The FJ calendar lists open meetings of a biological topic occurring anywhere in the world. Because of deadline restrictions, we list only meetings taking place more than 3 months after we receive an announcement. Meetings, symposia, and workshops will be included up to 2 years in advance of receipt; international congresses are included up to 3 years in advance. If you would like us to announce your meeting in The FASEB Journal, please include the date and year of the meeting, its title and location, and a contact name and address and send it to FJ Calendar, The FASEB Journal, FASEB, 9650 Rockville Pike, Bethesda, MD 20814 USA.

A comprehensive FJ Calendar is published 4 times a year (January, April, July, and October). In other months, only new listings will appear. When the complete calendar is published, FJ denotes a new listing.

OCTOBER 1988

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

11-13 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, U. of Kentucky, Lexington, KY 40506, USA.


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

17-18 Annual Meeting of The International Society of Regulatory Toxicology and Pharmacology, Omni International Hotel, Inner Harbor Place, Baltimore, Maryland, USA. Dr. C. Jelleff Carr, 6546 Bellevue Dr., Columbia, MD 20146, USA.

18-20 L. W. Frohlich Award Conference — Under the Volcano: Biomedical Science and the Third World, The Rockefeller University, New York, New York, USA. Conference Director, The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.

23-26 First National Symposium on New Crops: Research, Development, Economics, Adam's Mark Hotel, Indianapolis, Indiana, USA. Continuing Education Business Office, Rm. 110, Stewart Center, Purdue U., West Lafayette, IN 47907, USA.


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


27-28 Safety Assessment of Cytokines: Extrapolation of Toxicity Data from Animals to Humans, Shilo Inn, Lincoln City, Oregon. Dr. T. J. Hayes, Hoffman-La Roche, Nutley, NJ 07110, USA.

30 Oct. Genetic Basis for Obesity and -1 Nov. Diabetes, Stouffer Fine Isle Resort, Lake Lanier Islands, Georgia, USA. Dr. Carolyn D. Berdanier, U. of Georgia, Dept. of Foods and Nutrition, Athens, GA 30602, USA.


30 Oct. 6th International Congress of -5 Nov. Culture Collections, Rockville, Maryland, USA. Ms. Bobbie Brandon, American Type Culture Collections, 12301 Parklawn Dr., Rockville, MD 20852, USA.


NOVEMBER 1988


3-5 Annual Meeting of the Society for Complex Carbohydrates, San Antonio, Texas, USA. A. D. Elbein, Dept. of Biochemistry, U. of Texas Health Science Center, 7703 Floyd Curl Dr., San Antonio, TX 78282, USA.

4-6 Third Annual Conference on Clinical Immunology, Hyatt Regency Hotel, San Francisco, California, USA. Clinical Immunology Society, P.O. Box 827, Bowie, MD 20715, USA.

6-9 International Symposium on Clinical, Biochemical and Molecular Aspects of Fatty Acid Oxidation, Penn Tower Hotel, Philadelphia, Pennsylvania, USA. Dr. Paul M. Coates, Div. of Genetics, The Children's Hospital of Philadelphia, 34th St. and Civic Center Blvd., 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 Symposium on Genetics and Evolution, London, UK. Dr. R. N. Jones, Dept. of Agricultural Botany, University College of Wales, Penglais, Aberystwyth, Dyfed SY3 3DD, UK.

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


14-16 Biology, Toxicology and Carcinogenesis of Respiratory Epithelium, Albuquerque, New Mexico, USA. Dr. David G. Thomassen, Inhalation Toxicology Research Inst., PO Box 5890, Albuquerque, NM 87185, USA.

14-16 BIOTECH USA, 5th Annual Industry Conference and Exhibition, Hyatt Regency, San Francisco, California, USA. CMC, 200 Connecticut Ave., Norwalk, CT 06856, USA.

16-18 Alpha-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.

18-22 41st Annual Scientific Meeting of The Gerontological Society of America, San Francisco Hilton Square, San Francisco, California, USA. Ms. Jenny Youngdahl, Meetings Coordinator, 1275 K St. NW, Suite 350, Washington, DC 20005, USA.

28-29 SRA/NIH Grants Administration Seminar, San Francisco, California, USA. Society of Research Administrators, 1505 4th St., Suite 203, Santa Monica, CA 90401, USA.

30 Nov. Eleventh Frontiers in Basic and Preclinical Sciences that Relate to Heart, Lung, and Blood Diseases Symposium on Genetic Basis of Human Disease: Molecular Mechanisms and Strategies for Therapy, National Institutes of Health, Bethesda, Maryland, USA. Dr. Elliott C. Kulakowski, Ofc. of Program Planning and Evaluation, NHLBI, NIH, Bldg. 31, Rm. 5A06, Bethesda, MD 20892, USA.

DECEMBER 1988

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

5-6 Symposium on Unconventional Vertebrates as Animal Models in Endocrine Research, Bethesda, Maryland, USA. Dr. Ian P. Callard, Dept. of Biology, Boston U., 2 Cummington St., Boston, MA 02215, USA.

7-9 National Conference on Advances in Cancer Management, Hyatt Regency Hotel, Los Angeles, California, USA. American Cancer Society, National Conference on Advances in Cancer Management, 3340 Peachtree Rd., NE, Atlanta, GA 30326, USA.

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

15-18 Mechanisms and Regulation of Anion and Proton Transport, Sheraton Centre, New York, New York, USA. Conference Director, 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 Ct., 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, U. of Warwick, Coventry, CV4 7AL, UK.

12-19 Frontiers of NMR in Molecular Biology, Park City, Utah, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

14-20 Glycobiology, Frisco, Colorado, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

17-22 Protein and Pharmaceutical Engineering, Park City, Utah, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

19-21 Chloride, Bicarbonate and Proton Transport Systems, Sheraton Centre, New York, New York, USA. Conference Dept., The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.

20-27 New Directions in Biological Control, Frisco, Colorado, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

21-27 Growth Regulation of Cancer-II, Keystone, Colorado, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

21-27 Genetic Mechanisms in Carcinogenesis and Tumor Progression, Keystone, Colorado, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

21-28 Immunogenicity, Steamboat Springs, Colorado, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

22-26 The Second American Association for Cancer Research Conference. The Role of DNA Viruses in Human Tumors, Catamaran Resort Hotel, San Diego, California, USA. American Association for Cancer Research, 530 Walnut St., 10th Floor, Philadelphia, PA 19106, USA.

22-27 Thirty-second Annual Meeting of the Western Pharmacology Society, Breckenridge, Colorado, USA. Dr. Frank F. Vincenzi, Dept. of Pharmacology SJ-30, U. of Washington, Seattle, WA 98195, USA.
23-24 Insulin, IGF's and their Receptors: Molecular, Cellular and Functional Aspects, U. of Florida, Gainesville, Florida, USA. Dr. Derek LeRoith, Diabetes Branch, NIDDK, Bldg. 10, Rm. 8S-243, NIH, 9000 Rockville Pike, Bethesda, MD 20814, USA.

28 Jan. Transgenic Models in Medicine - 3 Feb. and Agriculture, Taos, New Mexico, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

FEBRUARY 1989
3-8 Early Embryo Development and Paracrine Relationships, Taos, New Mexico, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

3-10 Cellular and Molecular Biology of Normal and Abnormal Erythroid Membranes, Taos, New Mexico, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

4-11 Human Retroviruses, Tamarron, Colorado, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

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.

6-10 1989 Miami Bio/Technology Winter Symposium on Advances in Gene Technology: Molecular Neurobiology and Neopharmacology, Miami, Florida, USA. Concurrently, Second Annual Neural Systems Symposium February 7 and 8. Ms. Sandra Black, Administrative Organizer, Miami Bio/Technology Winter Symposium, P.O. Box 016129, Miami, FL 33101, USA.

8-10 11th Annual Conference on Clinical Laboratory Molecular Analysis, San Diego Princess Resort, San Diego, California, USA. Ms. Bonny Mower, Dept. of Academic Affairs, Box 4005, Scripps Clinic and Research Fndn., 10666 N. Torrey Pines Rd., La Jolla, CA 92037, USA.


20-26 Hematopoiesis, Tamarron, Colorado, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

20-27 Defense Molecules, Lake Tahoe, California, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

27 Feb. Molecular Evolution, Lake Tahoe, California, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

MARCH 1989
4-10 Molecular Biology of Aging, Santa Fe, New Mexico, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

11-18 Papillomaviruses, Taos, New Mexico, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

12-19 Developmental Biology, Tamarron, Colorado, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

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.

27 Mar. Biotechnology and Human Genetic Predisposition to Disease, Steamboat Springs, Colorado, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.


29 Mar. International Symposium on - 1 Apr. Serotonin from Cell Biology to Pharmacology and Therapeutics, Florence, Italy. Secretariat, Dr. N. Brunello, Inst. of Pharmacological Sciences, U. of Milan, Via Balzaretti, 9, 20133 Milan, Italy.

31 Mar. Nuclear Acid Methylation, - 7 Apr. Frisco, Colorado, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

APRIL 1989
1-7 Plant Gene Transfer, Park City, Utah, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

2-7 VI World Congress on In Vitro Fertilisation and Embryo Transfer, Jerusalem, Israel. Congress Secretariat, VI World Congress, In Vitro Fertilization and Embryo Transfer, P.O. Box 50006, Tel Aviv 61500, Israel.

3-9 Molecular and Cellular Biology of Yeasts and Filamentous Fungi, Steamboat Springs, Colorado, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

3-10 Parasites: Molecular Biology, Drug and Vaccine Design, Keystone, Colorado, USA. UCLA Symposium, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

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


9-11 International Society for Preventive Oncology/WHO 3rd International Symposium on Immunobiology in Clinical Oncology, Beach Regency Hotel, Nice, France. ISPO Symposium Office, 217 E. 85th St., Suite 303, New York, NY 10028, USA.

9-12 Fifteenth Fungal Genetics Conference, Asilomar, California, USA. Prof. Richard L. Weiss, Dept. of Chemistry/Biochemistry, UCLA, 405 Hilgard Ave., Los Angeles, CA 90024, USA.

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


10-17 Molecular Biology of the Cardiovascular System, Keystone, Colorado, USA. UCLA Symposium,
2032 Armacost Ave., Los Angeles, CA 90025, USA.

12 International Society for Preventive Oncology/WHO 1st International Symposium on AIDS-Associated Neoplasms, Beach Regency Hotel, Nice, France. ISPO Symposium Office, 217 E. 85th St., Suite 303, New York, NY 10028, USA.

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

13-15 International Society for Preventive Oncology/WHO 7th International Symposium on Prevention and Detection of Cancer, Beach Regency Hotel, Nice, France. ISPO Symposium Office, 217 E. 85th St., Suite 303, New York, NY 10028, USA.

16-19 American Association for the Study of Liver Disease Spring Conference on Connective Tissue Biology of the Liver, Asilomar Conference Center, Pacific Grove, California, USA. Dr. R. Montgomery Bissell, Liver Center Lab., Bldg. 40, Rm. 4102, San Francisco General Hospital, San Francisco, CA 94220, USA.

17-23 Obesity: Towards a Molecular Approach, Keystone, Colorado, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

17-24 Structural and Organization Aspects of Metabolic Regulation, Keystone, Colorado, USA. UCLA Symposia, 2032 Armacost Ave., Los Angeles, CA 90025, USA.

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

MAY 1989

1-3 First International Symposium on Endothelium Derived Vasodilating Factors, Philadelphia, Pennsylvania, USA. Dr. Gabor M. Rubanyi, Berlex Labs. Inc., Dept. of Pharmacology, 110 E. Hanover Ave., Cedar Knolls, NJ 07927, USA.

4-6 Embryonic Origins of Defective Heart Development, Key Bridge Marriott, Alexandria, Virginia, USA. Conference Dept., The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.

8-11 Beltsville XIVth Symposium on The Rhizosphere and Plant Growth, Beltsville, Maryland, USA. Dr. Donald L. Keister, Nitrogen Fixation and Soybean Genetic Lab., Bldg. 011, HH-19, BARC-W, Beltsville, MD 20705, USA.

