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INTRODUCTION TO UNDERGRADUATE RESEARCH AND INDEPENDENT STUDY OPPORTUNITIES

The commitment of Case Western Reserve University to research and scholarship and the University’s very favorable faculty/student ratio give undergraduates at the University unusually rich opportunities to participate in research or independent study under the supervision and guidance of scholars who are actively engaged in the production of new information, insights and understanding of humankind and the universe in which humankind exists. The purpose of this directory is to provide students with a listing of faculty, with their scholarly interests, with whom research or independent study can be pursued.

Take advantage of these opportunities! Through activities requiring original and innovative thinking, you will acquire critical, analytical, integrative, and creative skills. You will learn to persevere and to reformulate questions when data confuse or questions seem unclear. When you meet with success, there will be that moment when, until you share it with others, you will possess knowledge uncovered by you and known to no one else. That will be, intellectually, the most satisfying experience in your career as a student and nascent scholar.

Accompanying these research and independent study opportunities and activities are obligations and responsibilities. Your participation in research will require industry and integrity. You must be prepared to commit considerable time and energy, and to meet high standards for documentation and research methodology.

Your participation in research or independent study will make demands not only of you, but also of the faculty member who assumes responsibility for providing you with the support, oversight and guidance you may require. But if you engage wholeheartedly in the research enterprise, your mentor, too, will find rewards in your conscientious performance, intellectual growth, and productivity as a junior colleague.

Margaret B. Robinson
Dean of Undergraduate Studies

USING THIS DIRECTORY

The directory is organized into sections corresponding to The Faculties of Case Western Reserve University, including: the Case School of Engineering, the College of Arts and Sciences, the School of Medicine, the Weatherhead School of Management and the Frances Payne Bolton School of Nursing. Each section is subdivided by department, listing the department's research coordinator, the chair, a short description of the department's research orientation, the courses for which students can enroll in order to earn credit for their research efforts or independent study, and finally, the faculty offering research opportunities.

Each department offering undergraduates the opportunity to participate in research or independent study has designated a member of its faculty or staff to serve as a departmental Undergraduate Research Coordinator. Questions regarding the availability of research and independent study opportunities and/or support for participation in research should be referred to that person. While some of the opportunities listed in this volume are available to all students, there are others that will require background and skills that you can acquire only in specific programs and not earlier than your junior year. Each faculty member has his/her own standards and guidelines for eligibility for participation in research or independent study.

If you wish to explore a research program of your own choosing and design it may be difficult to find mentors whose resources and interests enable them to assist you in efforts that are quite unrelated to their own. As a result, students will usually find themselves assuming responsibility for work on a project or problem that is related to and part of the overall interests of the group or individual they join. Finally, faculty research interests are subject to change, so please be understanding if research topics listed in this directory are not currently being investigated. Check with the professor listed in the directory on specific departmental restrictions and updated faculty research interests.

Getting started:

1) Use the directory to identify persons working in areas for which you have some interest and preparation.
2) Arrange to meet with them in order to allow them to evaluate you and so that you can determine what research activities or independent study opportunities might be available to you
3) Establish the expectations the faculty member has regarding your commitment of time, attendance, participation in seminars, and preparation of reports.
4) Live up to the commitments you make.
ACADEMIC CREDIT

When engaging in research or independent study for academic credit, students should establish in advance with their faculty supervisors their obligations with respect to time commitment, progress reports, and final reports, and should register for the appropriate departmental course. Students employed and receiving monetary compensation as research or laboratory technicians are not normally eligible to earn credit for work being done as a condition of their employment.

EMPLOYMENT

Students may seek employment in research through the Office of Student Employment. However, students who are paid student employees in research activities are normally not eligible to receive academic credit for those activities.

VOLUNTARY PARTICIPATION

Students who wish to test their interest in research or gain initial research experience with a faculty member without receiving credit or compensation, may seek permission to work as volunteers.

GRANTS FOR UNDERGRADUATE RESEARCH

Funding for undergraduate students interested in research can be obtained from various sources. Grants and awards are available from such organizations as the National Science Foundation, the American Cancer Society, the American Heart Association, the National Endowment for the Humanities (Younger Scholars Awards Program), the National Institutes of Health, and the University’s chapter of Phi Beta Kappa. In addition, several departments of the University provide support for undergraduates pursuing research activities during the summer.

NOTICE OF NONDISCRIMINATORY POLICY AS TO STUDENTS

Case Western Reserve University admits students of any race, religion, age, sex, color, disability, sexual orientation, and national or ethnic origin to all the rights and privileges, programs, and activities generally accorded or made available to students at the University. It does not discriminate on the basis of race, religion, age, sex, color, disability, sexual orientation, or national or ethnic origin in administering its educational policies, admission policies, employment, promotion and compensation policies, scholarship and loan programs, and athletic or other University-administered programs.
COLLEGE OF ARTS AND SCIENCES
ANTHROPOLOGY
(Last updated 1998)

UNDERGRADUATE RESEARCH COORDINATOR:
Sandra D. Lane
246 Mather Memorial Building, 368-2631
E-mail: sxl45@cwru.edu

DEPARTMENT CHAIR:
Melvyn C. Goldstein
238 Mather Memorial Building, 368-2264
E-mail: mcg2@cwru.edu

RESEARCH ACTIVITIES
The undergraduate program in Anthropology offers broad training in the three subdisciplines of anthropology. In the social-cultural anthropology concentration it emphasizes inter-relationships between socioeconomic institutions, health and medicine, religion and symbolism, psychological variables, and language. In the archaeology concentration it stresses the long sequences of independent sociocultural, technological and ecological evolution that have taken place under diverse man-made and natural conditions. The focus of the physical anthropology concentration is on human ecology and adaptability, human growth and development, nutritional adaptation and epidemiology.

RESEARCH/INDEPENDENT STUDY COURSES
ANTH 399 Independent Study (1-6). Students may propose topics for independent reading and research. Prerequisite: Consent of instructor.

FACULTY

Professor Cynthia M. Beall
217 Mather Memorial Building, 368-2277
E-mail: cmb2@cwru.edu

High altitude adaptation; human adaptability; growth and development; biological aging

Professor Thomas J. Csordas
203 Mather Memorial Building, 368-2259
E-mail: txc9@cwru.edu

Comparative religion; religious healing; American Indians; language and culture; person and self; the human body in culture

Professor Atwood D. Gaines
205 Mather Memorial Building, 368-2257
E-mail: axg10@cwru.edu

Medical anthropology (ethnomedicine, ethnopsychiatry); urban anthropology; anthropology of religion; ethnicity, ethnic identity; culture and Alzheimer's disease

Professor/Chair Melvyn C. Goldstein
238 Mather Memorial Building, 368-2265
E-mail: mcg2@cwru.edu

Armington Professor Charlotte Ikels
207 Mather Memorial Building, 368-5331
E-mail: cxi@cwru.edu

Aging; care giving; intergenerational relations; death and dying; biomedical ethics; various aspects of Chinese society (Hong Kong, People's Republic of China)

Associate Professor Janis H. Jenkins
211 Mather Memorial Building, 368-2630
E-mail: jhj4@cwru.edu

Hispanic cultures in the U.S.; medical anthropology; psychiatric disorder; refugees and immigrants; culture and emotion

Professor Jill E. Korbin
210 Mather Memorial Building, 368-2264
E-mail: jek7@cwru.edu

Family violence; child abuse and neglect; medical anthropology; child and family health; children's health and illness

Associate Professor Janet W. McGrath
216 Mather Memorial Building, 368-2287
E-mail: jwm6@cwru.edu

Epidemiology; disease models and transmission; AIDS; infectious disease

Associate Professor Jim G. Shaffer
240 Mather Memorial Building, 368-2267
E-mail: jgs3@cwru.edu

Archaeological research in South Asia and other areas of the Old World
ART HISTORY  
(Last updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR:  
John J. Ciofalo  
317 Mather House, 368-4232  
E-mail: jjc22@cwru.edu

DEPARTMENT CHAIR:  
Henry Adams  
103 Mather House, 368-4119  
E-mail: hxa28@cwru.edu

RESEARCH ACTIVITIES
The Department of Art History offers opportunities to study art history, both Western and Non-Western, to partake in an extensive array of studio offerings, to pursue certification in art education, and to engage in pre-professional museum training. All art programs are considerably enhanced by close cooperation with and access to the facilities of cultural institutions located in University Circle, in particular the Cleveland Museum of Art and the Cleveland Institute of Art. The undergraduate and graduate programs in art history are offered as part of the program in Art History of Case Western Reserve University and the Cleveland Museum of Art. All classes are taught at the museum, and courses are offered by museum curators who hold appointments in the department.

RESEARCH/INDEPENDENT STUDY COURSES
ARTH 398  
Independent Study in Art History (3). Individual research and reports on special topics. Prerequisite: consent of instructor before registering.

FACULTY

**John J. Ciofalo**  
317 Mather House, 368-4232  
E-mail: jjc22@cwru.edu

**Professor Henry Adams**  
318 Mather House, 707-2418  
E-mail: Adams@cma-oh.org

**Professor Ellen Landau**  
103 Mather House, 368-4119  
E-mail: exl3@cwru.edu

**Professor Jenifer Neils**  
321 Mather House, 368-4039  
E-mail: jxn4@cwru.edu

**Professor Edward J. Olszewski**  
319 Mather House, 368-2347  
E-mail: ejo@cwru.edu

**Associate Professor Catherine Scallen**  
315 Mather House, 368-2383  
E-mail: cbs2@cwru.edu

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**John J. Ciofalo**

- **19th-Century European Art**
- **American art and museum studies**

**Professor Henry Adams**

- **Greek art and field archaeology in the Mediterranean**

**Professor Ellen Landau**

- **Abstract Expressionism and other 20th century art movements**

**Professor Jenifer Neils**

- **Patronage and iconography in Italian Renaissance and Baroque Art**

**Professor Edward J. Olszewski**

- **15th-18th Century Northern European art, history of photography, history of prints in Europe**
UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:
Christopher Mihos      R. Earle Luck
420 A. W. Smith Building, 368-3729    414 A. W. Smith Building, 368-6697
E-mail:  jcm9@cwru.edu     E-mail:  luck@fafnir.astr.cwru.edu

RESEARCH ACTIVITIES
Important assets of the Department of Astronomy program are the strength of our mathematics and physics instructional base, our small class sizes and the active research involvement of our faculty and staff. Much of this research is centered on our Burrell Schmidt telescope located on Kitt Peak near Tucson, Arizona. The Nassau Station located 30 miles east of campus also offers facilities which can be incorporated into student research projects. Opportunities are provided for student participation in observational and theoretical projects and for original research for a senior honors thesis.

