells. U.S. citizenship or permanent residency required. Send curriculum vitae and three references to: **J. L. Spivak, M.D., Hematology Division, The Johns Hopkins Hospital, Baltimore, Md. 21205.**

*Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

### POSTDOCTORAL POSITIONS— ATHEROSCLEROSIS RESEARCH

Two postdoctoral positions are available in the Section of Atherosclerosis Research. The research projects involve (i) isolation and characterization of monocyte chemotactic factors from atherosclerotic arteries; applicant for this position must have a strong background in biochemistry, cell biology and related techniques; and (ii) evaluation of the effects of fiber-optic lasers in removing atherosclerotic plaques in vivo. Applicant for this position should have background in ultrastructural morphology and interpretation. Starting stipend: \$17,600.

Applicants should submit curriculum vitae, bibliography, and three letters of reference to:

**Ross G. Gerrity, Ph.D.**  
Section of Atherosclerosis Research  
Division of Research  
Cleveland Clinic Foundation  
9500 Euclid Avenue  
Cleveland, Ohio 44106

**SEVERAL POSTDOCTORAL POSITIONS** now available in immunology laboratories at Dartmouth Medical School. Areas of interest include Fc receptors, antibody-dependent cellular cytotoxicity, normal myeloid differentiation and myeloid leukemia cell biology, cell-mediated immunity to murine retrovirus-induced tumors, endocrine regulation of the secretory IgA immune system, and human hybridoma production. Contact: **Dr. William R. Green, Department of Microbiology, Dartmouth Medical School, Hanover, N.H. 03756.**

**POSTDOCTORAL POSITION** available immediately to investigate the structure and regulation of connective tissue (elastin and collagen) genes in animal development and human disease. Biochemistry/molecular biology background highly desirable. Send curriculum vitae, three reference letters, and a description of research goals to: **Dr. Jeffrey M. Davidson, Department of Pathology, University of Utah School of Medicine, Salt Lake City, Utah 84132.**

*Equal Opportunity/Affirmative Action Employer.*

## POSITIONS OPEN

**POSTDOCTORAL POSITION** available immediately in virology and immunology to join in studies of lymphocyte, neutrophil, and macrophage function in the guinea pig model of human cytomegalovirus infection. Studies involve pathogenesis of maternal CMV infection and effects upon immune function in progeny, including oxidative metabolism of phagocytic cells. Please send curriculum vitae, description of research experience, and names of three references to: **Frank J. Bia, M.D., Infectious Disease Section, Department of Medicine, Yale University School of Medicine, LCI 208, 333 Cedar Street, New Haven, Connecticut 06510.** *Yale is an Affirmative Action/Equal Opportunity Employer.*

### POSTDOCTORAL POSITIONS

**Biochemistry**—Two postdoctoral positions are available immediately for studies on the regulation of prostaglandin biosynthesis and the mechanisms of enzymes involved in the arachidonate cascade. Some experience with lipid methodology, protein chemistry, or cell culture techniques would be desirable. Applicants should send their curriculum vitae and the names of three references to: **Dr. William E. M. Lands, Department of Biological Chemistry, University of Illinois at Chicago, 1853 West Polk Street, Chicago, Illinois 60612.**

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

**POSTDOCTORAL RESEARCHER.** Ph.D. in pharmacology with ability to analyze appropriate scientific literature and use radioactive isotopes, scintillation counters, ultracentrifuges, and thin layer chromatography. Performs experiments on small animals probing mechanisms involved in producing intestinal secretion; produces biological buffers; isolates and separates villus and crypt intestinal epithelial cells; performs neurotransmitter receptor binding, phospholipid turnover and protein phosphorylation studies. Salary: \$16,200. Please contact: **Betty Williams, Ohio Bureau of Employment Services, 3434 Cleveland Avenue, Columbus, Ohio 43229.**

## Postdoctoral Research Appointments

Postdoctoral fellowships are available in several diverse areas in the Life Sciences Division at the Los Alamos National Laboratory. Major programs involve: molecular biology, somatic cell genetics, cellular immunology, NMR studies of transport and metabolism, regulation of cellular growth and transformation, radiobiology, animal, cellular and genetic toxicology, biophysics, environmental science, theoretical and mathematical biology, plant science and neurobiology.

The National Flow Cytometry Resource and National Nucleic Acid Sequence Database are at Los Alamos, and fellowships can be arranged with these facilities.

The Laboratory is operated by the University of California for the Department of Energy. Appointments are for one year, renewable for second year and pay a stipend amount of \$26,220 to \$27,600 per annum (depending on research experience). We provide incoming travel, moving expenses and a full-range of benefits. Candidates no more than three years past their Ph.D. or M.D. are invited to apply.

For more information call M. Duane Enger at (505) 667-2690.

To apply please send curriculum vitae, statement of research interests and the names of three references to:

Madeline Lucas  
Personnel Services Div. 83-BO  
Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

University of California

**Los Alamos**

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

An Affirmative Action/Equal Opportunity Employer:  
Women, Minorities, Handicapped and Veterans are urged to apply.

## Study Fellowships for Scientists and Engineers in Science, Technology, and Society

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

Applicants should have a record of outstanding performance in a particular field of engineering, science or medicine. The fellowships are intended to assist people who wish to pursue further advanced studies in science, technology, and society, but who do not necessarily have a highly defined research project.

