

using three-dimensional structures from single crystal X-ray diffraction studies; conformational analysis of small-molecule structures; analysis of analogous structures from structural databases.

\***Andrew M. Gulick**, Ph.D., University of Wisconsin, 1994. Assistant Professor. Crystallographic and biochemical characterization of enzymes; structural studies of the catalytic domains of the non-ribosomal peptide synthetases and related enzymes.

**Dongyao Guo**, Ph.D., Jilin University, 1966. Research Professor. Direct methods solutions for the crystallographic phase problem; low-resolution phasing for macromolecular crystals.

\***Herbert A. Hauptman**, Ph.D., University of Maryland, 1955. Nobel Laureate, Chemistry, 1985. Distinguished Professor. Direct methods in the crystallographic phase problem.

\***David A. Langs**, Ph.D., State University of New York at Buffalo, 1968. Associate Professor. X-ray crystallographic phase determination methods (ab initio, MR, SIR, SAS) and structure refinement of biological macromolecules; the design of efficient computer algorithms; biological ion channels and drug/receptor interactions.

\***Joseph R. Luft**, B.S., D'Youville College, 1985. Instructor and Senior Research Associate. Studies of crystallization of biological macromolecules. Computer automated, robotic technology for high-throughput biomolecular crystallization.

\***Michael Malkowski**, Ph.D., Wayne State University, 1997. Assistant Professor. Membrane protein biochemistry; structural biology of integral membrane proteins and enzymes involved in metabolizing polyunsaturated fatty acids; macromolecular crystallography.

\***Walter A. Pangborn**, Ph.D., University of Maryland, 1973. Associate Professor. X-ray crystallographic diffraction instrumentation and experimental methodology.

\***Carleen M. Pope**, M.S., SUNY at Buffalo, 1997. Instructor and Senior Research Associate. Molecular biology for genetic engineering of protein expression for milligram-scale protein production, purification, and crystallization.

\***L. Wayne Schultz**, Ph.D., Cornell University, 1995. Assistant Professor. Structure-activity relationships of enzymes associated with polycystic kidney disease and the extracellular matrix; protein crystallography and structure-based drug design.

\***Jeffrey Skolnick**, Ph.D., Yale University, 1978. Distinguished Professor. Computational biology and bioinformatics; prediction of function from sequence; functional genomics; structure prediction; folding pathways; drug design.

\***Timothy C. Umland**, Ph.D., University of Pittsburgh, 1994. Assistant Professor. Macromolecular crystallography; structural studies of the yeast prion protein Ure2p and associated proteins. Host-cell cofactors of HIV infection.

\***Yangzhou Wang**, Ph.D., State University of New York at Buffalo, 1999. Assistant Professor. Structural determination of DNA damage checkpoint proteins in human and yeast *Saccharomyces cerevisiae*; high-throughput protein purification; structure-based drug design.

\***Charles M. Weeks**, Ph.D., State University of New York at Buffalo, 1970. Professor. Computational crystallography; phasing methods for macromolecular crystal structure determinations; protein structure.

\***Hongliang Xu**, Ph.D., State University of New York at Buffalo, 1998. Assistant Professor. Direct methods; mathematical and computational crystallography.

*Cross-Appointed and Adjunct Faculty Members - Structural Biology:*

**Jeremy A. Bruenn**, Ph.D., University of California at Berkeley, 1970. Professor (Department of Biological Sciences). Viral dsRNAs from *Ustilago maydis* and *Saccharomyces cerevisiae*; translational frameshifting and its dependence on RNA pseudoknots; structure and function of a channel-forming toxin produced by the *Ustilago* viruses.

**Philip Coppens**, Ph.D., University of Amsterdam, 1960. Distinguished Professor (Department of Chemistry). Studies of laser-generated transient states by X-ray diffraction and infrared spectroscopy; spectroscopy and crystallography of metastable states of transition metal nitrosyl complexes; use of synchrotron radiation in crystallography; experimental mapping of the electron density in biomolecules; theoretical calculations on transition metal complexes and small peptides.

**Tibor Koritsanszky**, Ph.D., Free University of Berlin, 1992. Associate Research Professor (Department of Chemistry). Experimental charge density determination; high-resolution crystallography; interpretation of atomic displacement parameters obtained from diffraction data; crystallographic computing.

**Claude Lecomte**, Ph.D. (Doctorat d'Etat), Université Henri Poincaré, Nancy, France, 1979. Distinguished Professor (Laboratoire de Cristallographie et Modélisation des Matériaux Minéraux et Biologiques, Université Henri Poincaré, Nancy). Crystallographic analysis of electronic charge and spin density distributions in molecules and crystals of mineral and biological materials.

**Andrea Markelz**, Ph.D., University of California at Santa Barbara, 1995. Assistant Professor (Department of Physics). Pulsed terahertz spectroscopy of solid state and biomolecular materials.

**Norma Nowak**, Ph.D., State University of New York at Buffalo, 1986. High-throughput genome mapping for the human and mouse genomes, and the development and application of array based technologies for comparative analyses at the genomic and transcriptional levels.

**Russ Miller**, Ph.D., State University of New York at Binghamton, 1985. Distinguished Professor (Department of Computer Science and Engineering). Parallel algorithms, image processing, computational geometry, computational crystallography, parallel processing.

**G. David Smith**, Ph.D., Ohio University, 1968. Professor Emeritus (Department of Structural Biology and Biochemistry, University of Toronto and Hospital for Sick Children, Toronto). Structural chemistry of insulin; the T<sub>R</sub> transition in hexameric insulin; the phase problem in X-ray crystallography.

**Thomas Szyperki**, Dr.Sc.Nat., 1992, Habilitation, 1999, Eidgenössische Technische Hochschule, Zürich. Associate Professor (Department of Chemistry). Structure determination of biological macromolecules using nuclear magnetic resonance (NMR) spectroscopy; development of bio-NMR techniques; structural genomics; investigation of cellular metabolism using carbon-13 NMR.

**Troy Wood**, Ph.D., Ohio State University, 1993. Associate Professor (Department of Chemistry). High-resolution electrospray ionization Fourier transform mass spectrometry (FTMS) of macromolecules; on-line separations/mass spectrometry; gas-phase protein conformation and protein folding; electrospray mass spectrometry of conducting polymers; protein function; multidimensional FTMS of mixtures; ion dissociation methods.