RESEARCH/INDEPENDENT STUDY COURSES
ASTR 369  Undergraduate Research (credit as arranged)

FACULTY
Professor/Chair R. Earle Luck
414 A. W. Smith Building, 368-6697
E-mail:  luck@fafnir.astr.cwru.edu

R.E. Luck's research deals with studies of chemical abundances in a variety of objects: cepheids, supergiants, and nearby stars harbouring planets. The objectives of these analyses are to provide data on galactic and stellar chemical evolution.

Associate Professor Heather L. Morrison
416 A. W. Smith Building, 368-6698;
E-mail: heather@vegemite.astr.cwru.edu

Professor H.L. Morrison's principal research interest is the formation and evolution of galaxies, which she studies by investigating the properties of old stars (of the halo, thick disk, and bulge) in both the Milky Way and other nearby disk galaxies. She is also interested in dark matter around galaxies, and the possible relationship between a galaxy's old stellar population and its dark matter. She uses CWRU's Burrell Schmidt for her observations, and also other telescopes at major observatories worldwide.

Associate Professor Christopher Mihos
A. W. Smith Building, 368-3728
E-mail:  jcm9@cwru.edu

Chris Mihos' research focuses on the dynamics and evolution of galaxies. Using both numerical models and observational data he has studied the triggering of starburst activity in colliding galaxies, and the formation of elliptical galaxies from mergers of spiral galaxies. His research employs numerical simulations performed at the national supercomputing centers as well as observational data obtained using both space-and ground-based telescopes.
RESEARCH ACTIVITIES
The Department of Biology offers programs leading to the degrees of Bachelor of Science in biology, Bachelor of Arts, Master of Science and Doctor of Philosophy. Cooperative programs between the Department of Biology, the Case Western Reserve School of Medicine, other departments in CWRU, the Cleveland Museum of Natural History and the Cleveland Clinic, significantly extend the range of resources available to biology students. Individual research projects form a valuable and influential part of the curriculum for many undergraduates. Collaborative research projects with faculty members in other departments provide for multidisciplinary approaches to important biological problems. Some areas of research are: Biochemistry, Biotechnology and Genetic Engineering, Cell and Molecular Biology and Cell Physiology, Developmental Biology, Ecology, Population Biology, Environmental Science, Genetics, Physiology, Neurobiology and Animal Behavior, Immunology, and Plant Science.

PRIZES:

THE RUSSELL M. LAWALL PRIZE for excellence in Biology.

THE FRANCIS HOBART HERRICK PRIZE for outstanding biological research and academic achievement in biology.

THE MATHER ALUMNAE AWARD for outstanding academic achievement in biology.

THE J. PAUL VISSCHER MEMORIAL AWARD for outstanding ability and promise in ecology or environmental science.

THE RALPH A. SPENGLER, JR. AWARD for excellence in plant science.

MICHELSON-MORLEY RESEARCH COMPETITION: Prizes awarded for the best formal presentations of undergraduate research.

THE DANIEL BURKE PRIZE for excellence in Biology & Chemistry.

HOWARD HUGHES SUMMER RESEARCH FELLOWSHIPS: Apply directly to Mary Jones, Biology Department, $2500 stipend (plus housing if needed) for approximately ten weeks of research.

RESEARCH/INDEPENDENT STUDY COURSES

BIOL 388 Undergraduate Research (1-3). Guided laboratory research under the sponsorship of a biology faculty member. May be carried out within the biology department or in associated departments. Prerequisite: consent of department chair.

BIOL 389 Selected Topics in Biology (credit as arranged). Individual library research projects under the guidance of a biology sponsor. A major paper must be submitted and approved before credit is awarded. Prerequisite: consent of department chair.

BIOL 390 Advanced Undergraduate Research (credit as arranged). Offered on a credit-only basis (no letter grade). Credits count toward graduation but not toward the biology major. Students may carry out research in biology or related departments, but a biology sponsor is required. Prerequisite: consent of department chair.

BIOL 395 Undergraduate Research Discussions (1).

BS Students are required to undertake one year of supervised research (388, 389, 390) and take BIOL 395.

FACULTY

Professor Morris Burke
107S Millis Science Center, 368-6652
E-mail: mxb18@cwru.edu

Structural basis of muscle contraction and actomyosin based motility
Development and repair of cartilage, muscle, tendon, skin, and bone using biochemical, morphological, or microsurgical approaches to understand how these tissues are formed and how they repair themselves.

Visiting Assistant Professor Jens Cavallius
203 Biology Building, 368-8853
E-mail: jxc15@cwru.edu

Protein biosynthesis in eukaryotes

Associate Professor Hillel J. Chiel
304 Biology Building, 368-3846
E-mail: hjc@cwru.edu

Computational processes in small networks of neurons; neuronal computation during behavior

Professor Christopher A. Cullis (on leave 2001-2002)
10N Millis Science Center, 368-5362
E-mail: cac5@cwru.edu

Plant molecular biology with relevance to agriculture

Visiting Assistant Professor Nancy A. DiIulio
305N Millis Science Center, 368-8867
E-mail: nad3@cwru.edu

Cell and molecular biology; studies on cytokine regulated gene expression

Associate Professor Stephen E. Haynesworth
303NA Millis Science Center, 368-2740
E-mail: seh5@cwru.edu

Mechanisms of cellular aging; responses of mesenchymal stem cells from different aged animals to factors influencing growth and development

Professor/Chair Joseph F. Koonce
308 Clapp Hall, 368-3561
E-mail: jfk7@cwru.edu

Studies of Great Lakes fish communities and management of fishery resources

Assistant Professor Jennifer O. Liang
203 Biology Building, 368-3557

Effects of nodal signaling in patterning the zebrafish brain and ventral spinal cord; development of pineal organ in fish

Instructor/University Farm Director Ana B. Locci
306 Clapp Hall, 368-8598 or 368-0275
E-mail: abl3@cwru.edu

Terrestrial ecology, University Farm

Professor Arnold I. Caplan
100SC Millis Science Center, 368-3562

Adjunct Assistant Professor Elizabeth A. Pehek
VA Medical Center 151 (W)
10701 East Blvd., 791-3800 x4237
E-mail: eap6@cwru.edu

The neurochemical regulation of brain dopamine systems involved in cognition, emotion, and reward

Visiting Assistant Professor Jane P. Petschek
103SE Millis Science Center, 368-1639
E-mail: jpp12@cwru.edu

Molecular genetics of RNA editing in Drosophilia

Professor Roy E. Ritzmann
220 Biology Building, 368-3554
E-mail: rer3@cwru.edu

Neurobiology of insect behavior

Associate Professor/Associate Chair Charles E. Rozek
108N Millis Science Center, 368-2765
E-mail: cer2@cwru.edu

Molecular biology; studies on gene structure and function

Professor Norman B. Rushforth
203 Biology Building, 368-3557
E-mail: nbr@cwru.edu

Studies of violent death in the Cleveland region: homicides, suicides, fatal unintentional injuries

Associate Professor Christopher D. Town (on leave 2001-2002)
103N Millis Science Center, 368-3593
E-mail: cdt2@cwru.edu

Molecular biology and genetics of development; biology of plant tumors; genetic control of plant hormones; microbial genetics

Associate Professor Mark A. Willis
203 Biology Building, 368-3557

Dynamics of flight and orientation behaviors in insects; integration of multiple sensory inputs in the regulation of insect flight; use of biologically inspired robotics to test hypotheses concerning insect flight and orientation behaviors

Assistant Professor Debra E. Wood (at CWRU starting January 2002)
203 Biology Building, 368-3557

Dynamics of motor control in neuronal networks; rhythmic activation of projection neurons; biomechanical modeling of rhythmic pattern generation
CHEMISTRY
(Last updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR:
John Stuehr
207 Clapp Hall, 368-5099
E-mail: jes6@cwru.edu

DEPARTMENT CHAIR:
Lawrence M. Sayre
411 Millis Science Center, 368-3704
E-mail: lms3@cwru.edu

RESEARCH ACTIVITIES
Qualified undergraduate chemistry majors are encouraged to participate in the Undergraduate Research Program. The student should consult with faculty members in the department and select one under whose guidance the student undertakes a specific research project. The student has the opportunity to join a research group, to work with faculty, graduate students, and research associates. Many such research projects have resulted in papers published in scientific journals and co-authored by undergraduate students. Please consult the individual faculty member for information on the research.

RESEARCH/INDEPENDENT STUDY COURSES
CHEM 397  Research (1-6). Independent research for candidates for honors in chemistry and other qualified students. Not open to graduate students. Prerequisite: consent of department.

FACULTY

Professor Alfred B. Anderson
228 Millis Science Center, 368-5044
E-mail: aba@cwru.edu

Undergraduates who would like to work with a computer and apply quantum mechanics to problems of molecular structures and reactions. Quantum mechanics or chemistry 337 are prerequisites when space permits. Surface Science: The current research focus is on Low Pressure Diamond Growth Diamond surface structures and reaction mechanisms. Bulk electronic structure modification by doping. Electrochemistry Potential dependence of fundamental electrocatalytic reactions; focus on fuel cells.

Professor Mary Barkley
202 Clapp Hall, 368-0602
E-mail: mdb4@cwru.edu

Laser fluorescence spectroscopy; biophysical chemistry; proteins, DNA, and RNA; HIV and Hepatitis C viral enzymes.

Assistant Professor Clemens Burda
225 B Millis Science Center, 368-5918
E-mail: cxb77@cwru.edu

Research in the Center of Chemical Dynamics and Nanomaterials Research involves collaboration with several national centers on nanomaterials research. Motivated Undergraduates will be integrated in the ongoing research on novel and functional nanomaterials. Laboratory training includes synthesis of nanomaterials, bioconjugation techniques and fine-tuning of nanomaterials by adjusting the chemistry of more complex systems. We prepare nanomaterials with new electronic, magnetic, and optical properties with applications in catalysis, photovoltaics, micro/nano-electronics, and biology/medicine. A wide range of state-of-the-art techniques is available for characterization on campus and special studies are conducted at National Laboratories. Motivated students are encouraged to take part in our endeavor in this new area of science. Synthesis and opto-electronic characterization will be performed in our laser laboratory, where chemical reactions can be investigated on a femtosecond (10^-15 sec) time-scale.

Assistant Professor James D. Burgess
225A Millis Science Center, 368-4490
E-mail: jdb22@cwru.edu

Research focuses on immobilizing biological structures on electrode surfaces for sensing. Energetic students can gain experience in electrochemistry and surface science. Some characterizations of biosensor performance are well suited for the beginning scientists.