Selection of fellows will be based on:

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

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

Application should consist of a curriculum vitae, names of three references, and a description of the applicant's proposed studies not to exceed five typed pages. Additional material will be requested if needed. A Ph.D. or equivalent in science or engineering is desirable. Partial or full stipend is available, normally not to exceed \$25,000, and to be based on current salary. Fellows are expected to reside in the Boston area, and appointments will begin in September 1984. Address inquiries and applications to:

Professor Leon Trilling, Chairman  
Mellon Fellowship Committee  
STS Program, E51-128  
Box S  
M.I.T.  
Cambridge, MA 02139

Deadline for receipt of applications: February 1, 1984

M.I.T. is an equal opportunity/  
affirmative action employer.

**MIT**

## Postdoctoral Research Appointments

The Biological Nuclear Magnetic Resonance Group in the Life Sciences Division at Los Alamos National Laboratory is seeking candidates for postdoctoral fellowships in metabolism and multi-nuclear imaging using stable magnetic isotopes. Current studies include adipocyte metabolism, ion transport, plant cell wall synthesis, and tumor metabolism. These form the basis for potential clinical application of NMR at the University of New Mexico/Los Alamos National Laboratory Center for Non-invasive Technology. Potential participants in this program should have experience in metabolic regulation, biochemical NMR or NMR techniques.

The Laboratory is operated by the University of California for the Department of Energy. Appointments are for one year, renewable for second year and pay a stipend amount of \$26,200 to \$27,600 per annum (depending on research experience). We provide incoming travel, moving expenses and a full range of employee benefits. Candidates no more than three years past their Ph.D or M.D. are invited to apply.

For information call Laurel Sillerud at (505) 667-2766

To apply, please send curriculum vitae, statement of research interest, and the names of three references to:

Madeline Lucas  
Personnel Services Div 83-BN  
Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

University of California

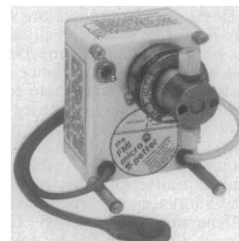
# Los Alamos

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

An Affirmative Action/Equal Opportunity Employer:  
Women, Minorities, Handicapped and Veterans are urged to apply.

## Pipetting? Single-Shot Microliter Dispensing?

# Try the all-new FMI Micro $\pi$ -Petter!



It provides a simple low-cost means of dispensing very small amounts of fluids for applications such as pipetting, reagent preparation, syringing, precision sampling, repetitive and volumetric dispensing. The variable displacement, valveless RR piston design makes it possible to dispense volumes of 2 to 100  $\mu$ l per shot with incremental adjustment of less than 0.5  $\mu$ l.

A simple, sealed push-button hand/foot pendant switch makes a momentary contact for one dispense per push when the mode switch is in the down (Singles) position, or it may be held down for purging or reagent rinsing when the mode switch is in the up (Repeat) position. Wetted surfaces of ceramic and fluorocarbon provide for maximum chemical compatibility. A three-speed 110 VAC 60 Hz synchronous motor provides three shot velocities to meet your fluid and vessel requirements.

\*Micro  $\pi$ -Petter is a registered trademark of Fluid Metering, Inc.

Two standard models are available at a price of \$450 each FOB FMI:

Model PIPOCKC—0 to 50  $\mu$ l;

Model PIP1CKC—0 to 100  $\mu$ l.

See our Catalog

in Thomas Register



# FLUID METERING, INC.

29 ORCHARD STREET, OYSTER BAY, N.Y. 11771 • (516) 922-6050

Circle No. 63 on Readers' Service Card

## Bristol-Myers announces its CNS Post-Doctoral Fellowship Program

*Under the direction of an experienced scientist, you'll define a research objective, establish experimental goals, develop and implement the laboratory study plan, formulate conclusions, and prepare manuscripts for publication. The problem will be in the area of the biological basis of psychopathology and the mechanism of action of psychotherapeutic drugs. You'll collaborate with behavioral, electrophysiological, and neurochemical professional staff to broaden your repertoire of research skills.*

*We're a well-equipped research group tackling problems which place us in the forefront of CNS research. Creativity and innovation are encouraged and you'll work with successful scientists on this one or two year appointment. We're located in Evansville, Indiana, a community of outstanding recreational opportunities and exceptional cultural and educational facilities.*

*Requires a Ph.D. in a neuroscience including knowledge of techniques for measurement of neurotransmitter dynamics, behavioral and neurochemical aspects of mental illness, and current research geared to elaborate the mechanism of action of psychotherapeutic agents.*

Please send resume and availability data to:

### Bristol-Myers Research Recruitment

Employment Department L-22  
Mead Johnson & Company  
Evansville, IN 47721

An Equal Opportunity Employer M/F/H/V

## AAAS Memberships and Subscriptions

- Whenever you write us about your membership or subscription, please attach a Science address label to ensure prompt service.

- **Mail to:** Membership and Subscription Records, AAAS, 1515 Massachusetts Ave., NW, Washington, D.C. 20005.

- ☐ **Change of Address:** Please provide 6 weeks' notice. Paste an address label from a recent issue in the space provided. Print new address below.

- ☐ **Query:** If you have a question, place your address label here and attach this form to your letter.

- **To join or subscribe:** Mail this form with your payment, mark the appropriate boxes, and print your name and address in the space below. (For renewals, attach label.)

