Policy for Announcements in the FJ Calendar

We will consider for advertising in the FJ Calendar any open meeting of a biological topic occurring in any location worldwide. Please send your announcement to the Executive Editor, The FASEB Journal, FASEB, 9650 Rockville Pike, Bethesda, MD 20814, USA. Your announcement should be restricted to: date (include year), title and location of meeting, contact address (with name if appropriate). We will advertise only meetings taking place more than 5 months after the date of receipt of the announcement. Meetings, symposia, and workshops will be included up to 2 years in advance; international congresses will be included up to 3 years in advance.

[FJ Indicates New Entry.]

MAY 1988


5-6 Therapeutic Drugs and Drugs of Abuse Monitoring: Practice and Concepts, Boston University School of Medicine, Boston, Massachusetts, USA. Dept. of Continuing Medical Education, Boston Univ. Sch. of Medicine, 80 E. Concord St., Boston, MA 02118, USA.

5-13 Course on Tissue Culture in Neurobiology, University of Saskatchewan, Saskatoon, Saskatchewan, Canada. S. Fedoroff, Dept. of Anatomy, Univ. of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 0W0.

8-12 79th American Oil Chemists' Society Annual Meeting, Phoenix Civic Plaza, Phoenix, Arizona, USA. Meetings Manager, American Oil Chemists' Society, P.O. Box 3489, Champaign, IL 61821, USA.

9-13 Endocrine Pathology, London, UK. Histochemistry Unit, Dept. of Histopathology, Royal Postgraduate Medical Sch., Hamme-

MAY 1988

9-13 VIIIth International Washington Spring Symposium: Biomedical Advances in Aging '88: Molecular and Immunological Mechanisms, Intervention and Clinical Approaches to Treatment, Washington, DC, USA. Dr. Allan L. Goldstein, Dept. of Biochemistry, The George Washington Univ. Sch. of Medicine and Health Sciences, 2300 Eye St., NW, Washington, DC 20037, USA.

10-13 Galveston Chapter of the Society for Neuroscience Symposium: Neuroendocrine Modulation of Central Nervous System Function, Galveston, Texas, USA. Dr. J. M. Lakoski, Dept. of Pharmacology J-31, Univ. of Texas Medical Sch., Galveston, TX 77550, USA.

11-13 Annual Meeting of the Association of Systematics Collections, Field Museum, Chicago, Illinois, USA. Dr. K. E. Hoagland, Association of Systematics Collections, 730 11th St., NW, 2nd Fl., Washington, DC 20001, USA.


12-13 Royal Australian Chemical Institute, Polymer Division, Symposium on Controlled Release: Science and Technology 1988, Victorian College of Pharmacy, Melbourne, Australia. Dr. R. C. Oppenheim, Victorian Coll. of Pharmacy Ltd., 381 Royal Parade, Parkville, Victoria 3052, Australia.

12-14 Cholesterol Metabolism, an International Symposium in memory of the 90th birthday of Rudolph Schoenheimer, New York University Medical Center, New York City, USA. Dr. Norman B. Javitt, Registration Office, NYU Postgraduate Medical Sch., 550 First Ave., New York, NY 10016, USA.


16-20 In Vitro Autoradiographic Techniques, London, UK. Histochemistry Unit, Dept. of Histopathology, Royal Postgraduate Medical Sch., Hamme-

MAY 1988


18-20 Midwest and Southern Section Meeting of the Society of Research Administrators, The Alber-}


18-20 International Conference on the Role of Folate and Vitamin B-12 in Neurotransmitter Metabolism and Degenerative Neurologic Changes Associated with Age, FASEB Conference Center, Bethesda, Maryland, USA. Sue Ann Anderson, Senior Staff Scientist, Life Sciences Research Office, FASEB, 9650 Rockville Pike, Bethesda, MD 20814, USA.

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19-23 Advances in the Biology and Chemistry of N-Nitroso and Related Compounds, Omaha, Nebraska, USA. Ma. Terri Eastman, Epley Inst. for Research in Cancer, Univ of Nebraska Medical Center, Omaha, NE 68105, USA.

20-22 1st International Congress on Mucopegalysaccharidosis and Related Diseases, Radisson University Hotel, Minneapolis, Minnesota, USA. Continuing Medical Education, Univ of Minnesota, Box 202 UMH, 420 Delaware St SE, Minneapolis, MN 55455, USA.

22-25 26th Annual Meeting of the Association for Gnotobiology, Pallas Suite Hotel, New Orleans, Louisiana, USA. Dr. James B. Henghan, LSU-Surgery, 1542 Tulane Ave., New Orleans, LA 70112, USA.

22-26 International Conference on Diet, Lipids and Cancer, Yulara Resort (via Ayers Rock), Northern Territory, Australia. Cosponsored by IUB. Dr. John R. Sabine, Univ of Adelaide, Waite Agricultural Research Inst., Glen Osmond, South Australia 5064, Australia.

23-25 7th Stony Brook Symposium on Recent Advances in Intercellular Communication, Stony Brook, New York, USA. Biochemistry Dept., State Univ of New York, Stony Brook, NY 11794, USA.

25-28 Seventy-Ninth Annual Meeting of the American Association for Cancer Research, New Orleans Convention Center, New Orleans, Louisiana, USA. Margaret Foti, Executive Director, AACR, Temple Univ School of Medicine, West Blvd., Rm. 301, Broad and Tioga Sts., Philadelphia, PA 19140, USA.


26-27 Current Issues in Anatomic Pathology, San Francisco, California, USA. Office of Extended Programs in Medical Education, Rm. U-569, Univ of California, San Francisco, CA 94143, USA.

26-28 International Symposium on Cyclosporin in Autoimmune Diseases and in Organ Transplantation, Brescia, Italy. Organizing Secretariat, CLAS International, Via Pace, 8, 25122 Brescia, Italy.


26-29 Continuous Cell Lines as Substrates for Biologicals, National Clarion Hotel, Arlington, Virginia, USA. Cell Substrates Conference Registrar, Talley Management Group, Inc., 22 Euclid St., Woodbury, NY 08096, USA.

26-31 Annual Meeting of American Association for the Advancement of Science, Boston, Massachusetts, USA. AAAS Meeting Officer, 1101 Vermont Ave., 10th Fl., Washington, DC 20005, USA.


26-27 May 1988

6-8 Thirteenth National Nutrient Data Bank Conference, Framingham State College, Framingham, Massachusetts, USA. Dr. Charlene Hamilton, Chairperson, Dept. of Home Economics, Framingham State Coll., 100 State St., Framingham, MA 01701, USA.

6-10 1988 Annual Scientific Meeting of Undersea and Hyperbaric Medical Society, Fairmont Hotel, New Orleans, Louisiana, USA. Ms. Jane Dunne, Undersea and Hyperbaric Medical Society, 9650 Rockville Pike, Bethesda, MD 20814, USA.


8-10 70th Annual Meeting of The Endocrine Society, New Orleans, Louisiana, USA. The Endocrine Society, 9650 Rockville Pike, Bethesda, MD 20814, USA.

9-11 International Symposium on Immunotoxins, Sheraton University Center, Durham, North Carolina, USA. Ms. Rosemary Borne, c/o Dr. Arthur Frankel, Duke Univ Medical Center, Box 3898, Durham, NC 27710, USA.

12-15 International Symposium on Alzheimer's Disease, Kuopio, Finland. Prof. Paavo Riekkinen, Dept. of Neurology, Univ of Kuopio, SF-70211 Kuopio, Finland.

12-16 Immunology and Immunopathology of the Alimentary Canal, 11th International Convocation on Immunology, Hyatt Regency Hotel, Buffalo, New York, USA. Dr. James F. Mohn, Director, The Ernest Witebsky Center for Immunology, 233 Sherman Hall, State Univ of New York at Buffalo, Buffalo, NY 14214, USA.

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<td>12-16</td>
<td>19-22</td>
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<td>Hormones, Thermogenesis and Obesity, University of Wisconsin, Madison, Wisconsin, USA. Steenbock Symposium, Inst. for Enzyme Research, Univ. of Wisconsin, Madison, WI 53706, USA.</td>
<td>International Symposium: Basic and Clinical Approaches to Virus Chemotherapy, University of Helsinki, Helsinki, Finland. Secretariat, Antivirals 88, c/o Duodecim, Kalevankatu 11 A SF-00100 Helsinki, Finland.</td>
<td>Smooth Muscle, FASEB Summer -1 Jul. Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.</td>
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<td>12-17</td>
<td>19-23</td>
<td>26 Jun.</td>
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<td>Yeast RNA: Transcription, Splicing, Translation, Replication and Transposition, FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.</td>
<td>Molecular and Cellular Mechanisms of Antiarrhythmic Agents, Nashville, Tennessee, USA. Dr. Luc Hondeghem, Vanderbilt Univ., Cardiovascular Research Program, Rm. CC-2209 Medical Center N., Nashville, TN 37223, USA.</td>
<td>Neuroimmunomodulation, FASEB -1 Jul. Summer Research Conferences, Copper Mountain, Colorado, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.</td>
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<td>Biological Membranes in Cancer Cells, Le Tre Vasele Hotel, Torgiano, Perugia, Italy. New York Academy of Science Conference, Dr. A. Scarpa, Case Western Reserve Univ., Dept. of Physiology and Biophysics, Cleveland, OH 33106, USA.</td>
<td>Retinoids, FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.</td>
<td>Fourth Congress of the International -2 Jul. Society for Biomedical Research on Alcoholism, Kyoto, Japan. Dr. Kinya Kuriyama, Chairperson, Dept. of Pharmacology, Kyoto Prefectural Univ. of Medicine, Kawaramachi-Hirokoji, Kamikyo-ku, Kyoto 602, Japan.</td>
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<td>8th Annual Symposium of the American Society for the Immunology of Reproduction, Portland, Maine, USA. Dr. Neal Rote, Foundation for Blood Research, Box 190, Route 1, Scarborough, ME 04074, USA.</td>
<td>Midwest Regional Section Meeting of the Association of Official Analytical Chemists, Holiday Inn West, Columbia, Missouri, USA. George Rottinghaus, Univ. of Missouri, Columbia, Veterinary Medicine Diagnostic Laboratory, Columbia, MO 65211, USA.</td>
<td>50th Annual Scientific Meeting of the Committee on Problems of Drug Dependence, Sea Crest Resort and Conference Center, North Falmouth, Massachusetts, USA. Dr. Martin W. Adler, Executive Secretary, CPDD, Dept. of Pharmacology, Temple Univ. Sch. of Medicine, 3420 N. Broad St., Philadelphia, PA 19140, USA.</td>
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<td>18-29</td>
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<td>NATO Advanced Study Institute on Vascular Endothelium: Receptors and Transduction Mechanisms, Porto Carras, Halkidiki, Greece. Dr. John D. Caravas, Dept. of Pharmacology and Toxicology, Medical Coll. of Georgia, Augusta, GA 30912, USA.</td>
<td>Pacific Northwest Regional Section Meeting of the Association of Official Analytical Chemists, Evergreen College, Olympia, Washington, USA. Mike Wehr, Oregon Dept. of Agriculture, 635 Capitol St., NE, Salem, OR 97310, USA.</td>
<td>The Molecular Aspects of Autoimmunity, Hotel L'Esterel, Ville D'Esterel, Canada. Dr. Nadir R. Farid, Thyroid Research Laboratory, Health Sciences Centre, St. John's, Newfoundland, A1B 3V6 Canada.</td>
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6-8 Biotechnological Aspects of Protein Production by Cultured Cells, Prague, Czechoslovakia. Satellite symposium of 14th IUB Congress. Dr. F. Franek, Inst. of Molecular Genetics, Videnaka 1083 CS-142 20 Praha 4, Czechoslovakia.

6-9 Local Changes in DNA Structure and Their Biological Implications, Brno, Czechoslovakia. Satellite Meeting of the IUB. 14th International Congress of Biochemistry, 166 50 Prague 6, Czechoslovakia.

10-15 14th International Congress of Biochemistry, Prague, Czechoslovakia. Sponsored by IUB. 14th International Congress of Biochemistry, 166 50 Prague 6, Czechoslovakia.

10-15 Phospholipases, FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.


11-15 CRYO 88—25th Annual Meeting of the Society for Cryobiology, Aachen, FRG. Dr. Christoph Körber, Helmholz-Instit für Biomedizinische Technik, Pauwelstr., D-5000 Aachen, FRG.

11-16 Design and Analysis of Scientific Experiments, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA. Director of the Summer Session, Room E19-356, Massachusetts Institute of Technology, Cambridge, MA 02139, USA.

17-21 The International Congress on Natural Products Research, Prospector Hotel, Park City, Utah, USA. Co-sponsored by the American and Japanese Societies of Pharmacognosy. Prof. Chris M. Ireland, Dept. of Medicinal Chemistry, 308 Skags Hall, Univ. of Utah, Salt Lake City, UT 84112, USA, or Dr. Yohei Hashimoto, President, Japan Society of Pharmacognosy, Kobe Women's Coll. of Pharmacy 4-19-1, Motoyamakita-Machi, Higashinada-Ku, Kobe 658, Japan.

17-22 Immunopharmacology, FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

17-22 Molecular Biology and Infectious Diseases, FASEB Summer Research Conferences, Copper Mountain, Colorado, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

17-23 8th International Biotechnology Symposium, Paris, France. International Convention Representatives, 35 W. 65th St., New York, NY 10023, USA.

17-23 8th International Congress of Endocrinology, Kyoto, Japan. The Secretary, 8th International Congress of Endocrinology, Travel Planners-Kyoto Congress, Suite 150, GPM Bldg., San Antonio, TX 78216, USA.

18-20 Biotechnological Aspects of Protein Production by Cultured Cells, Prague, Czechoslovakia, Satellite Meeting of the IUB. 14th International Congress of Biochemistry, 166 50 Prague 6, Czechoslovakia.

18-20 21st Century Prospects of Biotechnology in Agriculture and Environment, Slusovice, Czechoslovakia, Satellite Meeting of the IUB. 14th International Congress of Biochemistry, 166 50 Prague 6, Czechoslovakia.
18-20 July 1988

18-20 10th Symposium on Biology, Biochemistry and Clinical Biochemistry of Lectins, Prague, Czechoslovakia, Satellite Meeting of the IUB. 14th International Congress of Biochemistry, 166 50 Prague 6, Czechoslovakia.

18-20 Cellular Pathology and Pharmacology, Budapest, Hungary. Dr. Jozsef Gaal, CHINOIN Pharmaceutical and Chemical Works Ltd., Research Centre, P.O. Box 110, 1325 Budapest, Hungary.

18-20 Fourth International Symposium on Selenium in Biology and Medicine, University of Tubingen, Tubingen, FRG. Dr. Albrecht Wendel, Physiologisch-Chemisches Inst. der Univ., Hoppe-Seyler-Str. 4, D-7400 Tubingen, FRG.


18-29 The Jackson Laboratory and Johns Hopkins University Short Course in Medical and Experimental Mammalian Genetics, The Jackson Laboratory, Bar Harbor, Maine, USA. Genetics Course, Training and Education Office, The Jackson Lab., 600 Main St., Bar Harbor, Maine 04609, USA.

20-22 Annual General Meeting, Nottingham, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

20-23 International Symposium on Tachykinins, University of Graz, Graz, Austria. Dr. F. Lemberg, Tachykinin Symposium, Dept. of Pharmacology, University of Graz, Universitätsplatz 4, A-8010 Graz, Austria.

24-27 The Mammalian Myocardium—Biochemical and Physiological Mechanisms Underlying the Heartbeat, Leeds, UK. Dr. C. Orchard, Dept. of Physiology, The Worsley Medical and Dental Bldg., The University, Leeds LS2 9NQ, UK.

24-28 Sixth International Symposium on Calcium-Binding Proteins in Health and Disease, Hotel Nagoya Castle, Nagoya, Japan. Satellite symposium of 8th International Congress of Endocrinology. Secretariat, Sixth International Symposium on Calcium-Binding Proteins in Health and Disease, Dept. of Pharmacology, Nagoya Univ. Sch. of Medicine, Showaku, Nagoya 466, Japan.

24-29 Structure and Function of Cell Membranes, FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

24-29 Trichothecine, Blue-green Algal, and Marine Toxins: Mechanisms, Detection, and Therapy, FASEB Summer Research Conferences, Copper Mountain, Colorado, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

24-29 Universities Associated for Research and Education in Pathology Teaching and Research Conference on Molecular Biology and Pathology, Copper Mountain, Colorado, USA. UAREP Teaching and Research Conference Coordinator, 9650 Rockville Pike, Bethesda, MD 20814, USA.