Professor Robert C. Dunbar
G22A Millis Science Center, 368-3712
E-mail: rcd@cwru.edu

The group’s research focuses on chemistry of gas-phase ions using mass spectrometry, particularly the technique of Fourier-transform mass spectrometry (FTMS). We combine these experimental studies with quantum calculations of the same reactions that we observe in the mass spectrometer. Both experiments and computations have provided successful topics for undergraduate activities in the group. FTMS studies of metal ion binding to amino acids, aromatic hydrocarbons, and other interesting molecules. Interstellar chemical reactions of metal ions combining with known components of interstellar clouds, modeled by experiments in the mass spectrometer at very low pressure, and by calculations and simulations. Quantum chemical calculations of complexation of transition metals with curved and planar...
graphitic sheets and extended aromatic hydrocarbons, as well as biologically interesting model sites.

Professor Philip P. Garner
214 Millis Science Center, 368-3696
E-mail: ppg@cwru.edu

Research focuses on the development of new strategies and methodologies for asymmetric synthesis as well as novel nucleic acid surrogates. Motivated students can develop their laboratory skills and learn how to use modern instrumentation to solve chemical problems. Undergraduates can start research upon completion of CHEM 223/224, 233/234.

Assistant Professor Zhongwu Guo
410A Millis Science Center, 368-3736
E-mail: zxg5@cwru.edu

The main research focus of this group is chemical and solid-phase synthesis of complex oligosaccharides and glycoconjugates, as well as their applications to the treatment of human diseases. We are especially interested in the development of immunotherapies for cancer based on biochemical engineering of tumor-associated carbohydrate antigens on cancer cell surfaces. Undergraduates involving in these research projects will gain experiences in organic synthesis, carbohydrate chemistry and glycobiology.

Professor Malcolm E. Kenney
432 Millis Science Center, 368-3739
E-mail: mek9@cwru.edu

Organosilicon Compounds. Some of our studies deal with the synthesis and characterization of organosilicon compounds. The silicones being sought have structures which are new and can be expected to have properties which are desirable and unique. Macrocyclic Complexes. We are also working on metal phthalocyanines (compounds which are closely related to metal porphyrins). The metal phthalocyanine work has as a goal the synthesis and characterization of compounds that can be used as drugs in cancer therapy and for purging donated blood of HIV and hepatitis viruses. Particular attention is being given to making compounds that have the needed physical properties.

Professor Gilles Klopman
223 Millis Science Center, 368-3618
E-mail: gkx@cwru.edu

1. Structure Activity Studies. Biological properties of chemicals often depend in a complex way on their topological and electronic structure. Our research activity aims at discovering these relationships, using them to design potentially active new molecules and synthesizing those molecules that are predicted to be the most active.

2. Drug Design. Applications currently being investigated including the design of pharmaceuticals such as AIDS drugs, antibacterials, anticancer and various enzyme inhibitors. A major part of our research efforts is also directed at evaluating the environmental hazard of chemicals, particularly their potential genotoxicity.

3. Self-Consistent Field Calculations. Our group also deals with the development of new methodologies to be used in future computer-aided molecular design programs. This includes studies of topological maps throughout the use of graph theory and computer graphics, improved quantum mechanical methodologies and artificial intelligence approaches to drug design.

Assistant Professor Irene Lee
G24A Millis Science Center, 368-6001
E-mail: ixl13@cwru.edu

Our research focuses primarily on the application of biochemical techniques to elucidate the chemistry of the biological processes associated with protease. Instruments such as the fluorimeter and spectrophotometer are employed in enzyme kinetics experiments. Standard procedures include solid phase peptide synthesis, cloning, PCR, and preparing and running electrophoretic gels.

Professor Gheorghe D. Mateescu
205 Clapp Hall, 368-2589
E-mail: gdm2@cwru.edu

Thoroughly learn the basics and applications of modern nuclear magnetic resonance (NMR) spectroscopy and participate in original life processes research.

Project 1. Oxygen-17 and phosphorus-31 NMR studies of mitochondrial respiration (nascent metabolic water) in cells (yeast) or larvae (meal worms). Project 2. The chemistry of water monomers: a multinuclear NMR investigation related to understanding contrast in magnetic resonance images (MRI) and the role of water in biopolymer properties.

Professor Anthony J. Pearson
433A Millis Science Center, 368-5920
E-mail: ajp4@cwru.edu

Undergraduate research participants are welcome to join our group and gain experience with a variety of techniques and methods in organic and organometallic chemistry. Our major interests are in the applications of organometallic complexes in the solution of difficult organic synthesis problems. This has involved us in a number of projects aimed at the total synthesis of natural products, one example being our synthesis of trichodermol. We have introduced new methods for stereocontrol which are suitable for approaches to the newly discovered immunosuppressive agent FK-506, and we have developed methods for diaryl ether formation which are being used to prepare subunits for construction of molecules related to the complex glycopeptide antibiotics ristocetin A and vancomycin.

Associate Professor John D. Protasiewicz
Specific projects center around the study of metal catalyzed atom and group transfer reactions (such as oxo, nitrene, phosphido, carbene, hydride, and other similar moieties). Understanding the details is key to the optimization of current technologies and for the rational design of new bond forming reactions. Mechanistic studies can identify potential intermediates; synthetic and structural studies yield important information about the bonding in intermediate and precursor species. Our labs house the departmental X-ray facility; thus we routinely use single crystal diffraction studies to uncover the molecular details of “never seen before” complexes and relate these structural data to observed reactivity patterns.

Professor Robert G. Salomon
212 Millis Science Center, 368-2592
E-mail: rgs@cwru.edu

Enthusiastic undergraduates eager to learn laboratory chemistry and committed to invest reasonable time and effort are always welcome in our group. Research projects involving one or more of the following areas are always available:
1. Synthesis of medicinally useful and biologically important natural products.
3. Biological chemistry of lipids. Some of the techniques which may be learned include: analytical and preparative gas-liquid phase, high performance liquid, column, and thin-layer chromatography, gel electrophoresis, nuclear magnetic resonance, ultraviolet, and mass spectroscopy, immunoassay, liquid scintillation counting, advanced techniques of preparative organic chemistry.

Professor/Chair Lawrence M. Sayre
411 Millis Science Center, 368-3704
E-mail: lms3@cwru.edu

Research in my group focuses on understanding reaction mechanisms that underlie selected problems in bioorganic chemistry. Three projects are currently being pursued:

Chemical and biological oxidation of amines. By combining chemical and enzymologic approaches, we are unraveling the mechanisms of biologically relevant amine oxidation reactions. This includes the development of selective inhibitors for the copper-containing quinone-dependent amine oxidases. 

Metal-catalyzed reactions of molecular oxygen with organic substrates. We are investigating the potential of readily accessible metal complexes to catalyze selective oxidation and/or oxygenation reactions as a function of substrate-metal coordination. These studies will help unravel the mechanisms of the various biological metalloenzymes and pathophysiologic processes associated with the role of copper and iron in oxidative stress.

Pathological posttranslational oxidative modification of proteins in degenerative disease. Modification of proteins during conditions of oxidative stress can result in abnormal protein function and contribute to diseases such as atherosclerosis and Alzheimer disease. We are using a combination of chemical model studies, immunochemical analysis, mass spectrometry, and enzyme studies to investigate the structural aspects of these protein modifications and the mechanisms that explain them.

Professor Daniel A. Scherson
227 Millis Science Center, 368-5186
E-mail: dks16@cwru.edu


Assistant Professor M. Cather Simpson
219A Millis Science Center, 368-1911
E-mail: mcs9@cwru.edu

Biophysical Chemistry; vibrational spectroscopy studies of biologically significant processes.

Professor Fred L. Urbach
418B Millis Science Center, 368-3665
E-mail: flu@cwru.edu

Biomimetic Models for Copper Active Sites in Proteins. We are involved in a broad research program involving synthetic monoo- and di-copper chelates as models for selected structural, spectroscopic and reactivity aspects of copper active sites in proteins. Our principal thrust in recent years has been the development of antiferromagnetically coupled bi-nuclear copper systems which exhibit high redox potentials for the CuII/CuI couple. These complexes serve as useful models for the active sites of hemocyanin, tryosinase and the binuclear portions of the active sites of the “blue oxidases”, i.e., laccase, ceruloplasmin and scorbate oxidase. Currently, we are examining the detailed electrochemical behavior of the complexes using a variety of voltammetric techniques.

Associate Professor Michael G. Zagorski
G27A Millis Science Center, 368-3706
E-mail: mxz12@cwru.edu

Protein Misfolding and Human Disease
Undergraduate students who are eager to learn state-of-the-art nuclear magnetic resonance (NMR), peptide synthesis and purification, as well as other analytical techniques for protein structure characterization are encouraged to join my group. The major research projects focus on studying the dynamics and structures of proteins in solution. Frequent collaborations with scientists in the School of Medicine are fundamental to the long-term goals of the group’s research, which is the
understanding the relationship between protein misfolding and human disease. Current research efforts are focused on proteins that are important pathological features in Alzheimer’s disease, including the Aβ peptide, the Aβi peptide of Familial British dementia, serum amyloid A, α-synuclein, the human prion protein, and a 43-residue peptide segment that includes the membrane-spanning region of the amyloid precursor protein.

The Zagorski group has primarily focused their efforts with the Aβ peptide, which produces amyloid plaques in Alzheimer’s disease. The Aβ pathologic effects are related to the formation of insoluble aggregates dominated by β-sheet structures. To gain physical insight into the various possibilities, the Zagorski group has been systematically examining the structures and stabilities of the 40-residue Aβ (1-40) and the 42-residue Aβ(1-42) peptides as a function of pH, solvent polarity, and the presence of a membrane-like surface. In fact, they are still the only group that has successfully applied high-resolution NMR methods to study the structure and aggregational properties of the full length (native) Aβ peptides in solution, as monomers, the earliest stage before it begins to aggregate as amyloid.
RESEARCH ACTIVITIES
The Department of Classics offers courses in the Greek and Latin language and literatures, in ancient history and in various other aspects of the culture and life. In our research pursuits, we have a long standing interest in Greek history and epigraphy. Some recent work has analyzed the influence of Greek religion and ritual on tragedy. Finally, we have a strength in the study of exile in literature in general.

RESEARCH/INDEPENDENT STUDY COURSES

**CLSC 381** Special Studies (1-6). Subject matter varies according to need. Supervised by the department chairman. Prerequisites: 18 hours in the Department of Classics, and offered only with the approval and under the supervision of the chairman.