- ☐ **Membership rates** (individual only)
  - ☐ \$53 USA ☐ \$77 Canada ☐ \$80 Foreign
  - ☐ \$118 air-surface delivery via Holland

- ☐ **Subscriber rates**
  - ☐ \$90 USA ☐ \$114 Canada ☐ \$117 Foreign
  - ☐ \$155 air-surface delivery via Holland

- ☐ Payment enclosed ☐ Bill me later

Name Please print

Address

City

State

Zip

SM10

**ATTACH  
LABEL  
HERE**

## POSITIONS OPEN

### POSTDOCTORAL POSITION— TREE CELL CULTURE

The Department of Pomology, University of California at Davis, invites applications for a postdoctoral position for research on cell culture of Douglas fir and sugar pine. Available 1 June 1984. The salary is consistent with level of experience and current university rates for the postgraduate research pomologist series. The appointee will be located in Davis. A Ph.D. is required with training in plant physiology, biochemistry, and horticulture.

Submit curriculum vitae, official undergraduate and graduate transcripts, list of publications, and names and addresses of three referees to: **Dr. D. J. Durzan, Department of Pomology, University of California, Davis, California 95616; telephone: 916-752-0123.** Applications must be received by 1 March 1984.

*In compliance with federal and state laws and University policy, the University of California does not discriminate on the basis of race, color, national origin, religion, sex, handicap, age, or against disabled veterans of the Vietnam era. The University of California is an Affirmative Action/Equal Opportunity Employer.*

**ONE POSTDOCTORAL POSITION** available immediately to study amylase and chymotrypsin content in individual zymogen granules and isolated acinar cells' secretory processes using microfluorescence techniques. Experience in enzyme biochemistry and micromanipulation necessary. Salary follows NIH guidelines. Send curriculum vitae and two letters of reference to: **Dr. Claude Lechene, Department of Physiology and Biophysics, Harvard Medical School, 221 Longwood Avenue, Boston, Mass. 02115.**

### POSTDOCTORAL POSITION CELL MOTILITY

Available June 1984 at Marine Biological Laboratory to study rotary axostyles and fluid membranes in termite flagellates, or control of ciliary motion and mechanosensory transduction by cilia in ctenophores. Send curriculum vitae, research experience, and names of references to: **Dr. Sidney L. Tamm, Boston University Marine Program, Marine Biological Laboratory, Woods Hole, Mass. 02543.**

**POSTDOCTORAL RESEARCHER IN MOLECULAR BIOLOGY/BIOCHEMISTRY** to study the interaction between eukaryotic topoisomerase regulation and function in chromatin. Ph.D. in microbiology, biochemistry, genetics, or related field. Experience in molecular biology or protein purification desirable. The position is available immediately in a modern, NIH-funded molecular biology/biochemistry laboratory for a minimum of 1 year and is renewable for a second year. Salary is commensurate with qualifications. Applicants should send curriculum vitae and names/telephone numbers of two references to: **Dr. Mark T. Muller, Department of Microbiology, 484 West 12 Avenue, The Ohio State University, Columbus, Ohio 43210.** *An Equal Opportunity/Affirmative Action Employer.*

**POSTDOCTORAL/RESEARCH ASSOCIATE POSITION** available to study the biochemical regulation, histochemical localization, and functions of Melatonin-synthesizing cells of vertebrate retina. The project involves tissue culture, HPLC assays for hormones and neurotransmitters, enzyme purification and analysis, and immunohistochemistry. Experience in one or more of the above techniques is required. Send curriculum vitae and names of three references to: **Dr. P. Michael Iuvone and Dr. Joseph C. Besharse, Emory University School of Medicine, Department of Pharmacology, Atlanta, Ga. 30322.**

*An Affirmative Action/Equal Opportunity Employer*

**Position available—POSTDOCTORAL RESEARCH ASSOCIATE** in cellular or tumor immunology. Ph.D. in immunology required. Some experience in clinical and monoclonal technology helpful. Available immediately. Send curriculum vitae to: **Dr. Zacharie Brahmi, Department of Medicine/Microbiology, Indiana University School of Medicine, 702 Barnhill Drive, Indianapolis, Ind. 46223.**

**POSTDOCTORAL RESEARCH ASSOCIATE.** A position is available immediately in the field of intercellular communication. Applicant must have Ph.D. Electrophysiological and computer expertise necessary. Send application letter, curriculum vitae, and the names of three references to: **Dr. P. R. Brink, Anatomical Sciences, Health Sciences Center, School of Medicine, State University of New York (SUNY) Stony Brook, Stony Brook, New York 11794.** *SUNY Stony Brook is an Equal Opportunity/Affirmative Action Employer. AK 746.*

## POSITIONS OPEN

### POSTDOCTORAL RESEARCH ASSOCIATE

Opening for postdoctoral research associate to conduct laboratory experiments and research in nucleic acid and molecular cloning, in conjunction with laboratory instruction and teaching of graduate students and medical students. Position is with Department of Biochemistry of university school of medicine located in St. Louis, Missouri. Qualified applicants must have M.D. or equivalent degree. Starting salary: \$16,024 per year plus university faculty benefits for 40-hour week. Send résumé to:

**Arnold W. Strauss, M.D.  
Associate Professor of Pediatrics  
and Biological Chemistry  
WASHINGTON UNIVERSITY  
SCHOOL OF MEDICINE  
DEPARTMENT OF BIOCHEMISTRY  
660 South Euclid Avenue  
St. Louis, Missouri 63110**