25-28 1st World Congress of World Association of Veterinary Microbiologists, Immunologists and Specialists of Infectious Disease, Lyon, France. Prof. Y. Richard, WAVMI, École National Vétérinaire de Lyon, Route de Sain Bel, Marcy-l'Étoile, 69260 Charbonnieres-les-Bains, France.

25-30 International Symposium on Mucus and Related Topics, Society for Experimental Biology, University of Manchester, UK. Dr. E. Chantler, Dept. of Obstetrics and Gynaecology, Univ. Hospital of South Manchester, Nell Ln., West Didsbury, Manchester M20 8LR, UK.

27-31 International Symposium on Inflammatory Heart Disease: A Multidisciplinary Approach to Myocarditis and Heart Allograft Rejection, Snowmaas, Colorado, USA. Ms. Marge Adey, Center for Continuing Education, Univ. of Nebraska Medical Center, 42nd and Dewey Ave., Omaha, NE 68105, USA.

31 Jul. Cellular and Molecular Genetics, -5 Aug. FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

31 Jul. Folate, Vitamin B-12 and One Carbon Metabolism, FASEB Summer Research Conferences, Copper Mountain, Colorado, USA. Dr. Robert W. Krauss, Executive Director, FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

31 Jul. 8th International Congress of Histochecmy and Cytochemistry, Omni Shoreham Hotel, Washington, DC, USA. Congress Secretariat, Dr. Constance Oliver, NIH-NIDR Bldg. 10, Rm. 1A23, Bethesda, MD 20892, USA.

31 Jul. Animal, Plant and Microbial Toxins, 9th World Congress of International Society on Toxoinology, Oklahoma State University, Stillwater, Oklahoma, USA. Dr. C. L. Ownby, Dept. of Physiological Sciences, Oklahoma State Univ., Stillwater, OK 74078, USA.

AUGUST 1988

6-12 1988 World Congress on Medical Physics and Biomedical Engineering, San Antonio, Texas, USA. Dr. David T. Kopp, Secretary General, Dept. of Radiology, UTHSCSA, 7703 Floyd Curl Dr., San Antonio, TX 78284, USA.
AUGUST 1988

7-12 Receptors, FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director. FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

7-12 Endothelium and Cardiovascular Function, FASEB Summer Research Conferences, Copper Mountain, Colorado, USA. Dr. Robert W. Krauss, Executive Director. FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

7-13 14th International Congress on Yeast Genetics and Molecular Biology, Espoo, Finland. Tarja Koistinen, Research Labs. Alko Ltd., POB 350, SF 00101, Helsinki, Finland.

8-11 XIIth Meeting of the International Society of Oxygen Transport to Tissue, Ottawa, Canada. K. Rakusan, Dept. of Physiology, Sch. of Medicine, Univ. of Ottawa, 451 Smyth Rd., Ottawa, Ontario, Canada K1H 8M5.

8-12 Fifth International Magnesium Symposium, Kyoto International Conference Hall, Kyoto, Japan. Professor Yoshinori Itokawa, Dept. of Hygiene, Faculty of Medicine, Kyoto Univ., Kyoto 606, Japan.


11-13 NATO Advanced Research Workshop on Cell and Molecular Biology of Artemia Development, Ramada Renaissance du Parc, Montreal, Quebec, Canada. Dr. A. H. Warner, Dept. of Biological Sciences, Univ. of Windsor, Windsor, Ontario, Canada N9B 3P4.

13-17 Second Symposium of The Protein Society, Sheraton East Hotel, San Diego, California, USA. Protein Symposium Secretariat, Ms. Shirley E. Schlessinger, 400 E. Randolph, Suite 1015, Chicago, IL 60601, USA.

14-18 39th American Institute of Biological Sciences Annual Meeting, University of California, Davis, California, USA. Ms. Louise Salmon, AIBS Meetings Dept., 730 11th St., NW, Washington, DC 20001, USA.

14-19 International Conference on Human Lactation, Melbourne University, Melbourne, Australia. Nursing Mothers Association of Australia, PO. Box 231, Nunawading, Victoria 3131, Australia.

14-19 Electrophysiological Mechanisms of Propagation and Activation of Cardiac Muscle and Smooth Muscle, FASEB Summer Research Conferences, Saxtons River, Vermont, USA. Dr. Robert W. Krauss, Executive Director. FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.

14-19 Neoplastic Transformation of Liver Cells, FASEB Summer Research Conferences, Copper Mountain, Colorado, USA. Dr. Robert W. Krauss, Executive Director. FASEB Summer Conferences, 9650 Rockville Pike, Bethesda, MD 20814, USA.


15-19 General Principles in Toxicology and Toxicologic Pathology, Parker House Hotel, Boston, Massachusetts, USA. Dept. of Continuing Medical Education, Boston Univ. Sch. of Medicine, 80 E. Concord St., Boston, MA 02118, USA.

16-19 Groupe Polyphenols International Conference, Ontario, Canada. Dr. T. Fuleki, Horticultural Research Inst. of Ontario, Vineland Station, Ontario, Canada L0R 2E0.


17-20 29th Annual Drosophila Conference, University of Toronto, Toronto, Ontario, Canada. Dr. Ellen Larsen, Dept. of Zoology, Univ. of Toronto, 25 Harbord St., Toronto, Ontario, Canada M5S IA1.


21-24 Bioavailability — Chemical and Biological Aspects of Nutrient Availability, University of East Anglia, Norwich, UK. G. R. Fenwick, AFRC Inst. of Food Research, Norwich Lab., Colney Ln., Norwich, Norfolk NR4 7UA, UK.

21-25 Key Issues in Mental Retardation Research, 8th International Congress of the International Association for the Scientific Study of Mental Deficiency, Dublin, Ireland. Mr. John O'Gorman, Congress Chairperson, 8th World Congress, IASSMD, 12, Pembroke Park, Dublin 4, Ireland; or Dr. Michael Mulcahy, Stewarts Hospital, Palmerstown, Dublin 20, Ireland.

22-26 The Pharmacology of Thermoregulation, 7th International Symposium, The University of Odense, Odense, Denmark. Dr. Peter Lomax, Dept. of Pharmacology, UCLA Sch. of Medicine, Los Angeles, CA 90024, USA.

23-26 7th International Symposium on Mass Spectrometry in Life Sciences, State University of Ghent, Ghent, Belgium. Dr. A. De Leenheer, Lab. voor Medische Biochemie en voor Klinische Analyse, Harelbekestraat 72, B-9000 Gent, Belgium.

24-28 Cold Spring Laboratory Meeting on Mouse Molecular Genetics, Cold Spring Harbor, New York, USA. Meetings Coordinator, Cold Spring Harbor Lab., Cold Spring Harbor, NY 11724, USA.


29 Aug. 102nd Annual International Meeting and Exposition of Association of Official Analytical Chemists, The Breakers, Palm Beach, Florida, USA. Ms. Margaret Ridgell, AOAC, 1111 N. 19th St., Suite 210, Arlington, VA 22209, USA.


31 Aug. Symposium on Cholecystokinin, CCK '88, Robinson College, Cambridge, UK. Prof. G. J. Dockray, Physiological Laboratory, Univ. of Liverpool, Brownlow Hill, PO. Box 147, Liverpool L69 3BX, UK.


SEPTEMBER 1988

3-7 Advances in Liquid Chromatography: 8th Annual American-Eastern European Colloquium and Symposium on Liquid Chromatography, Szeged, Hungary. Dr. Huba Kelalasz, Dept. of Pharmacology, Semmelweis Univ. of Medicine, Budapest VIII. Nagyvarad tef 4, Hungary 1089.

4-7 The International Congress on Forensic Sciences, Beijing, China. Office of International Congress on Forensic Sciences, China Express Congress Limited, 1201-2 Energy Plaza, 92 Granville Rd., Tsimshatsui East Kowloon, Hong Kong.

4-8 8th International Congress of Eye Research, Hyatt Regency Hotel, San Francisco, California, USA. 8th ICER Secretariat, Stanford Univ. Medical Center, Rm. S-030, Stanford, CA 94305, USA.

4-9 XVIII World's Poultry Congress and Exhibition, Nagoya, Japan. XVIII World's Poultry Congress and Exhibition, c/o International Congress Service, Kashi Bldg., 2-14-9 Nihombashi Chuo-Ku, Tokyo, Japan 103.

5-7 Eleventh International Conference on Oral Biology: Chemical Control of Plaque, Hotel Furama Intercontinental, Hong Kong. International Association for Dental Research, 1111 14th St., NW, Suite 1000, Washington, DC 20005, USA.

6-9 Protein Targeting, 8th John Innes Symposium, John Innes Institute and University of East Anglia, Norwich, Norfolk, UK. J. Fox, Symposium Secretary, John Innes Inst., Colney Ln., Norwich NR4 7UH, UK.

7-9 Prenatal Abuse of Licit and Illicit Drugs, Hyatt Regency Hotel, Bethesda, Maryland, USA. Conference Dept., The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.


11-17 Thermodynamics Applied to Biological Systems, Santa Margherita Ligure, Italy. Co-sponsored by IUB. Prof. Giovanni Rialdi, Centro Studi Chimico Fisico Macromolecole CNR, Corso Europa 30, 16132 Genova, Italy.

12-13 2nd International Symposium on Lipid Metabolism in the Nervous and Ischemic Heart, Maastricht, The Netherlands. Dr. G. J. van der Vusse, Dept. of Physiology, Univ. of Limburg, PO. Box 616, 6200 MD Maastricht, The Netherlands.


13-16 Fourth International Conference of the International Organization of Psychophysiology, Prague, Czechoslovakia. Prof. Tomas Radil, Czechoslovak Academy of Sciences, Inst. of Physiology, 142 20 Praha 4-KRC Videnaska 1083, Czechoslovakia.

13-17 Ninth European Immunology Meeting, Rome, Italy. Organizing Secretariat, MGA Via P. Cossia, 41 00193, Rome, Italy.

14-16 Meeting of the British Electrophoresis Society, Glasgow, Scotland. Dr. J. A. Beeley, Oral Biology Group, Glasgow Dental Hospital and School, 378 Sauchiehall St., Glasgow, UK.

SEPTEMBER 1988

15-17 IX European Meeting of the International Society for Heart Research, Oxford, UK. Prof. David J. Harse, Cardiovascular Research, Rayne Inst., St. Thomas' Hospital, London SE1 7EH, UK.

17-18 Nutrition in the Pathogenesis and Treatment of Organ Failure, Clarion Hotel, New Orleans, Louisiana, USA. ASCN Postgraduate Course, 9650 Rockville Pike, Bethesda, MD 20814, USA.

19-22 29th International Conference on the Biochemistry of Lipids, Tokyo, Japan. Prof. Y. Seyama, Dept. of Physiological Chemistry and Nutrition, Faculty of Medicine, Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan.


21-23 Galway Meeting, University College, Galway, Ireland. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.


25-30 196th Annual Meeting of the American Chemical Society, Los Angeles, California, USA. ACS Meetings Dept., 1155 16th St. NW, Washington, DC 20036, USA.

26-29 11th International CODATA Conference, Karlsruhe Congress and Exhibition Centre, Karlsruhe, FRG. DEHEMA, Attm. CODATA Conference, P.O. Box 97 01 46, D-6000 Frankfurt/M 97, FRG.


OCTOBER 1988

2-5 Fifth American Motility Society Symposium and Symposium on Cell Membrane Receptors, Asilomar, California, USA. Dr. William J. Snape, Jr., Harbor-UCLA Medical Center, 1124 W. Carson St., A-4 Annex, Torrance, CA 90502, USA.

2-7 1988 World Congress and Expo on Vegetable Protein for Human and Animal Use, Westin Stamford/Plaza Hotel, Raffles City, Singapore. Meetings Manager, American Oil Chemists' Society, P.O. Box 3489, Champaign, IL 61821, USA.

2-7 2nd International Conference on Biochemical Separations, Keszthely, Hungary. MTESZ, Hungarian Biochemical Society, P.O. Box 240, H-1368, Budapest, Hungary.

3-5 Molecular Biology of Hormone Action in Endocrinology and Pharmacology, Milan, Italy. Organizing Secretariat, Fondazione Giovanni Lorenzini, Via Monte Napoleone 23, 20121 Milan, Italy.

9-12 Joint Meeting of the 11th Rochester Trophoblast Conference and The European Placenta Group, Rochester Plaza Hotel, Rochester, New York, USA. Dr. Richard K. Miller, 11th RTC/EPG, The Univ. of Rochester, Box 668, 601 Elmwood Ave., Rochester, NY 14642, USA.

9-12 22nd Annual Meeting of the Society of Research Administrators, Boston Park Plaza Hotel, Boston, Massachusetts, USA. SRA, 1505 4th St., Suite 203, Santa Monica, CA 90401, USA.

9-13 8th International Symposium on Atherosclerosis, Rome, Italy. Dr. G. Crepaldi, Symposium Chairperson, c/o Organizing Secretariat, Centro Italiano Congressi, C.I.C., Via L. Spallanzani, 11, 00161, Rome, Italy.

9-14 Annual Fall Meeting of The American Physiological Society/ American Society for Pharmacology and Experimental Therapeutics, Montreal, Quebec, Canada. FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814, USA.


10-14 Sixth International Neurotoxicology Conference: Drug Abuse and Brain Development, Little Rock, Arkansas, USA. Dr. Joan M. Cranmer, Dept. of Pediatrics 512, Univ. of Arkansas for Medical Sciences, Little Rock, AR 72205, USA.

11-15 39th Annual Meeting of The American Society of Human Genetics, New Orleans, Louisiana, USA. Ms. Peggy Gardiner, Meetings Manager, ASHG Administrative Office, 9650 Rockville Pike, Bethesda, MD 20814, USA.

12-14 International Symposium on Biological and Synthetic Membranes, Lexington, Kentucky, USA. Prof. D. Allan Butterfield, Center of Membrane Sciences, 12 Bradley Hall, Univ. of Kentucky, Lexington, KY 40506, USA.
OCTOBER 1988


16-21 XIII International Congress of Allergology and Clinical Immunology, Montreux, Switzerland. Congress Secretariat, XIII ICACI, 611 E. Wells St., Milwaukee, WI 53202, USA.


25-28 International Conference on Gastroenteric Biology, Oxnard, California, USA. Ms. Joyce Fried, Brain Research Inst., Univ. of California, Center for the Health Sciences, Los Angeles, CA 90024, USA.


NOVEMBER 1988

6-9 International Symposium on Clinical, Biochemical and Molecular Aspects of Fatty Acid Oxidation, Philadelphia, Pennsylvania, USA. Dr. Paul M. Coates, Division of Genetics, The Children's Hospital of Philadelphia, Philadelphia, PA 19104, USA.

8-10 The 9th International Conference of the Cardiovascular System Dynamics Society, Chateau Halifax Hotel, Halifax, Canada. Dr. Gerald A. Klassen, Rm. 5005 A.C.C., Victoria General Hospital, 1278 Tower Rd., Halifax, Nova Scotia, Canada B3H 2Y9.

11-12 Role of the Ventrolateral Medulla in Autonomic Regulation, London, Ontario, Canada. Dr. J. Cirillo, Dept. of Physiology, Health Sciences Centre, The Univ. of Western Ontario, London, Ontario, Canada N6A 5C1; or Dr. C. Polosa, Dept. of Physiology, McGill Univ., McIntyre Medical Sciences Bldg., Montreal, Quebec, Canada H3G 1Y6.


16-18 α-Keto Acid Dehydrogenase Complexes: Organization, Regulation, and Biomedical Aspects, Radisson Plaza Hotel, Austin, Texas, USA. Conference Dept., The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.

28-29 SRA/NIH Grants Administration Seminar, San Francisco, California, USA. Society of Research Administrators, 5305 4th St., Suite 203, Santa Monica, CA 90401, USA.

DECEMBER 1988

4-9 2nd International Conference on Mechanisms of Antimitogenesis and Anticarcinogenesis, Ohito Hotel, Ohito, Japan. Dr. Yukikai Kuroda, National Inst. of Genetics, 1,111, Yata, Mishima, Shizuoka 411, Japan.

12-14 Regulation of the Acute Phase and Immune Responses: A New Cytokine, The Sheraton Centre, New York City, USA. Conference Dept., The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.

19-21 London Meeting of The Biochemical Society, Royal Free Hospital of Medicine, London, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London, WC1R 5DP, UK.

JANUARY 1989

5-6 Society for General Microbiology Irish Branch Meeting, Maynooth College, Dublin, Ireland. Dr. C. S. Dow, Dept. of Biological Sciences, Univ. of Warwick, Coventry, CV4 7AL, UK.

FEBRUARY 1989

5-9 Royal Australian Chemical Institute Symposium on Advances in Biomedical Polymers, Observation City, Perth, Western Australia. The Secretary, W. A. Polymer Group, Royal Australian Chemical Inst., 125 Hay St., Perth WA 6000, Australia.