## THE FACULTY AND THEIR RESEARCH

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\*Faculty members actively engaged in research and training graduate students.

### DEPARTMENT OF BIOCHEMISTRY

\***Kenneth M. Blumenthal**, Professor and Chair; Ph.D., University of Chicago. Architecture and function of ion transport proteins.

**Christine Campbell**, Research Assistant Professor; Ph.D. University of Toronto. The T-box family of transcription factors and their role in kidney development and disease.

**Murray J. Ettinger**, Distinguished Teaching Professor; Ph.D., Hahnemann. The role of protein and RNA methylation in regulating the cell cycle and growth in yeast.

\***Lee Ann Garrett-Sinha**, Assistant Professor; Ph.D. University of Texas Health Science Center, Houston. Role of ets transcription factors in hematopoiesis; B cell development and function; signal transduction pathways in B cells.

\***Michael D. Garrick, Professor**; Ph.D., Johns Hopkins. Molecular genetics; medical genetics; iron metabolism; hemoglobin biosynthesis; regulation of gene expression in eukaryotes; molecular evolution.

\***Richard M. Gronostajski**, Professor; Ph.D. Harvard University. Mechanisms of transcriptional modulation by the Nuclear Factor I family of transcription factors and their functions in nematode, mouse and human development.

\* **Marc Halfon**, Assistant Professor; Ph.D. Yale. Regulatory networks in *Drosophila* mesoderm development; cis-regulation of transcription, combinatorial intercellular signaling, genetics, genomics, bioinformatics, and computational biology.

\***Shahrokh C. Khani**, Research Assistant Professor; M.D., Ph.D., Michigan. Molecular genetics of inherited retinal disorders with emphasis on cloning new genes expressed in the retina and studying these genes in patients with inherited retinopathies.

\***Daniel J. Kosman**, Professor; Ph.D., Chicago. Molecular mechanisms of iron transport in yeast; iron trafficking and homeostasis in viral pathogenesis; structure and function in copper oxidases.

**Shiu-Ming Kuo**, Research Associate Professor; Ph.D., Cornell University. Mechanism of action of dietary flavonoids, molecular biochemistry and localization of sodium-dependent vitamin C transporters.

\***Te-Chung Lee**, Associate Professor; Ph.D., Virginia Commonwealth. Cardiac myocyte apoptosis; hypoxia; proteolysis; myocardial preconditioning; transcriptional regulation.

\***Tom Melendy**, Associate Professor; Ph.D., UCLA. Mechanisms and DNA damage regulation of human and viral DNA replication.

\***Mark R. O'Brian**, Professor, Ph.D., Johns Hopkins. Genetic and biochemical control of heme biosynthesis; heme-mediated signal transduction; oxidative stress response; iron metabolism.

\***Mulchand S. Patel**, UB Distinguished Professor and Associate Dean for Research and Biomedical Education; Ph. D. Illinois at Urbana-Champaign. Structure-Function Relationship of the pyruvate dehydrogenase complex; brain development and PDC deficiency; metabolic programming and diet-induced obesity.

\***Alfred S. Ponticelli**, Associate Professor, Ph.D., University of Washington (Seattle). Molecular mechanisms of eukaryotic RNA polymerase II transcription.

\***Satrajit Sinha**, Assistant Professor, Ph.D. University of Texas Health Science Center, Houston. Transcriptional regulation of epidermal cell fate, development and differentiation.

\***Mark D. Sutton**, Assistant Professor: Ph.D. Michigan State University. Regulation and coordination of DNA replication, DNA repair, and DNA damage tolerance.

\***Mary L. Taub**, Professor, Ph.D., California, Santa Barbara. Molecular mechanisms and signal transduction pathways in the regulation of kidney epithelial cell growth and differentiated function. Genetics.

**Jui H. Wang**, Einstein Professor; Ph.D., Washington (St. Louis). Regulation of kinases; design, synthesis and application of antiviral and anticancer agents; antisense-induced apoptosis in targeted cells.

\***Gail R. Willsky**, Associate Professor; Ph.D., Tufts. Vanadium and other transition metal metabolism in *S. cerevisiae*, diabetic animals and humans is studied using DNA microarray, proteomics, biochemistry, molecular biology, magnetic resonance (51V-NMR and EPR), pharmacology and physiology techniques.

### DEPARTMENT OF MICROBIOLOGY

#### *Bacteriology*

\***Piero R. Bianco**, Ph.D., Assistant Professor, University of Texas Health Science Center at Houston. Single Molecule studies of DNA helicases. Role of DNA helicases in cancer prevention; DNA recombination and repair; Single molecule studies of the effects of human recombination proteins.

#### *Bacterial Molecular Pathogenesis*

\***Anthony A. Campagnari**, Ph.D., Prof., SUNY at Buffalo. Role of lipooligosaccharides and porins in the pathogenesis of *Haemophilus ducreyi*; identification and characterization of vaccine antigens for *Moraxella catarrhalis*-induced otitis media; analysis of mechanisms of iron acquisition and utilization and bacterial factors involved in attachment and colonization.

\***Terry D. Connell**, Ph.D., Associate Professor, University of North Carolina, Chapel Hill. Bacterial iron acquisition and virulence of the *Bordetella*; cellular and molecular mechanisms of mucosal immunology; biology of heat-labile enterotoxins; recombinant vaccine development.

**V. James Hernandez**, Ph.D., Assistant Professor, University of Texas at Dallas. Genetic biochemical, and molecular analysis of stress and adaptive responses in bacteria; role of environmental adaptation in bacterial pathogenesis.

\***Timothy F. Murphy**, M.D., Professor, Tufts University. Molecular biology of outer membrane protein antigens of *Haemophilus influenzae* and *Moraxella* (*Branchamella*) *catarrhalis* and development of vaccines against these mucosal pathogens.

\***Thomas A. Russo**, M.D., C.M., Associate Professor, McGill University. Microbial pathogenesis, modulation of host response, and vaccine development; extraintestinal isolates of *Escherichia coli*.

**Murray W. Stinson**, Ph.D., Professor. Rutgers University. Biochemistry, immunology, and molecular biology of *Streptococcus* components important in infections (pharyngitis, pyoderma, endocarditis) and delayed sequelae (rheumatic fever and glomerulonephritis).