10-12 International Congress on Peer Review in Biomedical Publication, Chicago, Illinois, USA. Congress on Peer Review, JAMA, 535 N. Dearborn St., Chicago, IL 60610, USA.

14-18 XIII Congress of the International Society for Heart Research, in conjunction with the ISHR-American Section Meeting: Pharmacologic Mechanisms and Heart Disease, The U. of Michigan, Ann Arbor, Michigan, USA. Ms. Glenda Radine, U. of Michigan Extension Service, Dept. of Conferences and Institutes, 200 Hill St., Ann Arbor, MI 48104, USA.

24-27 23rd Annual Hugh Lofland Conference on Arterial Wall Metabolism, Rippling River Resort, Welches, Oregon. Dr. M. R. Malinow, Oregon Regional Primate Research Center, 505 NW 185th Ave., Beaverton, OR 97006, USA.

24-27 Eightieth Annual Meeting of the American Association for Cancer Research, San Francisco, California, USA. Margaret Foti, Executive Director, AACR, Temple U. Sch. of Med., West Bldg., Rm. 301, Broad and Tioga Sts., Philadelphia, PA 19140, USA.


28 May XIV International Symposium on Cerebral Blood Flow and Metabolism: Brain '89, Bologna, Italy. GIBI Studio Congressi, Via Marco Besso 40, 00191 Rome, Italy.

JUNE 1989

1-2 Micronutrient Effects on Immune Functions, Omni Park Central, New York, New York, USA. Conference Dept., The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.

4-9 13th International tRNA Workshop, Vancouver, Canada. Dr. Gordon Tener, Dept. of Biochemistry, U. of British Columbia, Vancouver, British Columbia, Canada V6T 1W5.

4-9 V International Conference on AIDS, Convention Center, Montréal, Canada. Secretariat, Kenness Canada Inc., P.O. Box 120, Station B, Montréal, Québec, Canada H3B 3J5.

19-23 7th International Conference on Fourier Transform Spectroscopy, George Mason U., Fairfax, Virginia, USA. Robert F. Cozzens, George Mason Inst., 4400 University Dr., Fairfax, VA 22030, USA.

JULY 1989

3-7 International Symposium on Trichomonas and Trichomoniasis, Edinburgh, Scotland. Dr. John P. Ackers, Dept. of Medical Protozoology, London Sch. of Hygiene and Tropical Med., Kepkel St., London, WClE 7HT, UK.

9-15 XXXlst International Congress of International Union of Physiological Sciences, Helsinki, Finland. Prof. Osma 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 Ct., 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.

17-30 UNESCO and International Cell Research Organization International Course on Plant Biotechnology, Complutense U. Madrid, Spain. Dr. Ana M. Vazquez, Departamento de Genetica, Facultad de Ciencias Biologicas,
Universidad Complutense de Madrid, 28040 Madrid, Spain.

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

23-28 4th World Conference on Clinical Pharmacology and Therapeutics, Mannheim-Heidelberg, FRG. Contact CPT 89, c/o GKV, Congress and Conventions, P.O. Box 100619, D-6050 Offenbach 1, FRG.

24-28 Second International Veterinary Immunology Symposium, Hannover, Germany. Dr. Wolfgang Leibold, Immunology Unit, Veterinary Sch. Bischofsholer Damm 15, D-3000 Hannover, FRG.

24-28 Fourth International Conference on Bioinorganic Chemistry, Cambridge, Massachusetts, USA. Prof. Kenneth D. Karlin, Chairperson, ICBIC-4, Dept. of Chemistry, SUNY at Albany, Albany, NY 12221, USA.


30 Jul. 7th International Congress of Immunology, Berlin, FRG. DER Congress Organization, Augsburger Str. 27, D-1000 Berlin 30, FRG.

AUGUST 1989


2-7 32nd IUPAC Congress, Stockholm, Sweden. 32nd IUPAC Congress, Stockholm Convention Bureau, P.O. Box 6911, S-102 39, Stockholm, Sweden.

7-11 Conference on the Biochemistry and Genetics of Ribosomes, East Glacier, Montana, USA. Professor Walter E. Hill, Dept. of Chemistry, U. of Montana, Missoula, MT 59812, USA.


20-23 Third International Symposium on Lipofuscin and Ceroid Pigments, Maui, Hawaii, USA. Dr. Eduardo A. Porta, Dept. of Pathology, Sch. of Med., U. of Hawaii, 1960 East-West Rd., Honolulu, HI 96822, USA.

20-24 4th International Congress on Pediatric Laboratory Medicine, Washington, D.C., USA. Dr. Jocelyn M. Hicks, Children's Hospital National Medical Center, Dept. of Laboratory Med., 111 Michigan Ave., NW, Washington, DC 20010, USA.

20-25 Protein Engineering '89, Kobe, Japan. IRL Press Inc., P.O. Box 8, McLean, VA 22101, USA.


SEPTEMBER 1989

7-9 10th European Section Meeting, International Society for Heart Research, Rotterdam, The Netherlands. Dr. J. W. de Jong, Cardiochemical Laboratory/Thoraxcenter, Erasmus U. 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.

11-15 European Association for Cancer Research, University College, Galway, Ireland. Dr. J. H. Weisburger, American Health Fdn., Dana Rd., Valhalla, NY 10595, USA.

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

24-29 10th International Conference on Enzyme Engineering, Kashiokojima, Japan. Engineering Foundation, 345 E. 47th St., New York, NY 10017, USA.

25-28 103rd Annual International Meeting and Exposition of Association of Official Analytical Chemists, The Clarion Hotel, St. Louis, Missouri, USA. Ms. Margaret Ridgell, AOAC, 1111 N. 19th St., Suite 210, Arlington, VA 22209, USA.

OCTOBER 1989

1-6 13th World Congress on Fertility and Sterility, Casablanca, Morocco. Congress Secretariat, Societe Marocaine de Fertiliite-Contraception, P.O. Box 12537, AINDIAB, Casablanca, Morocco.

2-4 Neuropeptides and Immunopeptides: Messengers in a Neuroimmune Axis, Sheraton Centre, New York, New York, USA. Conference Dept., The New York Academy of Sciences, 2 E. 63rd St., New York, NY 10021, USA.

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

8-13 7th International Conference on Second Messengers and Phosphoproteins: The Biology and Medicine of Signal Transduction, Kobe, Japan. Dr. Chikako Tanaka, Japan Convention Services, Inc., 14-3, Nishitenma 4 chome, Kita-ku, Osaka 530, Japan.

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<th>Date</th>
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<tr>
<td>NOVEMBER 1989</td>
<td>8-11 Tenth International Symposium on Drugs Affecting Lipid Metabolism, Westin Galleria Hotel, Houston, Texas, USA.</td>
<td>Dr. Louis C. Smith, International Meeting Managers, Inc., 4550 Post Oak Pk., Suite 248, Houston, TX 77027, USA.</td>
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<td>11-15 40th Annual Meeting of The American Society of Human Genetics, Baltimore, Maryland, USA. Ms. Peggy Gardiner, Meetings Manager, ASHG Administrative Office, 9650 Rockville Pike, Bethesda, MD 20814, USA.</td>
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<td>DECEMBER 1989</td>
<td>18-20 London Meeting of The Biochemical Society, St. Bartholomew's Hospital Medical School, London, UK. Meetings Officer, The Biochemical Society, 7 Warwick Ct., London WC1R 5DP, UK.</td>
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<td>APRIL 1990</td>
<td>1-6 11th World Congress on Pain, Adelaide, Australia. International Association for the Study of Pain, 909 N.E. 43rd St., Suite 306, Seattle, WA 98105, USA.</td>
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<td>1-6 74th Annual Meeting of the Federation of American Societies for Experimental Biology, Washington, D.C., USA. FASEB Office of Scientific Meetings, 9650 Rockville Pike, Bethesda, MD 20814, USA.</td>
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<td>3-6 Bath Meeting of The Biochemical Society, Bath, UK. Meetings Officer, The Biochemical Society, 7 Warwick Ct., London WC1R 5DP, UK.</td>
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<td>22-27 American Chemical Society, Boston, Massachusetts, USA. ACS Meetings Dept., 1155 16th St. NW, Washington, DC 20036, USA.</td>
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<td>29 May 7th International Conference on Prostaglandins and Related Compounds, Florence, Italy. Organizing Secretariat, Fondazione Giovanni Lorenzini, Via Monte Napoleone, 23—20121 Milan, Italy.</td>
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<td>15-18 Eighty-Second Annual Meeting of the American Association for Cancer Research, Houston, Texas, USA. Margaret Foti, Executive Director, AACR, Temple U. Sch. of Med., West Bldg., Rm. 301, Broad and Tioga Sts., Philadelphia, PA 19140, USA.</td>
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<td>16-19 Manchester Meeting of The Biochemical Society, Manchester, UK. Meetings Officer, The Biochemical Society, 7 Warwick Ct., London WC1R 5DP, UK.</td>
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<td>28 Oct. Annual Meeting of the Society for Neuroscience, St. Louis, Missouri, USA. Nancy Beang, Executive Director, Society for Neurosciences, 11 Dupont Circle, NW, Suite 500, Washington, DC 20036, USA.</td>
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<td>6-11 Eighth International Congress of Human Genetics, Washington, D.C., USA. Dr. John J. Mulvihill, Secretary-General, ASHG, 9650 Rockville Pike, Bethesda, MD 20814, USA.</td>
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<td>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.</td>
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<td>28 Mar. 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.</td>
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<td>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.</td>
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**FJ Calendar**

Reviewed by Kathleen A. Mahon, Laboratory of Molecular Genetics, National Institutes of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland 20892, USA

The preeminence of the mouse as an experimental model system for the study of mammalian development is aptly demonstrated by this volume: most of its chapters concentrate exclusively on this organism. The book reviews in comprehensive detail the development of the mouse, bringing together cellular, molecular, biochemical, and genetic analyses of early mammalian embryology, while highlighting new approaches and future directions. This is a timely enterprise: recently there has been a tremendous expansion and integration of these fields, sparked by technological advances in experimental embryology and gene transfer methodology combined with sophisticated refinements in molecular biology. Because of this, a great need exists for a single comprehensive volume to review recent advances and place them in perspective. This book is largely successful in this respect. On the whole, the reviews are well written and the book is logically organized. Each chapter has been written by a noted professional in the field and has been assigned to one of three sections according to its subject. The first section, Cellular Aspects, addresses the nature of determinative decisions made during early mammalian embryogenesis, and lays the conceptual framework for studies that are described in subsequent sections. These reviews focus primarily on developmental potency, cell fate, and lineage relationships during early development. Also included is a chapter on comparative mammalian embryology, which makes interesting reading and justifies the use of the word mammalian in the book title. The second section, Molecular and Biochemical Aspects, includes several chapters on gene expression and regulation during gametogenesis and embryogenesis, as well as chapters on the differential expression of cell surface molecules during early development, biochemistry and metabolism of early mouse embryos, and X-chromosome inactivation. A chapter on the molecular events occurring during fertilization would have made this section more complete. The last section examines genetic aspects of development either through analysis of existing development mutations in the mouse or through the promise of more directed genetic manipulation via gene (or nuclear) transfer technology. Subjects are covered in depth, but have been limited principally to preimplantation and early postimplantation development. Topics relevant to later stages of development, such as embryonic induction, organogenesis, and sex determination, are beyond the scope of this book. Recent work on the expression of onco genes and homeo box genes (reviewed by J. Robertson) does not necessitate a good review of these areas.

Although the book is intended for a varied audience, including advanced undergraduates and graduate students, it will be most useful to researchers working in the field of mammalian development, in particular for new recruits from the field of molecular biology. Because chapters are so detailed and contain extensive citations of the literature, the book is a useful reference and a fine companion volume for the excellent technical manuals that have been published in the last 2 years, especially Manipulating the Mouse Embryo (B. Hogan, F. Costantini, and E. Lacy, Cold Spring Harbor Laboratory, N.Y.) and Transgenic and Embryonic Stem Cells: A Practical Approach (edited by E. J. Robertson, IRL Press, Oxford, UK).