13-17 International Conference on Fats, University of Auckland, Auckland, New Zealand. Dr. L. Eyres, International Conference on Fats, c/o Chemistry Dept., Univ. of Auckland, Private Bag, Auckland, New Zealand.

MARCH 1989

19-24 73rd Annual Meeting of the Federation of American Societies for Experimental Biology, New Orleans, Louisiana, USA. FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814, USA.
MARCH 1989
29 Mar. International Symposium on Serotonin from Cell Biology to Pharmacology and Therapeutics, Florence, Italy. Secretariat, Dr. N. Brunello, Inst. of Pharmacological Sciences, Univ. of Milan, Via Balzaretti, 9, 20133 Milan, Italy.

APRIL 1989
2-7 VI World Congress on In Vitro Fertilization and Embryo Transfer, Jerusalem, Israel. Congress Secretariat, VI World Congress, In Vitro Fertilization and Embryo Transfer, PO. Box 50006, Tel Aviv 61500, Israel.

4-7 Society for General Microbiology Easter Meeting, University of Cambridge, UK. Dr. C. S. Dow, Dept. of Biological Sciences, Univ. of Warwick, Coventry CV4 7AL, UK.

9-14 American Chemical Society, Dallas, Texas, USA. ACS Meetings Dept., 1155 16th St. NW, Washington, DC 20036, USA.

12-14 Aberystwyth Meeting of The Biochemical Society, Aberystwyth, Wales. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

20-22 International Atherosclerosis Congress, Hofburg, Vienna, Austria. Dr. G. M. Kostner, Medical Biochemistry, Univ. of Graz, Harrachgasse 21, A-8010 Graz, Austria.

MAY 1989
24-27 Eightieth Annual Meeting of the American Association for Cancer Research, San Francisco, California, USA. Margaret Foi, Executive Director, AACR, Temple Univ. School of Medicine, West Bldg., Rm. 301, Broad and Tioga Sts., Philadelphia, PA 19140, USA.

JUNE 1989
4-9 V International Conference on AIDS, Convention Center, Montreal, Canada. Secretariat, Kennessa Canada Inc., P.O. Box 120, Station B, Montreal, Quebec, Canada H3B 3J5.

JULY 1989
9-15 XXXIst International Congress of International Union of Physiological Sciences, Helsinki, Finland. Prof. Osmo Hanninen, Secretary General, P.O. Box 722, 00101 Helsinki, Finland.

11-14 Guildford Meeting of The Biochemical Society, Guildford, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

16-21 V International Congress of Toxicology, Brighton, UK. Secretariat, IUTOX'89, Congress House, 65 West Dr., Sutton, Surrey SM2 7NB, UK.

23-27 International Symposium on Developmental Neuroscience, Beijing, China. Dr. Ramon Lim, Division of Neurochemistry and Neurobiology, Dept. of Neurology, Univ. of Iowa, Iowa City, IA 52242, USA.

SEPTEMBER 1989
7-9 10th European Section Meeting, International Society for Heart Research, Rotterdam, The Netherlands. Dr. J. W. de Jong, Cardiochemical Lab./Thoraxcenter, Erasmus Univ. Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands.

10-15 American Chemical Society, Miami Beach, Florida, USA. ACS Meetings Dept., 1155 16th St. NW, Washington, DC 20036, USA.
SEPTEMBER 1989

19–22 Cork Meeting of The Biochemical Society, University College, Cork, Ireland. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.


25–28 103rd Annual International Meeting and Exposition of Association of Official Analytical Chemists, The Clarion Hotel, St. Louis, Missouri, USA. Ms. Margaret Kidgell, AOAC, 111 N. 19th St., Suite 210, Arlington, VA 22209, USA.

OCTOBER 1989

1–6 13th World Congress on Fertility and Sterility, Casablanca, Morocco. Congress Secretariat, Société Marocaine de Fertilité-Contraception, P.O. Box 12537, AİNDIAB, Casablanca, Morocco.

4–6 4th International Conference on Immunobiology and Prophylaxis of Human Herpesvirus Infections, Fukuoka, Japan. Dr. Ryoichi Mori, Dept. of Virology, Sch. of Medicine, Kyushu Univ., Fukuoka 812, Japan, or Dr. Bernard Roizman, Dept. of Virology, The Univ. of Chicago, 910 E. 58th St., Chicago, IL 60637, USA.


NOVEMBER 1989

7–11 Drugs Affecting Lipid Metabolism, Houston, Texas, USA. Dr. Louis C. Smith, Baylor Coll. of Medicine, The Methodist Hospital, Dept. of Medicine, Mail Station A-601, 6565 Fannin St., Houston, TX 77030, USA.

8–10 Tenth International Symposium on Drugs Affecting Lipid Metabolism, Westin Galleria Hotel, Houston, Texas, USA. Ms. Lynne K. Tiras, International Meeting Managers, Inc., 4550 Post Oak Pl., Suite 248, Houston, TX 77027, USA.

11–15 40th Annual Meeting of The American Society of Human Genetics, Baltimore, Maryland, USA. Ms. Peggy Gardiner, Meeting Manager, ASHG Administrative Office, 9650 Rockville Pike, Bethesda, MD 20814, USA.

18–20 London Meeting of The Biochemical Society, St. Bartholomew’s Hospital Medical School, London, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

APRIL 1990

1–6 74th Annual Meeting of the Federation of American Societies for Experimental Biology, Washington, DC, USA. FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814, USA.

3–6 Bath Meeting of The Biochemical Society, Bath, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

22–27 American Chemical Society, Boston, Massachusetts, USA. ACS Meetings Dept., 1155 16th St. NW, Washington, DC 20036, USA.

SEPTEMBER 1990


OCTOBER 1990

21–26 International Congress on Obesity, Kobe, Japan. Prof. Yutaka Oomura, Dept. of Physiology, Sch. of Medicine, Kyushu Univ., Fukuoka 812, Japan.

DECEMBER 1989

28 Oct. Annual Meeting of the Society of Neuroscience, St. Louis, Missouri, USA. Nancy Beang, Executive Director, Society for Neuroscience, 11 Dupont Circle, Suite 500, Washington, DC 20036, USA.

DECEMBER 1990


18–20 Birmingham Meeting of The Biochemical Society, Birmingham, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

APRIL 1991

10–12 Reading Meeting of The Biochemical Society, Reading, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

14–19 75th Annual Meeting of the Federation of American Societies for Experimental Biology, Atlanta, Georgia, USA. FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814, USA.

MAY 1990

23–26 Eighty-First Annual Meeting of the American Association for Cancer Research, Washington, DC, USA. Margaret Foti, Executive Director, AACR, Temple Univ. School of Medicine, West Bldg., Rm. 301, Broad and Tioga Sts., Philadelphia, PA 19140, USA.
MAY 1991

15-18 Eighty-Second Annual Meeting of the American Association for Cancer Research, Houston, Texas, USA. Margaret Foti, Executive Director, AACR, Temple Univ. School of Medicine, West Bldg., Rm. 301, Broad and Tioga Sta., Philadelphia, PA 19140, USA.

SEPTEMBER 1991

4-6 Edinburgh Meeting of The Biochemical Society, Heriot Watt, Edinburgh, Scotland. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

APRIL 1992

5-10 76th Annual Meeting of the Federation of American Societies for Experimental Biology, Anaheim, California, USA. FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814, USA.

JULY 1991

16-19 Manchester Meeting of The Biochemical Society, Manchester, UK. Meetings Officer, The Biochemical Society, 7 Warwick Court, London WC1R 5DP, UK.

MARCH 1993

28 Mar.-2 Apr. 77th Annual Meeting of the Federation of American Societies for Experimental Biology, New Orleans, Louisiana, USA. FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814, USA.

AUGUST 1993

22-27 XVth International Congress of Nutrition, Adelaide, Australia. Dr. R. M. Smith, General Secretary, CSIRO Division of Human Nutrition, Kintore Ave., Adelaide, South Australia 5000.
This book has gathered together a great deal of information that is needed for investigating many aspects of cell fusions and the production of antibodies. Therefore it is of considerable use to young scientists in this area of research and to established scientists who want to utilize new methods in their own area of research. It is also useful to teachers who do not actually do research involving these techniques but who need to present the results of these techniques to their classes. These teachers must understand how the results that they discuss are actually produced. This book is especially good because in many cases it gives the reasons for using a particular chemical, and that type of information is often difficult to find.

The book is organized into 24 sections or articles written by different authors. Each article is divided into many subsections and sub-subsections. Each of these is listed in the table of contents, which covers 14 pages. This provides some idea of the number of topics covered. When I first looked at this book, I wondered why the chapters were not numbered. As I read it I realized that the book is a series of articles and not an integrated text. There is considerable overlap in some of the articles. I think the book would have been easier and quicker for the reader to use if the editors had synthesized the material and presented a more integrated sequence of chapters. It also would have been considerably shorter if the overlap in both text material and references had been reduced.

In a practical, methods-type book, I expect a rather detailed index. The index in this book is only four pages—much less than the table of contents. A better index, a glossary, and a list of abbreviations used throughout the book would have been a help to the novice in this area. The physical appearance of the book is very good. The type is large, very dark, and easy to read. The figures are also large and clear.


In most cases, the authors gave both the advantages and disadvantages of a method and why they preferred a particular procedure. A number of authors briefly discussed future possibilities and areas of research where hybridomas would be valuable tools.

In summary, there is a great deal of interesting, useful, practical information in this book. In general the articles are well-written and easy to read, and represent a compilation of information on hybridomas up to at least 1985. This is a valuable book for libraries and for individuals just starting to work in this fascinating, growing field.


Reviewed by E. E. Smith, Department of Biochemistry and Molecular Biology, University of Miami School of Medicine, Miami, Florida 33101, USA

This is the latest publication in the Ellis Horwood series in biochemistry and biotechnology. The editors have attempted, in large part successfully, to define the most important aspects of sugar transport and metabolism in gram-positive bacteria. The volume has 18 chapters, each with a detailed bibliography, authored by an international selection of authorities in specialized fields. Although there is the usual variation expected in multi-authored publications of this type, the overall presentation of material, tables, and figures is good, and the absence of errors reflects a high standard of editing and printing.

Topics include a general review of primary and secondary transport in gram-positive bacteria that critically evaluates different experimental model systems used in investigations of solute transport mechanisms. Although mostly noncarbohydrate solutes are discussed, it provides a useful reference for methodology in the transport field. An excellent general review of the regulatory mechanisms of sugar transport in gram-positive bacteria is contributed by the editors, a more specialized review describes catabolite repression in Bacillus subtilis and Streptococcus, and other chapters review sugar transport and/or metabolism in lactic acid bacteria, in clostridia, and in oral streptococci and actinomycetes. Articles devoted to specific metabolites and pathways include those on anion exchange, pentitol transport and metabolism in lactic acid bacteria, and the regulation of glycolysis and the metabolism of polysaccharides in streptococci. Although the chapter on polysaccharides is restricted to intracellular glycogen and extracellular homopolysaccharides (glucans and fructans) formed from sucrose by oral streptococci, it provides a comprehensive review of the structure of the polysaccharides and of the properties and specificities of the multiple glycosyltransferases involved in their synthesis. With more than 200 citations, it is an excellent source article for readers interested in subjects that range from the relationship of streptococcal polysaccharides to the etiology of dental caries.

The importance to bacterial metabolism of phosphoenolpyruvate: sugar phosphotransferase systems is recognized by the inclusion of two chapters describing the kinetics and characterization of protein components of the different systems found in gram-positive and gram-negative bacteria, which, as elegantly described in a third chapter, evolved from a simple fructose-specific system into the multiple, complex, and highly specific phosphotransferase systems that enable single organisms from diverse genera (Escherichia, Bacillus, Staphylococcus, Streptococcus) to transport a wide variety of sugars.

As stated in the preface, a section dealing with carbohydrate metabolism and sporula-

Reviewed by David Putt, Department of Biochemistry and Molecular Biology, University of Miami School of Medicine, Miami, Florida 33101, USA

Within the past several years there has been an enormous proliferation of research articles on oncogenes and growth factors. Indeed, the convergence of several areas of molecular and cell biology has provided a conceptual framework on which current progress in elucidating the regulatory mechanisms of cell growth and transformation is based. Such rapidly developing areas in the biological sciences invariably lead to a proliferation of general reviews, minireviews, and monographs aimed at summarizing the important advances. All too often such reviews tend to be dated by the time they appear and, most unfortunately, the excitement, enthusiasm, and controversy generally associated with emerging areas seem to be diminished in the author's or editor's attempt to fairly and succinctly report on complex and rapidly changing topics.

The current book provides an excellent overview of several growth factors, their receptors, and genes. The editor has included 12 chapters, with 28 coauthors, that address platelet-derived growth factor and the six oncogene product, transforming growth factors α and β, genes for nerve growth factor, granulocyte-macrophage colony-stimulating factor (CSF), multi-CSF (interleukin 3), erythropoietin, epidermal growth factor and its receptor, interleukin 2 and its receptor, and transferrin and its receptor. The last chapter, entitled "The interactions of peptide growth factors and oncogenes," provides a nice summary of the mechanisms by which growth factors, including the products of certain oncogenes, regulate the cell cycle. Most of the individual chapters provide a reasonably detailed treatment of the subject, and the bibliographies are as current as can be expected. In the concluding sentence of the preface, the editor states, "If, as many seem to suspect, the field of growth factor-oncogene interaction is only at its inception, this book will provide an accurate, complete, and authoritative description of the early stages." One might take issue with the completeness of this or any other book of comparable size, particularly when the emphasis is on growth factors, but the editor has succeeded in assembling a number of chapters that convincingly demonstrate the interrelationships between selected growth factors, their receptors, and the products of certain oncogenes. This book should prove useful in providing a general introduction to investigators planning to enter this area; moreover, it will serve as a useful reference to those already in the field. The focus of all chapters is toward pertinent results and proposed models. Thus, the lack of a working knowledge of modern techniques in molecular biology should not prove an impediment to beginning graduate students or scientists/physicians from other disciplines.


Reviewed by Diane C. Tucker, Department of Psychology, University of Alabama at Birmingham, Birmingham, Alabama 35294, USA

Both neurobiological and regulatory approaches have contributed to our current understanding of autonomic nervous system development. The neurobiological approach has examined how autonomic neuronal phenotypes are determined and how specific connections are formed between the central nervous system and peripheral target organs. Potential for plasticity of neuronal type has been demonstrated for populations of autonomic and sensory neuronal precursors in the neural crest; potential for plasticity in transmitter phenotype has been demonstrated for individual autonomic neurons both in vivo and in vitro. The regulatory approach has been used to examine how the immature autonomic nervous system facili-

Prasing because the editors' own chapter on a complex topic is a model of clarity and organization.

Despite these reservations, if, as the editors suggest, each chapter is evaluated in its own right, there is no doubt that this volume achieves its intended objective of satisfying a perceived need for a source book on the regulation of sugar transport in gram-positive bacteria. Active researchers in this area will find the collection of up-to-date reviews into a single volume invaluable, not only as a source of information and literature citations, but also as a guide to those research areas and directions that are likely to be productive. Already there are indications that the gram-positive organisms may provide insights into unique mechanisms involved in the regulation of solute transport. This volume is well worth its price to active researchers but probably not to other interested scientists. However, it should be a useful addition as a reference book on the shelves of all major biological science libraries.
Reviewed

This 2416 and determine ing cological and perspectives, from tern, neurons devoted neural and sympathetic, or sensory neurons in re- sponse to local cues, but notes that evidence supporting plasticity of individual precursor cells is lacking. Reflecting the paucity of developmental investigation, a single chapter is devoted to the parasympathetic nervous system. In fact, E. Giacobini devotes much of his chapter to aspects of sympathetic develop- ment already covered in the chapter by Smith, with the rationale that sympathetic neurons placed in culture express cholinergic transmitter phenotype. In his clearly written and well-organized chapter on development of the sympathoadrenal axis, T. A. Slotkin emphasizes the unique adaptive function of the adrenal gland in fetal and neonatal life. Slotkin summarizes extensive work by his group examining ontogeny of splanchic innervation of the adrenal gland in the neonatal rat in which morphological and pharma- cological measures were used.

Beginning a series of four chapters focusing on autonomic innervation of the heart, Slotkin presents work largely from his laboratory indicating that endocrine factors determine the timing of synaptic development in sympathetic cardiac innervation. In an informative and well-organized chapter, M. L. Kirby and D. E. Stewart detail events in the ontogeny of parasympathetic and sympathetic innervation of the avian heart from an embryologic perspective. Their work indicates that autonomic innervation influences aspects of cardiac development such as the development of the arterial outflow and the densities of cardiac β-adrenergic and muscarinic receptors. H. L. Cohen's chapter on autonomic innervation of the mammalian heart illustrates the necessity of con- sidering indices of sympathetic maturation in the context of species differences and of their implications for functional control. For example, in the newborn rat, norepinephrine content of the heart is very low, but the high density of β-adrenergic receptors allows some functional sympathetic control of heart rate and contractile force. Electrophysiological development of the heart is described con- cisely by R. F. Reder, O. Binah, and P. Danilo. Readers without a background in cardiac electrophysiology may find this chapter difficult, but the authors illustrate clearly several instances in which sympathetic innervation altered receptor coupling and receptor expression.