\***Hiroaki Suga**, Ph.D., Assistant Professor, Massachusetts Institute of Technology. Paralysis of quorum sensing in *Pseudomonas aeruginosa* and other bacteria.

#### *Molecular Parasitology*

\***Laurie K. Read**, Ph.D., Associate Professor, Tufts University. Molecular mechanisms of RNA processing in *Trypanosoma brucei*; role of protein arginine methylation in the regulation of gene expression in trypanosomes.

\***Noreen Williams**, Ph.D., Professor, New York University. Biochemical and molecular biological approaches to understanding mechanisms of regulation of gene expression in the parasitic protozoans, *Trypanosoma brucei* and *Trypanosoma cruzi*.

#### *Molecular Virology*

**Arlene R. Collins**, Ph.D., Associate Professor, SUNY at Buffalo. Neuropathogenesis of human coronavirus; viral virulence determinants and immune mechanisms of viral pathogenesis and host protection; role of cysteine protease inhibitors in coronavirus replication.

\***John Hay**, Ph.D., Professor and Chairman, University of Glasgow. Molecular biology and pathogenesis of human viral infections, including varicella zoster virus (chicken pox and shingles), chronic fatigue syndrome (CFS), and Hantaan virus (the type virus of Hantavirus pulmonary syndrome).

\***Paul R. Knight**, M.D., Ph.D., Professor, Pennsylvania State University. The interaction of anesthesia and surgery on host responses to viral respiratory tract infections.

\***Thomas Melendy**, Ph.D., Associate Professor, UCLA. Factors and mechanisms of DNA replication of papillomaviruses, SV40, and human cells; control of DNA replication by S-phase DNA damage checkpoint pathways.

**Edward G. Niles**, Ph.D., Professor, University of Massachusetts. Vaccinia virus transcription and mRNA processing; *Schistosoma* gene expression.

\***William T. Ruyechan**, Ph.D., Professor, University of Illinois. Molecular biology of herpesviruses; protein-nucleic acid interactions; DNA replication and gene regulation.

**Stanley Schwartz**, M.D., Ph.D., Professor, M.D., Albert Einstein College of Medicine, Ph.D., University of California, San Diego. Immunobiology of human immunodeficiency virus.

**Harshad R. Thacore**, Ph.D., Associate Professor, Duke University. Molecular biology of virus-cell interactions; virus entry into cells; mechanism of induction and action of interferons; role of cellular signal transduction in the cytokine network.

#### *Immunology*

##### *General Immunology*

\***Sarah L. Gaffen**, Ph.D., Assistant Professor, University of California, Berkley. Signal transduction mediated by immune cytokines; cytokine use to protect lymphocytes from apoptosis; Connection between inflammatory cytokines and bone metabolism.

**Madhavan P.N. Nair**, Ph.D., Research Professor, Bombay University. Studies of the molecular mechanisms operative on immunopathogenesis of HIV infection.

\***Kate Rittenhouse-Olson**, Ph.D. Associate Professor and Director of Biotechnology Program, University at Buffalo. Carbohydrate immunology and the effect of photodynamic therapy in the regulation of the immune response. In studying the antibody response to carbohydrates, the research encompasses efforts to improve vaccine efficacy to carbohydrate antigens. In addition, antibody to carbohydrate antigens is used as a tool for analysis of tumors and bacterial disease. Photodynamic therapy agents are used in studies concerning manipulation of the immune response and in carbohydrate lectin targeting of PDT agents.

\***Michael W. Russell**, Ph.D., Professor, University of Reading (England). Mucosal immunology; functions of IgA; mucosal vaccine development especially in relation to dental caries, periodontal disease, and gonorrhea; enterotoxins as mucosal immunomodulators.

\***Yasmin Thanavala**, Ph.D., Research Professor, University of London. Candidate vaccine antigen identification and delivery systems for HBV, human papillomavirus (HPV) and nontypeable *Haemophilus influenzae*; special emphasis on oral and nasal vaccination and mucosal immunity.

#### *Tumor Immunology*

\***Richard A. Bankert**, V.M.D., Ph.D., Professor, University of Pennsylvania. Molecular and cellular networks in human tumor microenvironments and anticancer immunotherapies.

#### *Clinical Microbiology*

**Daniel Amsterdam**, Ph.D., Professor, New York University. Epidemiology of antibiotic resistance in bacterial pathogens; molecular and immunologic detection.

## NEUROSCIENCE PROGRAM

\***John M. Aletta**, Ph.D., Assistant Professor, Columbia University. The role of protein arginine methylation in signal transduction mechanisms leading to neuronal differentiation.

\***Anthony L. Auerbach**, Ph.D., Professor, University of Oregon. Structure and function of synaptic receptor ion channels, including mechanisms of gating and permeation

\***Joan S. Baizer**, Ph.D., Associate Professor Brown University. Effects of methylphenidate (Ritalin) on gene expression in the rat brain; compartmental organization of the vestibular nuclear complex in cat and monkey; structure-function correlates in human neocortex; cell types and compartmental organization in cat claustrum.

\***David Bender**, Ph.D., Professor, Princeton University. Neurophysiology of vision.

\***John A. Krasney**, Professor; Ph.D., Wisconsin, 1966. Cardiopulmonary regulation during environmental stress; physiology of the cerebral circulation; physiology and pathophysiology of sleep.

**Thomas J. Langan**, Associate Professor of Neurology and of Pediatrics and member, Astrocyte Biology and Brain Regeneration Laboratory; M.D., Brown, 1976. Astrocyte and glioma cell-cycle regulation.

\***Claes E. G. Lundgren**, Professor and Director of the Center for Research and Education in Special Environments; M.D., 1959, Ph.D., 1967, Lund (Sweden). Hyperbaric and environmental physiology.

\***Michael J. Morales**, Assistant Professor; Ph.D., Texas Southwestern Medical Center at Dallas, 1990. Molecular biology of cardiac ion channels.

**Frederick C. Morin III**, Professor; M.D., Yale, 1976. Fetal, newborn, and perinatal pulmonary circulation.

**Shinpei Ohki**, Professor; Ph.D., Kyoto, 1965. Membrane fusion-molecular mechanisms of viral entry into target cells and exocytotic processes in neurosecretory cells.