**CLSC 395** Directed Readings (1-3). Readings in English on a topic of interest to the student and acceptable to the instructor. Designed and completed under the supervision of the instructor with whom the student wishes to work.

FACULTY

**Associate Professor/Chair Martin Helzle**
404 Mather House, 368-2294
E-mail: mxh13@cwru.edu

*Classical literature and drama, especially Latin poetry*

**Professor Donald R. Laing, Jr.**
52 Mather House, 368-6026
E-mail: drl2@cwru.edu

*Ancient history; Greek and Latin documents on stone*

**Assistant Professor Angeliki Tzanetou**
406 Mather House, 368-2251
E-mail: axt31@cwru.edu

*Greek tragedy, women in antiquity*

**Dr. Paul A. Iversen**
314 Mather House, 368-2352
Email: pai2@cwru.edu

*Ancient history; Greek and Latin documents on stone*
COMMUNICATION SCIENCES
(First updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR: Claire Penn
Cleveland Hearing and Speech Center
368-2470
E-mail: mac46@cwru.edu

DEPARTMENT CHAIR: Claire Penn
Cleveland Hearing and Speech Center
368-2470
E-mail: mac46@cwru.edu

RESEARCH ACTIVITIES
There are a number of research opportunities available within the department. Students may pursue an individual line of study or assist in the various programs of research currently underway. Communication Disorders faculty conduct research in a number of areas including traumatic brain injury; respiratory-laryngeal interaction in normal and disordered populations; and professional voice users; aphasia and multicultural and bilingual issues; to name a few. The Communication Studies faculty can direct individual research efforts in many areas of human communication including inter-cultural, organizational, interpersonal, media, persuasion, and health communication. Faculty research laboratories house state-of-the-art equipment and provide opportunities with faculty and students with similar research interests.

RESEARCH/INDEPENDENT STUDY COURSES

COSI 390 Independent Study and Research (3). Either COSI 390 or 391 are required for students intending to graduate with departmental honors. Prerequisite: 18 or more credit hours in the major with a GPA not less than 3.25; approval of the plan by instructor.

FACULTY

Professor/Chair Claire Penn
Cleveland Hearing and Speech Center, 368-2470
E-mail: mac46@cwru.edu

Aphasia and multicultural and bilingual issues

Lecturer Barbara Hugenberg
Cleveland Hearing and Speech Center, 368-1236
Email: bsh5@cwru.edu

Organizational, critical-cultural, and rhetorical communication.

Lecturer Mary Step
Cleveland Hearing and Speech Center, 368-3352
E-mail: mms8@cwru.edu

The role of emotion and affect in human communication processes

Assistant Professor Lyn S. Turkstra
Cleveland Hearing and Speech Center, 368-1791
E-mail: lst2@cwru.edu

Communication disorders after traumatic brain injury; cognitive-communication disorders in adolescents and adults

Assistant Professor Peter J. Watson
Cleveland Hearing and Speech Center, 368-5381
E-mail: pjw4@cwru.edu

Speech motor control in normal and disordered populations
ENGLISH
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:
Gary L. Stonum      Gary L. Stonum
315 Guilford House, 368-3342     315 Guilford House, 368-3342
E-mail:  gxs11@cwru.edu     E-mail: gxs11@cwru.edu

RESEARCH ACTIVITIES
Included within the English Department's programs of study are major periods of English and American literature, film, linguistics, rhetoric, composition, creative writing and business and technical writing. Some topics of individual research include the history of American cinema; how poets revise; American and European detective novels; Renaissance poem; Robert Frost; mock-heroic in fiction and poetry; the epistemology of technical communications; biography and autobiography, Emily Dickinson and film versions of English novels, Victorian medicine, psychology, and fiction; cognition and rhetoric; the short story; cultures of writing and the construction of authorship.

RESEARCH/INDEPENDENT STUDY COURSES
ENGL 390  Independent Study and Creative Projects (1-6). Up to six semester hours of independent study may be taken in a single semester, normally in the senior year. Projects may be critical or creative in nature. Prerequisite: consent of instructor.
GEOLOGICAL SCIENCES
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR: Philip O. Banks
DEPARTMENT CHAIR: Gerald Matisoff
212 A.W. Smith Building, 368-3765
110 A.W. Smith Building, 368-3690
E-mail: pob@cwru.edu
E-mail: gxm4@cwru.edu

RESEARCH ACTIVITIES
The Geological Sciences encompass a wide range of inquiries into the physical, chemical and biological processes that shape the Earth. What is learned of the past and present reveals the constraints of our environment and serves as a guide for the future. The research facilities within the department are excellent. They include standard equipment for rock preparation, a wide range of equipment for mineralogical and petrographic studies, well-equipped laboratories for paleontological and micro-paleontological investigations, and laboratories for work in ecology and sedimentology.

RESEARCH/INDEPENDENT STUDY COURSES
GEOL 349 Geological Problems (1-3). Special work arranged according to the qualifications of the student. Prerequisite: consent of departmental adviser.

FACULTY

Associate Professor Philip O. Banks
212 A.W. Smith Building, 368-3765
E-mail: pob@cwru.edu
Geology and geomorphology of Northeastern Ohio

Assistant Professor Ralph Harvey
316 A.W. Smith Building, 368-0198
E-mail: rph@cwru.edu
Studies of the nature of Antarctic meteorites - their concentrations, relationships to glacial history, to climate, and to weathering processes

Professor/Chair Gerald Matisoff
110 Smith Building, 368-3690
E-mail: gxm4@cwru.edu
Use of natural radionuclides to determine sedimentation rates and fine particle erosion and transport; exchange of solutes from sediments to water; geochemical computer models

Professor Peter L. McCall
211 A.W. Smith Building, 368-3676
E-mail: plm4@cwru.edu
Ecology of benthic invertebrates; animal-sediment relations; invertebrate paleoecology

Assistant Professor Beverly Saylor
216 A.W. Smith Building, 368-3763
E-mail: bzs@cwru.edu
Sequestration of carbon dioxide in deep sedimentary formations; chemostratigraphy of the late Proterozoic of Namibia and Pleistocene Lake Erie

Associate Professor Peter J. Whiting
220 A.W. Smith Building, 368-3989
E-mail: pjw5@cwru.edu
Studies of earth surface processes in channels, on hillslopes, along coastline geotechnical engineering; environmental geology; weather and climate
HISTORY
(Last updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:
Professor Miriam R. Levin     Professor Carroll Pursell
218 Mather House, 368-2624     104 Mather House, 368-2261
E-mail:  mrl13@cwru.edu     E-mail:  cxp7@cwru.edu

RESEARCH ACTIVITIES
Historians seek an understanding of the past by analyzing society and culture and their change over the course of time. The Department of History offers instruction within the customary political-economic framework, and it also has developed special emphases in social, cultural, and legal perspectives that allow instruction and the encouragement of research on such topics as class relationships, cultural studies, gender history, the environment, and technology.

AWARDS:
THE DONALD GROVE BARNES AWARD in History to a senior for excellence in research and writing of history.
THE CLARENCE H. CRAMER AWARD for excellence in research and writing of history.
THE ANNIE SPENCER CUTTER PRIZE to a senior for outstanding achievement in history.
THE SIGMA PSI PRIZE for excellence in history.
THE JOHN HALL STEWART PRIZE for excellence in historical studies.
THE HISTORY DEPARTMENT AWARD for exceptional achievement.

RESEARCH/INDEPENDENT STUDY COURSES
HSTY 250:  Issues and Methods in History (3).  Methodological introduction to historical research (Fall only)
HSTY 397:  Undergraduate Tutorial in History (1-3).  Independent study
HSTY 398 Undergraduate Seminar (3).  Training in the nature and methods of historical writing and research (Spring only)

FACULTY

Instructor and Assistant Dean Molly W. Berger
311 Mather House, 368-2429
Email:  mwb2@cwru.edu
History of technology; American women’s history; cultural history

Associate Professor John J. Grabowski
308 Mather House 368-2380
E-mail:  jjg4@cwru.edu
Immigration and ethnicity; local (Cleveland) urban history; and public history, particularly archives and museums

Professor David C. Hammack
212 Mather House, 368-2671
E-mail:  dch3@cwru.edu
History of non-profit organizations and the non-profit sector; history of cities, education; history of U.S. politics; history of Cleveland; history of social science

Assistant Professor Elisabeth Koll
211 Mather House, 368-2623
E-mail:  exk@cwru.edu
Modern Chinese and East Asian History

Associate Professor Kenneth F. Ledford
208 Mather House, 368-4144
E-mail:  kxl15@cwru.edu
Modern German history; social history of Europe (19th and 20th centuries); history of the European middle class; history of European professions; European legal history

Associate Professor Miriam Levin
213 Mather House, 368-2624
E-mail:  mrl3@cwru.edu
The history of science education in America; cultural history of technology in the industrial era
Professor Carroll Pursell  
104 Mather House, 368-2261  
E-mail: csp7@cwru.edu  

History of technology

Professor Alan J. Rocke  
207 Mather House, 368-2614  
E-mail: ajr@cwru.edu  

The history of science and/or technology

Associate Professor Jonathan Sadowsky  
204 Mather House, 368-2622  
E-mail: jas@cwru.edu  

African history; history of medicine

Assistant Professor Renée Sentilles  
206 Mather House, 368-5413  
E-mail: rms30@cwru.edu  

American women’s history; cultural history; American studies

Professor Ted Steinberg  
214 Mather House, 368-4137  
E-mail: txs18@cwru.edu  

U.S. legal and environmental history

Assistant Professor Gillian W. Weiss  
208 Mather House, 368-4107  
Email: glw@cwru.edu  

Early modern Europe; Mediterranean world; comparative slavery

Assistant Professor Rhonda Y. Williams  
216 Mather House, 368-2515  
E-mail: ryw@cwru.edu  

20th Century U.S. and African-American history

Professor Angela Woollacott  
202 Mather House, 368-4165  
E-mail: axw11@cwru.edu  

Modern British and women’s history
RESEARCH ACTIVITIES
Mathematics plays a central role in the physical and social sciences (especially economics), in engineering, and in business. The Department of Mathematics is an active center for mathematical research. The department maintains weekly seminars in algebra, analysis, geometry and topology, probability, and mathematical physics. Faculty conduct research in algebra, applied mathematics, analysis, geometry and topology, numerical analysis, and probability.

RESEARCH/INDEPENDENT STUDY COURSES
MATH 301 Undergraduate Reading Course (1-3). Students must obtain the approval of a supervising professor before registration. More than one credit hour must be approved by the undergraduate committee of the department.