My only major criticism is that the information presented, particularly in some of the more rapidly advancing fields such as the use of transgenic mice and embryonic stem cells, was already somewhat dated by the time of publication. Nevertheless, the newly emerging field of molecular embryology of the mouse is still in its infancy, and the strength of a review volume of this nature lies not just in a presentation of general principles but also in its emphasis on potential future directions.


Reviewed by Donald Hilvert, Department of Molecular Biology, Research Institute of Scripps Clinic, La Jolla, California 92037, USA

Since enzymes are essential actors in any biotechnological process, an operational understanding of their properties is needed by researchers in the field. This volume attempts to survey the "basic information required on fundamental aspects of enzymes, their chemistry, biochemistry, and biology" with special emphasis on the practical application of biocatalysts in industry. This is a daunting agenda, but this compendium comes close to meeting many of its stated goals.

Taken together, the five sections of Enzyme Technology provide an overview of procedures, process design, and results related to the deliberate use of enzymes by humans. Roughly two-thirds of the book is devoted to the properties and production of biocatalysts. Chapters 1 and 2, for instance, survey the fundamentals of enzyme chemistry and biology, recapitulating knowledge that will be familiar to most readers. Chapter 3 draws on extensive practical experience to discuss fermentative techniques for producing enzymes in quantity, and chapters 4 and 5 review methods for recovery and purification of enzymes on laboratory and industrial scales, respectively. Chapter 6 examines the application of genetic engineering to the problems of enhancing gene expression and product secretion, and rightly points out the enormous potential of recombinant DNA techniques to improve existing protein production protocols and to make available previously inaccessible enzymes. The success of many biotechnology ventures depends, of course, on the availability of stable biocatalyst preparations: chapters 7 and 8 review and critically appraise techniques for immobilization of enzymes and whole cells. Artificial enzymes are the subject of chapter 9. The attempts of chemists to mimic the properties of enzymes with nonprotein, entirely synthetic systems are briefly described.

Practical applications of enzymes are considered in the final third of the text. Chapter 10 introduces general considerations for reactor design and performance. Excellent reviews of the uses of enzymes in food processing (chapter 11), the pharmaceutical and chemical industries (chapter 12a and 12b), and the development of novel analytical sensors (chapter 13) are included. These chapters are especially valuable for the numerous examples they contain. The last chapter of the book is devoted to considerations of safety in enzyme technology. Specifically, the safe industrial use of enzymes is reviewed and various legal concerns and safety measures are discussed.

Contributions to Enzyme Technology are generally of a high caliber. Subject matter is presented in great detail, and many references are provided at the close of each chapter. Students, teachers, and workers in industry are likely to find much of value in this work. Where space limitations prevent full consideration of a relevant topic, the reader is referred to the primary and secondary literature. In most chapters, limitations of existing technologies are discussed and per-

Reviewed by Joel F. Habener, Department of Medicine, Harvard Medical School, Boston, Massachusetts 02114, USA

This highly informative, multi-authored book provides an excellent sampling of some of the more recent major contributions in neuropeptide research. Although the authors emphasize basic molecular biology and biochemistry, most of them give broad consideration to the topics, so that the book should interest clinicians as well as laboratory investigators. The book divides naturally into three sections, moving from molecular biology through to the design of therapeutic agents.

The first section (pages 3–86) concerns the molecular biology of certain neuropeptides. L. L. Ivensen provides a succinct, cogent overview of the complexity of neuropeptides in the nervous system. The gene structures of many neuropeptide gene families are presented and discussed by J. E. Dixon. R. Ivel lucidly discusses the structures and organizations of the vasopressin and oxytocin genes, followed by an account of the elegant studies that he and his co-workers undertook to identify and elucidate the genetic defect in the expression of the vasopressin gene in the vasopressin-deficient Brattleboro rat. A chapter by Y. P. Loh and D. C. Parish critically reviews the status of the enzymes involved in the posttranslational processing of prohormones. Evidence indicates that concerted actions of three enzymes are involved in the cleavage of prohormones, namely, the pairing of residuespecific, prohormone-cleaving enzyme, a carboxypeptidase B-like enzyme, and an amidation enzyme. The data accumulated thus far suggest that these same enzymes may carry out each of the processing steps involved in the conversion of various prohormones in different tissues.

The second section (pages 65–164) deals with selected neuropeptides of current interest including the tachykinins, gastric peptides, and atrial natriuretic peptide. This section emphasizes the structure-activity relationships of the peptides as well as their distributions in different tissues and physiological actions. N. Bunnett gives particularly detailed and highly informative descriptions of the gastric peptides, gastrin, cholecystokinin, and gastrin-releasing peptide accompanied by an enlightening discussion of their physiological roles in the alimentary tract and the brain.

The third section (pages 165–292) highlights some of the enzymes that have been implicated in neuropeptide metabolism, including endopeptidase-24.11, angiotensin-converting enzyme, and the calpains, and finishes with an in-depth review of design and therapeutic applications of selective and potent inhibitors of the zinc peptidases. The last chapter, by E. D. Thorsett and M. J. Wyvratt of Merck Sharp & Dohme Laboratories, is a fascinating chronological account of the approaches used by a pharmaceutical research laboratory in designing inhibitors of several peptidases that are important in the metabolism of neuropeptides. The discussion focuses on the zinc metallopeptidases and on the design and synthesis of highly effective inhibitors of the angiotensin-converting enzyme, the results of which have opened a new era in the treatment of hypertension. This chapter makes not only interesting reading to those uninitiated in the design of enzyme inhibitors but would also be highly instructive to those actively working in this field.


Reviewed by Linda D. Caron, Department of Biology, California State University, Northridge, Northridge, CA 91330, USA

Reading this summary of the Symposium on Autoimmunity and Autoimmune Disease, held at the CIBA Foundation, London, September 30–October 2, 1986, is almost as good as having been there. By supplementing each article with the discussion that followed its presentation, the editors have enabled the reader to enjoy the responses to the papers presented and alternative points of view.

Autoimmunity is important not only because of the grief it causes those who suffer from its manifestations, but also for the opportunity it affords for a better understanding of the regulation of the immune response. In trying to understand what causes an organism to mount an immune response against its own body, experimental models have been developed in animals immunized with known antigens. Although these models have been helpful, many questions remain, in part because of the wide spectrum of immune mechanisms that cause the symptoms of various autoimmune diseases.

As Hugh McDevitt points out in a general discussion on autoimmune disease (page 172), "... autoimmunity is probably not a single condition, but a large variety of genetic predispositions in which the genes that predispose are quite different, and the processes leading to the particular autoimmune manifestations are also probably quite different." He adds that in most cases not only is the target autoantigen unknown, but also so is the initiating event, such as viruses or environmental agents. Ian Mackay, who suggested autoimmunity as the topic for this symposium, adds dysregulation as a component of autoimmune disease (page 177).

This collection of well-written, informative articles ranges from discussions of general concepts to experimental papers that describe work on specific diseases. In a paper I would have placed at the beginning of the book, G. J. V. Nossal critically evaluates the main theories as to how tolerance is generated. Other contributions include a paper on cardiac myosin and autoimmune myocarditis (N. B. Rose et al.); another on intracellular autoantigens as diagnostic fingerprints (E. M. Tan et al.); and a discussion of the significance of carbohydrate components of cell surfaces (T. Feizi). Studies dealing with regulation include one on suppressor T cells and their soluble factors in experimental interstitial nephritis (C. J. Kelly et al.) and another on the regulation of HLA class II expression and its role in autoimmune disease (M. Feldmann).

Three separate articles discuss idiotypes and autoimmunity (J. K. Kearney et al.;
D. A. Carson et al.; and I. M. Roitt and A. Cooke). F. S. Rosen examines the relationship between autoimmunity and immunodeficiency disease, and P. J. Lachmann and M. J. Walport present interesting ideas about the deficiency of the effector mechanisms of the immune response and autoimmunity. Two studies use monoclonal antibodies: in one, monoclonal anti-1A is used therapeutically in animal models of autoimmune disease (H. O. McDevitt et al.); in the other, monoclonal antibodies are used to deplete specific subpopulations of lymphocytes (H. Waldmann et al.).

M. Revel and A. Schattner consider the role of interferons acting as cytokines in autoimmunity, because they can control levels of HLA class I and II antigens on cells. C. M. Lockwood et al. discuss the results of studies using specific immunooabsorption as a means of removing humoral mediators of tissue injury. A final general discussion includes the role of external triggers of autoimmunity and immunoregulatory approaches to treatment. The book concludes with a summary by the chairman, D. K. Peters, and a complete subject index.

The many references found throughout the book, the lucid comments in the discussions, and the range of types of articles make this a most useful book to immunologists, physiologists, and clinicians. Recent developments and ideas have made autoimmunity one of the most intriguing areas of immunology. This book is a timely, worthwhile addition to the literature.


Reviewed by D. Borovsky, Florida Medical Entomology Laboratory, IFAS University of Florida, Vero Beach, Florida 32962, USA

C. M. Williams of Harvard University suggested 30 years ago that disruption of the molt-metamorphosis cycles in insects might be an effective way to control pest insects. Indeed, early studies of insect control focused mainly on juvenile hormone and the effects of ecdysteroids. Naturally occurring proteinaceous neurohormones were ignored, mainly because it was not clear how they could be used effectively in insect control. New advances in peptide chemistry and the introduction of gas-phase sequencers have made it possible to deduce the primary structure of insect neuropeptides from as few as 10 pmoles of pure peptide.

The Second International Conference on Insect Neurochemistry and Neurophysiology, held at the University of Maryland August 4-6, 1986, was a testimony to the tremendous interest now evident in these areas of entomology. The report of the Conference is divided into four parts. The first, about one-third of the book, contains seven review papers by invited speakers. These discuss specific neuropeptides: proctolin, adipokinetic hormones, prothoracitropic hormones, and brain hormones of Bombyx mori (ecdision hormone, melanization hormone, and redish coloration hormone), for which partial or complete amino acid sequences are known. The review papers also discuss the physiology of ecdysis (shedding of cuticle), diuresis, nervous transmission, and biogenic amine receptors. The three remaining parts of the book contain up-to-date (i.e., to 1986) short reports, each about four pages, that are contributed papers in the fields of neurochemistry, neurophysiology, and neuroanatomy of insects. Each chapter is preceded by a summary and a brief historical background on the advances in each subject.

One drawback of the book is that the editors allotted the seven reviews one-third of the available space, about 20 pages per review, and gave the 65 research reports only four pages each. Thus, many of the short reports only superficially cover current research. This book is important to the relatively few biochemists who use insects in research, and probably of even greater interest to biologists, zoologists, entomologists, and those molecular biologists who work with pest insects.

The book was produced from camera-ready typescript for rapid publication and distribution and is therefore not of uniform format, a compromise necessary to produce an up-to-date book. Its price probably will not encourage purchase by individuals. I recommend the book as a library acquisition and as a reference book in departmental libraries.


Reviewed by Jan A. Witkowski, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York 11724, USA

There can be little doubt that the present period will come to be regarded as the dawn of a golden age of human genetics. It is evident from the continued expansion of Victor McKusick's Mendelian Inheritance in Man that our knowledge of the number and variety of human genes is continuing to grow. The techniques of recombinant DNA technology have given us undreamed of powers for the isolation and manipulation of human genes. The number of mapped genes and anonymous probes has risen from about 1000 in 1985 to over 3000 in 1987, and the number of restriction fragment length polymorphisms has increased in about the same proportion. The rate at which this new knowledge is being applied to human diseases is remarkable, and these techniques are now revolutionizing medical genetics. Some of the most spectacular examples of our increased knowledge are the thalassemias, Lesch-Nyhan syndrome, Duchenne's muscular dystrophy, and (soon) cystic fibrosis and Huntington's disease (chorea).

All these are single-gene defects, but the most common and the most devastating of the diseases that affect us in the Western world are probably due to complex genetic factors. A major challenge facing molecular geneticists concerned with human diseases is the need to embark on the analysis of diseases that are polygenic and whose expression may be highly variable depending on particular environmental conditions. This CIBA Foundation Symposium, chaired by Sir David Weatherall, brought together a group of molecular and population geneticists and clinicians to examine what can be done about these disorders and what strategies should be followed.