*An Equal Opportunity Employer*

**POSTDOCTORAL RESEARCH ASSOCIATE** position available to study DNA replication and mutagenesis in mammalian cells. This project involves the investigation of in vitro replication of DNA containing mutagenic lesions using mammalian enzyme systems. Procedures to be employed include cell and virus culture, DNA molecular biology, sequencing and cloning, and some enzymology. Experience in one or more of these techniques together with an understanding of genetics and DNA replication would be desirable. Send curriculum vitae and names of three references to: **Dr. Peter Moore, Department of Microbiology/Immunology, E-703 MSA, 835 South Wolcott, Chicago, Ill. 60612.** *The University of Illinois is an Affirmative Action/Equal Opportunity Employer.*

### POSTDOCTORAL RESEARCH FELLOW

An experienced cell biologist is sought with interests in somatic cell genetics and hemostatic functions. Applicant should be able to function independently and must be available early in 1984. Please send curriculum vitae, along with a letter of application which includes the names, addresses, and phone numbers of three references, to: **C.-J. S. Edgell, Pathology Department 228H, University of North Carolina, Chapel Hill, N.C. 27514.** *Equal Opportunity/Affirmative Action Employer.*

### POSTDOCTORAL AND RESEARCH ASSOCIATE POSITIONS

Are available for research on lysosomal enzyme gene characterization and sequencing. A cloned rat  $\beta$ -glucuronidase gene sequence is currently being used to study ontogeny and regulated expression of  $\beta$ -glucuronidase messenger RNA in rodents and man. The development of DNA methods for prenatal diagnosis and gene correction in this area is a future priority. Experience in recombinant DNA technology is desirable. Starting salary at \$15,000 and an appointment of 2 years is anticipated. Curriculum vitae and letters of reference should be sent to: **Drs. Virginia Hieber or Dr. Golder N. Wilson, Room K-2015 Holden, Department of Pediatrics, University of Michigan, Ann Arbor, Mich. 48109.**

**POSTDOCTORAL TRAINING POSITIONS** available immediately in the following areas: (i) protein chemistry, (ii) peptide synthesis, (iii) gene sequencing and recombinant DNA, (iv) molecular immunology, and (v) cellular immunology. Ph.D. required. Previous experience not necessary, but desirable. Send curriculum vitae and three letters of recommendation to: **Dr. M. Z. Atassi, Department of Biochemistry, Baylor College of Medicine, 1200 Moursund Avenue, Houston, Texas 77030.** *Baylor College of Medicine is an Equal Opportunity/Affirmative Action Employer.*

**Louisiana State University—Charles T. McCord, Jr. Endowed Professorship in Hydrocarbon Exploration:**

The Geology Department is seeking an internationally recognized leader in some research specialty critical to the search for oil and gas to fill the Charles T. McCord, Jr. Endowed Professorship. Applicants are expected to maintain scholarly research in their area of specialty. Rank at full professor level with salary competitive with endowed professorships at other major research universities. For consideration, send résumé, three letters of reference, and a description of future research programs to: **Lyle McGinnis, Faculty Search, Department of Geology, Louisiana State University, Baton Rouge, La. 70803-4101.** Search will remain open until position is filled.

*Louisiana State University is an Affirmative Action/Equal Opportunity Employer.*

## POSITIONS OPEN

**PSYCHOPHARMACOLOGIST.** The Department of Psychology of the University of Illinois at Champaign-Urbana invites applications for a tenure-track academic position. Candidates conducting research in all areas of psychopharmacology will be considered. The position will most likely be filled at the assistant professor level but outstanding candidates at other levels are also encouraged to apply. Earliest starting date: August 1984. For full consideration, applications, including letters of recommendation, should be received by 1 February 1984. Interviews will be conducted during the application period. Applicants should send complete curriculum vitae, representative reprints, and a brief statement of research interests, and arrange to have three letters of reference sent to: **Dr. Edward J. Roy, Department of Psychology, 603 East Daniel Street, Champaign, Illinois 61820.** *The University of Illinois is an Affirmative Action/Equal Opportunity Employer.*

### U.S. DEPARTMENT OF ENERGY

#### Senior-Level Staff Positions in Biomedical Research Management RADIATION BIOLOGIST GENETICIST

Office of Health and Environment Research, Office of Energy Research, U.S. Department of Energy (DOE), is seeking qualified applicants for the staff positions of **RADIATION BIOLOGIST** and **GENETICIST** in the Health Effects Research Division, which administers a broad multidisciplinary program of basic and applied research to understand and quantify health effects associated with the large-scale production and use of energy. Both positions involve appointments for a period of 2 years.