FACULTY

Professor James Alexander
220 Yost Hall, 368-2880
E-mail: jca10@cwru.edu

Professor David Gurarie
331 Yost Hall, 368-2857
E-mail: dxg5@cwru.edu

Professor Michael Hurley
307B Yost Hall, 368-2885
E-mail: mgh3@cwru.edu

Professor Joel Langer
Yost Hall, 368-2897
E-mail: jxl6@cwru.edu

Professor Marshall J. Leitman
309 Yost Hall, 368-2890
E-mail: mxl5@cwru.edu

Professor Charles Wells
308 Yost Hall, 368-2893
E-mail: cfw2@cwru.edu

Associate Professor Steven Izen
305 Yost Hall, 368-2891
E-mail: shi@cwru.edu

Mathematical modeling of optics experiments; development of user interfaces for scientific software; Mathematica user interface implementation
MODERN LANGUAGES AND LITERATURES
(Last updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR: Desiree Knauer
DEPARTMENT CHAIR: Marie Lathers
201 Guilford House, 368-3071
204 Guilford House, 368-8983
E-mail: dak16@cwru.edu
E-mail: mhl5@cwru.edu

RESEARCH ACTIVITIES
The Department of Modern Languages and Literatures comprises the programs in comparative literature, French, German, Japanese, and Spanish, as well as instruction in Chinese, Italian, Hebrew, and Russian. By teaching students to participate fully in cultures other than their own, through the acquisition of language skills and cultural awareness, we prepare them for lifelong learning in an increasingly multilingual and multicultural world. We encourage study abroad as a means of reinforcing and strengthening language skills and of acquiring new perspectives and appreciation. The faculty members of the Department are researchers who produce knowledge in a range of areas including language, literature, culture, and film.

RESEARCH/INDEPENDENT STUDY COURSES
CMPL 399 Independent Studies (in Comparative Literature) (1-3). For qualified students with special interests and commitments that are not fully addressed in regular courses. Directed readings and meetings with as arranged. Prereq.: Consent of department.
FRCH 399 Directed Reading (1-3). For students who wish to work independently on a topic, literary or non-literary, in French. Prerequisite: Permission of department.
GERM 399, RUSN 399, SPAN 399, CHIN 399, ITAL 399, and JAPN 399 Independent Studies (1-3). Prerequisite: Permission of department.

FACULTY
Antonio Candau
309 Guilford House, 368-8976
E-mail: axc102@cwru.edu
Spanish literature and culture; 19th and 20th centuries; Spanish literature and artistic production

Takao Hagiwara
Guilford House, 368-6188
E-mail: txh13@cwru.edu
Modern Japanese literature; women/the mother in Japanese literature; Western and Eastern comparative studies

Marie Lathers
204 Guilford House, 368-8983
E-mail: mhl5@cwru.edu
French literature; 19th & 20th centuries; the intersection of art history, feminism, and literature

Jutta Ittner
305 Guilford House, 368-6202
E-mail: jxi6@cwru.edu
Modern German literature; exile studies; women’s literature
RESEARCH ACTIVITIES
The aim of the Department of Music is to offer superior programs that balance humanistic knowledge of music with excellence in performance. The department has collaborated with the Cleveland Institute of Music in a joint music program to give students the added benefit of pursuing studies at both schools. Special areas of concentration offered by the department are: early music performance practices, where musical research in early music, instruments and performance problems is directly applied to performance; and, in the department's music education program the faculty stresses both the practical and theoretical understanding of the creative thinking processes in music by supervising a wide variety of research on creativity.

RESEARCH/INDEPENDENT STUDY COURSES
MUSC 399 Undergraduate Independent Studies (3). Each student develops a topic of interest to be explored with a faculty member. Prerequisite: consent of instructor.

FACULTY
John G. Suess
214 Haydn Hall, 368-2400

Music of Baroque era, circa 1600-1700 (Monteverdi-Bach); 20th century music (Stravinsky-Scheonberg to date); electronic, chance, minimal music
RESEARCH ACTIVITIES
The Department of Philosophy emphasizes the relevance of philosophy to mathematics, computer science, disciplines in the natural sciences, social sciences, the humanities and arts, and law. Students learn to develop the skills of analytical and critical reasoning and the skills for effective communication and rational decision, needed in a wide range of endeavors. Although the Philosophy Department has no course other than PHIL 399 (Directed Study) to accommodate undergraduates who wish to do independent research in philosophy for credit, all members of the Philosophy faculty are willing to provide informal assistance for those students whose research project has dimensions falling into their fields of expertise. It is strongly recommended, however, that a student at least minor in philosophy to be able to benefit from a close academic supervision provided in PHIL 399.

RESEARCH/INDEPENDENT STUDY COURSES
PHIL 399  Director Study.  Open to majors and minors in philosophy.  Consent required.

FACULTY
Assistant Professor Laura Hengehold
203C Clark Hall, 368-2810
E-mail: leh7@cwru.edu

Social and political philosophy, contemporary continental philosophy, Foucault, feminist philosophy

Professor Chin-Tai Kim
203B Clark Hall, 368-2811
E-mail: csk6@cwru.edu

History of philosophy; theory of knowledge; metaphysics; foundations of ethics; philosophy of religion; comparative philosophy, East-West; phenomenology; Kant

Associate Professor/Chair Colin McLarty
203A Clark Hall, 368-2632
E-mail: cxm7@cwru.edu

Philosophy of mathematics, especially topos theory; philosophy of natural science; philosophy of logic; philosophy of feminism

Professor Caroline Whitbeck
211 Clark Hall, 368-0757
E-mail: caw9@cwru.edu

Practical ethics, engineering and research ethics
RESEARCH ACTIVITIES
The Department of Physics offers research programs concerned with the basic laws of nature and of the properties of light and matter in their various forms. Many of the latter areas of physics are of great technological relevance; they often overlap with interests of faculty in other departments on campus and lead to interdisciplinary research projects. All senior physics majors are required to work with a faculty member in an original research project but there are also many opportunities to join a research group before the senior year.

RESEARCH/INDEPENDENT STUDY COURSES
PHYS 329 Independent Study (1-3). An individual reading course in any topic of mutual interest to the student and the faculty supervisor. Prerequisite: Consent of department chair.

PHYS 351 Senior Project (6).

PHYS 353 Senior Engineering Physics Project (6).

FACULTY

Associate Professor Daniel S. Akerib
212 Rockefeller Building, 368-2813
E-mail: dsa5@cwru.edu

Experimental particle astrophysics; dark matter detection; low-temperature particle detectors

Professor Robert W. Brown
204 Rockefeller Building, 368-4010
E-mail: rwb@cwru.edu

Mathematical/computational physics projects running the gamut from A to B (astroparticle physics, industry, baseball, quantum computing, and biology)

Professor Gary S. Chottiner
104D Rockefeller Building, 368-4024
E-mail: gsc2@cwru.edu

Solid state physics; surface science; growth and properties of thin film technology; 2-D physics

Professor Arnold J. Dahm
225E Rockefeller Building, 368-3586
E-mail: ajd3@cwru.edu

Quantum computing; Low-dimensional systems with electrons on a helium surface; quantum transport in solid helium

Professor Kathleen Kash
105B Rockefeller Building, 368-4021
E-mail: kkk43@cwru.edu

Projects in crystal growth and optical properties of semiconductors, and nanostructures and nanotechnology

Professor/Chair Lawrence M. Krauss
215 Rockefeller Building, 368-4000
E-mail: lmk9@cwru.edu

Theoretical astrophysics; dark matter

Professor Kenneth L. Kowalski
205 Rockefeller Building, 368-4011
E-mail: klk3@cwru.edu

Theoretical and computational nonlinear optics and high-energy physics; mathematical physics

Professor Walter R. L. Lambrecht
104B Rockefeller Building, 368-6120
E-mail: wxl2@cwru.edu

Electronic structure of solids

Professor Rolfe G. Petschek
225C Rockefeller Building, 368-4035
E-mail: rgp@cwru.edu

Thermodynamics and statistical mechanics; phase transitions; liquid crystals; dynamic behavior of macroscopic systems; mathematical and computational physics

Professor Charles S. Rosenblatt
105C Rockefeller, 368-4125
E-mail: cxr@cwru.edu

Liquid crystals; macromolecules; complex fluids using optics and magnetic fields
Professor Donald E. Schuele
118A Rockefeller Building, 368-4013
E-mail: des3@cwru.edu

Measurements of the basic properties of materials and
computerization of experiments

Professor Kenneth D. Singer
225D Rockefeller Building, 368-4017
E-mail: kds4@cwru.edu

Projects in non-linear optics

Associate Professor Glenn D. Starkman
213 Rockefeller Building, 368-3660
E-mail: gds6@cwru.edu

Particle physics and cosmology; dark matter, extra
dimensions, satellite design

Professor Cyrus C. Taylor
206 Rockefeller Building, 368-3710
E-mail: cct@cwru.edu

Mathematical and computational physics problems;
thoretical high energy physics

Professor Philip L. Taylor
225F Rockefeller Building, 368-4044
E-mail: plt@cwru.edu

Theoretical physics; calculation of properties of polymers
and liquid crystals

Professor William Tobocman
228A Rockefeller Building, 368-4020
E-mail: wst@cwru.edu

Theory of medical ultrasound imaging
POLITICAL SCIENCE
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR AND DEPARTMENT CHAIR:
Vincent E. McHale
113 Mather House, 368-2425
E-mail: vem@cwru.edu

RESEARCH ACTIVITIES
The study of political science is primarily concerned with governmental structures and processes in world societies, including who governs, why, and how. Faculty specialties include: American politics and governmental institutions; political psychology; women and politics; violence and civil disorder; public policy analysis and administration; international relations; the politics of world technology and resources; research methods; the political systems of Africa, Europe and North America; and comparative politics with various regional concentrations.

Special Opportunities - Two Washington Study Programs: 1) The Washington Semester Program: full semester's credit received for specialized work in one of five programs: American National Politics, Foreign Policy Analysis, American Justice, Economic Policy, or Journalism. All work is conducted in Washington, D.C.; 2) The Washington Center Program: receive up to a full semester's credit. Emphasis is on practical experience in the form of a full-time internship.

For more information on internship opportunities see Prof. Lee (219 Mather House)

RESEARCH/INDEPENDENT STUDY COURSES
POSC 395 Special Projects (1-6). Study of a topic of particular interest, or an approved internship. The student must submit to the departmental office a project prospectus form, approved and signed by the faculty supervisor. Prerequisite: consent of instructor.