The following list will give some idea of the scope of the symposium. Four chapters are concerned with the molecular genetics of lipoproteins, another three with other aspects of coronary heart disease, two chapters dealing with HLA-related disorders, and single chapters describing human gene mapping, diabetes, psychiatric disorders, gene therapy, and ways in which knowledge of polygenic diseases might be applied. All these are interesting accounts of the state of the art in November 1986 when the Symposium was held, but they are (we hope) going to become obsolete rapidly.

The discussions of the individual chapters and the two general discussions are a different matter. Here the participants tackle some of the issues that tend to be glossed over in the formal presentations and consider the general problems of analyzing polygenic diseases and the strategies that might be followed. There is a good discussion of the relative merits of approaches based on linkage
disequilibrium or linkage studies in families. There is an interesting debate on whether one should begin with the extremes of the distribution of affected individuals in the hope of finding something in them that will enable one to go back to the cases where resolution of the components may be more difficult. I am not as sanguine as some of the participants about the likelihood of success for using the candidate gene approach unless there are good reasons to think that a particular protein is involved. And for some disorders, like schizophrenia, there are no such candidates for this approach despite numerous studies on the biology of schizophrenia. This book does not offer any answers to the problems of molecular genetics of polygenic diseases, but it does provide some interesting and provocative discussions of why the answers are going to be hard to find.

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Reviewed by Luis Glasser, Executive Vice President and Provost, University of Miami, Coral Gables, Florida 33124, USA

Books have been written on many subjects to tell us how to do things, but this is the first one in this reviewer's knowledge on how to manage laboratories, big and little. The book is well written, clearly printed, and well indexed. Who will read this and how well does the book satisfy its reader's needs?

The author points out that a laboratory manager should be a talented researcher, a charismatic individual, and a good manager. The book vacillates somewhat between a description of the habits of charismatic managers and a series of descriptions on how to do things. Whereas the former are primarily anecdotal, the latter give this book its classification of handbook.

It is in the latter context that the book fails. Although nothing in the book is incorrect, it is written as if the newly appointed manager has had no previous experience. This almost never happens. Individuals in laboratories, just as elsewhere, rise through the ranks. They have worked in laboratories; they have had lower-level managerial duties; and they understand the subject. This book assumes that they know too little. A few examples will suffice.

On page 111, the desirability of the laboratory manager reviewing the research the laboratories conduct is a good idea, but do we need a full paragraph that starts with, "The size of the laboratory and the number of researchers in the various fields will determine the number of reviewers needed and their responsibility?" Later we read, "The size of the laboratory and type of research it performs determines the management and size of your safety program staff." Further along, we find that a good laboratory equipment salesman may be useful in determining how to design and equip laboratories.

Those who would find this book interesting are people who are not in management: young scientists who are thinking about their future, or individuals who wonder why the organization they are in functions in the particular way it does. If working managers need to read this book, they are already in trouble. Their systems cannot possibly be functioning.

It is a pity that this well-written book has fallen short of its mark. A book for managers in this field might indeed be needed, but I am afraid this one does not serve the purpose.


Reviewed by Dagmar Ringe, Department of Chemistry, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, USA

Protein engineering is a new field formed by the merger of molecular genetics and structural biophysics. The main elements that make this field exciting are advances in gene manipulation and in structural data on proteins by X-ray crystallography and NMR. Protein engineering will have far-reaching theoretical and practical consequences: it can be used to explore fundamental questions about structure, function, and folding of proteins, and to design new and useful proteins for industrial and medical applications.

This book presents a systematic approach to protein engineering from both the theoretical and operational points of view. It is to supplement introductory biochemistry textbooks and to use as a source for independent study by biochemists. The material is divided into four main sections: physical methods that are important in the analysis of protein design; methods available for design and redesign of primary sequences; principles of protein intermolecular forces; and functional and structural consequences of protein modification.

The first section contains three excellent articles on physical methods for determination of protein structure: X-ray crystallography (Hendrickson), NMR (Markley), and dynamics (Karplus). These articles give a good introduction to the theory underlying each method in a manner easily understood by the nonprofessional in the field. I would like to have seen a section in each case on what I will call credibility analysis. For instance, what are the molecular weight limits for which NMR is applicable? At a given resolution and R-factor, how much information can be extracted from a 3-dimensional model and at what level of certainty? The use of dynamics to begin to study single mutation structures is discussed well. However, proteins with greater numbers of differences in primary sequence (e.g., 50% homology) cannot be handled by this method, and again, a critical discussion of such limitations would be desirable.

The second section covers a wide range of topics from cloning (Rossi and Zoller) to DNA synthesis (Caruthers), protein purification (Burgess), strategies for analyzing proteins (Shortle), and, most important, folding (Creighton, Beatty et al., and King et al.). Although the treatment of each topic is rather cursory, the methods and problems are clearly stated. These are followed by three chapters about the key problem in obtaining new proteins, which is folding. Folding is the single step in the process that remains unsolved. Two chapters in this section, those by King et al. and Shortle, discuss alternative approaches to protein engineering: analysis of phenotypic mutations, second-site suppression analysis, and detailed characterization of doubly mutant proteins.

Section III features the design of new proteins. The general principles of protein design are only beginning to be formulated and the contributions here reflect this primitive state of knowledge. The section begins with a good overview by Baldwin and Eisenberg on protein stability. This chapter is followed by articles on design of β-sheet (Richardson and Richardson) and α-helical (Ohtodoro et al.) synthetic proteins. Key chapters follow in which the specific component forces contributing to protein stability are discussed. These chapters (by Lesser et al. and Eisenberg et al. on hydrophobic forces, and by Dill on protein stability in general and entropy of folding) are tucked into the center of this section and should really begin it, since a more thorough understanding of these forces is essential before routine protein design can realistically be contemplated. The final chapters describe synthesis and stability of polypeptides (Erickson-Viitanen et al. on amphiphilic α-helices and Kaiser on amphiphilic β-stands) and the basis of thermal stability of proteins to irreversible denaturation (Klibanov and Ahern).

This section on protein design examines attempts to formulate and characterize the principles governing the thermodynamic (stability) and kinetic (folding) properties of proteins. The mixture of topics and lack of
unifying rules that characterize this new science are reflected in the diverse topics presented in this section. However, this attempt to formulate rules is also the origin of the sense of excitement that emanates from these topics.

The final section of the book brings the reader up to date with some of the progress made so far. It can be divided into two main categories: mutants without structures and mutants with structures. The importance of structural information to protein engineering is dramatically illustrated by a comparison of the two. I particularly liked the chapters by Rutter et al. and by Alber and Matthews, because they illustrate the combination of structural data and molecular biology experiments that are well chosen, with results that are interesting and, at times, unexpected. The chapter by Howell et al. on dihydrofolate reductase, though too short, presents a lovely example of the use of careful kinetic data with X-ray crystallography.

The book is, for the most part, well illustrated, although the placement of color plates at the end of the book (instead of being integrated in the text) is unfortunate. The references are up to date and include titles, which makes them very useful. The index is excellent. On the whole, the editors have achieved their goal of having the leaders in this new and exciting field produce a worthwhile introduction to protein engineering. Although a more critical treatment of some aspects would have been preferred, the book is highly recommended.


Reviewed by Frank S. Parker, Department of Biochemistry, New York Medical College, Valhalla, New York 10595, USA

This is a good book put together in an interesting, unconventional manner with a minimal (but not simple) mathematical approach. I say "put together" because the 60-odd sections are treated in alphabetical order, as in an encyclopedia.

In approaching this book, I did as the author suggests in his preface, by starting with one of the "cartoons" by Valeria Petrone. Each of these is presented to focus attention on an anecdote illustrating nuclear magnetic resonance (NMR) concepts, and one of the best examples (page 211) is Dante's purgatory. You must see the picture and read Freeman's explanation of DANTE (Delays Alternating with Nutation for Tailored Excitation) to appreciate the beautiful parallel between cartoon and explanation. Accompanying this is an excellent diagram (page 209) of selective excitation by the DANTE sequence of short pulses separated by periods of free precession. Another cartoon I enjoyed shows three men getting "music" from a piano by smashing it with sledgehammers, and Freeman differentiates this from the pulse-excited mode operating in all new research-type NMR spectrometers.

Under the heading "Modulation and Lock-in Detection," the author makes an analogy between frequency modulation and the case of an ice skater performing a rapid spin. Several such analogies help to explain specific principles.

Excellent diagrams are displayed throughout the book, and the mathematical processes are presented in good form. Topics run from about two to 10 pages. An example of the clarity of Freeman's explanations the one included under "Chemical Exchange": "The possibility of chemical exchange can inhibit the use of the NMR method for certain structural determinations. Suppose that a molecule is suspected of existing in two conformers. The fact that only one spectrum is observed does not mean that only one conformer exists: it may merely indicate that the two forms are interchanging at a rate which is fast compared with the appropriate chemical shift difference."

Many sections are given from two to five pages; others, e.g., "Composite Pulses" is allotted nine pages; "Two-Dimensional Spectroscopy," seven pages; "Product Operator Formalism," nine and a half pages; "Spin-Lattice Relaxation," nine pages. Under the topic "Chemically Induced Nuclear Polarization," Freeman indirectly refers to the need for one to know not only something about the chemistry of a substance but also how radiation may interact with that chemistry (e.g., page 36, "What they [spectroscopists] did not realize was that a free radical reaction was involved, initiated by UV irradiation.") How often have we cautioned students to know (if possible) the chemistry of the system before trying to interpret spectra?

Perhaps "practitioners of NMR will welcome the fresh, unconventional approach of this book," it says on the back cover. But this is not a handbook in the ordinary sense for students being introduced to NMR and its applications. As Freeman says, there are no entries under chemical shift or spin-spin coupling.

Each topic has pertinent bibliographic references and a list of cross-references to other topics in the book. In some cases the reader may have to jump to a cross-reference section to understand the sentence at hand. "It is not a treatise for the complete novice in the field. It is written for those who already have a grounding in practical NMR spectroscopy and who would like to understand it better. In a certain sense, this is a specialist glossary or lexicon . . . [it] is a book for dipping into when there is nothing more exciting to do on the spectrometer," the author says.

In a useful six-page index, main sections are in bold print.


Reviewed by Lewis C. Mokrash, Department of Biochemistry and Molecular Biology, Louisiana State University Medical Center, New Orleans, Louisiana 70119-2799, USA

The idea that cultured cells would be valuable as models of aging is as recent as 1965, after the classic report by Hayflick and Moorhead in 1961. The literature on the use of fibroblasts in aging research showed a slow growth from then until the early 1970's when cells grown in culture began to be used widely to study aging. Most important in this monograph is the distillation of contemporary ideas about aging into concepts that transcend the current Neo-Orgelhrean preoccupation of researchers with DNA replication/repair.

Chapter II compares in detail the aging of cells in culture, mostly fibroblasts, with the aging of cells in vivo. A good discussion relates neoplastic cells and the effect of oncogenic viruses on normal cells to spontaneous transformations of cultured cells. This is crucial to the selection of cells for studies of aging.

The third chapter uses almost half of the entire text. The first topic is the reorganization of the genome and the development of aneuploidy in aging cells. The various changes in the composition and properties of DNA are examined in great detail; however, causality for aging is not attributed to any of these changes. One of the themes introduced here and repeated often is the sensitivity of DNA to changes induced by alterations of non-DNA structural features: the nuclear "cage," the cytoskeleton, and the plasmalemma. The elusive relations of protein synthesis and enzyme activity to aging are reviewed at length. The many contradictory features of this subject are detailed without apparent affiliation to one or another school of thought. The notion of cell topology and the role of nutrient transport into the cells are discussed as likely sources of some contradictory conclusions among investigators.

The cogent concept proposed by the author is that, if anything, the age-related changes
in cells are the product of disordered regulatory processes, not of a genetic mandate.