Must be U.S. citizen. Ph.D. or equivalent required. Experience in independent research required. Salary range for GS-15 is from \$48,553 to \$63,115. Duty station: Headquarters Office, Germantown, Md. Send SF-171, application for federal employment, or direct inquiries to:

**Stephanie Chaconas  
Office of Personnel Operations, GTN  
MA-205.4  
Office of Personnel  
U.S. Department of Energy  
Washington, D.C. 20545  
Telephone: 301-353-5591**

*The Department of Energy is an Equal Opportunity Employer.*

**Research Associate or Postdoctoral Position** to study surface membranes of African trypanosomes and regulatory mechanisms. Experience relevant to project may be in the area of membrane biochemistry, glycoproteins, phosphoproteins, protein purification cell culture, or hybridoma technology. Submit, before 11 November 1983, curriculum vitae, names of three references, and research summary to: **Curtis L. Patton, Yale University School of Medicine, 60 College Street, New Haven, Conn. 06510.** *Equal Opportunity/Affirmative Action Employer.*

**RESEARCH ASSOCIATE—SOIL SCIENCE.** Position is available with Dr. J. A. Kittrick working on the stability and weathering of minerals in soils. Measurements of solution equilibria and construction of stability diagrams required. Applicants must be interested in writing and coauthorship of publications. Applicants with interests in these areas and training in soil chemistry, soil mineralogy, or a closely related area should send curriculum vitae and three letters of reference to: **Dr. J. A. Kittrick, Department of Agronomy and Soils, Washington State University, Pullman, Wash. 99164-6426.** Appointment is for one year with options for renewal. Screening will start 1 December 1983, but applications will be accepted until suitable candidates are identified.

### RESEARCH ASSOCIATE/ MOLECULAR VIROLOGIST

A position is available immediately for a Ph.D. research scientist trained in molecular virology or related field (biochemistry, virology, organ, and tissue culture). Work involves latent herpes virus study at Cullen Eye Institute, Baylor College of Medicine. Possibility of faculty position. Funding available. Salary negotiable. Send curriculum vitae to:

**M. T. Green, Ph.D., M.D.  
Cullen Eye Institute  
6501 Fannin Street  
Houston, Texas 77030**

*Baylor College of Medicine is an Equal Opportunity/Affirmative Action Employer.*

# The MX Missile and the Strategic Balance of Power

A collection of recent articles from SCIENCE on contemporary strategic ideology is now available for use by professionals, teachers, and researchers interested in the nuclear arms race.

"Anyone seeking a better understanding of the MX debate would do well to look at [this] series of brief, clearly written analyses."

—*The Boston Globe*

Winner of the National Association of Science Writers 1982 Science-in-Society Journalism Award

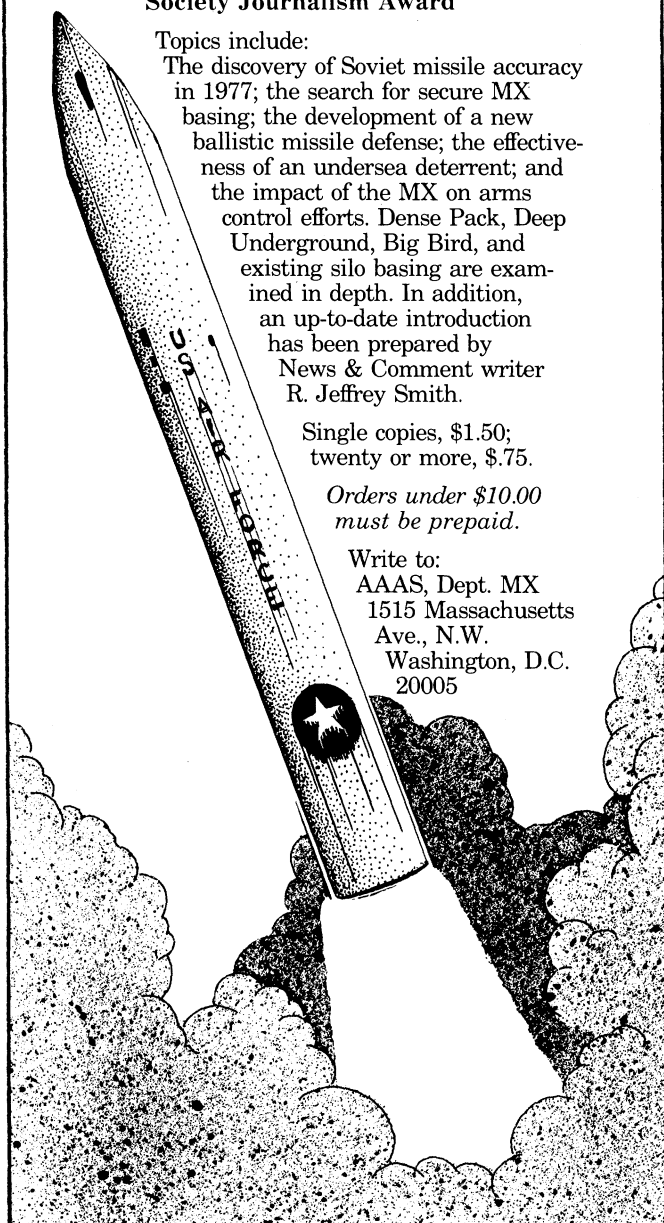
Topics include:

The discovery of Soviet missile accuracy in 1977; the search for secure MX basing; the development of a new ballistic missile defense; the effectiveness of an undersea deterrent; and the impact of the MX on arms control efforts. Dense Pack, Deep Underground, Big Bird, and existing silo basing are examined in depth. In addition, an up-to-date introduction has been prepared by News & Comment writer R. Jeffrey Smith.

Single copies, \$1.50;  
twenty or more, \$.75.

Orders under \$10.00  
must be prepaid.

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



Cooper Cooper Cooper Cooper

LABORATORY

## MONOCLONAL ANTIBODY PRODUCTION

CooperBiomedical, Inc., Scientific Division, a leading manufacturer of immunochemical products, has an immediate opening for the position of Manager, Monoclonal Antibody Production. Responsibilities include all aspects of hybridoma technology. An advanced degree in immunology or cell biology is required with a minimum of 5 years hybridoma experience.