FACULTY
Professor Kenneth W. Grundy
223 Mather House, 368-2646
E-mail: kwg@cwru.edu
The political role of theater in South Africa; apartheid politics; the politics of culture; international relations in Southern Africa; the third world, including international relations and the political economy of the third world

Associate Professor Alexander P. Lamis
222 Mather House, 368-2696
E-mail: apl2@cwru.edu
Recent elections in the U.S.; national and state voting patterns analysis, including Ohio

Assistant Professor Frances E. Lee
219 Mather House, 368-5265
E-mail: fel@cwru.edu
American government; Congress; legislative policy-making

Professor Vincent E. McHale
113 Mather House, 368-2425
E-mail: vem@cwru.edu
Political database construction and analysis (Western Europe); political violence; empirical analysis, historical and contemporary; aggregate data analysis

Professor Joseph White
222 Mather House, 368-2426
E-mail: jxw87@cwru.edu
American government; public policy; health and welfare policy
PSYCHOLOGY
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:
Robert L. Greene      Robert L. Greene
124 Mather Memorial Building, 368-6473   124 Mather Memorial Building, 368-6473
E-mail:  rlg2@cwru.edu     E-mail:  rlg2@cwru.edu

RESEARCH ACTIVITIES
The undergraduate programs in the Department of Psychology are designed to provide a broad education in the science
of behavior. Programs in psychology prepare students for work in service-oriented professions such as teaching and
research, social work, counseling and guidance, special education, and management. The department offers
undergraduates many opportunities for pursuing individualized study and diversified research activities. The University
has excellent course offerings and research opportunities in the biological and social sciences, management and
computer technology. The department also maintains laboratories in the major research areas of experimental
psychology: Affect and Cognition, Cognition, Health Psychology, Human Memory, Mental Retardation, Parent and Child
Interaction, Human and Machine Perception, Perceptual Development, Physiology and Social Psychology. Research
activities are also conducted at neighboring medical centers and psychiatric institutions. Topics of research that students
have chosen include: biochemical aspects of mental illness, moral development in children, attitude change and mass
media, perceptual development in infants and the effects of punishment.

RESEARCH/INDEPENDENT STUDY COURSES
PSCL 397 Independent Study (1-3). Students with a special interest in a particular research area are encouraged to
participate in an independent study with a faculty member who has the same or similar research interests.

FACULTY
Professor Roy F. Baumeister
126B Mather Memorial Building, 368-2639
E-mail:  rfb2@cwru.edu

Experimental research on social psychology; personality; self and identity

Professor Douglas K. Detterman
117 Mather Memorial Building, 368-2681
E-mail:  dkd2@cwru.edu

Human intelligence and cognition; mental retardation

Assistant Professor Julie Exline
140 Mather Memorial Building, 368-2851
E-mail:  jaj20@cwru.edu

Clinical psychology; social psychology

Professor Joseph F. Fagan
131 Mather Memorial Building, 368-6476
E-mail:  jff@cwru.edu

The origins and development of intelligence

Professor Grover C. Gilmore
103 Mather Memorial Building, 368-2686
E-mail:  gcg@cwru.edu

Visual perception and aging

Professor/Chair Robert L. Greene
124 Mather Memorial Building, 368-6473
E-mail:  rlg2@cwru.edu

Human memory, reading, problem-solving and other cognitive processes

Professor James Overholser
144A Mather Memorial Building, 368-2686
E-mail:  jxo5@cwru.edu

Personality factors related to depression and suicide. Dependency and self-esteem assessed in adult outpatients and college student control subjects; patterns of social functioning measured by questionnaires and behavioral observation; clinical and analogue treatments used to make specific changes

Professor Sandra Russ
145 Mather Memorial Building, 368-2814
E-mail:  swr@cwru.edu

Creativity; clinical child psychology

Associate Professor Elizabeth Short
146 Mather Memorial Building, 368-2815
E-mail:  ejs3@cwru.edu

Cognitive, metacognitive and motivational correlates of school failure, learning disabilities, problem solving and developmental psychology
Professor Milton Strauss  
127B Mather Memorial Building, 368-2695  
E-mail: mes3@cwru.edu  

Disorders of attention and information processing in mental disorders  

Associate Professor Lee Thompson  
123A Mather Memorial Building, 368-6477  
E-mail: lat@cwru.edu  

Behavior genetics; developmental psychology; cognitive development  

Professor Dianne Tice  
126A Mather Memorial Building, 368-2686  
E-mail: dxt3@cwru.edu  

Health psychology; personality and individual differences in behavior; social psychology  

Assistant Professor Eric Youngstrom  
127B Mather Memorial Building, 368-4890  
E-mail: eay@cwru.edu  

Clinical child psychology; emotion
RELIGION

(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR AND DEPARTMENT CHAIR:
William E. Deal
112 Mather House, 368-2205
E-mail: wed@cwru.edu

RESEARCH ACTIVITIES
The Department of Religion engages in academic studies of religion that are multicultural, non-sectarian, and both
disciplinary and interdisciplinary. Students examine a range of past and present cultures and societies using methods
and approaches drawn from the humanities, arts, social sciences, and sciences, all of which sharpen critical and
evaluative skills. Religious beliefs, institutions, and practices are studied with emphasis placed on the critical problems
and possibilities inherent in the theories, methods, and technologies employed. Research opportunities in the Department
of Religion focus particularly on issues of religion and culture, including religion and film, religion and literature, religion
and politics, religion and ethics, religion and space, and service learning.

RESEARCH/INDEPENDENT STUDY COURSES
RLGN 392: Independent Study
RLGN 395: Honors Research

FACULTY

Associate Professor Alice Bach
105 Mather House, 368-1637
E-mail: ahb5@cwru.edu

Literary and cultural studies of the Bible; feminist thought; film studies; society and religion

Associate Professor Timothy K. Beal
217 Mather House, 368-2221
E-mail: tkb5@cwru.edu

Biblical studies; gender studies; cultural history of the Bible; religion and visual culture; religion and ecology

Associate Professor/Chair William E. Deal
112 Mather House, 368-2205
E-mail: wed@cwru.edu

Japanese Buddhism; religion and postmodernism; comparative ethics; methodology of religion; East Asian religions

Professor James W. Flanagan
Mather House, 368-4129
E-mail: jwf2@cwru.edu

Hebrew scriptures; archaeology; history and religion of Ancient Israel; social world of the Ancient Near East

Professor Peter J. Haas
215 Mather House, 368-2741
E-mail: pjh7@cwru.edu

Holocaust; Middle East conflict; Jewish bio-ethics; American Jewish history
SOCIOLOGY
(Last updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:
Susan Hinze       Eva Kahana
221 Mather Memorial, 368-2702     226C Mather Memorial Building, 368-2700
E-mail:  sxh3@cwru.edu     E-mail:  exk@cwru.edu

RESEARCH ACTIVITIES:
Sociology inquiry investigates the many ways in which people deal with the recurring tasks of living together socially. Whether the focus is on the functioning of whole societies or on the dynamics of a two-person group, the sociologist explores the social relationships which characterize our personal and collective worlds. Undergraduate research opportunities in the Department of Sociology lie mainly in the areas of social gerontology, the family, and the social aspects of illness and health. In the last five years, research supported by outside funding has included research on care giving to frail elders, the relation of age to crime, the impact of divorce on relationships of grandparents and grandchildren, friendship through the life course, the division of responsibility towards parents of siblings, health outcomes of stress and coping, race and educational achievement, and altruism in later life. Undergraduates have the opportunity to work with faculty and graduate students on projects such as these.

RESEARCH/INDEPENDENT STUDY COURSES

SOCI 303 Social Research Methods (3). Principles of making causal inferences about human behavior; problem formulation and research design; measurement of sociological concepts; data collection and analysis method; evaluation research findings. Prerequisite: SOCI 112B.

SOCI 314 Qualitative Methods/Field Research (3). General introduction to qualitative research methods in which each student conducts a research project. Guides students through research process from entering field and data collection and analysis to writing article suitable for publication. Prerequisite: SOCI 112B.

SOCI 375 Independent Study (3). Original work under supervision of faculty member. Limited to junior and senior sociology majors. Prerequisite: 12 credit hours in SOCI, including 112, 229 and 300; approval of written prospectus.

SOCI 397/398 Honors Studies. Intensive investigation of research on an original research question conducted under the supervision of a faculty member. These courses facilitate advanced and in-depth investigation of specific conceptual models and allow for the opportunity to graduate with departmental honors. Prerequisite: 3.4 in SOCI courses and 3.0 overall, and recommendation of faculty advisor.

FACULTY

Professor Gary Deimling
231A Mather Memorial Building, 368-5173
E-mail:  gtd@cwru.edu

Life-threatening illness and the mental health of older adults; family; caregiving for dementia patients

Assistant Professor Brian Gran
223C Mather Memorial, 368-2694
Email:  bkg2@cwru.edu

Cognitive sociology, social policy, sociology of law

Assistant Professor Susan Hinze
221 Mather Memorial Building, 368-2702
E-mail:  sxh3@cwru.edu

Medical Sociology; Social Inequality; Sex and Gender

Professor/Chair Eva Kahana
226C Mather Memorial Building, 368-2700
E-mail:  exk@cwru.edu

Environmental influences of aging individuals; stress and coping; life course perspectives

Associate Professor Richard Settersten
223B Mather Memorial Building, 368-2697
E-mail:  ras2@cwru.edu

Adult Development and Aging, Theory, Social Policy, Life Course Methods

Professor Eleanor Stoller
224 Mather Memorial Building, 368-2638
E-mail:  eps3@cwru.edu

Lay understandings and management of chronic disease; informal networks of elderly people; intersections of gender, race/ethnicity, and social class in late life
RESEARCH ACTIVITIES
The undergraduate program in Statistics begins with a foundation in mathematics then adds statistical theory plus intensive modern data analysis and a concentration in a field of each student's choice where statistics is used. The goal is to develop an appreciation of each facet of the discipline and a mastery of technical skills. This prepares students to enter a growing profession with opportunities in the academic, governmental, actuarial and industrial spheres. For the undergraduate student looking toward graduate school, the course of study within these guidelines easily incorporates additional mathematics in preparation for the more abstract mathematical level of graduate courses.

RESEARCH/INDEPENDENT STUDY COURSES

STAT 395 Senior Project in Statistics (3). An individual project done under faculty supervision involving the investigation and statistical analysis of a real problem encountered in university research or an industrial setting. Written report. Prerequisite: Permission of department.