The original paper by Hayflick and Moorhead described three phases in the life span of fibroblast cultures. In 1982 Macieiro-Coelho and Taboury proposed an additional short terminal phase IV. In the fifth chapter, the metabolic characteristics of cells are related to the phases of the culture life-span. A clear cataloging of the changes characterizing the progress of cell senescence is given. The function of the cell membrane relating to aging is well covered. Again, the relationship of membrane to cytoskeleton is emphasized. “Since DNA is anchored on a nuclear matrix which is linked to the cell membrane through the cytoskeleton, its high order organization is influenced by the dynamics of the cell scaffold and by cell attachment to the extracellular matrix” (page 110). In a further discussion about the question of whether phase IV is a degeneration or dedifferentiation, the role of membrane proteins, enzymes, and transport is emphasized. A tentative conclusion is offered that “aging could be a sort of deregulation of differentiation, i.e., a paradifferentiation” (page 133).

Chapter VI features the cell cycle as it relates to cell senescence. Again, emphasis is placed on topological and structural factors: the cell membrane and cytoskeleton, receptors, and transport. Deregulation of normal cell processes is identified as a key process.

Chapter VII is an outstanding discussion on the characteristics of fibroblast-like cells. Both the similarities and divergences in character of these mesenchyme-derived cells are detailed with reference to the anatomic origin of the cell specimen.

The numerous errors in grammar, syntax, and spelling are somewhat distracting in an otherwise splendid text. This work will stand as a scholarly standard for future reviews on the same subject. It is recommended for all professionals in experimental gerontology.


Developments in Biological Standardization, Volume 69. Cytokines: Laboratory and Clinical Evaluation. Edited by the International Association for Biological Standardization. New York, N.Y.: Karger. 1988. 240 pages. $80.00 (U.S.); 144 deutsche marks. ISBN 3-8055-4846-X.


FASEB Summer Research Conferences

1988 Series Completed, 1990 Topics Sought

The seventh FASEB Summer Research Conference Series has been completed. Eighteen concurrent conferences were held at the conference sites—Saxtons River, Vermont, and Copper Mountain, Colorado. More than 2,100 scientists from the United States and 20 foreign countries attended. Once again conference participants were able to discuss and exchange information on the cutting edge of biomedical research while enjoying quiet, natural settings.

Many of the participants requested that their conference topics be scheduled again for future FASEB Summer Research Conference Series. The Advisory Committee charged with selecting topics is also seeking additional proposals for new conference topics. The committee invites topic proposals on subjects of interest to biological and medical researchers in fields that require concentrated 5-day sessions at which the latest developments can be discussed in depth. A topic proposal outline is available from Dr. Robert W. Krauss, FASEB Executive Office (301-530-7093), to assist in the submission of proposals for the 1990 and/or 1991 conferences.

The topics for the 1989 series have been determined and are outlined below. The Conference Advisory Committee will meet in October or November of this year to finalize the 1990 schedule and outline a tentative schedule for 1991.

1989 FASEB Summer Research Conference Schedule and Organizers

Saxtons River, Vermont

Renal Hemodynamics: Integrative and Cellular Control Mechanisms, June 11-16, L. Gabriel Navar, The University of Alabama/Birmingham, and Donald Marsh, University of Southern California

Cellular and Molecular Genetics, June 18-23, Gretchen Darlington, Baylor College of Medicine, and Inder Verma, The Salk Institute

The Biology and Chemistry of Vision: Molecular Mechanisms of Transduction and Information Processing, June 25-30, Denis Baylor, Stanford University, and Bernard K. Fung, UCLA School of Medicine

Ubiquitin, July 2-7, Milton J. Schlesinger, Washington University School of Medicine, and Alfred L. Goldberg, Harvard Medical School

Calcium and Cell Function, July 9-14, Anthony R. Means, Baylor College of Medicine, and Kevin Campbell, Iowa University

Cellular and Molecular Studies of Bone Marrow Transplantation, July 16-21, Brian R. Smith, Harvard Medical School, and Steven J. Burakoff, Dana-Farber Cancer Institute

Lymphocytes and Antibodies, July 23-28, Carol Cowing, Medical Biology Institute, and David Parker, University of Massachusetts Medical School

Regulation of Energy Balance and Nutrient Partitioning, July 30-August 4, M. R. C. Greenwood, Vassar College, Samuel Cushman, National Institutes of Health/NIDDK, and Ahmed Kissebah, Medical College of Wisconsin

The Neurobiology of CNS Injury, August 6-11, Alan I. Faden, University of California, San Francisco, and Wise Young, New York University Medical Center

Molecular Neurogenetics, August 13-18, J. Gregor Sutcliffe, Research Institute of Scripps Clinic, and Allan J. Tobin, University of California, Los Angeles

Copper Mountain, Colorado

Biochemical and Biophysical Mechanisms in Gravity Responses, June 25-30, A. Carl Leopold, Cornell University, and Marc E. Tischler, University of Arizona

Gastrointestinal Tract: Regulation of Organ/Cellular Functions, July 2-7, Jackie D. Wood, Ohio State University, and Gilbert A. Castro, University of Texas Health Science Center

Genetic Recombination and Genome Rearrangements, July 9-14, John Wilson, Baylor College of Medicine, and Richard Kolodner, Dana-Farber Cancer Institute

Protein Kinases, July 16-21, Perry J. Blackshear, Duke University Medical Center, and Jackie Corbin, Vanderbilt University Medical School

Micronutrients: Trace Elements, July 23-28, Robert J. Cousins, University of Florida, and Ananda Prasad, Wayne State University

Nutrients and Gene Expression in Carcinogenesis, July 30-August 4, Willard J. Visek, University of Illinois College of Medicine, and Lionel Poirer, National Center for Toxicological Pathology

Plant Gene Expression, August 6-11, Peter H. Quail, USDA Albany Labs, and Michael Bevan, FBI Cambridge

Molecular Mechanisms of Carcinogenesis, August 13-18, Michael J. Weber, University of Virginia School of Medicine, and Michael W. Lieberman, Fox Chase Cancer Center

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FJ FEDERATION NEWS
Society for Mucosal Immunology. Because the field of mucosal immunology is broad and involves many disciplines and because there is no specific organization representing the interest of investigators in this area, the Society for Mucosal Immunology has been formed. The purposes of the Society are 1) to advance the research, literary, and educational aspects of the scientific field of mucosal immunology; 2) to organize and coordinate national and international functions including research conferences, seminars, and workshops, in mucosal immunology; 3) to promote interest and encourage young investigators in the field; and 4) to stimulate interaction among members of diverse disciplinary interests and expertise who are dispersed around the world.

Membership is open to immunologists, physicians, dentists, veterinarians, biochemists, or other scientists who do research in or who have an active interest in mucosal immunology and who have published at least one first-authored paper in a peer-reviewed journal. For a membership application or further information, write to Charles O. Elson, M.D., Secretary-Treasurer, Society for Mucosal Immunology, Division of Gastroenterology, University of Alabama at Birmingham, Birmingham, AL 35294, USA.

The Papers of Wallace Osgood Fenn. The History of Medicine Section of the Edward G. Miner Library has recently completed processing the papers of Wallace Osgood Fenn, Ph.D. (1893-1971), Chairman of the Department of Physiology at the University of Rochester School of Medicine & Dentistry from 1924 until 1959. A physiologist of international stature, Dr. Fenn made pioneer contributions to the fields of muscle metabolism, electrolyte physiology, and the physiology of respiration. During the period 1937-1947, Dr. Fenn served successively as Treasurer, Secretary, and Honorary President of the American Physiological Society. The Fenn papers include extensive series of correspondence, reports, manuscripts, and lecture notes, as well as laboratory notebooks, chronicling Fenn's research activities from 1915 to 1971. An inventory of the collection is available from Christopher Hoolihan, History of Medicine Section, Edward G. Miner Library, 601 Elmwood Ave., Rochester, NY 14642, USA.

1989 Oberly Award Nominations. Nominations are sought for the 1989 Oberly Award for bibliographic excellence in the agricultural or related sciences. To be eligible, a bibliography must have been published in 1987 or 1988, and at least one author, editor, or compiler must be a U.S. citizen. Bibliographies will be judged on usefulness, scope, accuracy, format, explanatory features, and indexing methods. The award is administered by the Science and Technology Section of the Association of College and Research Libraries Division of the American Library Association. It will be presented at the 1989 annual meeting of the American Library Association in Dallas. Nominations in the form of a letter (including, if possible, a copy of the letter) should be sent by January 1, 1989, to Carolyn L. Warnmann, Chair, Oberly Award Committee, Reference Department, Carol Newman Library, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, USA.

Attention Former NIHers. The newly reorganized Alumni Association of the National Institutes of Health (NIHAA) wants to compile as complete a list as possible of former staff and associates, so that we may contact as many alumni as possible as further plans and items of interest develop. Accordingly, the NIHAA would like to hear from all those who were ever at an NIH facility in any capacity—staff, fellow, executive administrative, etc. Please send a note with your name, former NIH affiliation, current position, mailing address, and telephone number to Harriet R. Greenwald, Executive Director, NIHAA, 9101 Old Georgetown Road, Bethesda, MD 20814, USA.

1989 Doctoral Fellowships in Biological Sciences. Sixty fellowships will be awarded by the Howard Hughes Medical Institute for full-time study toward a Ph.D. or Sc.D. degree in biological sciences. Awards are for 3 years, with an option to extend the fellowship for 2 additional years. Stipends are $12,300 annually; a $10,700 annual cost-of-education allowance is provided to the fellowship institution on behalf of each fellow. Eligible fields of study include biochemistry, biophysics, cell biology and regulation, developmental biology, genetics, immunology, microbiology, molecular biology, neuroscience, pharmacology, physiology, structural biology (of macromolecules), and virology.

The application deadline is November 14, 1988. This international fellowship competition is administered by the National Research Council. For copies of the program announcement or applications, write to Hughes Doctoral Fellowships, The Fellowship Office, National Research Council, 2101 Constitution Avenue, N.W., Washington, DC 20418, USA.
Dear Dr. Whelan:

The interview with Ken Endicott, published in the June 1988 issue of The FASEB Journal, was wonderful. It served to capture the essence of a very positive, imaginative person who devoted much of his career to ensuring that the Federal commitment to medical research and education was carried out in the most effective and efficient manner possible. As an officer in both the American Association of Pathologists and Universities Associated for Research and Education in Pathology, it was my great pleasure to work with Ken following his retirement from the NIH in this his third, or perhaps even fourth, career, this one as the executive officer of the two organizations. Ken's untimely death on July 16, 1987, left a significant void in all of our lives.

Thank you again for a particularly penetrating interview—a nice memorial to a wonderful person.

Sincerely,

Robert E. Anderson, M.D.
Professor and Chairman
Department of Pathology
The University of New Mexico
School of Medicine
Albuquerque, NM 87131, USA

Editor's note: In turn we thank Dr. Stephen P. Strickland who conducted and wrote the interview. This is also an opportunity to point out that the photographs that accompanied the article on page 2442 were taken at a briefing to President Lyndon B. Johnson by Dr. Endicott on behalf of the National Cancer Institute.

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JN/88
Capillary Electrophoresis

Microphoretic Systems introduces an analytical tool for the rapid high-resolution separation of complex biomolecules, the Microphore™ 1000. This is the first implementation of capillary electrophoresis in an automated instrument designed for routine laboratory use. A patented multichannel UV/fluorescence detection system provides the sensitivity and versatility required to fully exploit the power of capillary electrophoresis. An automated sampling system is based on standard 96-well microplates and can introduce samples by controlled vacuum or electromigration techniques. Replenishing and changing of multiple electrolytes, as well as purging of the capillary between analyses, are computer controlled. The Microphore 1000 can accommodate a variety of capillary electrophoresis separations based on molecular charge, including isoelectric focusing, isoelectrophoresis, and micellar electrophoresis. Separations based on molecular size, such as restriction fragment analyses and SDS-PAGE, can be accomplished using gel-filled capillaries.


Quick-Freeze Freezers

Rush Qualitemp chest-type freezers designed for general laboratory use that freeze materials quickly are available from Hotpack Corporation, Philadelphia, Pa. Engineered to maintain constant low temperatures, the refrigeration system is capable of uninterrupted pull-down to −85°C in less than 4 hours, providing fast freezing without affecting the temperature of materials already in storage. The Rush freezers are used for research, testing, production process chilling, and cold storage of film, materials, chemical and biological substances in industrial, pharmaceutical, and independent laboratories. They are used in clinical and health care facilities to store research samples and frozen blood.