CooperBiomedical, Inc., offers an excellent salary and outstanding employee benefits program.

Candidates are requested to submit curriculum vitae to: Director of Personnel.

CooperBiomedical, Inc.

Scientific Division

1 Technology Court

Malvern, PA 19355

Equal Opportunity Employer M/F

Cooper Cooper Cooper Cooper

## SCIENCE

### SCIENCE Introduces "The Four-Day Close"

We now offer our recruitment advertisers the convenience formerly found only in daily newspapers. We call it "**The Four-Day Close.**" Instead of reserving space a month or more in advance, you now have until just four days before the issue is mailed to its 160,000-plus subscribers.

Film (right-reading, emulsion face down, 1/4 or 1/2 page size only) and insertion order must reach: **SCIENCE, Room 107, 1515 Massachusetts Avenue, N.W., Washington, D.C. 20005**, by 3 p.m. Mondays (except for legal holidays when material must reach Washington by 3 p.m. Fridays). Because space is limited, the four-day close page will be reserved on a first-come, first-served basis.\*

Now you don't have to wait for the professional you need **as soon as possible**. 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.

We call it "**The Four-Day Close.**"

You can call it "**Instant Recruitment.**"

For further information, telephone Dick Charles at **SCIENCE: 212-730-1050**, or write: **1515 Broadway, New York, N.Y. 10036**.

\*At a 15% premium.

## POSITIONS OPEN

**RADIOPHARMACEUTICAL SCIENTIST.** A position on the scientific staff is now open in the internationally recognized Radionuclide and Radiopharmaceutical Research Division of the Medical Department at Brookhaven National Laboratory. Responsibilities involve planning and carrying out research on new and improved radiopharmaceuticals based on conventional as well as novel radionuclides. Candidates should have a Ph.D. in inorganic/analytical chemistry or radiochemistry, with a minimum of two years of experience in radiopharmaceutical research. Demonstrated capabilities in one or more of the following areas are highly desirable: technetium chemistry, immunochemistry, protein biochemistry, radiolabeled monoclonal antibodies, iodination techniques, and analytical research including immunologic and HPLC methods. Candidates should send résumé to: **Dr. Suresh C. Srivastava, Medical Department, Building 801, Brookhaven National Laboratory, Associated Universities, Inc., Upton, New York 11973. Telephone: 516-282-4459. Equal Opportunity Employer, M/F.**

### RESEARCH ASSOCIATE

Postdoctoral position available immediately for 2 years to develop assays for measuring serum antibody levels to oral spirochetes. Familiarity with the cultivation and serology of spirochetes desirable. Salary: \$16,000 to \$20,000 per year. Send résumé to:

**Dr. M. A. Listgarten**  
Department of Periodontology  
University of Pennsylvania  
School of Dental Medicine  
4001 Spruce Street  
Philadelphia, Pa. 19104

*An Affirmative Action/Equal Opportunity Employer*

**RESEARCH ASSOCIATE.** Attractive position in established research laboratory for a person with at least one year of postdoctoral experience or extensive graduate training in molecular biology/genetics to work on characterization of genes coding for tumor-associated immunosuppressive proteins. Send a copy of curriculum vitae, bibliography, and three letters of reference to: **Dr. Ralph Snyderman, Professor of Medicine and Immunology, Box 3892, Duke University Medical Center, Durham, N.C. 27710.**

**RESEARCH ASSOCIATE.** Postdoctoral position available immediately for research on processes controlling pH and ion activity in neural tissue as they relate to control of breathing. Doctoral degree in physiology, biomedical engineering, or related area required. Please send curriculum vitae and names of three references to: **Dr. J. Milton Adams, Biomedical Engineering, Box 377 Medical Center, University of Virginia, Charlottesville, Va. 22908. Deadline for applications: 1 December 1983. Equal Opportunity/Affirmative Action Employer.**

**RESEARCH POSITION** for postdoctoral or research associate in developmental immunobiology. Applicant should have a Ph.D. or M.D. degree and some experience in radioimmunoassay and hybridoma technology. Interest in T-cell differentiation and thymic hormones is essential. Send curriculum vitae and three letters of recommendation to: **Dr. Genevieve S. Incefy, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, N.Y. 10021.**

**RESEARCH—Research staff position, tenure track, available for independent research in the general area of NMR investigations of structure, dynamics, and function of biological macromolecules and their complexes. Multinuclear high-resolution FT NMR spectrometers available. Send curriculum vitae and statement of proposed research to: **Dr. Mildred Cohn, Chairman, Search Committee, Institute for Cancer Research of the Fox Chase Cancer Center, 7701 Burholme Avenue, Philadelphia, Pa. 19111. Equal Opportunity Employer.****

**TOXICOLOGY.** The School of Veterinary Medicine, University of Wisconsin-Madison, is recruiting for a faculty position in toxicology. Responsibilities will include the development and implementation of programs in instruction, research, and service. The Ph.D. is required. The D.V.M. or equivalent degree is desirable. Salary and rank will be commensurate with experience and qualifications. Applications should include curriculum vitae and names and addresses of three references. Closing date is 31 December 1983 or until filled. Apply to: **Dr. Gerald E. Bisgard, Department of Structural and Functional Sciences, School of Veterinary Medicine, 2015 Linden Drive West, Madison, Wis. 53706. The University of Wisconsin is an Affirmative Action/Equal Opportunity Employer.**