**Albert Olszowka**, Profesor, Upstate Medical Center (M.D. 1962, State University of NY at Syracuse 1962 Research: Pulmonary Gas Exchange

\***David R. Pendergast**, Professor; Ed.D., SUNY at Buffalo, 1973. Exercise and environmental physiology.

\***Feng Qin**, Assistant Professor, Ph.D., State University of New York at Buffalo, New York, 1996, Research: Computational modeling of ion channels, structural and functional studies of capsaicin receptor (VRI)

\***Randall Rasmusson**, Associate Professor, Ph.D. 1991, Duke University, Durham, N.C. Research: Cellular and molecular properties of cardiac arrhythmia's and ion channels are studied using voltage clamp techniques and extensive computer modeling.

**Mary Anne Rokitka**, Ph.D. Assistant Dean, Clinical Associate Professor 1973 - State University of New York at Buffalo; Curriculum development in the biomedical sciences and the use of case studies in the teaching of science are my current research interests; past interests:include physiological adaptations to extreme environments such as those encountered in diving and upon exposure to microgravity.

**Stephen Rudin**, Research Professor, Departments of Radiology and Neurosurgery, Director of Radiation Physics Division, and Co-Director of Toshiba Stroke Research Center; Ph.D., CUNY, City College, 1975. Radiological biophysics; biomedical image processing.

\***James A. Russell**, Professor of Physiology and Pediatrics; Ph.D., SUNY at Buffalo, 1972. Neurohumoral control of smooth muscle in the airways and pulmonary vasculature.

\***Frederick Sachs**, Professor; Ph.D., SUNY Upstate Medical Center, 1971. Cell and molecular mechanisms of mechanical transductions; light and atomic force microscopy; mathematical modeling; software and instrumentation development.

\***Malcolm M. Slaughter**, Professor and Director of Graduate Studies, Director of Neuroscience Program, Ph.D., Fordham, 1977. Retinal physiology and synaptic neuroscience.

**Stephen W. Spaulding**, Professor; M.D./C.M., McGill, 1966. Post-translational hormonal regulation of growth factors and RNA-binding proteins.

\***Harold C. Strauss**, Professor and Chairman; M.D./C.M., McGill, 1964.

Cardiac physiology, biophysics, and molecular biology of cardiac ion channels.

**Dr. Ingvald Tyssebotn**, MD from School of Medicine, University of Bergen, Norway 1968, licensed Norwegian physician from January 1970. Ph.D. is from 1980 University of Bergen, Norway; Research: During 30 Years of research I have worked with cardiovascular physiology in various schocks, during hyperbaric exposure, specially hyperbaric oxygen, during carbon monoxide poisoning, and development of a new oxygen carrier (the last 6 years).

\***Susan B. Udin**, Professor; Ph.D., MIT, 1975. Developmental neurobiology of visual systems.

\***Zhen Yan**, Associate Professor; Ph.D., University of Tennessee, 1997. Molecular and cellular mechanisms of ion channel regulation; signal transduction in CNS neurons.

\***Yaoqi Zhou**, Associate Professor; Ph.D., SUNY at Stony Brook, 1990. Theoretical & Computational study of protein folding, protein-structure prediction, protein-binding, protein-protein interactions, and structure-based drug design.

Israel Ziv, Research Professor and Professor; M.D., Hebrew (Jerusalem), 1973; D.Sc., Technion (Israel), 1990. Structure and properties of cartilage and bone; hip and knee biomechanics; osteoporosis.

## DEPARTMENT OF STRUCTURAL BIOLOGY School of Medicine and Biomedical Sciences and Hauptman-Woodward Medical Research Institute, Inc.

\***Changill Ban**, Ph.D., The Ohio State University, 1996. Assistant Professor. X-ray crystallographic and NMR studies on biological macromolecules; cloning, expression, purification, characterization, and structure determination of DNA binding proteins, DNA repairing proteins, and checkpoint proteins.

\***Robert H. Blessing**, Ph.D., Ohio University, 1971. Professor. Electron density distributions and electrostatic properties in biomolecules from crystallographic diffraction data; the crystallographic phase problem in structural chemistry and biology.

\***Vivian Cody**, Ph.D., University of Cincinnati, 1969. Professor. Structure-based drug design, molecular recognition, computer modeling, protein crystal structures of folate-dependent enzymes, thyroid hormone-dependent enzymes, bacterial endotoxins.

\***George T. DeTitta**, Ph.D., University of Pittsburgh, 1973. Professor and Department Chairman. Macromolecular crystallization problem; high throughput laboratory automation; structural biology; the macromolecular crystallographic phase problem.

\***William L. Duax**, Ph.D., University of Iowa, 1967. Professor. Molecular structure and biological activity of steroid hormones and the proteins controlling their function; structure of membrane active toxins and antibiotics that influence ion transport and the biological processes dependent upon it; correlation of X-ray diffraction data with data from other sources.

\***Debashis Ghosh**, Ph.D., University of Pittsburgh, 1981. Associate Professor. X-ray crystallography and structural biology of enzymes responsible for biosynthesis and activation of estrogens in breast tumors: cytochrome P450 aromatase, estrone sulfatase, and type-1 17 $\alpha$ -hydroxysteroid dehydrogenase.

\***Jane F. Griffin**, Ph.D., State University of New York at Buffalo, 1974. Associate Professor. Structure-activity correlations of steroids and opiates

\***Bruce A. Holm**, Professor and Senior Vice Provost; Ph.D., University of Rochester, 1987. Molecular and cell biological studies of the pulmonary surfactant system in health and disease, with particular emphasis on lung injury and development.

\***Joseph L. Izzo, Jr.**, Professor, M.D., Johns Hopkins, 1972. Cellular investigation: Cellular calcium and signal transduction in cultured sympathetic neurons. Clinical physiology: Mechanisms of hypertension and stress responses of blood pressure; Physiologic control of sympathetic nervous activity; Mechanisms of endothelial dysfunction and exaggerated vasoreactivity; Mechanisms of arterial stiffness and pulse wave transmission; Clinical trials: Antihypertensive and cholesterol-lowering drugs; Modeling of cardiovascular drug responses; Heterogeneity of drug response patterns.