The Rush Qualitemp freezers are available in six cascade models and six single-stage models. Temperature range for the cascade models is −60°C to −90°C and −10°C to −45°C for the single-stage models. Capacities range from 7.5 cu ft to 30.9 cu ft.

The freezers have solid-state temperature controls and feature digital indicator and controller. An alarm system has adjustable high and low alarm set points and audible and visual alarm. The unit’s refrigeration system consists of heavy-duty accessible, hermetic compressors and finned coil condenser with removable, cleanable air filter and nonflammable halocarbon refrigerants. Compressors run only on demand and cycle on-off to maintain temperature, reducing operating costs, energy consumption and wear. Five-inch, poured-in-place polyurethane foam provides exceptional insulation and temperature protection. Features include key lock lid equipped with two charged 7.5 cylinders for easy opening and a nonelectrically heated gasket area to prevent icing of gaskets.


Versafill Dispensing System

Oyster Bay Pump Works announces the Versafill Dispensing System for the precise, rapid filling and coating of microplates, tubes, and spotting of slides and membranes. A microprocessor controls plate sensing, indexing, and speed of the conveyor and pumps. The solid-state controller with easy pushbutton adjustments regulates all functions including fill patterns. The system is virtually inert and features autoclavable liquid path parts. It is also compact for use in hoods. For microplates, you can fill in either the 8- or 12-way direction and can do single, multiple, or alternating rows.

Each pump can fill different solutions and be set for different volumes or they can all be the same. Repeat accuracy, with no hanging drop, of better than +/−1% for fill volumes from 3 microliters up. The system has a throughput of up to 1200 plates an hour. The pumps are positive displacement and valveless with a gentle sinusoidal pumping motion that is compatible with biological solutions such as latex, proteins, or delicate cell suspensions. Optional systems are available to spot or coat slides, strips, cards, and membranes, and coat test tubes and small vials. Microplate and Tube Wash and Aspirate systems are also available. Oyster Bay Pump Works, 1 Bay Avenue, Oyster Bay, NY 11771, USA. Telephone 516-922-3789, telefax 516-624-9253. Circle 81 on Reader Service Card.

Antiseptic Foam Needs No Water

Minnetonka Medical announces DERMA STAT™ Antimicrobial Waterless Hand Foam, an antiseptic that enables hand degerming in areas where
washing with water is impractical or impossible. The antimicrobial activity of this hand foam is derived from foamed ethyl alcohol (65% by volume), which is effective against Gram-positive and Gram-negative bacteria, Mycobacterium tuberculosis, and yeast. DERMA STAT foam meets the recommended guidelines for use as a hand wash for health care personnel. Minnetonka Medical, P.O. Box 1A, Minnetonka, MN 55343, USA. Telephone 800-328-5928. Circle 77 on Reader Service Card.

Glass Fiber Biomat

The Manville glass fiber Biomat offers high flexural strength and water absorption, flexibility, and a 96.9-micron-mean pore diameter for efficient eukaryotic cell immobilization. The closely controlled pore size and high porosity maximizes cell or microbe concentration in the bioreactor. Appropriately charged surfaces enhance cell entrapment and facilitate attachment of anchorage-dependent cells. The properly sized pores also protect cells from damaging fluid movement and diffusion limitations. The Biomat has applications for mammalian and other eukaryotic cells, including fungi, yeast, and plant. The large pore size, good diffusion characteristics, and good flexural strength are important properties in cell immobilization and entrapment applications. In buffered applications, the 8.0 pH Biomat naturally adjusts to the buffer's pH. The 300 percent by weight water absorption is useful in tissue culture and seedling applications.

The fiber glass comes in shapes suitable for use in rotating contactor designs, which expose microorganisms or cells to ideal air and nutrient blends. The Biomat, which can be sterilized, conforms to most roller bottle or bioreactor configurations. Physical and surface characteristics can be modified to meet specific customer requirements. Designed for pharmaceutical, chemical, and waste disposal, for example, the Biomat can be used in the lab, in pilot tests, and for small- or large-scale commercial uses. Manville, P.O. Box 5108, Denver, CO 80217-5108, USA. Telephone 303-978-5080. Circle 78 on Reader Service Card.

Nonisotopic Nucleic Acid Detection System

Oncor Inc. now offers a highly sensitive, enzyme-based, non-isotopic nucleic acid analysis system, which has been qualified on human DNA to assure consistent results, sharp clear bands, and very low background when used for Southern, Northern, and Dot blot procedures. This nonradioactive nucleic acid analysis system consists of biotin-labeled probes, a total reagent system, and exclusive nylon membrane. The system uses biotin/streptavidin interactions to visualize nucleic acid hybridizations. Nucleic acid levels as low as 0.18 picograms per fragment can be detected in less than 6 hours. Enzymatic detection provides results after only 6 hours (4 days are required for autoradiography used with isotopically labeled probes). Biotin-labeled probes produce fast, accurate results while reducing the hazards, instability, and expense of working with radiolabeled probes. When frozen, nonisotopic probes remain stable and usable for at least 1 year. Radioactive probes, with a half-life of 14 days, become unstable within days. The entire system includes a total reagent system and exclusive nylon membrane to insure optimal performance. The hybridization and detection kit contains all the dyes, enzymes, washing solutions, blocking reagents, and hybridization reagents necessary for nonisotopic analysis. The system also offers a choice of two sizes of specially manufactured nylon hybridization membranes—packages of 20 precut standard size (13.5 × 10.9 cm) or a convenient roll (30 cm × 2 m). It is qualified on human genomic DNA by Southern analysis. The nylon membrane has a positively charged surface for high binding capacity of human DNA fragments over a wide range of molecular weights. Its high signal-to-noise ratio consistently provides low background and sharp clean bands. The flexible, noncurl nylon allows multiple stripping and re-probing of the same patient sample with no loss of sensitivity. This provides additional data from a single gel. The membrane is easy to manipulate, durable, and maintains its dimensions whether wet or dry. Oncor, Box 870, Gaithersburg, MD 20877, USA. Telephone 301-963-3500. Circle 79 on Reader Service Card.

Semidry Western Blotter

Hoefer Scientific's new SemiPhor® Semidry Blotter uses two screen-type electrodes to deliver complete, uniform Western transfers of up to six gels at once with low current and low voltage. Transfers in the unit are typically run at <50 mA and <15 V. In addition, transfers require just enough buffer to saturate the blotter paper and membrane and wet the gel. SemiPhor's anode is a platinum screen, the cathode is a stainless steel screen. Platinum and stainless steel eliminate the slaking and deterioration problem common to graphite electrodes used in other semidry blotters. SemiPhor electrodes will not leave deposits on membranes and will last indefinitely. The screens measure 14 × 16 cm so they can accommodate gels from standard-size and mini units. Hoefer also has a special 50 V constant current power supply designed for powering transfers in the Semiphor. Hoefer Scientific Instruments, P.O. Box 77387, San Francisco, CA 94107, USA. Telephone 415-282-2307. Circle 75 on Reader Service Card.
Accusphere HPLC Columns

J&W Scientific has introduced Accusphere HPLC Columns for the analytical laboratory. These columns are designed to handle the complete range of reverse-phase HPLC analyses, including organics, inorganics, proteins, amino acids, pharmaceuticals, alcohols, ions, carbohydrates, phenols, esters, pesticides, and other compounds. Accusphere columns are packed with custom-manufactured Accusphere Silica, in a choice of 3 μm, 5 μm and 7μm particle sizes. A selection of bonded functional groups such as octadecyl, octyl, methyl, cyano, amino, phenyl, and diol provide a range of selectives and pH stabilities.

High-quality Accusphere Silica columns are optimized for efficiency and reproducibility, with strict attention to peak symmetry, capacity, and selectivity. Both standard and cartridge versions of the columns are available. J&W Scientific, 91 Blue Ravine Rd., Folsom, CA 95630, USA. Telephone 916–985–7888. Circle 72 on Reader Service Card.

Remote Trigger

Squib™ generates an output trigger pulse that can initiate stimuli, oscilloscope sweeps, and the synchronous insertion of test waveforms. The instrument must be armed before an output trigger pulse can be produced. Arming and triggering can be performed manually with pushbuttons or electrically by application of logic level commands. Triggering generates a single 5-volt output pulse (0.1 microsecond) accompanied by a brief audible beep. The low drain on the 9-volt battery allows the device to operate continually for at least 1 year. World Precision Instruments, 375 Quinnipiac Ave., New Haven, CT 06513, USA. Telephone 203–469–8281. Circle 76 on Reader Service Card.

Kinetic Microplate Reader

The UVmax™ Kinetic Microplate Reader incorporates an optical system specifically designed to perform in the UV range without compromising performance at visible wavelengths. In the microplate format, UVmax delivers optical performance comparable to a quality spectrophotometer. With a measurement range extending from 340 nm to 750 nm, the reader performs excellent kinetic and endpoint analysis. UVmax is especially useful for enzyme analysis, monitoring 96 enzyme reactions simultaneously, whether positive or negative kinetics. All 96 wells on the microplate are read within 5 seconds—a rate fast enough to capture the initial portions of the curve. An on-board microprocessor calculates the linear rate of reaction of each well automatically and generates a printout of the kinetic curve for the 96 wells. Additional features for enzyme kinetics include an isothermal reading chamber and a built-in mixer for better precision in solid-phase enzyme analysis.

UVmax is also excellent for endpoint analysis with either single or dual wavelength measurements. Using the SPEED READ feature, five microplates can be read and processed in 1 minute. SOFTmax™, an IBM-compatible software package designed for use with UVmax, Vmax and Emax, expands the capabilities of UVmax. SOFTmax provides extensive data analysis and management features including five standard curve algorithms and a comprehensive set of data displays and reports. SOFTmax extends kinetics analysis capabilities to negative kinetic reactions, particularly useful for assays performed in the UV range. Molecular Devices Corporation, 3180 Porter Dr., Palo Alto, CA 94304, USA. Telephone 800–635–5577. Circle 72 on Reader Service Card.

Wheaton Reciprocating Water Bath

The Wheaton Reciprocating Water Bath has a secondary adjustment knob for fine adjustment of bath temperature. Easy-to-read LED displays both temperature and set temperature. Stirring is accomplished through reciprocating shaking and is electronically controlled from 10 to 200 strokes/min with either a .5- or 1.5-inch stroke length. The bath is constructed of stainless steel and is supplied without platform. Platforms accommodate 50-, 125-, 250-, 500-, and 1,000-mL Erlenmeyer Flasks. The bath's specific features are: temperature range — room temperature plus 5°C up to 100°C; stability at 37°C ± 0.1°C; bath capacity — 32 liters; overall dimensions — 31½" × 16½" × 13½" (810 mm w × 420 mm d × 345 mm h); power — 110 to 120 VAC, 50/60 Hz, 1440 watts. The Wheaton Agency, 1301 N. Tenth Street, Millville, NJ 08332, USA. Telephone 609–825–1400. Circle 73 on Reader Service Card.

Literature

Spectrofluorometer brochure describes the Nova-3, from SPEX Industries Inc., 3880 Park Ave., Edison, NJ 08820.

G series compact floor model centrifuges, brochure from Jouan, Inc., P.O. Box 2716, Winchester, VA 22601, USA.

Biological and immunological products for the researcher, a catalog from Bioproducts for Science, Inc., P.O. Box 29176, Indianapolis, IN 46229, USA.

Advanced electron microscopes, information available from Carl Zeiss, Inc., One Zeiss Dr., Thornwood, NY 10594, USA.

LC and electrophoresis, a catalog from Isco, Inc., P.O. Box 5347, Lincoln, NE 68505, USA.

Fermentation software, a brochure from Astra Scientific International Inc., P.O. Box 611088, San Jose, CA 95161-1088, USA.