Autonomic innervation of smooth muscle target organs is the subject of the next three chapters. T. Cowen and G. Burnstok raise the important issue of whether similar processes are involved in the development and aging of innervation of the peripheral vasculature. In addition, they examine de- velopmental origins of heterogeneity in innerva- tion to various vascular beds and in different species. Relevant to both of these issues, they propose that the nerve population in each vascular bed is in a "mobile equilibrium" that is most pronounced during development and aging. Regional and species differences in vascular innervation are further detailed in N. M. Buckley's chapter on autonomic regulation of regional vas- cular beds. Her review supports the conclu- sion that maturation of circulatory responses is asynchronous across vascular beds. P. G. Smith reviews evidence that growth of smooth muscle targets is regulated by sym- pathetic innervation. Especially elegant and intriguing are his studies of sympathetic in- nervation of the smooth muscle extension of the levator palpebral muscle (Müller's muscle) demonstrating that interference with de- velopment of sympathetic innervation resulted in a deficit in muscle function not observed until adulthood.

Two chapters on central regulation of autonomic function conclude the book. Gootman reviews succinctly a large body of data from her laboratory, detailing development of cardiovascular reflexes in swine. A. M. Steele discusses neural control of respi- ration. Much of Steele's lengthy chapter is devoted to adult respiratory physiology, and his extensive use of abbreviations makes it difficult reading. However, the inclusion of a chapter devoted to respiratory control does increase the breadth of the book beyond its emphasis on autonomic controls of cardi- ovascular function.

By featuring both neurobiological and regulatory approaches, this book takes an important step toward integrating these per- spectives. Autonomic development has not been reviewed since the CIBA Foundation Symposium published in 1981, and Goot- man's book provides a timely update. Knowledge of autonomic pharmacology and physiology is assumed by some of the authors and may make the book difficult for begin- ning students. Chapters have a consistent format and all but one end with a brief con- ceptual summary. Some information is re- peated in more than one chapter, but in most cases different points are being illustrated. The single list of all abbreviations used in the book should be a great help to readers for whom an area is new. Gootman does an admirable job of summarizing the current state of our knowledge about developmental interactions between autonomic nerves and their targets from the perspectives of neu- robiology and regulatory physiology, and the book will be a valuable resource for workers in this field.


**Reviewed by Seth Tyler, Department of Zoology, University of Maine, Orono, Maine 04469, USA**

This latest edition of Ralph Buchsbaum's widely recognized textbook of invertebrate zoology is every bit as readable, informative, and entertaining as the other two. As with the previous editions, this book is noteworthy for its abundance of illustrations and for its beautifully clear descriptions and explana- tions. Its style and depth of coverage are aimed largely at the general reader, and as such it is most suitable as a textbook for courses in college-level introductory biology, in junior college-level invertebrate zoology, or in advanced high school biology.

The book's emphasis is on differences in structural types among invertebrates, i.e., on differences in basic organization of body plans, as opposed to a strict coverage of in- vertebrate systematics. The story line follows a progression from what is viewed as simpler structure through that of greater complexity. Each group and each step in complexity are used to illustrate the broader principles of life processes. For most major groups, one species that is taken as representative is described in fair detail, and a short discus- sion of variations on this generalized theme among other members of the group follows. The ordering of topics follows some of the older classification systems (most notably for the Protista, e.g.), and it is probably because such an ordering is more readily comprehensible to the general reader than are newer systems that the book does not emphasize systematics even as much as its earlier edi- tions did. Still, there is an appendix listing classification of major groups, a welcome addition to the earlier editions.

The book's many illustrations—large- format photographs and simple line draw- ings that uncomplicately illustrate a few key points, all with ample captions—form a story in their own right, parallel to but not duplicating information in the body of the text. Their organization is one of the major differences between this and previous edi- tions; they are better integrated with the text. Most chapters seem to have more space devoted to illustrations than to text, and

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although the information content of each is not necessarily high, they do give the flavor of how the animals would be seen in a student laboratory. The material covered by the illustrations, as well as by the text, is of features easily seen by students without sophisticated equipment.

Among such introductory texts, the book is unusual in giving good coverage to parasitic and fossil groups of invertebrates. It is somewhat disappointing, however, for not dealing with such groups as the Vestimentifera, Gnathostomulida, and Loricifera except for mention in the appendix on classification. Although these are admittedly obscure groups, they represent important organizational types, and their discovery marks some of the more exciting developments in invertebrate zoology of this century. Despite the addition of names of three coauthors, the text seems little changed even from that of the first edition of 1938. There are, of course, updatings, mentions of such new developments as the use of the nematode Caenorhabditis in genetics and the discovery of the remarkable cave-dwelling crustacean Spelionectes, and several chapters have been reorganized and regrouped, but, for instance, discussion of research on invertebrates is left to topics of greater interest 50 years ago.

With its entertaining mix of science, history, and wit, this is a textbook that can grab beginning students' interest, and one that can give them an accurate impression of the biology of major invertebrate groups. It can also be a useful reference for the general reader, giving an amply illustrated account of invertebrate animals likely to be encountered in casual searches of marine, freshwater, and terrestrial environments. This new edition is to be welcomed wholeheartedly.


NIH RECRUITS UNIVERSITY, INDUSTRY SCIENTISTS FOR AIDS VACCINE DEVELOPMENT

The National Institutes of Health is making a special effort to recruit top researchers from universities and industry to collaborate on the development of a vaccine against AIDS.

Through a major new initiative called the National Cooperative Vaccine Development Groups for AIDS (NCVDGs), the National Institute of Allergy and Infectious Diseases hopes to team up researchers with expertise in the diverse skills needed to successfully design and evaluate innovative strategies for AIDS prevention.

Each of these multi-disciplinary and multi-institutional groups will work closely with NIH scientists who will coordinate and assist the efforts among what will become an international network of scientists working on AIDS.

The concept behind NCVDGs is not new, said Dr. Wayne C. Koff, acting director of the institute’s AIDS prevention branch, but the magnitude is. "There’s never before been this large of an attempt to link industry and academic institutions or such a coordinated approach on the development of any vaccine," he said. "In this case, the magnitude is tremendous" compared to other programs.

The institute has recently announced six NCVDG awards totaling about $6 million and has just issued a Request for Applications (RFA) for eight to ten more awards. About $10 million has been set aside for the second round of awards. By early 1989, NIAID plans to have in operation a total of 15 to 16 groups.

The application receipt date for round two is July 15.

"Because AIDS is so multi-disciplinary, we are hoping to attract to the program individuals who are really regarded as the best and the brightest in those fields," Koff said. "And they are coming, but it’s a continual quest for [program] promotion; there has to be a rationale as to why they would want to come over and tackle a new problem like this."

Koff sees the cooperative groups as a mechanism to "expedite the whole vaccine development process as fast as we can." He said the "genesis" of the program was the recognition that no one research center — whether it is a university, company or government laboratory — has the expertise and resources needed to carry AIDS vaccine research and development from "a" to "z".

By pooling talent from a variety of disciplines and institutions, the groups will have the capacity to generate new approaches and strategies for the development of AIDS vaccines and to be able to translate their concepts rapidly into improved candidate AIDS vaccines.

One advantage of NCVDGs is that they will be supported by the cooperative agreement mechanism, rather than by the traditional research grant or contract.
"In this type of cooperative approach the group itself is directing its own research and the government is providing information, reagent and technology exchange. It's acting as a facilitator of research rather than a director of research," Koff said. "We have more of a coordinating and facilitating role."

"We will have an active part and we'll be involved with all of the meetings of the groups," he added, "but it's more along the lines of 'what can we do at NIH to expedite what you are doing,' as opposed to 'I want you to do this.'"

For example, Koff explained, if one group comes up with a product it wants tested in primates, but doesn't have any, NIH will be able to expedite testing through a variety of its other contracts and have the product tested for the group.

The NCVDG investigators will use approaches to the development of AIDS vaccines based on leads from basic studies in virology, molecular biology, structural biology, genetics and immunology.

The strategies for AIDS vaccine development may include such approaches as • live attenuated vaccines; • whole inactivated vaccines; • recombinant proteins or protein fragments; • recombinant viruses; • synthetic peptides; • anti-idiotypic vaccines; and • passive immunization.

The application request for the second round of NCVDG awards, published in the March 25 issue of the NIH Guide for Grants and Contracts, advises that applications are limited to vaccines against the AIDS virus itself, and should not be directed towards vaccine development for AIDS-associated opportunistic infections such as mycobacterium and Pneumocystis carinii.

Otherwise, the request states, scientific approaches to the development of effective vaccines "are broad and limited only by the creativity and the ability" of the groups.

NIAID estimates that each NCVDG will consist of about five or six projects at up to five or six institutions. While there is, however, no restriction on group size, the institute points out that a group's efficiency may diminish if it were larger.

The RFA stipulates that applications for NCVDG funding should address "all aspects" of the vaccine research and development process.

This includes any basic research proposed through the subsequent developmental studies, scale-up and production, evaluation in laboratory animals, protection of appropriate species from infection or disease following virulent
challenge. Applications should also address any other considerations relating to the acceptability and utility of candidate vaccines for clinical trials, and the conduct of appropriate clinical trials, either independently or with NIAID assistance.

Recognizing that patent coverage could be complicated since the groups will involve multiple institutions, the institute requires that a proposed patent plan be submitted with each application.

The patent plan must provide a detailed description of the approach that would be used for obtaining a patent and for licensing, in particular where an invention may involve investigators from more than one institution.

Organizationally, AIDS vaccine development and evaluation initiatives are coordinated and managed by the Prevention Branch, AIDS Program, NIAID (see chart, preceding page).

The NCVDG program is one of many efforts in a comprehensive and multi-disciplinary approach to AIDS vaccine development.

In addition to NCVDGs, NIH and other Public Health Service agencies are supporting extramural and intramural projects for the study of the etiology, natural history, and demographics of AIDS; for the screening of high risk individuals; for determining means of diminishing the risk of infection; and for the development of prophylactic vaccines and other methods of prevention.

Despite such efforts, NIAID says, the speed at which diagnosed cases of AIDS are increasing and the disease's morbidity require that the most creative scientific talents from various disciplines and institutions mobilize into groups "to pursue aggressively a concerted research effort to discover entities and strategies for prevention of this disease through the use of vaccines."

According to NIH data, by February 1988, over 50,000 cases of AIDS had been reported in the United States and more than 28,000 of these patients had died. Recent surveillance studies indicate that the total number of AIDS cases is doubling every 10 to 12 months, with projections of approximately 140,000 to 200,000 cases by 1991.

Recent projections indicate that 1.5 million persons presently in the United States may already be infected with the Human Immunodeficiency Virus (HIV), the etiologic agent associated with AIDS.

In emphasizing the potential risk to the general population, NIAID notes that "it has been estimated that a significant percentage of infected persons will progress to develop AIDS."

For more information on the NCVDG program, contact: Dr. Wayne C. Koff, Acting Chief, Prevention Branch, National Institute of Allergy and Infectious Diseases, 6003 Executive Blvd., Room 234P, Rockville, MD, 20892; 301-496-8200.

— Carter Blakey, Associate Editor FASEB Office of Public Affairs
NOMINATIONS INVITED FOR FOURTEENTH ANNUAL “3M LIFE SCIENCES AWARD”

The Federation of American Societies for Experimental Biology is pleased to announce that the fourteenth annual “3M Life Sciences Award,” administered by the Federation, will be presented at the 1989 FASEB Annual Meeting in New Orleans, LA. The award, sponsored and supported by 3M, provides a sum of $25,000 to the awardee.

CRITERIA FOR ELIGIBILITY

The nominee must have contributed to the welfare of mankind by conducting research in the broad area of the life sciences that has led to a significant increase in scientific knowledge. The criterion will be excellence.

NOMINATIONS

1. Nominations may be made only by members of the FASEB Societies and must be endorsed by at least one additional member, preferably from a different Society. Letters of appraisal from Society members in other than the candidate's own institution are particularly appropriate.

2. Nominations must be made in the form of a letter, original and seven (7) copies, setting forth in detail the significance of the work upon which the nomination is based. An original and seven (7) copies of the curriculum vitae and brief selected bibliography of the nominee, as well as seven (7) copies of no more than five (5) reprints, must accompany the nomination.

SELECTION OF Awardee

An Award Committee comprised of one member from each constituent Society of the Federation will receive and review all nominations and select the awardee. The awardee must agree to present a 3M Award Lecture at the FASEB Annual Meeting.

DEADLINE FOR RECEIPT OF NOMINATIONS

The deadline for receipt of nominations and supporting letters is October 15, 1988. This deadline must be strictly observed. Nominations should be sent to:

Mrs. Marge Averi
3M Life Sciences Award Committee
Executive Office
Federation of American Societies for Experimental Biology
9650 Rockville Pike
Bethesda, Maryland 20814
Telephone: (301) 530-7092
American Society of Pharmacognosy Awards and Grants, 1988. To stimulate interest in all phases of natural products research, The American Society of Pharmacognosy offers the following awards and grants. 1) Research Starter Grants: Members of the Society who are within the first 5 years of assuming their first professional position are eligible for a grant of $2000-$5000 to aid in their research. These grants will not provide overhead money to the grantee institution. 2) Travel Grants for Active Members: Members of the Society who are within the first 5 years of assuming their first professional position are eligible for a grant of $300-$500 to enable them to present a paper at an annual meeting of the Society. 3) Travel Grants for Graduate Students: Graduate students working under supervision of a Society member are eligible for a grant of $300-$500 to enable them to present a paper at an annual meeting of the Society. 4) Undergraduate Research Awards: Undergraduate students interested in investigating a career in natural products research are eligible for a research award to study under the direction of a Society member on the faculty of an American college or university. These awards ($2000 to the student and $500 to the advisor) do not provide overhead money to the grantee institution. The research project is to be accomplished in a summer during the student’s academic program leading to the B.S. or Pharm.D. degrees. Address inquiries to Chris M. Ireland, Ph.D., Chairperson, Awards Committee, American Society of Pharmacognosy, College of Pharmacy, University of Utah, Salt Lake City, Utah 84112, USA.

Wood/Whelan International Union of Biochemistry (IUB) and International Council of Scientific Unions (ICSU) Research Fellowships. Objectives: The

The Council for International Exchange of Scholars has announced the opening of competition for the 1989-1990 Fulbright grants in research and university lecturing abroad. The awards include more than 300 grants in research and 700 grants in university lecturing for periods ranging from 3 months to a full academic year. There are openings in more than 100 countries and, in many regions, the opportunity for multicountry research is available. Fulbright awards are granted in virtually all disciplines, and scholars in all academic ranks are eligible to apply. Applications are seriously encouraged from retired faculty and independent scholars. Benefits include round-trip travel for the grantee and, for most full academic year awards, one dependent; maintenance allowance to cover living costs of grantee and family; in many countries, tuition allowance for school-age children; and book and baggage allowances. The basic eligibility requirements for a Fulbright award are U.S. citizenship; Ph.D. or comparable professional qualifications; university or college teaching experience; and, for selected assignments, proficiency in a foreign language. It should be noted that there is no limit on the number of Fulbright grants a single scholar can hold, but there must be a 3-year interval between awards. Application deadlines for the awards are: June 15, 1988 (for Australasia, India, and Latin America, except lecturing awards to Mexico, Venezuela, and the Caribbean); September 15, 1988 (for Africa, Asia, Europe, the Middle East, and lecturing awards to Mexico, Venezuela, and the Caribbean); November 1, 1988 (for institutional proposals for the Scholar-in-Residence Program); January 1, 1989 (for Administrators’ Awards in Germany, the United Kingdom, and Japan; the Seminar in German Civilization; the NATO Research Fellowships, and the Spain Research Fellowships); and February 1, 1989 (for the France, Italy, and Germany Travel-Only Awards). Application materials will be available in April 1988. For more information and applications, call or write Council for International Exchange of Scholars, 11 Dupont Circle NW, Washington, DC 20036, USA. Telephone 202-939-5403.