\***Paul J. Kostyniak**, Professor and Director of Toxicology Research Center; Ph.D., Rochester, 1975. Studies on toxicity of heavy metals; metabolism of halogenated organics; development of biomarkers of exposure and antidotal drugs and procedures to speed elimination and prevent manifestation of toxicity; mechanisms of degradation of polyolefins; development of antimicrobial compositions and surface coatings.

\***Suzanne G. Laychock**, Professor; Ph.D., Virginia Commonwealth, 1976. Endocrine regulation; role of cyclic nucleotides, phospholipases, prostaglandins, sphingolipids and calcium in cell biochemistry and hormone secretion; carbohydrate metabolism and models of diabetes mellitus.

\***Alan J. Lesse**, Associate Professor; M.D., Virginia, 1981. Molecular biology of bacterial pathogenesis; interactions of bacterial surface components and host immune response.

**James W. Lohr**, Adjunct Associate Professor, M.D., Kansas, 1980. Cellular mechanisms of osmoregulation; disorders of water metabolism; pharmacologic therapy of hypertension.

\***James R. Olson**, Professor; Ph.D., Medical College of Wisconsin, 1978. Toxicology of halogenated aromatic hydrocarbons of concern to human health and the environment; relationship between the metabolism and disposition of these compounds and their toxicity; mechanisms of toxicity; biomarkers of exposure, effect, and susceptibility; regulation and expression of cytochrome P-450s.

\***Richard A. Rabin**, Professor; Ph.D., South Carolina, 1978. Action of drugs of abuse on neurotransmitter receptor systems; regulation of signal transducing systems; mechanisms for the neurotoxicity of ethanol.

**Alan M. Reynard**, Professor; Ph.D., Minnesota, 1960. Applications of computers in pharmacology.

**Jerry B. Richards**, Ph.D., Adjunct Assistant Professor and Assistant Professor of Pediatrics, Emory University. Behavioral Pharmacology with an emphasis on drug abuse, animal and human models of impulsive behavior, behavioral processes mediated by dopamine and serotonin.

\***Jerome A. Roth**, Professor; Ph.D., Cornell, 1971. Signal transduction mechanisms regulating manganese induced neuronal differentiation and cytotoxicity; mechanisms of manganese and iron transport.

\***Ronald P. Rubin**, Professor and Chair; Ph.D., Yeshiva (Einstein), 1963. Secretory mechanisms; signal transduction in exocrine glands, especially protein kinase C calcium, and ryanodine receptors.

\***Satpal Singh**, Associate Professor; Ph.D., Tata Institute of Fundamental Research (India) 1980. Structure and function of calcium and potassium channels, and their role in neurodegenerative disorders. Genetic, molecular biological, electrophysiological, pharmacological and imaging techniques are integrated to study genes involved in neurological disorders and in modulation of ion channels.

**Vijay Swamy**, Associate Professor, Ph.D. Ohio State University, 1967. Adrenergic mechanisms and vascular responses in hypertension.

\***Jerrold C. Winter**, Professor; Ph.D., SUNY at Buffalo, 1966. Behavioral pharmacology of psychoactive drugs, including psychotherapeutic agents and drugs of abuse; mechanisms of action of hallucinogens; the effects of aging on the function of the central nervous system; nootropics.

## DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS

\***Anthony L. Auerbach**, Professor; Ph.D., Oregon, 1978. Ligand-gated and synaptic-receptor ion channels; molecular kinetics; molecular basis of drug action.

\***Joan S. Baizer**, Associate Professor; Ph.D., Brown, 1973. Neuroanatomy and physiology of vision.

\***David B. Bender**, Professor; Ph.D., Princeton, 1974. Neurophysiology of vision.

**Beverly Bishop**, Distinguished Teaching Professor, Ph.D., Buffalo, 1958. Neural control of motor systems.

\***Donald Campbell**, Associate Professor; Ph.D., Texas Medical Branch, 1986. Cardiac ion channels; drug effects; neuromodulation of ion channels, nitric oxide.

**John M. Canty Jr.**, Professor; M.D., SUNY Buffalo, 1979. Coronary physiology; endothelium-dependent vasodilation.

\***Michael E. Duffey**, Professor; Ph.D., Carnegie-Mellon, 1977. Regulation of epithelial ion channels.

\***Jian Feng**, Assistant Professor, Ph.D. Tennessee, 1997. Mouse genetic models for neurological disorders; molecular and cellular mechanisms of neurodegeneration.

**George Hajduczuk**, Assistant Professor; Ph.D., SUNY at Buffalo, 1986. Neural control of circulation; mechanosensory transduction; regulation of renin secretion.

**Herbert A. Hauptman**, Research Professor and 1985 Nobel laureate; Ph.D., Maryland, 1955. Theoretical "direct methods" in X-ray diffraction structure analysis.

**Perry Hogan**, Distinguished Teaching Professor; Ph.D., Wisconsin, 1968. Electrophysiology of cardiac muscle.

**Peter Horvath**, Associate Professor; Ph.D., Cornell, 1981. Dietary fiber and colon cancer; exercise nutrition.

**Sek Wen Hui**, Professor, Ph.D., Monash (Australia), 1968. Membrane structures using electron and X-ray diffraction, electron microscopy, and image processing.

\***Chan Y. Jung**, Professor; M.D., Yonsei (Korea), 1959; Ph.D., Rochester, 1964. Molecular mechanism of biological membrane transport.

\***Parsa Kazemi-Esfarjani**, Assistant Professor; Ph.D., McGill University, 1995. Drosophila genetic models of neurodegenerative disorders, Huntington's disease.

**Edward Koenig**, Professor; Ph.D., Pennsylvania, 1961. Molecular neurobiology.

\***Beverly Bishop**, Ph.D., Distinguished Teaching Professor, University of Buffalo. Hypoxia's effects on circadian temperature and motor activity.

\***Kenneth Blumenthal**, Ph.D., Professor, University of Chicago. Peptide Toxin Probes of Ion Channel Function and Architecture.

**Robert Burkard**, Ph.D., Professor, University of Wisconsin. Auditory evoked potentials, physiologic manifestations of auditory masking, auditory adaptation, acoustics and sound measurements, digital signal processing, and comparative studies of hearing.