FACULTY

Assistant Professor Nidhan Choudhuri
325 Yost Hall, 368-6013
E-mail: nxc23@cwru.edu

Bayesian nonparametric, Empirical likelihood, Bootstrap, Multivariate spline

Assistant Professor Jiming Jiang
338 Yost Hall, 368-5013
E-mail: jxj3@cwru.edu

Generalized linear models, mixed effects models, small area estimation, asymptotic theory

Professor Joseph Sedransk
335 Yost Hall, 368-6941
E-mail: jxs123@cwru.edu

Bayesian inference, sample survey theory and methodology

Professor Nell Sedransk (on leave 2001-2002)
335 Yost Hall, 368-6941
E-mail: nxs20@cwru.edu

Bayesian design, spatial statistics, topology and foundations

Associate Professor Jiayang Sun
326 Yost Hall, 368-0630
E-mail: jxs60@cwru.edu

Statistical computing, biased sampling, semiparametric and nonparametric inference, statistics in astronomy

Professor/Chair Wojbor Woyczynski
334 Yost Hall, 368-6942
E-mail: waw@cwru.edu

Probability theory, stochastic models, random dynamical systems, statistical hydromechanics, mathematical physics
The Department of Theater Arts encourages undergraduates to learn about and participate in all aspects of drama and dance. They can elect courses in acting, dance technique, stagecraft, costume and scene design. They also have the opportunity to perform and serve on the technical crews in our major dance concerts and mainstage theatrical productions each year. The small size of the theater program guarantees that undergraduates will be able to work closely with highly skilled professionals. The department treats all performances as educational experiences and welcomes the participation of all undergraduates regardless of their academic majors and career goals.

### RESEARCH/INDEPENDENT STUDY COURSES

**THTR 385**  Rehearsal, Performance and Production (1-3). Practicum for students participating in performance or production work in the Department of Theater Arts.

**THTR 397**  Honors Studies I (3). Individual projects in acting, design, dance and directing. Prerequisite: consent of instructor.

**THTR 398**  Honors Studies II (3). Individual projects in acting, design, dance and directing. Prerequisite: consent of instructor.

### FACULTY

**Assistant Professor Catherine Albers**  
Eldred Hall, 368-5926  
E-mail: cla2@cwru.edu  
*Acting*

**Assistant Professor Russ Borski**  
Eldred Hall, 368-5927  
E-mail: rxb33@cwru.edu  
*Scene lighting design; portfolio*

**Professor Christa Carvajal**  
203 Guilford House, 368-2220  
E-mail: csc3@cwru.edu  
*Theater history; dramaturgy*

**Associate Professor Park Goist**  
Eldred Hall, 368-4117  
E-mail: pdg@cwru.edu  
*American theater and culture; American playwrights*

**Associate Professor Kelly Holt**  
Mather Dance Center, 368-2854  
E-mail: kxh@cwru.edu  
*Dance*

**Lecturer Charles Lawrence**  
Eldred Hall, 368-5927  
*Technical theater*

**Associate Professor S. Beth McGee**  
2nd Floor, Eldred Hall, 368-2860  
E-mail: sbm2@cwru.edu  
*Acting; voice; script analysis*

**Associate Professor/Chair John Orlock**  
2nd Floor, Eldred Hall, 368-5926  
E-mail: jmo3@cwru.edu  
*Directing; play writing*
RESEARCH ACTIVITIES
Biomedical engineering students are urged to become involved in research with one of the many faculty with active research labs. Students are introduced to the research labs during the junior year through the laboratory courses (EBME 313, 314) and have formal opportunities to conduct research/design projects in the senior research or design project courses (EBME 398, 380). However, there are many opportunities at all levels (freshmen through senior year) including summer research internships. Laboratories are located on the main Case campus, the School of Medicine, University Hospitals, the Cleveland Clinic Foundation, the VA Medical Center, MetroHealth Medical Center, and the Ohio College of Podiatric Medicine. The major areas of research concentration are 1) biomaterials and tissue engineering, 2) cardiac bioelectricity, 3) neural engineering and neural prostheses, and 4) sensing and imaging.

RESEARCH/INDEPENDENT STUDY COURSES
EBME 398, 399 Senior Projects Laboratory (3), EBME 380 Design for Biomedical Engineering.

PRIMARY FACULTY
Associate Professor Ravi V. Bellamkonda 368-4195, E-mail: rvb@cwru.edu
Biomaterials, neural and vascular and tissue engineering, 3D scaffolds for peripheral and central nerve regeneration; receptor targeted drug and gene delivery vehicles for proliferative vascular diseases and brain tumors

Professor/Chair Patrick E. Crago 368-3977, E-mail: pec3@cwru.edu
Control of neuroprotheses for motor function; neuromuscular control systems

Assistant Professor Jianmin Cui 368-0657, E-mail: jxc93@cwru.edu
Molecular and biophysical mechanisms of ion channel function and modulation, the role of ion channels in cardiac excitation and arrhythmias

Professor Dominique Durand 368-3974, E-mail: dxe6@cwru.edu
Neural engineering, neural prostheses, magnetic and electric stimulation of the nervous system, electrophysiology of epilepsy, computational neuroscience

Associate Professor Igor Efimov 368-1916, E-mail: ire@cwru.edu
Flourescent imaging and modeling of cardiac fibrillation and defibrillation

Assistant Professor Steven J. Eppell 368-4067, E-mail: sje@cwru.edu
Biomaterials, Instrumentation, nanoscale structure-function analysis of orthopedic biomaterials, cellular biomechanics, scanning probe microscopy and spectroscopy of skeletal tissues

Assistant Professor Jinming Gao 368-1083, E-mail: jmg23@cwru.edu
Biomaterials, cancer-targeted drug delivery, gene therapy, contrast agents

Associate Professor Miklos Gratzi 368-6589, E-mail: mxg13@cwru.edu
Electrochemical and optical biosensors and cost-effective diagnostic devices, measurements of cellular neurotransmitter release and cancer cell drug resistance

Assistant Professor Warren Grill 368-8625, E-mail: wmg@cwru.edu
Neural prostheses, neural engineering, interfaces with the brain and spinal cord, neural modeling, bioelectromagnetics

Assistant Professor Robert Kirsch 368-3158, E-mail: rfk3@cwru.edu
Human movement control, restoration by functional stimulation
Assistant Professor Dmitri E. Kourennyi  
368-6047, E-mail: dek@cwru.edu  
Retina: ion channels, synaptic mechanisms, second messengers, nitric oxide, modeling

Associate Professor Roger E. Marchant  
Director of the Center for Cardiovascular Biomaterials  
368-3005, E-mail: rxm4@cwru.edu  
Biopolymers, biosynthetic surfactants, polymer surface modification for implants and sensors, protein-surface interactions by AFM

Associate Professor Niels F. Otani  
368-4798, E-mail: nfo@cwru.edu  
Computer models of cardiac action potential wave propagation, nonlinear dynamical properties of excitable tissues

Professor P. Hunter Peckham  
Director of the Functional Electrical Stimulation Center  
778-3480, E-mail: pxp2@cwru.edu  
Motor function restoration with neural prostheses, control of orthotic and prosthetic systems

Professor Yoram Rudy  
Director of the Cardiac Bioelectricity Research and Training Center  
368-4051, E-mail: yxr@cwru.edu  
Models of cardiac cellular activity and cardiac excitation, cardiac electric mapping, mechanisms of cardiac arrhythmias, electrocardiographic imaging

Associate Professor David L. Wilson  
368-4099, E-mail: dlw@cwru.edu  
Biomedical image processing; digital processing and quantitative image quality of X-ray fluoroscopy images; interventional MRI

ASSOCIATED FACULTY

Professor James M. Anderson  
Pathology, University Hospitals, 844-1012  
E-mail: jma6@cwru.edu  
Biocompatibility of implants

Assistant Professor Marco E. Cabrera  
Pediatric Cardiology, Rainbow Babies & Children's Hospital, University Hospitals, 844-5085  
E-mail: mec6@cwru.edu  
Modeling and control of metabolic processes; metabolic regulation in hypoxia, ischemia, and exercise

Assistant Professor John Chae  
Physical Medicine and Rehabilitation, 778-3472  
E-mail: jxc18@cwru.edu  
Application of neuroprotheses in hemiplegia

Professor Hillel J. Chiel  
Biology, 368-3846  
E-mail: hjc@cwru.edu  
Biomechanical and neural basis of feeding behavior in the marine mollusk Aplysia californica, neuromechanical system modeling, analysis of neural network dynamics

Assistant Professor David Dean  
Neurological Surgery, The Research Institute, University Hospitals of Cleveland, Biomedical Engineering, Anatomy and Orthodontics, 368-1795  
E-mail: dxd35@cwru.edu  
Computer assisted surgery: three dimensional surgical guidance (MR, CT), radiosurgery/therapy, CAD/CAM skull, protheses, skull tissue engineering

Professor Louis F. Dell'Osso  
Neurology, VA Medical Center, 421-3224  
E-mail: lfd@cwru.edu  
Neuropsychological control,ocular motor control and oscillations

Professor Pedro J. Diaz  
Neurology, VA Medical Center, 778-4039  
E-mail: pjd2@cwru.edu  
Magnetic resonance imaging; image processing

Associate Professor Jeffrey L. Duerk  
Radiology, University Hospitals, 844-7794  
E-mail: duerk@uhrad.com  
Interventional MRI, Magnetic resonance imaging; flow visualization

Adjunct Assistant Professor Brian Davis  
Cleveland Clinic Foundation, 444-1055  
E-mail: davis@bme.ri.ccf.org  
Human locomotion, diabetic foot pathology, space flight-induced osteoporosis and biomedical instrumentation

Adjunct Assistant Professor Mark D. Grabiner  
Cleveland Clinic Foundation, 444-7276  
E-mail: grabiner@bm.ri.ccf.org  
Neuromotor control of human performance
Adjunct Associate Professor Hiroaki Harasaki
Cleveland Clinic Foundation, 444-7693
E-mail: harasaki@bme.ri.ccf.org

Artificial heart; blood-surface interactions

Adjunct Assistant Professor Vincent J. Hetherington
Biomedical Engineering, Surgery, Ohio College of Podiatric Medicine, 231-3300 ext. 8012
E-mail: vjh@ocpm.edu

Biomaterials and biomechanics of foot prostheses

Adjunct Assistant Professor David Huang
Cleveland Clinic Foundation, 444-0848
E-mail: huangd@ccf.org

OCT of the eye, corneal wound healing, laser vision correction

Assistant Professor Brian Johnstone
Orthopaedics, 752-6590
E-mail: bxj9@cwru.edu

Orthopaedic biomechanics, cartilage

Adjunct Assistant Professor Jill W. Kawalec
Biomedical Engineering, Research Director Ohio College of Podiatric Medicine, 231-3300 ext. 7401