Wood/Whelan IUB and ICSU Research Fellowships are designed to support biochemists who need to travel to other laboratories in the IUB/ICSU areas to carry out experiments requiring special techniques or for other forms of scientific collaboration or advanced training. Conditions of the fellowships: The fellowships will be awarded for short periods (2 weeks to 2 months, exceptionally 3 months). The fellowship will cover travel costs on the basis of economy or tourist fares (coverage will only be partial for long distances). A basic subsistence allowance of US $25/day will be allotted to fellowship holders, with a geographic adaption factor. There will be no additional stipend for dependents and no provisions made for accidental or health insurance, which are expected to be contracted privately by the fellows. Recipients are required to make a full declaration to IUB/ICSU of all other support received toward the same travel and subsistence. IUB/ICSU may reduce its financial contribution accordingly. IUB/ICSU fellowships cannot be used to supplement other full time/support fellowships. Applications: Applications should be sent in triplicate with the following documents: 1) A research proposal of about two pages typescript indicating clearly: a) the nature of the project and the type of experiments to be carried out; b) why it is necessary to travel to another laboratory to conduct the experiments rather than to perform them in the applicant’s own laboratory or simply ship the materials; c) why the particular laboratory has been selected; d) why the project will require the particular time period requested. If the aforementioned material is not sufficiently clear, the application is likely to be rejected or the decision on it seriously delayed. 2) A short curriculum vitae of the applicant with a list of publications indicating names and other authors. 3) A letter of acceptance from the head of the receiving institute and signed by the leader of the group receiving the recipient. 4) A letter of recommendation from the head of the department of the applicant’s institution indicating support of the applicant and the reasons why the
fellowship would be beneficial. This letter should also list all other fellowships previously received by the applicant, especially for travel abroad to attend meetings or study at another institution. Applications from Africa, Europe, or North America should be sent to Dr. Marianne Grunberg-Manago, Institut de Biologie Physico-Chemique, Fondation Edmond de Rothschild, 13, rue Pierre et Marie Curie, 75005 Paris, France. Applications from Latin America or Asia should be sent to Dr. Jorge E. Allende, Departamento de Bioquímica, Facultad de Medicina (Norte), Universidad de Chile, Casilla 6671, Santiago 7, Chile. Applications can be submitted at any time but they will be reviewed twice each year, in June and December. Criteria for selection of fellows: The criteria for the selection of applicants are: 1) excellence of qualifications of the applicant; 2) need to travel to do the experiments and availability of other sources of funds to finance travel (only exceptionally will support be given to senior scientists or to heads of departments; fellowships will not be awarded to attend courses, symposia, meetings, or congresses); 3) geographic distribution.

ICTP/TWAS Donation Program: The International Centre for Theoretical Physics (ICTP) and the Third World Academy of Sciences (TWAS) have ever since their establishment been engaged in promoting and sustaining research activities in different scientific disciplines carried out in developing countries, by setting up a number of specific programs designed to achieve this purpose. As far as the problem of scientific infrastructures is concerned, the needs in developing countries are very great. The scientists living and working in developing countries are faced with the difficulty of obtaining scientific literature and adequate laboratory facilities. For this reason, the ICTP has initiated a scheme for providing mathematics and physics libraries in developing countries with books, journals, and equipment through the channels of its Book & Equipment Donation Program. The Centre has made several appeals to libraries, publishing companies, laboratories, and individuals requesting them to donate any books, journals, proceedings, and equipment they no longer need, with the ICTP acting as a broker. The response to these appeals has been very encouraging. As a result, the ICTP has, over the past 3 years, distributed a yearly average of approximately 14,000 journals, 4000 proceedings, and 2000 mathematics and physics books to more than 200 mathematics and physics institutes in 80 developing countries, and it is hoped that from 1986 onward the ICTP will be able to increase distribution to more than 50,000 books, journals, and proceedings annually. During this same time, the ICTP has also forwarded to laboratories in developing countries a large number of different items of equipment, which have been generously donated by various European laboratories. The TWAS has recently joined this Donation Program with the purpose of expanding it to the fields of biology and chemistry, to help in providing biology and chemistry libraries and laboratories in developing countries with scientific literature and equipment. Together with ICTP, TWAS has agreed to cover transportation costs of material that has to be sent to institutions in Third World countries. Although ICTP and TWAS are making every effort to alleviate the situation in universities in the Third World, still more can be done. These countries require assistance, and there is no need to stress how useful our Donation Program is and how precious your help can be. Those interested in helping by providing us with material in the fields of biology, chemistry, mathematics, and physics should kindly contact H. R. Dalafi, International Centre for Theoretical Physics (ICTP), P.O. Box 586, 34126 Trieste, Italy. Telephone (040) 2240-1.
Cubic Splines

Dear Dr. Whelan:

In their article, Fitting curves to data using nonlinear regression: a practical and nonmathematical review, in the November 1987 issue of the *FASEB Journal*, the authors made the claim (page 366, column 1) that "Unlike nonlinear regression, cubic spline is not a tool useful for analyzing data." This letter is written to correct this misconception, which seems to have arisen from the authors' restriction to interpolating splines and from their lack of awareness of regression splines and smoothing splines.

In particular, a cubic spline is a curve consisting of cubic segments, smoothly joined at points called knots. With adjacent knots chosen to include more than four data points and the cubics then chosen so that the entire curve satisfies the least squares criterion, we obtain a cubic regression spline. Such a spline is little affected within a knot interval by data values from outside this interval.

Contrary to what the authors claim, regression splines can thus do a fine job of smoothing noisy data in a very stable manner, and as such have proved among the most useful of curve-fitting and data analysis procedures. Regression splines have the advantage that they can be computed using standard linear regression programs (programs that require far less computation than nonlinear regression packages, and that are at the same time more reliable).

Smoothing splines, somewhat more difficult to calculate, can be even more effective in certain data analysis problems.

For a worthwhile introduction to the use of splines in data analysis, readers can benefit by looking at the article Splines in statistics, by Wegman and Wright in the June 1983 issue of the *Journal of the American Statistical Association* (volume 78, number 382).

Sincerely,

Judah Rosenblatt
Director, Biomathematics
The University of Texas Medical Branch
Galveston, TX 77550, USA

Dear Dr. Whelan:

Dr. Rosenblatt made a good point in his letter of January 26, 1988, which was in response to our article in *The FASEB Journal*.

He is correct that by smoothing data, cubic spline procedures can be quite useful for some types of data analysis. Unlike nonlinear regression, however, spline procedures cannot be used to fit data to mathematical models. We appreciate his clarification.

Sincerely,

Harvey Motulsky
Lennart Ransnas
Department of Pharmacology
School of Medicine
University of California San Diego
La Jolla, California 92093, USA
Peptide Separation and Purification

Applied Protein Technologies announces a new, convenient way to separate peptides without using chromatographic equipment. PEP-SEPS, amino-acid-specific reagents bonded to glass beads, capture peptides containing one particular amino acid. The initial solution is easily decanted from the beads, and the peptide is reversibly removed. APT offers PEP-SEPS specific for cysteine, arginine, methionine, and tryptophan, and more amino acid reagents are being developed. PEP-SEPS have demonstrated their effectiveness in DNA probe production, protein sequence analysis, and scanning for sites of immunological activity. Whenever peptide mixtures must be separated, PEP-SEPS are a convenient alternative to chromatography. They are also convenient for pre-HPLC cleanup. Four different PEP-SEPS, used one after another, separate a mixture into 16 groups, depending on the composition of the peptide or protein. Applied Protein Technologies, 103 Brookline St., Cambridge, MA 02139, USA. Telephone 617-868-6085. Circle 81 on Reader Service Card.

XY Graphics and Numerical Analysis Program

Passage is a two-dimensional plotting and numerical analysis program for the Macintosh Plus, SE, and II, for scientists and engineers who need a powerful and easy-to-use program for analyzing large amounts of data and producing high-quality graphs. Numerical data generated by other computer programs (spreadsheets, program output, word processors) may be input quickly and easily. Passage will quickly scale and plot multiple sets of data, including data with asymmetric error values; analyze and manipulate data using routines to calculate integrals, Fourier transforms, polynomial fits, etc.; and evaluate and plot analytically defined functions. High-quality graphics may then be printed out on Apple's ImageWriter and LaserWriter printers. Hardware requirement: any Macintosh with at least one megabyte of memory. World Precision Instruments, 375 Quinnipiac Ave., New Haven, CT 06513, USA. Telephone 203-469-8281. Circle 82 on Reader Service Card.

LambdaGEM

Promega announces the addition of the LambdaGEM-II vector to their line of molecular biological and immunological products. This is a unique genomic cloning vector (cloning capacity 9–23 kilobases) containing SP6 and T7 RNA polymerase promoters flanking a region of multiple cloning sites. The polylinker contains unique sites for the restriction enzymes Sac I, Xho I, Bam HI, Eco RI, and Xba I. The LambdaGEM-II vector offers the options of 1) simplified RNA probe synthesis, 2) direct sequencing of DNA inserts, 3) high-resolution restriction mapping of inserts using two distinct peripheral Pst I sites. Although the Spi phenotypic selection against recombinants is available, with the LambdaGEM-II Bam HI arms (also available from Promega), the background for self-ligated arms alone is typically <100 pfu/μg DNA. This ultralow background level of nonrecombinant vector DNA eliminates the need for the Spi genetic selection against parental vector, which is known to bias libraries. Nonproductive ligation events are minimal, thereby resulting in larger genomic libraries, and fewer filters need to be processed for screening a library. Research Products, Promega, 2800 S. Fish Hatchery Rd., Madison, WI 53711-5305, USA. Telephone 608-274-4330 or 800-356-9526. Circle 83 on Reader Service Card.

Chromatography Workstation Integrator

Spectra-Physics Autolab Division has introduced a low-cost chromatography Workstation/INtegrator, WINner. This package includes the industry-standard SP4290 Computing Integrator, an Epson Equity I+ Personal Computer with 640 K of RAM, 20 MB hard drive, Epson monochrome monitor and Hercules-compatible graphics, and Spectra-Physics' LABNET networking system. It also includes a full range of software for chromatography applications, such as Data Capture, SPMenu, Display, Windows, Batch, and Summary. Multitasking is provided by Double DOS, also included. WINner operates as the ideal chromatography laboratory organizer, storing methods, raw data, reports, files, and BASIC programs on the hard disk for easy recall. As an LC system controller, it can also set up and operate an entire Spectra-Physics LC system from one keyboard, and then store all of the LC parameters (pump files, detector conditions, autosampler files) from each analysis. It provides true multitasking capability, allowing you to run general purpose PC software (such as spreadsheets, word processors, or database managers) while data are collected from one or two in-
dependent data channels. Spectra-Physics, Autolab Division, 3333 N. First
St., San Jose, CA 95134, USA. Telephone 408-432-3333 or 800-424-7666.
Circle 84 on Reader Service Card.

**VECTASTAIN Peroxidase System**

The new VECTASTAIN Elite ABC System from Vector Laboratories pro-
vides the highest sensitivity for immuno-
histochemical staining. Improvements in
the patented, preformed avidin/bioti-
nylated enzyme complex (ABC) generally
allow a 5- to 10-fold higher dilution of
primary antibody. Immunohistochemi-
ical staining can be accomplished in as
little as 10 min with the VECTASTAIN
Elite ABC system using higher primary
antibody concentrations. The VECTA-
STAIN system is ideal for all immuno-
histochemical applications, for Southern,
Western, or Northern blot techniques,
and for enzyme immunoassays. The
VECTASTAIN Elite ABC kit provides
about 110 ml of working solution, suf-
ficient for staining about 1000 tissue
sections. Kits are available with the
VECTASTAIN Elite ABC reagent alone,
or with a biotinylated antirabbit IgG or
biotinylated antimouse IgG for use with rabbit or mouse primary anti-
bodies and an appropriate blocking
serum. Vector Laboratories, 30 Ingold
Rd., Burlingame, CA 94010, USA. Tele-
phone 415-697-3600. Circle 85 on
Reader Service Card.

**Loading DNA-Sequencing Samples**

A new, 3-µl syringe from Hoefer Scien-
tific is designed to eliminate the con-
tamination problems that often occur
when loading DNA-sequencing samples.
The SYPD 3 Syringe uses disposable
polycarbonate tips, either 0.34 or 0.19
mm OD, that are easily replaced after
each sample application. Sample never
comes in contact with the plunger, so
there is no possibility of contamination
from one sample load to the next. The
SYPD 3 has a calibrated plunger for
delivering a sample in precise amounts
—from 0.5 to 3.0 µl in 0.05-µl incre-
ments. Hoefer Scientific Instruments,
P.O. Box 77387, San Francisco, CA
94107, USA. Telephone 415-282-2307.
Circle 86 on Reader Service Card.

**Dextran Sulfate Solution**

New, ready-to-use Oncor Dextran Sul-
fate 50% Solution simplifies preparation
and accelerates the Southern hybridiza-
tion procedure while providing low
background. The premixed solution
eliminates the time and labor required
to prepare dextran sulfate solution from
dry powder form. All lots of Oncor Dex-
tran Sulfate are functionally tested and
qualified on human DNA to ensure lot-
to-lot consistency and a strong signal
with low background. Oncor Dextran
Sulfate 50% Solution is packaged in
100-ml bottles (containing 100 ml solu-
tion), 500-ml bottles (containing 100 ml
50% solution), and 1-liter bottles (con-
taining 200 ml 50% solution). The
larger container sizes allow users to
simply add remaining hybridization
reagents to produce 500 ml or 1 liter
10% dextran hybridization solution.
Oncor, P.O. Box 870, Gaithersburg,
MD 20877, USA. Telephone 301-963-
3500. Circle 87 on Reader Service Card.

**TLC Photodocumentation System**

Analtech, a major manufacturer of thin-
layer chromatography (TLC) plates and
supplies, has introduced a comprehen-
sive photodocumentation system for
TLC separations. With this system, ac-
curate records of virtually any type of
TLC separation can be made easily in
the laboratory. The Analtech system
provides sharp, clear, instant black and
white or color photographs of TLC
plates up to 20 x 20 cm. Variable
camera shutter speeds and diaphragm
openings provide the exposure control
to capture even the faintest spots. The
Analtech Photodocumentation System
provides visualization in either the visi-
ble or the UV region of the spectrum.
Visualization techniques such as char-
ing, iodine vapor or color reactions,
fluorescence, and fluorescence quench
can be used. The system consists of a
light-tight darkroom viewing cabinet
with two overhead ports, which accept
8 W combination long- and short-wave
portable UV lamps. Centered between
the lamp ports is a UV filtered viewing
port, which can easily be removed to
accommodate the Polaroid DS-34 camera
assembly. Illumination in the visible
spectrum is provided from below by
means of a portable white light box.
The system is modular and can be con-
figured to accommodate virtually any
application. Analtech, 75 Blue Hen Dr.,
P.O. Box 7558, Newark, DE 19714,
USA. Telephone 800-441-7540 or
302-737-6960. Circle 88 on Reader
Service Card.

**Compact Mixer**

The Touch Mixer from Fisher requires
only 4 × 6 in of space (it is just 5¾ in
high). The new mini is made for reliable
day-in, day-out performance in laboratory environments, from its durable chemical-resistant finish to the built-in thermal overload protection and pre-lubricated sleeve bearings. Operation is simple: A touch of a hand-held sample container to the foam-rubber pad starts the motor, putting the pad into optimum orbit (3–4 mm) for vortex mixing. Typical mixing time: 30 s or less. The pad's recesses provide for convenient positioning of up to five test tubes; the pad also takes an Erlenmeyer flask, up to 125 ml capacity. The body is mounted on four resilient feet. Two models are available: the fixed-speed Model 231, delivering 3000 rpm, and the variable-speed research Model 232, which ranges from 1100 rpm for delicate samples to a vigorous 2800 rpm. Fisher Scientific, 711 Forbes Ave., Pittsburgh, PA 15219, USA. Circle 89 on Reader Service Card.

Radioactivity Decontaminant

Lift-Away is a super-concentrated decontaminant designed for effectively removing radioactive contamination. This product is normally diluted up to a ratio of 40:1 with water, making it economical. Lift-Away is a nonionic biodegradable solution; it is nonalkaline and noncorrosive with a neutral pH. Therefore, it is safe to use on all types of surfaces including skin, clothing, paint, plastic, and metal. It is also ideal for washing all glassware including glass scintillation vials. Lift-Away works using a two-way action. First, contaminated ions are sequestered, then contaminated particles are lifted up and firmly suspended. This allows the contamination to be rinsed away using ordinary water. Research Products International Corp., 410 N. Business Center Dr., Mt. Prospect, IL 60056, USA. Telephone 312-635-7330. Circle 90 on Reader Service Card.

New Literature

Aldrich Catalog Handbook of Fine Chemicals, 1988–1989, Aldrich Chemical Co., 940 W. Saint Paul Ave., Milwaukee, WI 53233, USA. Sequences, newsletter on transfer applications from Schleicher & Schuell, 10 Optical Ave., Keene, NH 03431, USA.