Neurochemicals for the Neuroscientist, 1988/89 catalog from RBI Research Biochemicals Inc., 9 Erie Dr., Natick, MA 01760-1312, USA.
POSITIONS AVAILABLE — Classified advertisement rates: $170.00 for first column inch, $150.00 for each additional inch or portion thereof. A column inch is eight lines, each containing 70 characters, including spaces. Display advertisement rates: $570.00 for ½ page (3½ inches × 4⅞ inches); $850.00 for ¾ page (vertical 3¼ inches × 9¾ inches or horizontal 7¼ inches × 4⅞ inches); $1130.00 for full page (7⅞ inches × 9¾ inches); copy received not camera-ready is subject to additional typesetting fee of 5% of rate. Advertisements will be published in next available issue unless otherwise specified. Deadline for receipt of copy is 5th day of month before publication. Payment or purchase order is required with insertion copy. Advertisements are noncommissionable to agents; no cash discounts are allowed. Blind advertisements are not accepted.

POSITIONS DESIRED — Candidates registered with FASEB Placement Service are allowed one advertisement of five lines, each containing 70 characters including spaces. The issue in which advertisement appears will be based on date of receipt of copy. Fee for publication in additional issues: $10.00 per issue.

Primary employers desiring identification and additional details concerning Positions Desired advertisers should write to address below, indicating hyphenated number appearing as last element of advertisement; a one-page application from advertiser(s) will be provided immediately. Advance telephonic determination of current availability of advertisers from earlier-than-current issues is recommended. Employers not currently registered with Placement Service are charged a minimum fee of $30.00 for identification of up to 10 advertisers, plus $3.00 for each above 10, payable in advance to FASEB Placement Service.

Some registered candidates do not prepare Positions Desired advertisements; some advertisements are published at times not coinciding with employer recruitment activities. Primary employers not finding advertisements that appear to match current or projected needs are invited to request a search of all active candidate files. Telephone a description of the desired qualifications; results of search will be discussed telephonically with requesting official, and applications from candidates declared suitable will be forwarded. Employers not currently registered with Placement Service are charged a minimum fee of $30.00 for up to 10 applications, plus $3.00 for each above 10.

In publishing these advertisements FASEB assumes no obligations as to qualifications of prospective employees or responsibility of employers, nor shall FASEB obtain further information concerning positions advertised or those seeking employment. Accuracy and completeness of all listings are the responsibility of the submitting party.

Various U.S. state and national laws against discrimination, including the Federal Civil Rights Act of 1964, prohibit discrimination in employment in the United States because of race, color, religion, national origin, age, sex, or any reason not based on a bona fide occupational qualification. The Federation of American Societies for Experimental Biology endorses these principles and reserves the right to edit all copy and to refuse advertisements not in consonance therewith.

Employment in countries other than the United States may be restricted by government visa and other policies. Moreover, it is suggested that the generally accepted employment practices, the cultural conditions, and the exact provisions of the specific positions being considered be investigated thoroughly. The U.S. Embassies in countries of interest to potential employees should be able to provide up-to-date data concerning internal conditions.

For a description of operation at annual meetings, please refer to the January or February issue or contact the Placement Service.

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

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| Classified advertisement | $ 25.00 per line (70 characters), $200.00 (8 line) minimum |
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RESEARCH POSITION. A research faculty position is immediately available at the Division of Transplantation at the University of Miami School of Medicine. At least 3 years seniority after a Ph.D. degree is a prerequisite with the opportunity to become codirector of a multi-institutional transplantation immunobiology research program. Experience in monoclonal antibody and T cell cloning technology, molecular genetics as related to histocompatibility antigens and immunogenetics are also needed. Salary is commensurate with faculty seniority. Send CV or call Dr. Joshua Miller, University of Miami, School of Medicine, Department of Surgery, P.O. Box 916301, Miami, FL 33101, (305) 447-6171. An affirmative action employer.

CARDIOLOGISTS, INTERNAL MEDICINE. The University of California, Davis, School of Medicine is recruiting for one full-time faculty position at the assistant/associate or full professor level. Candidate must be Board certified or eligible in Internal Medicine and its subspecialty of Cardiovascular Diseases and be eligible for licensure in California. A clinical and research interest in coronary angioplasty, electrophysiology, intensive care unit, NMR or in basic research in the areas of cellular biochemistry or molecular biology is preferred. Responsibilities include clinical care, teaching of medical students, residents and fellows and a commitment to basic and/or clinical investigation. Letters of interest including a complete CV, should be forwarded to Zak Vera, M.D., Chair, Cardiology Search Committee, Room 2040, Professional Building, 4301 X Street, Sacramento, CA 95817. Position open until filled. Applications will not be accepted after December 1, 1988. UCD is an equal opportunity/affirmative action employer.
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Department of Physiology and the Institute for Environmental Medicine of the University of Pennsylvania Medical Center seek a Cell Biologist for a tenure-track appointment as Assistant Professor. Research areas of special interest include lipid-protein interaction, endocytosis, secretion, epithelial cell differentiation, macromolecular synthesis, and lipid peroxidation. Guaranteed salary support and generous start-up funds are available. Deadline for application is December 15th, 1988. Send c.v. and statement of research interest to: Cell Biology/Asst. Professor, Search Committee, c/o Maureen Doran, Executive Assistant, Institute For Environmental Medicine.

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Letters of interest with resumes and references should be sent to:

Thomas E. Malone, Ph.D.
Vice President for Biomedical Research
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One Dupont Circle NW, Suite 220
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Professor and Head
Department of Medical Pharmacology & Toxicology
Texas A&M University College of Medicine
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ASSISTANT/ASSOCIATE PROFESSORS. One, possibly two, faculty positions are available at the Hormel Institute, a research division of the University of Minnesota. The Hormel Institute is an internationally recognized center for basic research on the physicochemical behavior, metabolism, and biological functions of lipids and lipid-related proteins. We seek talented investigators who can establish independent, high quality research programs which will complement those of our current faculty. Doctorate and two years of research experience required, more is desirable. Please submit CV, publication list, a brief description of research interests and the names of three references to Dr. Howard L. Brockman, Chairman of the Search Committee, The Hormel Institute, University of Minnesota, 801 16th Avenue NE, Austin, MN 55912 (507) 437-9620. Application deadline is November 18, 1988. The University of Minnesota is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities.

POSTDOCTORAL POSITION available January 1, 1989 for biochemistry/pharmacological research on the vesamolic receptor associated with acetylcholin storage system of brain synaptic vesicles (see Biochem 27, 5262-5274, 1988). Appointment for one year, $23,196; extension possible. Ph.D. required. Open until filled. Send CV with references to Dr. Stanley Parsons, Department of Chemistry, University of California, Santa Barbara, CA 93106. Proof of U.S. citizenship or eligibility for U.S. employment will be required prior to employment (IRCA 1986). An equal opportunity/affirmative action employer.

POSTDOCTORAL POSITION available to study regulation of Ldh-c gene expression and its relationship to spermatogenesis in the mammalian testis. Ph.D. in biochemistry or molecular biology and cell biology is preferred. Excellent references required. Please send names and addresses of three references and CV to Dr. Erwin Goldberg, Professor, Northwestern University, Department of Biochemistry, Molecular Biology and Cell Biology, Evanston, IL 60208. Equal opportunity employer.

POSTDOCTORAL FELLOW. Postdoctoral position available to characterize the immunological effects of immunomodulators which inhibit experimental retroviral or bunyaviral infections. Applicant to work with a team of immunologists, virologists and molecular biologists on a federally funded antiviral and AIDS research program. Applications accepted until position filled. Send CV and names of three references to Dr. Robert W. Sidwell, Director, Antiviral Program, Utah State University, Logan, UT 84322-5600. USU is an AA/EEO and IRCA employer.

HEAD, PUBLIC HEALTH NUTRITION, UCLA School of Public Health, July 1, 1989. The candidate will be expected to take a leadership role in the development of a multidisciplinary research and training program. This program will focus on the role of nutrition in health promotion and disease prevention at the community and national level. Extensive resources in nutrition-related sciences at UCLA and a funded Clinical Nutrition Research Unit provide a rich environment for collaboration. The candidate should be able to integrate various aspects of public health nutrition into nutritional health care delivery, epidemiology, biological sciences and behavioral aspects of diet. Qualifications should include a doctorate in nutrition or a closely related biological science or an M.D. with nutritional or related training. Experience is required in public health nutrition, delivery of nutritional services, food and nutrition policy, and the provision of nutritional information to the community. Salary negotiable. Full professor series. Send CV and names of three referees to Chair, Public Committee for Search, Room 71-279, School of Public Health, UCLA, Los Angeles, CA 90024-1772 by February 15, 1989. The University of California is an affirmative action/equal opportunity employer and welcomes applications from qualified women and minority candidates. Under federal law, the University of California may employ only individuals who are legally authorized to work in the United States as established by providing documents specified in the Immigration Reform and Control Act of 1986.

FACULTY POSITION. Division of Kinesiology at the University of California, Los Angeles invites applications from individuals with research specialties in musculoskeletal function and adaptation. Expertise in connective tissue biochemistry is preferred but not required. This is a tenure-track position at the assistant or associate professor level and is anticipated to start July 1, 1989. The appointee is expected to conduct an independent research program, teach courses in basic physiology, develop a graduate program and participate in the area of specialty. Applicants must have a Ph.D. or M.D. degree and have had at least two years of postdoctoral training or comparable experience. Submit CV, including a statement of research interests and three names for references to Professor. R. James Barnard, Department of Kinesiology, 2859 Slichter Hall, University of California, Los Angeles, CA 90024-1568 by January 15, 1989. The University of California is an equal opportunity/affirmative action employer.

FACULTY POSITION—IMMUNOLOGY. The Department of Microbiology, University of Texas Health Science Center at San Antonio, has a tenure-track faculty position (assistant to full professor) for a person with interest and training in immunology. Areas of preference include molecular immunology, antigen presentation, T cell biology and lymphokine research. Candidates with a strong record of research achievement are encouraged to apply. Successful candidates are expected to develop/maintain innovative research programs and to participate in departmental teaching activities. This is an exceptional opportunity to join our expanding department committed to excellence in research and teaching and located in a desirable academic-geographic setting. Applicants should include a CV and a statement of current research goals, and arrange to send three letters of reference by December 31, 1988 to Dr. Judy M. Teale, Immunology Search Committee, Department of Microbiology, University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, TX 78284-7758. UTHSCSA is an equal opportunity/affirmative action employer.

FACULTY POSITION IN MOLECULAR PHARMACOLOGY/TOXICOLOGY. The Department of Pharmacology, Northwestern University Medical School, invites applications for a tenure-track position at the assistant or associate professor level. Candidates should have a Ph.D. or equivalent degree in pharmacology or toxicology and have demonstrated excellence in research and commitment to teaching. Preference will be given to those who have had experience in application of molecular biology, genetics, cell biology or immunology to pharmacological and toxicological problems. Send CV, letters from three references and a brief statement of future research plans to Dr. Toshiro Narahashi, Professor and Chairman, Department of Pharmacology, Northwestern University Medical School, 3030 E Chicago Avenue, Chicago, IL 60611 (312) 928-8248. An equal opportunity/affirmative action employer.

RESEARCH SCIENTIST. Ph.D. in biophysics or related fields, with research experience in the physical properties of membrane lipids. Should have working knowledge in electron microscopy, x-ray diffraction, fluorescence spectroscopy, NMR, transport and fusion assays for membranes, protein and lipid purification, analysis and reconstitution. Good writing skill. Publications. Contact Dr. Hui, Roswell Park Memorial Institute, Buffalo, NY 14263. EO/AA.