**Kathleen M. Boje**, Ph.D., Associate Professor, University at Buffalo. The neuroinflammatory processes in of chronic neurodegenerative diseases; toxicokinetics and toxicodynamics of gamma hydroxybutyrate (GHB).

\***Christopher S. Cohan**, Ph.D., Associate Professor, Case Western Reserve University. Cytoskeletal mechanisms of axon guidance and growth cone motility

\***Arthur M. Edelman**, Ph.D., Associate Professor, Stanford University. Protein phosphorylation signaling in neuronal function and development.

\***Jian Feng**, Ph.D., Assistant Professor University of Tennessee. The in vivo function of parkin and its role in Parkinson's disease.

\***Richard M. Gronostajski**, Ph.D., Professor, Harvard University. Nuclear Factor I (NFI) transcription factor regulation of brain and muscle development.

\***Parsa Kazemi-Esfarjani**, Ph.D., Assistant Professor, McGill University. Genetic modifiers of polyglutamine toxicity in neurodegenerative disorders such as Huntington's disease.

\***Federico Gonzalez-Fernandez**, M.D., Ph.D., Baylor College of Medicine, Texas. Uncovering basic mechanisms important to retinal function, and the application of molecular approaches to understanding the pathogenesis of ocular disease. Elucidation of the mechanisms of photoreceptor / retinal pigment epithelium (RPE) interactions.

**Kenneth Gross**, Ph.D. Regulation of Tissue Specific Gene Expression/ Mouse Models of Disease.

\***Stanley W. Halvorsen**, Ph.D., Associate Professor, University of Washington. Role of neurokinins in development of nerve-nerve and nerve-target systems and in neurodegenerative diseases.

\***Todd M. Hennessey**, Ph.D., Professor, University of Wisconsin. Comparative cellular neurobiology using unicellular eukaryotes as models for excitable sensory cells.

\***Linda Hershey**, M.D. Neurological diseases diagnostics.

\***Dennis Higgins**, Ph.D., Professor, University of Connecticut Health Science Center. Molecules that control dendritic growth and synaptic interactions, including bone morphogenetic proteins and interferons.

\***Shahrokh Khani**, M.D., Ph.D., Assistant Professor, University of Michigan. Molecular mechanisms in vertebrate phototransduction

**Alan H. Lockwood**, M.D., Professor Cornell University Medical College. Use of Positron Emission Tomography (PET) to map and analyze neural systems.

\***Mulchand S. Patel**, Ph.D., Professor and Associate Dean, University of Illinois, Urbana-Champaign. Pyruvate dehydrogenase complex deficiency

(energy-deficit) and brain development. Diet-induced obesity and metabolic programming of the hypothalamus in early postnatal life.

**Kirkwood Personius**, Ph.D., Assistant Professor, University of Arizona School of Medicine. Influence of neuronal activity on synaptic connections between nerve and muscle during development and disease.

**Robert J. Plunkett**, M.D., Associate Professor, Indiana University School of Medicine. Two areas of active investigation: novel strategies to control malignant brain tumors and characterization of neural stem cells and progenitor cells in mice.

\***Feng Qin**, Ph.D., Assistant Professor, SUNY Buffalo. Structural and functional mechanisms of ion channels in thermal and pain perception.

\***Richard A. Rabin**, Ph.D., Professor, University of South Carolina. Action of drugs of abuse including alcohol and hallucinogenic drugs.

\***Randall Rasmussen**, Ph.D., Associate Professor, Duke University. Structure-function of voltage-gated channels.

\***Jerome A. Roth**, Ph.D., Professor, Cornell University. Heavy metal neurotoxicity, with a focus on iron and manganese, and dystonic movements associated with Parkinson's disease.

**Stephen Rudin**, Ph.D., Professor, City College of New York. Diagnostic and interventional neurovascular imaging in the brain including microangiography and micro computed tomography and development of endovascular devices such as stents and catheters for treatment of aneurysms and other cerebrovascular malformations.

**Richard J. Salvi**, Ph.D., Professor, Syracuse University. Anatomy and physiology of the auditory system, stem cell transplantation, animal psychophysics and PET imaging in normal hearing and hearing impaired subjects

\***Gail Seigel**, Ph.D., Assistant Professor, Albany Medical College. Ocular Engineering: use of precursor cells and neuroprotective agents in retinal degeneration.

**Roh-Yu Shen**, Ph.D., Senior Research Scientist. Brain dopamine systems, alcohol craving, and fetal alcohol syndrome.

**Randall Shortridge**, Ph.D., Associate Professor, North Texas State University.

**David W. Shucard**, Ph.D., Professor, University of Denver and Janet L. Shucard, Ph.D., Assistant Professor, University at Buffalo. Cognitive/behavioral neuroscience and neuropsychology with an emphasis on the use of event-related brain potentials in animals and humans in the study of normal cognitive functions (e.g., working memory) and cognitive functions affected by disease.

\***Satpal Singh**, Ph.D., Associate Professor, Tata Institute of Fundamental Research. The genetics of ion channels, using the Drosophila model system.

\***Malcolm M. Slaughter**, Ph.D., Professor, Fordham University. Role of ion channels and transmitter receptors in synaptic function and information processing in retina.

\***Robert N. Spengler**, Ph.D., Associate Professor, University of Michigan. Roles and mechanisms of cytokines in the interactions between the nervous and immune systems.

\***Michal K. Stachowiak**, Ph.D., Associate Professor, Academy of Medicine, Gdansk. Regulation of glial and neuronal development and plasticity by growth factors, and gene therapy for neurodegenerative disorders.

\***Susan Udin**, Ph.D., Professor, Massachusetts Institute of Technology. Multidisciplinary approach to development, plasticity, and neural circuitry in the visual system.

\***Jerrold C. Winter**, Ph.D., Professor, SUNY Buffalo. Behavioral pharmacology of psychoactive drugs, including psychotherapeutic agents and drugs of abuse; mechanisms of action of hallucinogens.

\***Zhen Yan**, Ph.D., Assistant Professor, University of Tennessee, School of Medicine. Molecular and cellular mechanisms for the regulation of ion channels and synaptic transmission by neuromodulator signaling in CNS neurons and developing new pharmacological agents for the treatment of neurological disorders.