Anasco winter 1988 catalog, Anasco Corp., 42A Cherry Hill Dr., Danvers, MA 01923, USA.

Bio 1000, directory of world biotechnology companies from BioEngineering News, P.O. Box 1210, Port Angeles, WA 98362, USA.

Physiology Research Instruments, 1988–1989, catalog from Stoelting, 1350 S. Kostner Ave., Chicago, IL 60623, USA.

BM Biochemica, Volume 5, Number 1, January 1988, newsletter from Boehringer Mannheim Biochemicals, P.O. Box 50816, Indianapolis, IN 46250, USA.
The FASEB Journal Information for Authors

Purpose and Scope

The FASEB Journal (FJ) is the official publication of the Federation of American Societies for Experimental Biology (FASEB). FJ publishes two types of articles: 1) brief, definitive, and essentially final research communications of broad interest that are considered to warrant prompt publication; and 2) state-of-the-art reviews, drawings, and tables, or, for other material, from the topics of the FASEB symposia.

Manuscripts containing original communications, or proposals for reviews, should be sent to the Editor-in-Chief, Dr. W. J. Whelan, The FASEB Journal, P.O. Box 016129, Miami, FL 33101-6129, USA, or, if a private courier is used, to the University of Miami School of Medicine, Room 6052, 1600 NW 10th Ave., Miami, FL 33136-1015, USA.

Original Research Communications

FJ devotes a major portion of its pages (outside the meeting abstracts) to the publication of brief, definitive, original, and essentially final research communications that are considered to warrant prompt publication.

The aim of FJ is to illustrate the unity of biology and the interdependence of its constituent disciplines. Therefore, in keeping with this policy, and to qualify for acceptance, an original communication must not only be of outstanding scientific quality but must also be of broad interest.

The subject coverage of FJ is illustrated by the following disciplinary areas: biochemistry, biophysics, cell biology, developmental biology, genetics, immunology, neurobiology, nutrition, pathology, pharmacology, and physiology.

Papers should begin with an abstract (maximum 200 words, written for the general reader) and be free from jargon. They should conclude with an introduction followed by the results and discussion; they should conclude with a succinct bibliography. Methods may be included within the figure legends and tables or as a separate section. Papers may not occupy more than four printed pages (equivalent of 4000 words and inclusive of illustrations and diagrams) and will be returned as unacceptable if they exceed this limitation.

Papers (an original and four copies) should be sent to the Editor-in-Chief. Proprietary information of acceptable papers will be ensured by careful conformity to the instructions to contributors and the expeditious return of proofs.

State-of-the-Art Reviews

FJ also presents research reviews. Heretofore these have been in the form of extended reports emanating from symposia or mini-symposia presented at FASEB meetings. To provide such research summaries in a more compact form and thereby to allow, within space limitations, a more comprehensive and representative survey of the acquisition of new biological knowledge, FJ publishes state-of-the-art reviews that emphasize interdisciplinary aspects of the growing points of research.

These reviews will serve as a window on topics addressed at Society-sponsored symposia or plenary lectures. Therefore, review authors are sought from among those engaged in organizing the symposia. At the same time, volunteered reviews are welcomed that embody the principles of timeliness, topicality, and broad interest.

A proposal for such a review, not a completed review, should be sent to the Editor-in-Chief, who will advise on its acceptability.

Copyright

FJ is copyrighted for the protection of authors and FASEB. Requests for permission for any reproduction of this copyrighted material should be made in writing to the Executive Editor at 9650 Rockville Pike, Bethesda, MD 20814, USA, and should include an explicit statement of intended use and detailed specification of the material to be reproduced.

Authors submitting a manuscript do so on the understanding that it is accepted for publication, copyright of the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the publisher. The publisher will not refuse any reasonable request by authors for permission to reproduce any of their contributions to the journal.

Authors will be asked to certify that an original communication has not been published other than as an abstract and is not being considered for publication elsewhere, and that the paper will not be submitted for publication elsewhere until its acceptability for FJ has been decided. Authors of reviews will be asked to certify that the review has not been published, is not being considered elsewhere, and will not be submitted elsewhere until its acceptability for FJ has been decided.

Style of Manuscript

General Instructions

1) Manuscripts should be typewritten, with double spacing and 1-inch margins, on 8½ × 11 inch bond paper. Computer printouts of manuscripts must be readable; a dot-matrix printer is generally unacceptable. Metric units should be used. An original and four copies, with figures and tables, should be submitted to the Editor-in-Chief. Pages should be arranged and numbered consecutively in the following order: title page, footnotes, abstract of up to 200 words and indexing key words (maximum of five), text, references, figure legends, tables, and illustrations.

2) The title page should show: title of article; author(s); laboratory or institution of origin with city and state or country; complete address for mailing proofs and telephone number for corresponding author; and shortened title (maximum of 50 characters and spaces) for the running foot.

3) The title should be brief (no more than 90 characters, including letters, spaces, and punctuation) and informative. Do not use phrases in which more than three words modify another word (use "Renal hemodynamic effects of atrial natriuretic factor" rather than "Atrial natriuretic factor renal hemodynamic effects"). Serial titles, such as "Interferon, IX," are not permitted, except as a footnote.

4) The abstract, a paragraph of no more than 200 words, should be written for the general readership and be free from jargon. It should be self-explanatory and suitable for use by abstracting services without rewriting. It should state the purpose and major findings and conclusions of the study. Citation of references should be avoided; if used, include bibliographic information.

5) Footnotes, double-spaced, should be assembled on one or more separate sheets; they should be numbered consecutively throughout.

6) The text should be readable, clear, and concise. Any corrections should be neat and legible. Standard nomenclature should be used; unfamiliar or new items should be defined at first mention. (See Abbreviations section below.) Foreign words not in general use in the English language should be underlined for italic type; italics should not be used for emphasis. Latin plurals should not be used if the English equivalent has been accepted, e.g., lamellas, not lamellae. Webster's new collegiate dictionary (1977) should be followed for spelling, compounding, and word separation.

7) Drugs and Trade Names. The chemical or generic name should precede the abbreviation of a drug name the first time it appears. Proprietary (trademarked) names should be capitalized and the spelling carefully checked. Trade names of chemicals or equipment should also be capitalized. Authors should supply an acceptable scientific name in every case as an alternative to the trade name. Trade names should not ordinarily be used in titles. More generally, the use of trade names should conform to the customary standards of good taste in scientific literature.

8) Active voice rather than passive voice should be used whenever possible. Present tense is used for references to existing knowledge or accepted concepts, and for proven conclusions from the present work; past tense is used when describing experimental work on which the paper is based.

Abbreviations, Symbols, and Terminology

Each author must include, as a footnote to the first page of text, a list of any new or special abbreviations used in the paper, with the spelled-out form and definition if necessary for clarity. For information on style in general, authors are referred to the CBE style manual, 5th ed. (1983), prepared by the CBE Style Manual Committee (Bethesda, MD). Chemical and biochemical terms and abbreviations should be in accordance with the recommendations for usage by the International Union of Pure and Applied Chemistry (IUPAC) and its committee on nomenclature [see Biochemical

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*April 1988.
The following abbreviations or acronyms may be used without explanation; others should be defined at first use in the text.

A ampere; blood group; chromosome group
A absorbance; area
A ångström
a atto-
a acceleration; activity, relative
AB blood group
ac alternating current
A.D. anno Domini
A.h amper-hour
AM before noon
AMP, ADP, ATP adenosine phosphates
AMPase, ADPase, ATPase adenosine phosphates
aq aqueous
at. wt atomic weight
BCG bacille Calmette-Guérin
bp boiling point
Bq becquerel
Btu British thermal unit
C coulomb
°C Celsius
c centi-
ca about
cal calorie
cAMP, cGMP, etc. cyclic AMP, cyclic GMP, etc.
CD circular dichroism
cd candela
cDNA complementary DNA
cf compare
Ci curie
cm, cm², cm³ centimeters
CMP, CDP, CTP cytidine phosphates
CoA coenzyme A
CoASAc acetyl coenzyme A
cpm counts per minute
cps counts per second
cp centipoise
cs cycles per second
cRNA complementary RNA
cubic use exponent ³
° degree, angle
D diffusion, coefficient
d dextro configuration
d deci-
d density
d, (+) dextrorotatory
Da dalton
da deci-
DB decibel
dc direct current
DDT 1,1,1-trichloro-2,2-bis-(p-chlorophenyl)ethane
DEAE-cellulose O-(diethylaminoethyl)cellulose
df degrees of freedom
DNA deoxyribonucleic acid
DNase deoxyribonuclease
dpm disintegrations per minute
dps disintegrations per second
dTMP, dTDP, dTTP dyn
e emf electron motive force; exa-
electrode potential; energy
ed effective dose; 50% effective concentration, 50%
editor
ED₅₀ effective dose, 50%
ethylenediaminetetraacetic acid
EGTA for example
ethylene glycol bis(β-aminoethyl ether)-N,N',N",N"-tetraacetic acid
electromotive force
EFPR electron paramagnetic resonance
Eq., Eqns. equation(s)
ER electron spin resonance
et al. and others
etc. and so forth
eV electron volt
exp exponential
f farad; filial generations
>F Fahrenheit
F femto-
FAD, FADH₂ flavin adenine dinucleotides
fc foot-candle
Fig., Figs. figure(s)
FMN, FMNH flavin mononucleotides
fp freezing point
ft foot
ft lb foot-pound
G gauss; general; giga-
g gram
GMP, GDP, GTP greater than
GSH, GSGS glutathiones
H henry
h hecto-; hour
Hb hemoglobin
hnRNA heterogeneous nuclear RNA
hp horsepower
ht height
Hz hertz
IC₅₀ inhibitory concentration, 50% ID₅₀ infective dose, 50%
i.d. inside diameter
i.e., that is
Ig immunoglobulin
i.m. intramuscular
IMP, IDP, ITP inosine phosphates
in inch
i.p. intraperitoneal
IR infrared
IU international unit
i.v. intravenous
J joule
Jr. junior, with names
K kelvin
Kₘ Michaelis constant
k kilo-
kacl kilocalorie
kg kilogram
km kilometer
L levo configuration
L, (-) levorotatory
lb pound
lb/in² pounds per square inch
LD₅₀ lethal dose, 50%
< less than
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln</td>
<td>natural log</td>
</tr>
<tr>
<td>log</td>
<td>logarithm</td>
</tr>
<tr>
<td>lx</td>
<td>lux</td>
</tr>
<tr>
<td>M</td>
<td>mega-</td>
</tr>
<tr>
<td>Mₚ</td>
<td>relative molecular mass</td>
</tr>
<tr>
<td>m</td>
<td>molar (moles/liter)</td>
</tr>
<tr>
<td>m, M</td>
<td>meter; milligram</td>
</tr>
<tr>
<td>m₁, m³</td>
<td>square and cubic meters</td>
</tr>
<tr>
<td>mA</td>
<td>milliamperre</td>
</tr>
<tr>
<td>max</td>
<td>maximum</td>
</tr>
<tr>
<td>meq</td>
<td>milliequivalent</td>
</tr>
<tr>
<td>mg</td>
<td>milligram</td>
</tr>
<tr>
<td>ml</td>
<td>milliliter</td>
</tr>
<tr>
<td>m/h</td>
<td>miles per hour</td>
</tr>
<tr>
<td>ml</td>
<td>millimeter</td>
</tr>
<tr>
<td>ml/min</td>
<td>milliliters per minute</td>
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<tr>
<td>mm</td>
<td>millimeters</td>
</tr>
<tr>
<td>mm Hg</td>
<td>millimeters of mercury</td>
</tr>
<tr>
<td>mol</td>
<td>mole</td>
</tr>
<tr>
<td>mol wt</td>
<td>molecular weight</td>
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<tr>
<td>mosmol</td>
<td>milliosmole</td>
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<tr>
<td>mp</td>
<td>melting point</td>
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<tr>
<td>m/s</td>
<td>meters per second</td>
</tr>
<tr>
<td>mrNA</td>
<td>messenger RNA</td>
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<tr>
<td>ms</td>
<td>millisecond</td>
</tr>
<tr>
<td>mtDNA</td>
<td>mitochondrial DNA</td>
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<tr>
<td>mtRNA</td>
<td>mitochondrial RNA</td>
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<tr>
<td>μ</td>
<td>micro-</td>
</tr>
<tr>
<td>μeq</td>
<td>microequivalent</td>
</tr>
<tr>
<td>μg</td>
<td>microgram</td>
</tr>
<tr>
<td>μl</td>
<td>microliter</td>
</tr>
<tr>
<td>μm</td>
<td>micrometer</td>
</tr>
<tr>
<td>μmol</td>
<td>micromole</td>
</tr>
<tr>
<td>×500</td>
<td>megawatt-hour</td>
</tr>
<tr>
<td>N</td>
<td>newton</td>
</tr>
<tr>
<td>N₀</td>
<td>normal (concentration); number (statistics)</td>
</tr>
<tr>
<td>n</td>
<td>number; neutron</td>
</tr>
<tr>
<td>nA</td>
<td>number (statistics); normal (chemical name)</td>
</tr>
<tr>
<td>NAD, NAD⁺, NADH, NADP⁺, NADPH</td>
<td>nicotinamide adenine dinucleotides and phosphates</td>
</tr>
<tr>
<td>nDNA</td>
<td>nuclear DNA</td>
</tr>
<tr>
<td>nRNA</td>
<td>nuclear RNA</td>
</tr>
<tr>
<td>nm</td>
<td>nanometer</td>
</tr>
<tr>
<td>NMN</td>
<td>nicotinamide mononucleotide</td>
</tr>
<tr>
<td>NMR</td>
<td>nuclear magnetic resonance</td>
</tr>
<tr>
<td>no.</td>
<td>number</td>
</tr>
<tr>
<td>N/m²</td>
<td>newton per square meter</td>
</tr>
<tr>
<td>Ω</td>
<td>ohm</td>
</tr>
<tr>
<td>o.d.</td>
<td>ortho-, in chemical name</td>
</tr>
<tr>
<td>osmol</td>
<td>osmole</td>
</tr>
<tr>
<td>oz</td>
<td>ounce</td>
</tr>
<tr>
<td>P</td>
<td>peta-; poise; pressure</td>
</tr>
<tr>
<td>Pₚ</td>
<td>phosphate other than inorganic; probability</td>
</tr>
<tr>
<td>Pᵢ</td>
<td>inorganic phosphate</td>
</tr>
<tr>
<td>PᵢP</td>
<td>picogram; para-, in chemical name</td>
</tr>
<tr>
<td>Pa</td>
<td>pascal</td>
</tr>
<tr>
<td>%</td>
<td>percent</td>
</tr>
<tr>
<td>%/cm</td>
<td>per mile</td>
</tr>
<tr>
<td>pK</td>
<td>negative log of hydrogen ion concentration</td>
</tr>
<tr>
<td>pKₚ</td>
<td>negative log of dissociation constant</td>
</tr>
<tr>
<td>pm</td>
<td>picometer</td>
</tr>
<tr>
<td>ppm</td>
<td>parts per million</td>
</tr>
<tr>
<td>Q₁₀</td>
<td>increase in rate of chemical reaction for each 10°C increase in temperature</td>
</tr>
<tr>
<td>R</td>
<td>roentgen</td>
</tr>
<tr>
<td>r</td>
<td>configuration; gas constant; resistance</td>
</tr>
<tr>
<td>rad</td>
<td>correlation coefficient</td>
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<tr>
<td>ref</td>
<td>reference</td>
</tr>
<tr>
<td>Rh</td>
<td>rhesus</td>
</tr>
<tr>
<td>RNA</td>
<td>ribonucleic acid</td>
</tr>
<tr>
<td>RNase</td>
<td>ribonuclease</td>
</tr>
<tr>
<td>rpm</td>
<td>revolutions per minute</td>
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<tr>
<td>rps</td>
<td>revolutions per second</td>
</tr>
<tr>
<td>rRNA</td>
<td>ribosomal RNA</td>
</tr>
<tr>
<td>S</td>
<td>siemens; Svedberg unit</td>
</tr>
<tr>
<td>s</td>
<td>configuration</td>
</tr>
<tr>
<td>s (c)</td>
<td>second</td>
</tr>
<tr>
<td>s (i)</td>
<td>submetrical, in chemical name</td>
</tr>
<tr>
<td>s (s.c.)</td>
<td>standard deviation</td>
</tr>
<tr>
<td>se</td>
<td>standard error</td>
</tr>
<tr>
<td>sec</td>
<td>secondary, in chemical name</td>
</tr>
<tr>
<td>SEM</td>
<td>standard error of the mean</td>
</tr>
<tr>
<td>sp.</td>
<td>species with generic name</td>
</tr>
<tr>
<td>sp gr</td>
<td>specific gravity</td>
</tr>
<tr>
<td>square</td>
<td>use exponent 2</td>
</tr>
<tr>
<td>STP</td>
<td>standard temperature and pressure</td>
</tr>
<tr>
<td>Sv</td>
<td>sievert (replaces rem)</td>
</tr>
<tr>
<td>T</td>
<td>tera-; tesla</td>
</tr>
<tr>
<td>t</td>
<td>metric ton</td>
</tr>
<tr>
<td>t½</td>
<td>half-life (half-time)</td>
</tr>
<tr>
<td>temp</td>
<td>tertiary, in chemical name</td>
</tr>
<tr>
<td>TTP</td>
<td>ribosylthymine phosphates</td>
</tr>
<tr>
<td>Tris</td>
<td>tris(hydroxymethyl)aminomethane</td>
</tr>
<tr>
<td>tRNA</td>
<td>transfer RNA</td>
</tr>
<tr>
<td>U</td>
<td>uniformly labeled; unit</td>
</tr>
<tr>
<td>uhf</td>
<td>ultrahigh frequency</td>
</tr>
<tr>
<td>UMP, UDP, UTP</td>
<td>uridine phosphates</td>
</tr>
<tr>
<td>UV</td>
<td>ultraviolet</td>
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<tr>
<td>V</td>
<td>volt</td>
</tr>
<tr>
<td>V</td>
<td>volume</td>
</tr>
<tr>
<td>vol/vol</td>
<td>volume ratio</td>
</tr>
<tr>
<td>vs.</td>
<td>versus</td>
</tr>
<tr>
<td>W</td>
<td>watt</td>
</tr>
<tr>
<td>Wb</td>
<td>weber</td>
</tr>
<tr>
<td>W-h</td>
<td>watt hour</td>
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<tr>
<td>wk</td>
<td>week</td>
</tr>
<tr>
<td>wt</td>
<td>weight</td>
</tr>
<tr>
<td>wt/vol</td>
<td>weight per volume</td>
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<tr>
<td>wt/wt</td>
<td>weight ratio</td>
</tr>
<tr>
<td>x̄</td>
<td>mean</td>
</tr>
<tr>
<td>XMP, XDP, XTP</td>
<td>xanthosine phosphates</td>
</tr>
<tr>
<td>yd</td>
<td>yard</td>
</tr>
<tr>
<td>yr</td>
<td>year</td>
</tr>
</tbody>
</table>

Note: standard three-letter or single-letter abbreviations for amino acids may be used in sequences and in tables and figures.