## POSITIONS OPEN

**PROJECT ASSOCIATE:** Ph.D. (biochemistry/chemistry) to study RNA replicases from virus infected plants. At least 2 years of postdoctoral experience in RNA virus molecular biology, especially replicase isolation and product characterization. Working knowledge of cloning and sequencing of viral RNA essential. Minimum: 40 hours per week; salary: \$16,500. Send application and three references to: **Bill Janek, Job Service, 206 North Broom Street, Madison, Wis. 53703. Not paid for by Job Service funds. An Equal Opportunity Employer.**

**RESEARCH FELLOW, DEVELOPMENTAL BIOLOGY.** Studies on structure and control of tubulin and protein synthesis factor genes in sea urchin and *Artemia*. Apply to: **Dr. Albert Wahba, Department of Biochemistry, University of Mississippi Medical Center, Jackson, Miss. 39216. Equal Opportunity Employer, M/F/V/H.**

### VICE PRESIDENT OF ACADEMIC AFFAIRS AND DEAN OF FACULTY Worcester Polytechnic Institute

Applications are invited for the position of Vice President of Academic Affairs and Dean of Faculty at Worcester Polytechnic Institute, an innovative College of Science and Engineering with an enrollment of 2500 undergraduate and 400 full-time graduate students, located in central Massachusetts.

Candidates should have an earned doctorate, a record of excellence in teaching/research/administration, proven academic leadership skills, excellent interpersonal skills, and a keen commitment to academic excellence. A candidate should have the qualifications normally associated with a tenured position in one of the College's academic departments.

The vice president for academic affairs and dean of faculty reports to the president and as chief academic officer of the College, is responsible for monitoring and recommending to the president academic appointments, the granting of tenure and promotion, and also the review, development, and evaluation of academic policies, standards, and budget. Specific duties involve educational program development, budget management, and management of related academic activities.

Candidates should submit letter of application and curriculum vitae, together with the names of three references, to: **Faculty Search Committee, Worcester Polytechnic Institute, Institute Road, Worcester, Mass. 01609, no later than 15 November 1983. Equal Opportunity/Affirmative Action Employer.**

## GRADUATE STUDY

### Ph.D. IN BASIC MEDICAL SCIENCES

Applications are now being accepted for September 1984 entrance into a graduate program leading to the Ph.D. with specialization in anatomy, biochemistry, microbiology/immunology, pharmacology, or physiology. A medical scientist training program admits three students each year. This program leads to both the Ph.D. and M.D. degrees. Participation in MCAS is required for application to the Medical Scientist Training Program and taking the GRE is recommended for all applicants. Tuition is waived. Stipend is \$5000 per year. Application deadline: 30 April. For further information, write:

**Edwin R. Hughes, M.D.**  
Director, Graduate Program  
University of South Alabama  
MSB 1015  
Mobile, Ala. 36688

## FELLOWSHIPS

**HYPERTENSION RESEARCH FELLOWSHIPS.** Fellowships in hypertension research for 2 years for qualified applicants are available at the Mayo Clinic and Mayo Graduate School of Medicine. This NIH-funded multidisciplinary program provides research training in hypertension by faculty in Nephrology, Endocrinology, Cardiovascular Diseases, Pharmacology, Pediatrics, Biochemistry, and Physiology. Applicants should have the M.D. or Ph.D. degree and hold a permanent visa if not a citizen of the United States. Degree programs leading to the master's or Ph.D. degrees are available to individuals with the M.D. degree. For further information, write to: **R. M. Weinschilbom, M.D., Director, Multidisciplinary Hypertension Research Training Program, Mayo Clinic, Rochester, Minnesota 55905. An Equal Opportunity/Affirmative Action Institution.**

## FELLOWSHIPS

**POSTDOCTORAL FELLOWSHIP** position in medicine and/or biological structure available 1 January 1984, renewable for up to 3 years at NIH funding level. Seeking applicants with experience in electron microscopy and interest in working in laboratory group involved in developmental biology and ultrastructure of skin. To work with M.D.'s and Ph.D.'s in funded studies on repair of experimental and incised wounds in laboratory animals and man. Send curriculum vitae and names of three references to: **George F. Odland, M.D., Departments of Medicine RM-14 and Biological Structure, University of Washington, Seattle, Wash. 98195.**

**POSTDOCTORAL FELLOWSHIPS—**The Cancer Research Center of the University of North Carolina (UNC) at Chapel Hill will have openings 1 July 1984, for persons completing graduate studies to train with investigators in basic cancer-related research in tumor virology, chemical carcinogenesis, drug development, cancer cell biology and tumor immunology. Training available in receptors, nucleic acid hybridization, gene cloning, in herpesvirus and retrovirus systems, DNA replication, molecular enzymology, cell cycle analysis, epithelial cell systems, and combined programs. Unique resources and departmental affiliations. Candidates must be U.S. citizens or permanent residents. Send for brochure and apply with curriculum vitae, three letters of recommendations, a statement of research interests, and graduate school records to: **Director, Cancer Research Center, Box 30, MacNider Building, Chapel Hill, N.C. 27514. UNC, Cancer Research Center, is an Affirmative Action/Equal Opportunity Employer.**