## DEPARTMENT OF ORAL BIOLOGY School of Dental Medicine

\***Libuse Bobek**, Professor; PhD, University at Buffalo. Antimicrobial activity and mechanism of action of salivary proteins/peptides; regulation of salivary gland-specific gene expression.

\***Moon-Il Cho**, Professor; PhD, SUNY Stony Brook. Dentinogenesis; regulatory mechanisms by which periodontal ligament fibroblasts differentiate into cementoblasts; development of an effective therapy capable of achieving periodontal regeneration.

\***Terry Connell**, Adjunct Associate Professor; PhD, Univ. of North Carolina. Molecular biology of protein secretion by *Vibrio cholerae*; iron acquisition systems of *Bordetella* spp; mucosal immunology; recombinant vaccine development.

\***Ernesto DeNardin**, Professor; PhD, SUNY Buffalo. Mechanisms by which chemoattractants or cytokines activate human neutrophils; characterization of various forms of periodontal disease as well as potential links between such disease and atheromatous cardiovascular disease.

\***Rosemary Dziak**, Professor and Interim Chair; PhD, University of Rochester. Bone cell metabolism (bone resorption and formation) with specific emphasis on signal transduction mechanisms in osteoblastic cells.

\***Mira Edgerton**, Research Associate Professor; DDS, PhD; CWRU, Dental School, Cleveland, Ohio; PhD, SUNY Buffalo. Innate immunity and antimicrobial defense mechanisms.

**Richard T Evans**, Professor; PhD, Univ. of Missouri. Rodent model of *P. gingivalis*-associated alveolar bone loss to investigate efficacy of putative vaccines and antimicrobial drugs.

\***Sarah L. Gaffen**, Assistant Professor; PhD, Univ. of California at Berkeley. Signal transduction mediated by immune cytokines; cytokine use to prevent lymphocytes from apoptosis, development of particular immune lineages.

\***Robert J. Genco**, Distinguished Professor; DDS, PhD, SUNY Buffalo, Univ. of Pennsylvania. Host bacterial interactions in periodontal disease; risk factors for periodontal disease; effects of periodontal disease on systemic conditions (diabetes, cardiovascular and cerebrovascular disease).

**Sara Grossi**, Senior Research Scientist; DDS, MS; SUNY Buffalo. Assessing risk factors for periodontal disease among behavioral, environmental, and genetic factors; the effect of diabetes mellitus on periodontal disease, effects of reduced bone density and estrogen

deficiency on oral bone loss; effects of periodontal disease on cardiovascular disease.

**Willard (Scott) McCall**, Adjunct Professor, Univ. of Michigan. The response of chronic pain patients using positron emission tomography, and the motor activities of jaw muscles using surface and fine wire electromyography; mastication, jaw reflexes, motor control, modeling of jaw muscle control, pain, and clinical studies.

**Molakala Reddy**, Clinical Professor; PhD, Univ. of Mysore, India. Mechanism of mucin (middle ear, nasopharyngeal, tracheobronchial and salivary) - bacterial (*P. aeruginosa*, *M. catarrhalis* and *S. pneumoniae*) interactions to determine the role of mucin in the diseases such as otitis media and pneumonia.

\***Michael Russell**, Professor; PhD, Univ. of Redding (England). Mucosal immunology; functions of IgA, mucosal vaccine development especially in relation to dental caries, periodontal disease, and gonorrhea; special emphasis on oral and nasal vaccination and mucosal immunity.

\***Frank Scannapieco**, Professor; DDS, PhD, Univ. of Connecticut, SUNY Buffalo. Microbial colonization of the oral cavity (particularly the binding of salivary amylase to *S. gordonii*); study of *A. actinomycetemcomitans*, a bacterium implicated in the pathogenesis of localized juvenile periodontitis; associations between oral health and respiratory disease.

**Robert Schifferle**, Associate Professor; DDS, PhD, SUNY Buffalo. Bacterial polysaccharides and lipopolysaccharides of *Porphyromonas gingivalis*, bacterium implicated in periodontitis.

\***Ashu Sharma**, Assistant Professor; PhD, Delhi Univ., India. Molecular mechanisms underlying the pathogenesis of *P. gingivalis* and *B. forsythus*, involved in the onset of periodontitis; development of non-pathogenic oral streptococci (*S. gordonii*) as vectors for vaccine delivery.

**Hakimuddin T. Sojar**, Assistant Professor; PhD, Poona Univ., India. Structure-function of *Porphyromonas gingivalis* cell surface components; immunogenicity of various components using synthetic peptide approach in order to evaluate their usefulness as vaccines.

\***Margaret Vickerman**, Associate Professor; DMD, PhD, Tufts Univ., Univ. of Michigan. Streptococcal genetics and molecular mechanisms regulating gene expression; oral microbiology with a focus on the ecological aspects of bacterial adhesion and growth of biofilms; endodontics.

**Joseph J. Zambon**, Professor; DDS, PhD, SUNY Buffalo. Clinical studies of oral bacteria and basic research on oral Gram-negative species, with special emphasis on *A. actinomycetemcomitans*.

## DEPARTMENT OF PATHOLOGY AND ANATOMICAL SCIENCES

**Harold Brody**, Ph.D., University of Minnesota, 1953; M.D., University of Buffalo, 1961. Aging in the central nervous system; Alzheimer's Disease.

\***Christopher Cohan**, Ph.D., Case Western Reserve University, 1980. Axon guidance and growth cone motility; Cytoskeletal basis of growth cone collapse and attractive and repulsive turning; in vivo imaging of actin and microtubule dynamics in growth cones.

\***John Cotter**, Ph.D., University of Michigan, 1974. Development and evaluation of computer-assisted instruction.

\***Cynthia A. Dlugos**, Ph.D. University at Buffalo, 1992. Assistant Professor. The mechanism of ethanol's effects on dendrites of CNS; dendritic degeneration due to aging; effects of ethanol treatment on the behavior, CNS morphology, and proteome of zebrafish.

**Samuel Gallant**, Ph.D., Associate Professor, University at Buffalo. Adrenal function in models of experimental hypertension, receptors for steroid hormones, mechanism of action of ACTH.

\***Chester A. Glomski**, Ph.D., University of Minnesota, 1961; M.D., University of Mississippi, 1965. Comparative hematology; hemopoiesis.