References

References should be cited in the text in numerical order, with the numeral placed in parentheses. References should be typed separately with inclusive pages and titles, double-spaced, with only one reference per number. Authors are completely responsible for the accuracy and completeness of their references; they will not be checked in the Editorial Office.

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Illustrations should be identified lightly with pencil on the reverse side with the figure number and author name(s); when necessary, the top should be clearly marked. They should be referred to as figures in the text, and should be numbered with Arabic numerals; each should have a legend. Inasmuch as good illustrations are possible only from good copy, authors should pay particular attention to the following:

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2) Lettering should be done in black ink and must be legible after reduction (i.e., at least 1.5 mm high). The smallest elements (subscripts or superscripts) should be readable when reduced. Typewritten or computer-generated lettering is not preferred.
3) Graphs such as electrocardiograms, kymograms, and oscillograms should be prepared by a skillful photographer so that the dark cross-hatched background is eliminated, the faint portions of the graphs are intensified, and sharp, contrasty prints are obtained. To avoid this processing, use blue-ruled instead of black-ruled recording paper for the original records.
4) When possible, all lettering should be within the framework of the illustration; likewise the key to symbols should be on the face of the chart. When the figure is so filled that it is necessary to explain symbols in the legend, only these standard characters should be used: □ ■ ○ ● △ ▲ ▼ △ ▲ ▼.
5) Actual magnification of all photomicrographs should be given. The Editorial Office will make corrections for reduction. An appropriate scale on the photomicrograph itself is, however, preferable and more accurate.
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8) Inasmuch as it is the policy of *FJ* to reproduce figures and charts in the smallest size consistent with readability and purpose of the illustration, it is understood that an author will accept the decision of the Editors on the printed size; however, recommendations may be submitted for reduction or enlargement.
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10) Figure legends should be typed double-spaced, consecutively on one or more sheets of paper. They should contain sufficient information to provide adequate description without reference to text.

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Each should be typed double-spaced, on a separate sheet of paper. Each should have a brief title and should be numbered with Arabic numerals. Explanatory matter should be in footnotes. Table footnotes should be listed in order of their appearance with consecutive superior letters. Tables should not duplicate material in text or illustrations. They should be prepared for printing either 3 1/4 or 7 1/4 inches wide. Nonsignificant figures in tabular data should be omitted. Short or abbreviated column heads should be used. Statistical measures of variation, P, SD, SE, etc., should be identified as such. The approximate position of each table should be indicated in the margin of the text.

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Structural chemical formulas, process flow diagrams, and complicated mathematical expressions should be precisely and carefully arranged, but they should be kept to a minimum because in typesetting they are composed by hand and are expensive. Glossy prints of complicated formulas and expressions suitable as line drawings are preferred. All subscripts, superscripts, Greek letters, and unusual characters must be clearly identified.

Acknowledgments

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Address all correspondence to FASEB Placement Service, 9650 Rockville Pike, Bethesda, MD 20814. (301) 530-7020

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960 Page Mill Road, Palo Alto, California, 94303-0802

CAREER OPPORTUNITY: RESEARCH SCIENTIST

JOB DESCRIPTION:
You will instigate and perform research on the problems of tissue irritation (mainly GI and cutaneous); evaluate relevance of current in vitro and in vivo models in use at ALZA; establish expertise applicable to all new areas of research where irritation is likely to be of concern, including electrotransport, peptide delivery and parenteral delivery.

QUALIFICATIONS REQUIRED:
Ph.D. in relevant biological science with postdoctoral experience and proven ability to independently conduct research. At least 3-4 years postdoctoral experience, preferably in microvascular physiology, irritation pharmacology and/or electrophysiology.

EXPERIENCE DESIRED:
Experience in microvascular toxicity and irritation pharmacology required. Electrophysiology desirable.

SALARY RANGE:
Title and salary commensurate with background and experience.

CONTACT: D. Markovich, Employment Manager
(415) 494-5214

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Musculoskeletal Emphasis

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Dr. Harry Ahekenas, 180-900
Department U46
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109
(818) 354-8251

An equal opportunity employer M/F

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SCIENTIFIC DIRECTOR

AFRRI is a Defense Nuclear Agency laboratory located in Bethesda, MD, that performs radiobiological research for the Department of Defense. Within the Institute, four scientific departments (Behavioral Sciences, Experimental Hematology, Physiology, and Radiation Biochemistry) conduct fundamental and applied biomedical research in programs of casualty management, performance management, and radioprotection. AFRRI invites applications for the position of Scientific Director to manage the overall technical content and execution of the AFRRI scientific research program.

The Scientific Director is responsible for the overall direction and management of a broad multi-disciplinary radiobiological research program concerned with the effects of ionizing radiation on health, performance, and disease induction. In response to research requirements of the military services, the Scientific Director formulates the direction of radiobiology research programs and ensures that results are provided to the requesting service. As the senior radiobiological scientist at the Defense Nuclear Agency, the AFRRI Scientific Director interacts with the Department of Defense, other governmental agencies, nongovernmental agencies and organizations, and the civilian scientific community in all areas of ionizing radiation effects and research programs directed at determining or modifying the effects of ionizing radiation.

The successful candidate will have earned a medical or doctorate degree in the field of radiation biology, health physics, physics, biology, or other life science field; demonstrated managerial ability to organize large multidisciplinary research programs and supervise high-quality scientific personnel; and a record of high professional stature and research publication. Experience in advising national and international organizations on biomedical effects of nuclear radiations or radiobiology, and experience with Federal Government policies, procedures, and programs are highly desirable.

For additional information, contact Dee Zehring at (703) 325-1108. Applications must be received by 10 June 1988.

Refer to Vacancy Announcement No. MSVA No. 19/88.
THE UNIVERSITY OF CALIFORNIA, DAVIS, SCHOOL OF MEDICINE is recruiting for a full-time faculty member to be jointly appointed at the level of Professor of Pharmacology and 50% in the Department of Internal Medicine/Cardiology. Appointment will be at the assistant or associate professor level commensurate with qualifications and experience. Candidates must have a Ph.D. or M.D. or M.D./Ph.D. (M.D. applicants must be board certified in Internal Medicine and board certified or eligible in Cardiology.) Candidates must have expertise in at least one of the following areas: central neural control mechanisms, neurophysiology, neuropsychopharmacology or neuroanatomy with reference to autonomic control mechanisms regulating the cardiovascular system. Responsibilities will include teaching, research and, if applicable, clinical rotations in Cardiology. Please submit a letter outlining research and teaching background, and identifying current research interests along with a CV and the names of 3 references to Larry G. Stark, Ph.D., Professor and Chairperson, Department of Pharmacology, School of Medicine, University of California, Davis, CA 95616. Applications will not be accepted after August 31, 1988. The University of California is an affirmative action/equal opportunity employer.

TENURE TRACK FACULTY POSITIONS IN MOLECULAR PHARMACOLOGY, THE UNIVERSITY OF MINNESOTA. Applications are invited for positions of Assistant Professor in the Department of Pharmacology, School of Medicine. Successful candidates are expected to establish an outstanding independent research program in the area of molecular neuropharmacology and to participate in departmental teaching responsibilities. Requirements include a Ph.D. in pharmacology, biochemistry or related field, or an M.D., and 2 years of postdoctoral experience. Candidates with a strong research background and experience using recombinant DNA technology for studying pharmacological problems and molecular biology of the CNS are preferred. Applicants must have demonstrated involvement in quality research published in peer-reviewed journals. Positions are available immediately. Salary and start-up funds are competitive. Appointment as Associate Professor may be considered for applicants with professional distinction in published research and ability to attract extramural grant support, and who have demonstrated effectiveness in teaching and advising. Applicants should send a CV, significant reprints, a statement of research plans, and three names for reference purposes to Dr. J. W. Miller, Professor and Chairperson of Search Committee, Department of Pharmacology, 3-260 MILLARD HALL, 435 DELAWARE STREET SE, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MN 55455. Deadline for receipt of applications is July 15, 1988. The University of Minnesota is an equal opportunity employer and specifically invites and encourages application from women and minorities.

FACULTY POSITION IN PHYSIOLOGY. The Department of Physiology of the Temple University School of Medicine seeks a Ph.D. to fill a non-tenure track position. Individual should demonstrate ability to develop and maintain a research program with special emphasis on snake venom proteins. Extensive experience required in oligosaccharide purification and structural analysis. Knowledge of recombinant DNA techniques to include composition of a DNA library from snake venom glands and gene cloning. In addition, experience in reverse phase high pressure liquid chromatographic (HPLC) and radioimmunoassay techniques are also required. Send CV and names of three references to Dr. Peter R. Lynch, Temple University School of Medicine, Department of Physiology, 3420 N Broad Street, Philadelphia, PA 19140. An equal opportunity/affirmative action employer.

PHYSIOLOGIST/BIOMEDICAL ENGINEER, Department of Medicine, Pulmonary Division, University of Pittsburgh. Seeking an Assistant or Associate Professor of Medicine for tenure/nontenure-track who has experience in research and who would participate in an ongoing clinical investigative unit which consists of 5 physicians. Areas of interest include: pulmonary mechanics, nutrition and COPD, sleep-related disorders of breathing, and exercise physiology. The individual should be skilled with all common pulmonary function testing and able to critique new equipment. The candidate must have a track record for working in a congenial manner with physicians and will help to integrate the teaching program within an academic fellowship training program. Applicants should submit CV, a statement of research interests, and 3 letters of reference to Robert Rogers, M.D., Pulmonary Medicine, 440 Scale Hall, Pittsburgh, PA 15261. An equal opportunity/affirmative action employer.

DIRECTOR, DIVISION OF TOXICOLOGY. The Department of Pharmacology and Toxicology of the University of Arkansas for Medical Sciences is conducting a search to identify candidates for the position of Director of the Division of Toxicology. A successful candidate will have an earned doctoral degree with active research interests in pharmacology, toxicology or occupational medicine. The Director of the Division of Toxicology will be responsible for administering graduate programs and grants, and developing industry hygiene. Other educational responsibilities include teaching, education in toxicology for health professionals. The director is expected to have and maintain an active research program and should have demonstrated ability to compete successfully for research support. Submit CV, summary of research and administrative experience, and the names of at least three references to Dr. Donald R. Mattison, Department of Obstetrics & Gynecology, University of Arkansas for Medical Sciences, 4301 W Markham, Slot 518, Little Rock, AR 72206. The University of Arkansas is an equal opportunity/affirmative action employer. Women and minority candidates are encouraged to apply.

PREDOCTORAL AND POSTDOCTORAL FELLOWSHIPS. A training program in nutrition and metabolism has been established at Case Western Reserve University, as part of a joint effort between the Departments of Nutrition, Biochemistry, Molecular Biology and Microbiology and the Pew Center for Molecular Nutrition. The program will provide postdoctoral fellows with training in the use of molecular biology in metabolic and nutritional studies stressing the use of modern techniques for transferring genes into cells and animals to alter the patterning of metabolic processes. The Pew Center for Molecular Nutrition provides expertise in the use of retroviral vectors and transgenic animals as models for metabolic studies. Formal course work, together with journal clubs and seminars, are available to provide the trainees with a detailed understanding of both metabolism and molecular biology. A program of graduate education in Nutritional Biochemistry, leading to a Ph.D., M.D./Ph.D. or M.S. degree, is available through the participating departments. Send inquiries or CV and the names of three references to Dr. Richard W. Hanson, Director of Biochemistry, Case Western Reserve University School of Medicine, Cleveland, OH 44106. An affirmative action/equal opportunity employer.

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POSTDOCTORAL POSITION available immediately in pulmonary biology for work in program areas involving developmental effects of pulmonary inflammation on airway contractility, including regulation of neurotransmitter biosynthesis and release, and investigation of altered receptor expression and post-receptor transduction mechanisms in matur ing airways. Candidates with a Ph.D. in neuropharmacology and/or experience in cellular or molecular biology are preferred. Salary commensurate with experience and qualifications. U.S. citizenship or eligibility for citizenship within 4 years required. Send CV and three letters of reference to M. M. Gunstein, M.D., Ph.D., Chief, Division of Pulmonary Medicine, Children's Hospital of Philadelphia, University of Pennsylvania School of Medicine, 34th and Civic Center Blvd., Philadelphia, PA 19104. An equal opportunity/affirmative action employer.

ASSISTANT/ASSOCIATE PROFESSOR OF PHYSIOLOGY. The Department of Physiology, Medical University of South Carolina is seeking candidates for a position of Assistant or initial Associate Professor. The Department is interested in applicants with research emphasis in molecular biology or cellular physiology who can develop an active research program, either independently or in collaboration with other departmental research in neuroscience, circulatory shock, neuroendocrinology, and cell biology. Candidates must have a Ph.D. and/or M.D., with demonstrated research excellence in previous postdoctoral or faculty positions. Applicants should send a CV, a statement of research interests, and three names of references to Dr. J. G. Ondo, Interim Chairman, Department of Physiology, Medical University of South Carolina, Charleston, SC 29425. The University is an equal opportunity/affirmative action employer.