FACULTY POSITIONS IN BIOMEDICAL ENGINEERING. Vanderbilt University School of Engineering announces the availability of tenure-track faculty openings in Biomedical Engineering. Positions are planned at the assistant professor level but applications by more senior candidates will be considered. Candidates with strong records of research will be considered. Applicants should have education to the doctoral level in biomedical engineering or a related field and experience in biomedical engineering research. Preference will be given to applicants with qualifications and interests in one of the following areas: biosensors, medical computing, including artificial intelligence and neural networks: some aspect of neurological/ bioelectrical science and engineering. Other interests related to biomedical instrumentation will also be considered. Vanderbilt has a well-established academic program in biomedical engineering which offers B.S., M.S. and Ph.D. degrees in the field and participates in the M.D./Ph.D. program of the School of Medicine. Vanderbilt is an affirmative action/equal opportunity employer. Minority and female candidates are urged to apply. Applicants should send a CV and the names of three references to Chair, Biomedical Engineering Search Committee, Vanderbilt University, Box 1724, Station B, Nashville, TN 37235.
FACULTY POSITION. M.D. or Ph.D. at instructor/assistant professor level to participate in a multifaceted research program on heart failure with emphasis on structure and function of cardiac connective tissue. Expertise in both electron microscopy and cardiovascular physiology required. Experience in coronary circulation and myocardial ischemia desirable. Competitive salary and benefits. Send CV and references to Dr. Edmund Sonnenblick, Cardiology Division, Albert Einstein College of Medicine, 1300 Morris Park Avenue, Bronx, NY 10461.

PREDOCTORAL/POSTDOCTORAL TRAINING POSITIONS IN PULMONARY PHYSIOLOGY, PATHOPHYSIOLOGY AND NEUROPHYSIOLOGY are offered to U.S. citizens or permanent residents, at the UW-Madison under the terms of a NHLBI training grant. Training faculty include G. E. Bisgard, J. A. Dempsey, G. S. Mitchell, J. B. Skatrud and E. H. Vidruk. Areas of research include neural, chemical, muscular and mechanical aspects of the regulation of breathing and their interactions, regulation of airway smooth muscle, and pulmonary system limitations to maximum gas transport. Studies are carried out in chronically instrumented unanesthetized animals, in anesthetized animals, in humans of various ages and in patients with chronic diseases. Current projects include ventilatory regulation in exercise, sleep, hypoxia and acid-base disturbances. Details of current research activities are available upon request. Send CV, names of three references, statement of career goals and, if appropriate, your current area of research interest to J. A. Dempsey, Ph.D., University of Wisconsin-Madison, 504 N Walnut Street, Madison, WI 53705 (608) 263-1732.

POSTDOCTORAL NUTRITION TRAINING at the University of Pennsylvania Medical Center. Six one-year appointments available July 1, 1989. NIH-sponsored research traineeships in Cancer & Nutrition and Clinical Fellowships in Nutrition/Metabolism (J. Mullen, M.D., Program Director) are awarded on an equal opportunity basis. Research traineeship with core didactic and nutrition research components are available for M.D.'s with two years of residency training and for Ph.D.'s. M.D.'s with three years of residency training may apply for Clinical Fellowships with the Hospital of the University of Pennsylvania Nutrition Support Service. Deadline February 1, 1989. Contact Irene Feurer, M.S.Ed., Department of Surgery, 4 Silverstein, HUP, 3400 Spruce Street, Philadelphia, PA 19104 (215) 662-6156.

ASSISTANT PROFESSOR, NUTRITION, tenure track for fall 1989. Doctorate or ABD required. College teaching and publication record preferred. Salary negotiable. Send resume to Lorraine Dorfman, Department of Home Economics, University of Iowa, Iowa City, IA 52242. Equal opportunity/affirmative action employer. Women and minority candidates are encouraged to apply.

ASSISTANT PROFESSOR. Public Health Nutrition, twelve month service, tenure track. Requirements: broad training in nutrition science, research interest in chronic disease in public health context, strong laboratory based skills, postdoctorate research experience and publications. Teaching experience desirable. Beginning date July 1, 1989. Application deadline December 1, 1988. AA/EOE. Send CV, selected publications, three reference letters to John Anderson, Ph.D., Department of Nutrition, School of Public Health, University of North Carolina, CB#7405, 315 Pittsboro Street, Chapel Hill, NC 27599-7405.

POSITIONS DESIRED

Ph.D., 1982; Biochemistry, pharmacology, cell physiology; Calcium transport studies in platelets, cardiac calcium antagonist receptor, solubilization and purification of proteins, polyacrylamide gel and free flow electrophoreses, enzyme kinetics; Avail. fall 1988; Research scientist position industry; Salary negot. 2-2852

Dr.P.H., R.D., 1982; Nutritional science, dietetics; Experience in nutritional biochemistry research, community and clinical nutrition, teaching nutrition, maternal and child nutrition; Date negot.; Position in academia or industry; Salary negot. 5-3084

Ph.D., 1988 (expected); Molecular and cell biology; Gene regulation, DNA sequencing, oncogenes, mitogenic signaling, nuclear proteins, liposomes, hybridoma, experience cell and viral cultures, immunohistology and neural science background; Avail. fall 1988; Molecular biology postdoc.; Salary negot. 2-3114

Ph.D., 1981; Immunology, biochemistry, cell biology, parasitology; Activation, identification, characterization of protein kinase C isoenzymes of lymphocytes assayed by in vivo substrate phosphorylation, gel analysis, lymphokine/receptor gene expression, cellular proliferation; Avail. immediately; Staff position academia/industry. 6-3120

Ph.D., 1988 (expected); Molecular biology, biochemistry; Culture of Physarum polycephalum & RNA isolation, in vitro replication of DNA, recombinant DNA cloning and selected mutagenesis, electron microscopy of DNA & RNA, 2-D gel electrophoresis of DNA; Avail. Jan. 1989; Postdoc. position in academia/industry; Salary $25K min. 2-3122

Ph.D., 1982; Biochemistry; Experience in enzymology, receptor-binding, purification, preparation of sarcolemma, sarcoplasmic reticulum from cardiac muscle, calcium transport, calcium channels (ryanodine sensitive), oxygen radicals, lipid peroxidation; Position in academia/industry. 2-3122

DVM (BVSc), 1977; Ph.D., 1984; Immunology, immunopathology, neuroendocrinology; Autoimmune disease, tissue culture of cells with hormones, flow cytometry, cellular immunology, veterinary medicine, serology pertaining to autoimmunity, teaching and supervisory experience; Avail. immediately; Tenure track or industry; Salary negot. 6-3124

Ph.D., 1982; Renal and cardiovascular physiology/pharmacology; Experience in shock, hypertension, renal hemodynamics and electrolyte excretion, whole animal experiments, isolated vascular rings, isolated kidney, isolated perfused tubules, micro puncture, cell culture; Avail. Dec. 1988; Research in academia/industry; Salary negot. 1-3125

Ph.D., 1983; Biochemistry, cell biology, immunology, molecular biology; Purification and characterization of proteins/enzymes, lipoproteins, and mucins, metabolic studies of lipoproteins, clinical biochemistry, tissue culture, animal surgery; Avail. immediately; Staff position academia or industry; Salary negot. 2-3352

M.D., 1981; Ph.D., 1985; Pharmacology, molecular biology, protein chemistry, heavy metal toxicology; Characterization and purification of dopamine receptor, neurotransmitter release, recombinant DNA technique, protein kinase assay, HPLC; Avail. spring 1989; Molecular biology postdoc. position academia or non-profit; Salary negot. 2-3359

M.D., 1981; Ph.D., 1988; Pharmacology, molecular biology, biochemistry; Neurotransmitter release, receptor binding assay, purification of protein kinase, recombinant DNA technique, site-directed mutagenesis, gene expression in E. coli; Avail. spring 1989; Molecular biology postdoc. position academia or non-profit; Salary negot. 2-3360

Ph.D., 1988 (expected); Chemical engineering, mammalian cell culture; Effect of gas environments on cell viability & functionality, static/perfused cell system design, islet of Langerhans physiology, animal surgery, microphotography, RIAs, mathematical modeling, regulatory policy in technology (M.S.); Industry &R&D position. 8-3367

Ph.D., 1981; Biochemistry, enzymology, protein chemistry; Experience in protein/enzyme purification and characterization, gene cloning, Southern hybridization, DNA sequencing, excellent publication record; Scientist position in industry; Salary negot. 2-3368

Ph.D., 1988 (expected); Molecular genetics, biochemistry; Tissue culture, in vitro run off replication and transcription, SDS-PAGE, infection and transfection, phase isolation, RNA and DNA isolation, cloning, Northern, Southern, DNA and RNA dot blots; Avail. Nov. 1988; Postdoc. position in molecular genetics; Salary negot. 2-3369

Ph.D., 1963; Protein chemistry, enzymology, immunohistochemistry, bacterial toxins; Isolation, purification & physico-chemical characterization, protein modification, enzyme kinetics & immobilization, antibody production & purification, teaching graduate level; Avail. Nov. 1988; Staff position academia/industry/government; Salary negot. 2-3370
Ph.D., 1971; Immunology, tumor biology, clinical cancer immunotherapy; Hybridoma production, flow cytometry, tumor vaccine preparation/analysis; Avail. immediately; Research lab director/supervisor in academia/medical center/government/industry; Salary $50-80K; Northeast preferred. E-3371

Ph.D., 1975; Physiology, membrane biophysics; Transduction mechanisms in chemical senses, transport studies in GI epithelia, computer simulation of biophysical phenomena, medical teaching experience; Date negot.; Research/teaching in academia/industry; Salary negot. 1-3372

M.D., 1970; ABIM, 1975; BC Endocrinology/metabolism, 1977; Recertification, 1987; University/NIH trained, experience in clinical and basic research, obesity-pituitary-renin-angiotensin axis, cellular biology, computer simulation of biophysical phenomena, medical teaching experience; Date negot.; Research/teaching in academia/industry; Salary negot. E-251

Ph.D., 1984; Molecular endocrinology; Hormonal regulation of gene expression, RIA, RRA, in vitro translation, electrophoresis, tissue culture, molecular biology, RIA/DNA purification and hybridization, perfusion, currently instructor; Research position in academia; Salary negot. E-264

M.D., 1983; Ph.D., 1981; Medicine residency, endocrine fellowship, 1988; Research gene regulation of AT & hormones of hypothalamic-pituitary-adrenal axis; nucleic acid isolation, cDNA cloning, hybridizations, DNA sequencing; Avail. Jan. 1989; Assistant professor academia or industry position in basic research. E-265

Ph.D., 1978; Biochemistry, neuropeptide chemistry; Research protein purification and characterization, immunochemical studies, ELISA, EIA, RIA, bioassay; Avail. Jan. 1989; Position in academia/industry; Salary negot. E-267

Ph.D., 1982; Biochemistry, reproductive endocrinology; Regulation of aromatase, cell culture, protein purification, extensive experience in analytical techniques, immunoassays, small animal surgery, monoclonal antibody production, teaching experience; Academia/industry position preferred. E-268

Ph.D., 1975; Biochemistry, cell biology; Research membrane receptor, tyrosine kinases, signal transduction, experience in subcellular fractionation, RIA, RRA, antibody production, biochemical methods; Avail. 1989; Industry/academia; U.S.A. or Canada. E-269

Ph.D., 1989 (expected); Endocrine biochemistry; Research regulation testicular steroidogenesis, 2-D, SDS-PAGE, RIA, Western blot analysis, GC, tissue culture; Avail. Sept. 1989; Postdoc. academia/industry. E-270

Ph.D., 1978; Endocrine biochemistry and physiology of hypothalamic peptide hormones, receptor S&F, protein purification, HPLC, FPLC, electrophoretic and tissue culture techniques; Avail. Jan. 1989; Research and/or teaching position in academia/industry; Northeast or western U.S.A. E-272

Ph.D., 1980; Comparative endocrinology, nutrition; Research in regulation of fertility, RIA development, bioassays, chromatography, receptor assay; Avail. immediately; Industry/government. E-273

Ph.D., 1955; Endocrine biochemistry; Hormone metabolism, protein purification, mechanism, assay methodology, coupling and immobilization of enzymes, fermentation, fungal products; Avail. July 1988; Basic or applied research position in academia, hospital or industry; Salary negot. E-301

M.D., 1981; BC Medicine, 1984; BC Endocrinology/metabolism, 1987; Certified user of radioiodine, interested in medical education, lipids, nutrition, osteoporosis, nephrolithiasis; Clinical academia/practice preferred. E-302

Ph.D., 1985; Reproductive endocrinology, physiology; Research regulation of gonadal function, purification, biochemical and functional characterization of receptors, experience in RIA, immunizations, lipid analysis, statistics and computers; Staff position industry/academia; Salary negot. E-303
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