\***Robert Hard**, Ph.D., SUNY at Albany, 1975. Videomicroscopy; image processing and analysis. Cell motility, ciliary and flagellar motility, mucociliary transport. Tissue engineering of trachea.

**Reid Heffner**, M.D., Professor, Yale University. Neuropathology, pathogenesis of neuromuscular disorders.

\***Tracey A. Ignatowski**, Ph.D., Research Assistant Professor, University at Buffalo. Regulation of neurotransmitter release and production in the nervous system; regulation of cytokine production and release from cells of the nervous system and the immune system; interactions among proinflammatory cytokines, adrenergic responses and opioid responses during persistent pain; interactions among proinflammatory cytokines, adrenergic responses and opioid responses during antidepressant drug administration providing possible mechanisms of action for antidepressants in the treatment of depression and chronic pain states.

\***John Kolega**, Ph.D., Yale University, 1984. Mechanisms of cell migration in wound healing and angiogenesis; regulation of cytoskeletal orientation and dynamics; quantitative image analysis.

\***Frank Mendel**, Vice Chairman, Ph.D., University of California, Davis, 1975. Imaging of capillary flow in hamster cheek pouch; effects of electrical fields on endothelial cells. Delivery systems of artificial tears and saliva. Form and function in extinct vertebrates.

**Peter Nickerson**, Ph.D., Professor, Clark University. Experimental hypertension, hyperoxia and lung. Pulmonary hypertension and vascular remodeling; reaction of lung to man made fibers electron microscopy-immunohistochemistry. (Director of Graduate Studies)

\***Peter Ostrow**, M.D., Ph.D., Associate Professor, Downstate Medical Center, and Neuropathology: Role of angiogenic factors, especially endothelins, in malignant behavior of gliomas; correlation of pathology with MRI appearance and clinical findings in small-vessel ischemic disease.

\***Robert Spengler**, Ph.D., Associate Professor, University of Michigan. Interactions between the nervous and immune systems; regulation of neurotransmitter production and release in the CNS; regulation by neurotransmitters of proinflammatory cytokine production and release from cells associated with the immune system, as well as regulation of gene expression of cytokines; receptor-related events and the mechanisms of signal transductions which regulate mediator production; role of leukocytes in host's homeostasis and disease; interactions between cytokine and adrenergic receptors as the mechanism of action of psychotropic drugs; localization and characterization of cytokines in the CNS; interactions between proinflammatory cytokines and adrenergic responses during persistent pain.

\***Michal K. Stachowiak**, Ph.D., Academy of Medicine, Gdansk, Poland, 1980. Molecular gene mechanisms in neural development and plasticity. New mechanisms in regulation of developmental gene programs and their involvement in neurodegenerative diseases. Development of transgenic models and potential gene therapies for such diseases. Studies of protein mobility and interactions in live cells using laser biophotonics.

\***Georgirene D. Vladutiu**, Ph.D., Professor, University at Buffalo. Biochemical and Molecular Genetics. Inborn errors of metabolism; diagnosis of metabolic muscle diseases, particularly mitochondrial myopathies, glycogen storage diseases disorders of exercise intolerance; identification of new mutations in muscle disease genes and establishment of allele-specific oligonucleotide analysis of pathogenic mutations; disease gene expression studies in the yeast, *Pichia pastoris*.

**John R. Wright**, M.D., Professor, University of Manitoba, Director Mini Medical School. Autopsy pathology in research, education and quality assurance.

## DEPARTMENT OF PHARMACOLOGY AND TOXICOLOGY

\***John M. Aletta**, Assistant Professor; Ph.D., Columbia, 1984. Cellular and molecular mechanisms of growth factor action during neuronal differentiation, with particular emphasis on neurotrophin-mediated signal transduction via protein arginine methyltransferase.

**Harvey A. Berman**, Associate Professor, Ph.D., University of Massachusetts/Amherst, 1974. Protein structure and function acetylcholinesterase (AChE) as well as regulation of AChE levels and biosynthesis. Cell mechanisms of neurotoxicity.

\***Peter G. Bradford**, Associate Professor; Ph.D., Rochester, 1982. Regulation of type I inositol trisphosphate receptor gene expression in human osteoblasts and breast epithelial cells; estrogen receptor action in transcriptional regulation; phytosterols and atherosclerosis.

\***John K. Crane**, Adjunct Assistant Professor and Associate Professor of Clinical Medicine; Ph.D., 1983, M.D., 1984, Virginia. Signal transduction pathways exploited by intestinal bacterial pathogens, especially diarrhea producing *E.coli*; guanylyl cyclase; toxin receptors; protein kinase C; enteropathogenic *Escherichia coli*; apoptosis.

\***Paresh Dandona**, Adjunct Professor and Professor of Medicine; Ph.D., Oxford University, 1975. Vascular cell reactivity encompassing platelet function, endothelial function, monocyte/macrophage function and the interactions between them.

\***Arthur M. Edelman**, Associate Professor; Ph.D., Stanford, 1978. Signal transduction in development and in the action of hormones and neurotransmitters; characterization of protein kinases in brain and other tissues; calcium ion in cellular events.

**Peter K. Gessner**, Professor, Ph.D., London, 1958. Drug interactions, methodologies, phenomenology and mechanism of the alcohol withdrawal syndrome, and the mechanism of action of disulfiram and its metabolite, ditiocarb; dispositional pharmacokinetics and metabolic fate of xenobiotics.

\***Stanley W. Halvorsen**, Associate Professor, Ph.D. University of Washington/Seattle, 1984. Molecular and pharmacological studies of trophic factors on neuronal development. Effects of neurotrophic factors on synaptogenesis.

**Linda A. Hershey**, Adjunct Professor, Ph.D., 1973, M.D., 1975, Washington (St. Louis). Randomized trials for the treatment of cerebrovascular, Parkinson's, Alzheimer's disease and dementia with Lewy bodies; longitudinal studies of TCD, PET and SPECT in patients with dementia, cerebrovascular diseases, parkinsonism and migraine.

\***Dennis M. Higgins**, Professor; Ph.D., Connecticut, 1980. Cell biology of autonomic neurons, including the regulation of dendritic growth and the response to bone morphogenetic proteins and other nerve growth factors.