POSITIONS DESIRED

Ph.D., 1969; Cardiovascular/pulmonary physiology; Nonadrenergic-noncholinergic mediation of baroreceptor and chemoreceptor reflexes, bronchial circulation, airway reactivity, asceptic surgery in large and small animals, in vivo/in vitro animal models, funding record; Industrial or academic research preferred; Salary negot. 2-2503

Ph.D., 1975; Biochemistry, enzymology/protein chemistry; Protein purification/characterization, enzyme kinetics/mechanisms, oxidoreductases, POQ proteins, protein sequencing, HPLC, FPLC, PAGE, Western blot, isoelectric focusing, UV/VIS spectroscopy, Fluorometry, fermentation; Avail. March 1988; Academia or industry; Salary negot. 2-2515

Ph.D., 1973; Pharmacology, biochemistry, toxicology, cell biology, bioanalytical chemistry; Biomembranes and glycoproteins S&S, receptor studies, carcinogenesis, drug toxicity, patents, drug discovery; Avail. Feb. 1988; Prefer lab manager/prin. scient/dir. position in industry/academia; Salary negot. 3-2521

Ph.D., 1988 (expected); Biochemistry, molecular biology, protein chemistry; Studies of microtubuli proteins and their binding of GF, gel chromatography, protein purification & isolation, Western blotting, HPLC, FPLC, IEF, SDS-PAGE, radioactive labeling, 4 yr. experience; Avail. Aug. 1988; Position in industry or academia; Salary negot. 2-2581

Ph.D., 1988 (expected); Physiology, cell biology, protein biochemistry, pharmacology; Tissue perfusion, microscopy, chromatography (affinity, filtration, ion), IEF, SDS-PAGE, pharmacol. of 5-HT, GABA and ACh, computer appl/instrument interface and BASIC; Avail. Mar. 1989; Postdoc. academia/industry; Salary negot. 1-2630

Ph.D., 1988 (expected); Immunology, immunochemistry; Cell and tissue culture, MAb techniques, in vivo/in vitro immunoassays, MHIC typing serology, detection and purification, electrophoresis, explosive and molecular genetics techniques; Avail. summer 1988; Molecular biology postdoc. position in academia or industry; Salary negot. 6-2653

Ph.D., 1986; Biochemistry, immunology; Purification and characterization of bioactive molecules, protein and carbohydrate experience, characterization microbial adherence/poly saccharide interactions, HPLC, GC, MS, MAb, lectin, PAGE techniques; Avail. late 1988; Staff position government, academia, industry; Salary negot. 2-2669

Ph.D., 1986; Physiology, cell physiology, biochemistry, enzymology; Drug inhibition, protease action on activities of membrane-bound ATPases in human RBC, characterization and endocrine control of Ca-ATPases in gill epithelium; Avail. 8/88; Research and/or teaching; Salary negot. 2-2694

Ph.D., 1988 (expected); Biology, biochemistry, molecular biology; DNA damage in vitro/in vivo, oxygen radical toxicity; Avail. Nov. 1988; Eucaryotic molecular biology postdoc. training position in academia or industry; Salary negot. 2-2724

Ph.D., 1979; Biochemistry, enzymology, molecular biology; Gene isolation, Southern, Northern & Western analyses, restriction enzyme mapping, protein & nucleic acid sequencing, expression of cloned genes, purification of soluble and membrane-bound proteins and enzyme kinetics; Avail. May 1988; Research in industry; Salary open. 2-2745

Ph.D., 1988 (expected); Physiology; Control of cardiac and respiratory function, cardiac denervation, coronary artery, pulmonary artery and vein catheterization, phrenic nerve recording, tracheal smooth muscle tone, teaching all sections of physiology; Avail. summer 1988; Postdoc. position in academia or industry; Salary open. 1-2759

Ph.D., 1983; Pharmacology, cell biology, hematopoietic/lymphoid toxicology; Cell culture (kidney, bone marrow, lymphocyte and mammary cell lines); cytochemistry, protein purification, biochemistry, cytometry, proteolytic enzymes, HPLC, column chromatography, management/lab administration experience; Avail. Aug. 1988; Industrial R&D position; Salary negot. 5-2750

Ph.D., 1976; Pharmacology, B.S., Pharmacy; Cardiovascular pharmacology, electrophysiology; Whole animal & isolated tissue studies, microelectrode techniques, antiarrhythmic testing, programmed electrical stimulation, computer data acquisition, aseptic surgical procedures, myocardial ischemia; Avail. May 1988; Industry, government, academia. 3-2763

Ph.D., 1988; Immunophysiology, biochemistry, microbiology; TEM, SEM, cell separation and culture, radiolabelling, electrophoreses, chromatography, techniques in clinical pathology, histology, microbiology, virology, hematology; Avail. fall 1988; Postdoc. position in academia or industry investigating processes regulating food intake preferred; Salary negot. 6-2764

Ph.D., 1987; Microbiology and cell science, biochemistry, microbial physiology, enzymology; CM/CW of bacteria and filamentous fungi, isolation and characterization of lipids, extracellular proteases and glycopeptides of Penicillium sp.; Avail. Jan. 1988; Staff position industry; Salary negot. 2-2765

Ph.D., 1988 (expected); Nutritional biochemistry, biochemistry, toxicology; Studies on role of metallothionein in zinc metabolism during inflammation/infection, protein purification/characterization, RNA isolation/analysis, electrophoresis; Avail. summer 1988; Postdoc. position using cell culture and molecular biology; Salary negot. 2-2766

Ph.D., 1983; Pharmacology, biochemistry, neurosciences; Exploration of receptor interactions by combining ligand binding studies with physiological or animal models, S&S studies, protein isolation and purification; Avail. immediately; Staff position in industry; Salary open. 3-2767

Ph.D., 1981; Arachidonic acid/phospholipid metabolism; Generation of lipid second messengers, enzymology, protein/lipid purification, human platelet physiology/biochemistry, regulation of agonist induced phospholipase A2 activity; Research/teaching preferred. 2-2768

Ph.D., 1980; Microbiology; Skills in molecular biology, macrophage immunology, immunochemistry, RIA's, complement biochemistry, tissue culture, enzymology, protein/peptide monoclonal antibody purification, microbial fermentations; Avail. July 1988; Staff position in industry/academia; Salary negot. 2-2769

Ph.D., 1983; Immunology, cell biology, flow cytometry; Regulation of hematopoiesis by growth factors and cytokines using multiparameter flow cytometry, phagocytic cell function-chemotaxis, oxidative metabolism, enzyme release, clinical immunology and microbiology; Avail. July 1988; Research and teaching preferred; Salary negot. 6-2770

2436 EMPLOYMENT OPPORTUNITIES
Ph.D., 1985: Molecular biology; Cloning and sequencing, regulation of transcription, DNA binding proteins, recombinant DNA techniques, 3 yr. postdoc. experience, teaching assistant 3 yr. in biochemistry and physical chemistry; Avail. summer 1988; Research position in academia or industry; Salary negot; Northern California only. 2-2771

Ph.D., 1988: Protein chemistry/enzymology, biochemistry; Enzyme purification & characterization; LC chromatography, electrophoresis, active-site modification, kinetics, 6 yr. teaching exp., biochemical techniques, biochemistry, biology & botany; Date negot.; Molecular biology position in academia or industry; Salary negot. 2-2773

Ph.D., 1988 (expected): Molecular biology, microbiology; Gene regulation through RNA processing, cloning, sequencing, in vitro transcription, RNase protection, bacterial/phage genetics, enzyme assays; Avail. fall 1988; Postdoc. position in academia or industry; Salary negot. 2-2774

Ph.D., 1988: Biochemistry, enzymology, membrane purification; Experience in quantitation of drugs and prostaglandins in biological fluids, cataract biochemistry, highly interested in mechanism of disease states; Avail. July 1988; Staff or postdoc. position in academia or industry; Salary negot. 2-2775

Ph.D., 1983: Pharmacy, pharmacology, tumor biology; In vivo experimentation of antineoplastic drug conjugates and immunoconjugates, pharmacokinetics using radioisotopes and HPLC, MAB production, purification, characterization, modification, ELISA, Western blot; Avail. July 1988; Staff position academia or industry; Salary open. 3-2777

Ph.D., 1986: Molecular genetics, cytogenetics; Experience in DNA and RNA isolation and sequencing, cDNA and genomic library construction, Southern and Northern blot analyses, tissue culture, hybridoma and monoclonal antibody production, ELISA; Avail. May 1989; Postdoc. position in academia or industry; Salary negot. 2-2778

Ph.D., 1988 (expected): Immunology, autoimmunity; Animal model T cell mediated autoimmune disease, radiation chimeras, lymphokines, in vitro/in vivo lymphocyte functional assays, tissue culture and fluorescence analysis, electrophoresis, CNS cell culture; Avail. fall 1988; Postdoc. position in academia or industry; Salary negot. 6-2780

Ph.D., 1988 (expected): Immunology, cell biology; In vivo models of murine DTH, flow cytometry, monoclonal antibody production, in vitro assays for cytotoxicity & lymphocyte stimulation, column chromatography, immunohistochemistry, electrophoresis, virus purification; Avail. fall 1988; Postdoc. research in academia preferred; Salary negot. 6-2781

Ph.D., 1988: Tumor immunology, cell biology; Idiotype vaccines, hybridoma techniques, in vitro bioassays, tissue culture, SDS-PAGE, affinity chromatography; Avail. fall 1988; Postdoc. fellowship; Mid-west to northeast. 6-2782

Ph.D., 1988 (expected): Molecular biology, biochemistry; Southern and Northern blots, cloning, protein purification, enzymology, immunological techniques, polyclonal Ab, Westerns, cell culturing, metabolic and synchrony studies, growth and isolation of resistant cell lines; Avail. Aug. 1988; Postdoc. position in academia or industry; Salary negot. 2-2783

Ph.D., 1980: Biochemistry, enzymology/protein chemistry; Analytical chemistry, methods development, purification, characterization, chemical modification, kinetics and reaction mechanism, LC, HPLC, solvent extraction, spectroscopy (UV/VIS, AAS), electrophoresis, radiolabelling; Date negot.; Staff position in academia or industry; Salary negot. 1-2786

Ph.D., 1986: Pharmacology/toxicology; Drug metabolism and chemical-induced liver/kidney injury, isolation/characterization of drug metabolites/proteins in biological tissues, assessment of enzyme activity in vitro, biochemical toxicity and clinical chemistry; Date negot.; Staff position in industry or academia; Salary open. 2-2788

Ph.D., 1988 (expected): Veterinary pathology; Renal and ocular pathology, diagnostic anatomic and clinical pathology, histomorphometrics, clinical chemistry; Date negot.; Staff position in academia/industry; Salary negot. 4-2790

Ph.D., 1987: Nutritional biochemistry, physiology; Body composition with isotopic dilution, protein chemistry, spirometry testing, indirect calorimetry, taught developmental biology and clinical nutrition; Avail. July 1988; Postdoc. position in academia or industry; Salary negot. 5-2791

Ph.D., 1986: Physiology, neurophysiology, neuropharmacology; Biochemical and electrophysiological studies in the central and/or peripheral nervous systems, experience in cholinergic mechanisms of the invertebrate and vertebrate nervous systems; Avail. Sept. 1988; Postdoc. position in academia; Salary negot. 1-2792

Ph.D., 1985: Cardiopulmonary physiology, exercise; Fluid exchange and microcirculation in skeletal muscle, ischemia-reperfusion injury in skeletal muscle, cardiopulmonary function testing in exercising horses and ponies, radiolabeled microspheres, hypertension, diabetes; Avail. July 1988; Staff position in academia; Salary negot. 1-2793

Ph.D., 1985: Cellular physiology, pharmacology, biochemistry; Receptor binding, kinase measurements, cellular transport kinetics, fluorescence and stopped flow techniques, tissue culture, membrane isolation and characterization, computer programming; Date negot.; Research and/or teaching preferred; Salary negot. 1-2795

Ph.D., 1988 (expected): Clinical pharmacology and drug metabolism; Experience with HPLC and GC/MS for drug and metabolite analysis including isolation and purification of metabolites; Postdoc. academia or industry; Salary negot. 2-2796

Ph.D., 1988: Biochemistry, pharmacology/toxicology; Enzyme purification and characterization in rat liver and pancreas, radiiodination, intestinal cell isolation, receptor binding techniques, polyclonal antibody production, RIA, dermal and inhalation toxicity; Avail. April 1988; Postdoc. position in molecular biology desired; Salary negot. 2-2797

Ph.D., 1983: Hypertension; CV physiology; VSM reactivity, endothelium, aortic coarctation, coronaries DOCA pigs, 3H7 attenuation, Li Sub, 86R uptake, perfused arteries, in vivo coronary velocity profiles, VO2/intramyocardial pressure, blood perfused intestine/hindlimb circulation. 1-2802

Ph.D., 1985: Enzyme technology/protein chemistry; Experience in purification and characterization, immobilization techniques, analytical methods, HPLC, electrophoresis, isolectric focusing, spectrophotometric assays; Avail. Sept. 1988; Salary negot.; New Jersey area preferred. 2-2803

Ph.D., 1985: Molecular biology, yeast genetics, toxicology; Analysis of mouse and sea urchin embryo gene expression using in situ hybridization and other nucleic acid hybridization techniques, analysis of a sea urchin repetitive gene family, isolation and study of DNA repair mutants of yeast; Avail. summer 1988; Staff position in industry. 2-2804

Ph.D., 1980: Pharmacology; Characterization of adrenergic and muscarinic cholinergic receptors, isolated tissues set up, plasma membrane preparation cardiac & vascular tissues, radioligand binding, adenyl cyclase, GTPase, PKC activation, PI radiolabelling, 10 yr. teaching; Avail. June 1988; Staff position in academia or industry; Salary open. 3-2806

Ph.D., 1984: Pharmacology, cardiovascular & reproductive physiology; Ovary, placenta, renin-angiotension systems, arachidonic acid metabolites, pregnancy, local blood flow regulation, enzyme purification & characterization, in vitro perfusion, receptor binding; Avail. June 1988; Staff position in academia or industry; Salary negot. 3-2809

Ph.D., 1988 (expected): Nutritional biochemistry, lipid metabolism and atherosclerosis; Experience diabetes, lipoprotein isoanopic labeling and tracer kinetics, prostaglandin metabolism, adipocyte isolation and manipulation; Avail. Sept. 1988; Postdoc. position in research institute or industry; Salary negot. 5-2810

Ph.D., 1976: Physiology, biochemistry; Glucocorticoid hormone action, receptor activation, purification, glucocorticoid pharmacology, mechanism of action; Experience in cultured human leukemic cells, extensive medical school teaching experience; Desire academic/industrial position; Salary negot. E-204
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To simplify choosing the right peristaltic pump, detector and fraction collector for your LC System, review these guidelines and send for our free Low Pressure System Selection Worksheet.

1 Identify your separation goals.
   - Know the characteristics of your sample. What mass will you load on your column? What flow rate will you need to achieve optimal speed and resolution? At which wavelengths does your sample exhibit maximum absorbance? What size fractions will you collect? Are you interested in collecting peaks?

2 Examine the components’ specs.
   - After you’ve identified the key operating parameters, take a look at the pump, detector and fraction collector specifications to be sure they meet your needs. To illustrate, let’s look at specifications for components in the Gilson Low Pressure System.

   The most important criteria used to select a peristaltic pump are smooth, stable flow and usable flow rate range. The Gilson system uses the new Minipuls 3 Pump, Stepper motor drive and proven pump head design ensure smooth flow from 1 ul to 50 ml/min. A high flow head allows flow rates from 50 ml to 220 ml/min. Interchangeable pump heads with 1-, 2-, 4-, or 8 channels are available.

   Wavelength specificity and ease-of-use are key considerations when choosing a detector. The Gilson 112 UV/VIS fixed-wavelength detector allows selection of wavelengths from 214 nm to 640 nm. A choice of five flow cells accommodates a wide range of flow rates and sample concentrations. A large digital readout and convenient autozero and event mark functions keep detector operation easy.

   Select a fraction collector according to your collection mode, fraction volume, and multiple column collection needs.

   Gilson’s FC 203 fraction collector allows drop, time, or peak collection modes with up to ten collection windows in each mode. The widest range of racks available—capable of handling as many as 128 fractions—makes the FC 203 suitable for almost any application.

3 Check for compatibility of components with each other and with your future needs.
   - At this point, you’ve identified components to meet basic needs, but also look at the components as a system. Were they designed to work together? Or will you need to buy complicated adapters and special plumbing? Working with a single supplier avoids the service and support problems often associated with a system assembled piece-by-piece.

   You should also assess your future needs. An LC system may work fine for your current application. But will you need to change detection wavelengths or collection volumes later? Is an upgrade to HPLC a possibility? If so, consider modular equipment that adapts to your changing needs easily and inexpensively.

4 Look at each supplier’s record of reliability, service and support.
   - After identifying suitable components, you narrow your choice by looking at each supplier’s track record for reliable equipment and efficient service.

   To evaluate the Gilson Low Pressure System, consider our reputation for fraction collectors and detectors. Gilson has a proven track record that began more than 35 years ago. More than 1000 FC 203s—introduced just 16 months ago—continue to display dependable, trouble-free operation.

   The Minipuls 2, the reliable predecessor to our new Minipuls 3, has earned spaces on more than 24,000 lab benches worldwide, making it the best-selling peristaltic pump.

5 Use our free Low Pressure LC System Selection Worksheet to gather and compare your options.
   - For the final step in choosing your system, compare the information you’ve gathered. To help, we’ve put together a selection worksheet to simplify the process.

   This free worksheet lists major criteria to use in your comparisons. We’ve filled in information about the Gilson Low Pressure System and have left space for you to fill in specs from other suppliers.

   Why do we encourage this comparison? Because it’s the best way to buy a system matched to your needs. Plus, we’re confident that in most cases your low pressure system will be a Gilson Low Pressure System.

   So, for your free Low Pressure System Selection Worksheet, simply circle the magazine’s reader service number or call us toll free at 800-445-7667. We’ll see that you get your worksheet fast.