**POSTDOCTORAL RESEARCH FELLOWSHIP.** Available immediately in Nutrition Research Laboratory involving drug nutrient interactions. Must have Ph.D. in biochemistry or physiology and research experience in alcohol, drug, or vitamin metabolism. Please send résumé to: **Dr. Richard S. Rivlin, Chief, Nutrition Service, Memorial Sloan-Kettering Cancer Center, Box 140, 1275 York Avenue, New York, N.Y. 10021.**

*An Equal Opportunity Employer*


## MARKETPLACE




- Computer controllable (RS 232 option)
- Two stepper driven independent pumps
- Stand-alone or remote control
- Flow from 0.1 to 999.9 ml/hr
- As accurate as most syringe pumps

**INSTECH LABORATORIES, INC.**  
434 Virginia Drive, Fort Washington  
PA 19034 Phone: (215) 541-1150

Circle No. 208 on Readers' Service Card



**BACTERIAL ACTIVITY**  
... Measure In Minutes ...  
No Wait for Culture Plate!  
Ask for TD-20 Bio-Assay  
System Clip/Copy and Mail or Phone  
2247 Old Middlefield Way  
Mountain View, CA 94043-2489  
(415) 965-9800



Circle No. 209 on Readers' Service Card

**Memo to:**  
**RESEARCHERS AND DESIGNERS**  
Temperature measurement with  
Bailey microprobes (in vivo or in vitro)  
is easy, inexpensive and accurate. We  
have developed sensor probes for  
hyperthermia, cryosurgery, anasto-  
mosis patency monitoring, etc.  
Bailey technology, interchangeable  
microprobes and electronic readouts  
are available to you for research, or  
for development of disposable devices  
and equipment.  
Call 201-845-7252 ext. 23  
**Bailey** 515 Victor St.  
INSTRUMENTS Saddle Brook, NJ 07662

Circle No. 23 on Readers' Service Card

# Polaroid introduces slides in 5 minutes.

Introducing three new Polaroid transparency films that fit any 35mm camera or instrument with a standard 35mm back.



Introducing Polaroid Polachrome CS 35mm color transparency film (ISO 40/17). Polaroid Polapan CT 35mm continuous tone black and white transparency film (ISO 125/22). And Polaroid Polagraph HC 35mm high contrast black and white transparency film (ISO 400/27).

The new Polaroid 35mm Autoprocess System lets you develop, mount, and project these films in under 5 minutes. And at a cost that's about the same as conventional transparency films with processing.\*

These Polaroid films are unlike any other 35mm films you've ever used. And the technology is totally

different. Polachrome CS film is based on an additive process; its base density is greater, and the ISO film speed is a little slower. Yet it produces unbelievably accurate, saturated colors with medium grain, sharp detail, and high resolution. The black and white films offer you the world's simplest, most direct way to get high quality, fine grain, continuous tone or high contrast slides right away.

Processing is easy. You load the film into the AutoProcessor. Turn the handle. Wait a minute. And rewind the film into the cartridge. Mounting is simple, and you're ready to project. All, in under 5 minutes.

**The scientific applications are virtually limitless.**

Polaroid transparency film can be used in hand-held 35mm cameras or in the most sophisticated laboratory instruments equipped with standard 35mm backs.

And because the Autoprocess System can give you slides in under five minutes, you can have scientific images ready on-the-spot. Securely, in-house. No darkroom is needed.

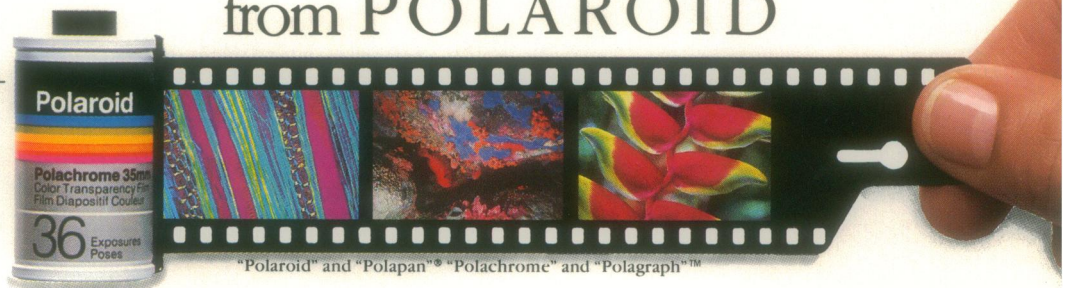
And you can be sure you have the results you need for documentation, presentation, or consultation.

**You've waited long enough. It's available at dealers now.**

See your local dealer now. Or find the name of the Polaroid Specialty Dealer nearest you by calling toll-free 800-526-7843 ext. 400 in the continental U.S.; 800-522-4503 ext. 400 in New Jersey.

\*Comparison based on suggested list price of film and processing for 36 exposure roll.

## The new 35mm Autoprocess System from POLAROID



"Polaroid" and "Polapan"® "Polachrome" and "Polagraph"™

Through a century and a half of reliability you have known  
our products under the names of American Optical  
and AO Scientific Instruments. Our commitment  
today is to the level of excellence the world  
associates with our Reichert microscopes.

Announcing our new name...



**AO Reichert**

A DIVISION OF WARNER-LAMBERT TECHNOLOGIES, INC.

MICROSCOPES • MICROTOMES • FIBER OPTICS • OPHTHALMIC INSTRUMENTS  
HISTOPATHOLOGY PRODUCTS • ANALYTICAL INSTRUMENTS

Circle No. 96 on Readers' Service Card