Biomaterials and biomechanics of foot prostheses

Adjunct Assistant Professor Kevin Kilgore
MetroHealth Medical Center, 778-3801
E-mail: kkilgore@metrohealth.org

Functional electrical stimulation, restoration of hand function in quadriplegics, hand biomechanics

Adjunct Professor Kandice Kottke-Marchant
Hematology, Cleveland Clinic Foundation, 444-2484
E-mail: marchak@ccf.org

Interaction of blood and materials

Adjunct Assistant Professor Melissa Knothe-Tate
Cleveland Clinic Foundation, 445-3223
E-mail: knothetate@earthlink.net

Mechanobiology of musculoskeletal system, cellular and orthopaedic biomechanics, implant design

Assistant Professor Kenneth R. Laurita
Heart and Vascular Research Center, MetroHealth Medical Center, 778-7340
E-mail: krl2@cwru.edu

Cardiac electrophysiology, arrhythmia mechanisms, intracellular calcium homeostasis, fluorescence imaging, instrumentation and software for potential mapping

Assistant Professor Zhenhong Lee
Department of Radiology, Division of Nuclear Medicine, University Hospitals, 844-3107
E-mail: zxl11@cwru.edu

Professor R. John Leigh
Neurology, VA Medical Center, 844-3190
E-mail: rjl4@cwru.edu

Normal and abnormal motor control of the eye

Assistant Professor Raymond Muzic
Radiology, University Hospitals, 884-3543
E-mail: rfm2@cwru.edu

Experiment design and analysis for positron emission tomography

Adjunct Assistant Professor Marc Penn
Cleveland Clinic Foundation, 444-7122
E-mail: pennm@ccf.org

Myocardial ischemia, remodeling, gene regulation and therapy

Adjunct Assistant Professor Kimberly Powell
Biomedical Engineering, Cleveland Clinic Foundation, 445-9364
E-mail: powell@bme.ri.ccf.org

Image post-processing for detection and diagnosis of breast cancer and quantitative microscopy

Assistant Professor Andrew M. Rollins
844-5904
E-mail: amr9@cwru.edu

Biomedical optics, optical biomedical diagnostics, novel optical methods for high-resolution, minimally invasive imaging, tissue characterization and analyte sensing, real-time microstructural and functional imaging using optical coherence tomography

Associate Professor David S. Rosenbaum
Heart and Vascular Research Center, MetroHealth Medical Center, 778-2005
E-mail: drosenbaum@metrohealth.org

High-resolution cardiac optical mapping, arrhythmia mechanisms, ECG signal processing

Assistant Professor Mark S. Rzeszotarski
Radiology, PHS Mt. Sinai Medical Center, 778-4021
E-mail: msr7@cwru.edu

Computer applications in radiology, magnetic resonance imaging, computed tomography, nuclear medicine, and ultrasound
Assistant Professor Ronald Triolo
Orthopaedics, VA Medical Center, 778-7877
E-mail: rxt24@cwru.edu

Restoration of lower extremity function through neuroprotheses and FES; Rehabilitation Engineering; biomechanics of human movement

Adjunct Associate Professor Ivan Vesely
Cleveland Clinic Foundation, 445-6671
E-mail: vesely@bme.ri.ccf.org

Micromechanics of heart valves; fatigue of soft tissue

Adjunct Assistant Professor D. Geoffrey Vince
Cleveland Clinic Foundation, 444-1211
E-mail: vince@bme.ri.ccf.org

Image and signal processing of intravascular ultrasound images, mechanics of coronary plaque rupture, cellular aspects of atherosclerosis

Professor Albert L. Waldo
Medicine/Cardiology, University Hospitals, 844-7196
E-mail: alw2@cwru.edu

Cardiac electrophysiology, cardiac excitation mapping

Adjunct Assistant Professor Guang H. Yue
Cleveland Clinic Foundation, 445-9336
E-mail: yue@bme.ri.ccf.org

Neural control of movement

Assistant Professor Nicholas P. Ziats
Pathology, University Hospitals, 368-5176
E-mail: npz@cwru.edu

Vascular grafts; vascular cells; blood vessels
CHEMICAL ENGINEERING

(First updated 1998)

UNDERGRADUATE RESEARCH COORDINATOR:  DEPARTMENT CHAIR:
J. Adin Mann, Jr.      Nelson C. Gardner
116 Smith Building, 368-4122     114 Smith Building, 368-4150
E-mail:  jam12@cwru.edu     E-mail:  nxg3@cwru.edu

RESEARCH ACTIVITIES

Chemical Engineers work on that very broad class of engineering problems in which chemistry plays an important role. These problems include design and control of large-scale chemical plants, water and air pollution abatement, coal and energy related problems, polymers and plastics, pharmaceuticals, metal plating electrochemical processes and many others central to our industrial economy. Current research topics include: colloidal phenomena, electrochemical engineering, separations, simulation, and surfaces and interfaces.

RESEARCH/INDEPENDENT STUDY COURSES

ECHE 250  Honors Research I (3).  A special program which affords a limited number of students the opportunity to conduct research under the guidance of one of the faculty. Faculty employs students through their sophomore and junior summers on their research teams.

ECHE 251  Honors Research II (3).  Same as ECHE 250.  Prerequisite: ECHE 250.

FACULTY

Professor John C. Angus
125 Smith Building, 368-4133
E-mail:  jca@cwru.edu

Low pressure growth of diamonds

Professor Coleman B Brosilow
131 Smith Building, 368-3810
E-mail:  ccb@cwru.edu

Simulation of large scale dynamic systems

Professor Robert V. Edwards
124B Smith Building, 368-4151
E-mail:  rve2@cwru.edu

Fluid flow measurement; laser anemometry; laser fluctuation spectroscopy; statistical data processing

Professor Donald L. Feke
111B Smith Building, 368-2750
E-mail:  dlf4@cwru.edu

Colloid materials and phenomena; separation processes for fine particles; interparticle forces; dispersive mixing

Associate Professor/Chair Nelson C. Gardner
113 Smith Building, 368-4150
E-mail:  nxg3@cwru.edu

Separation processes using high gravitational fields; flue gas desulfurization; polymer devolutilization.

Professor Uziel Landau
123 Smith Building, 368-4132
E-mail:  uxl@cwru.edu

Electrochemical engineering; electrodeposition and electro-dissolution; electroplating; electrosynthesis

Professor Chung-Chiu Liu
Smith Building, 368-2935
E-mail:  cxl9@cwru.edu

Electrochemical engineering; microelectronic materials; chemical biomedical sensors

Professor J. Adin Mann, Jr.
129 Smith Building, 368-4122
E-mail:  jam12@cwru.edu

Interfacial transport; liquid crystals; Langmuir-Blodgett films; liquid metal surface chemistry

Assistant Professor Philip W. Morrison, Jr.
133 Smith Building, 368-4238
E-mail:  pwm5@cwru.edu

Materials synthesis, in-situ diagnosis of thin film and particle formation processes

Professor Syed Qutubuddin
111C Smith Building, 368-2764
E-mail:  sxq@cwru.edu

Colloids; interfacial phenomena and polymers; surfactant systems; microemulsions and micelles

Professor Robert F. Savinell
111A Smith Building, 368-2728
E-mail:  rfs@cwru.edu

Applied electrochemistry; electrochemical engineering; batteries and fuel cells; electrochemical sensors
CIVIL ENGINEERING
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:       DEPARTMENT CHAIR:
Roberto Ballarini      Robert L. Mullen
205 Bingham Building, 368-2963      206 Bingham Building, 368-2423
E-mail:  rxb7@cwru.edu     E-mail:  rlm@cwru.edu

RESEARCH ACTIVITIES
Civil Engineering is concerned with the planning, design and construction of facilities for meeting the needs of modern society. Examples of such facilities are transportation systems, schools and office buildings, bridges, nuclear power plants, dams, land reclamation projects, water distribution systems, commercial buildings and industrial plants. Since Civil Engineering focus is on applications of technology for public good, research opportunities exist for undergraduate students with majors outside of the department who can apply their technological knowledge to civil engineering problems. An active research program gives students the opportunity to participate in projects related to design, analysis and testing. Projects are in areas such as probabilistic design, transportation structures and information systems, response of concrete and steel structures, fracture mechanics, mechanics of biological systems, static and dynamic behavior of soils, and earthquake engineering.

RESEARCH/INDEPENDENT STUDY COURSES:
ECIV 300  Undergraduate Research (3). Research conducted under the supervision of a sponsoring Civil Engineering faculty member. Research can be done on an independent topic or as part of an established ongoing research activity. The student will prepare a written report on the results of the research. Course may fulfill one technical elective requirement. Prerequisite: Consent of the instructor and department.

ECIV 396, 397  Civil Engineering Special Topics I and II (3). Special topics in civil engineering in which a regular course is not available. Conferences and report. Prerequisite: Consent of instructor.

FACULTY
Professor Roberto Ballarini
205 Bingham Building, 368-2963
E-mail:  rxb@cwru.edu

Solid mechanics; structural mechanics and engineering

Professor Ludwig Figueroa
210 Bingham Building, 368-6247
E-mail:  jlf@cwru.edu

Soil mechanics; pavement analysis and design; soil dynamics; constitutive equations of soils; liquefaction

Professor Dario Gasparini
209 Bingham Building 368-2699
E-mail:  dag6@cwru.edu

Structural dynamics; random vibration; stochastic processes

Associate Professor Arthur A. Huckelbridge, Jr.
211 Bingham Building, 368-2474
E-mail:  aah4@cwru.edu

Structural dynamics; design for dynamic loads

Professor Aaron A. Jennings
220 Bingham Building, 368-4998
E-mail:  aaj2@cwru.edu

Environmental modeling; environmental software; environmental decision making; remediation; aquatic chemistry; physico-chemical treatment process

Professor Robert L. Mullen
212A Bingham Building, 368-2423
E-mail:  rlm@cwru.edu

Computer methods in mechanics (finite elements); biomechanics of the skull, intelligent highway systems, image processing for experimental mechanics

Associate Professor Vassilis P. Panoskaltsis
207 Bingham Building, 368-2778
E-mail:  vpp@cwru.edu

Mechanics of solids; constitutive modeling of civil engineering materials; structural mechanics

Professor Adel S. Saada
105A Bingham Building, 368-2427
E-mail:  axs31@cwru.edu

Mechanics of materials; static and dynamic mechanical behavior of soils; foundation engineering

Assistant Professor Karen Skubal
219 Bingham Building, 368-6938
E-mail:  kls26@cwru.edu

Bioremediation of recalcitrant organic pollutants in soils and aquifers; environmental microbiology
Associate Professor Xiangwu (David) Zeng
212A Bingham Building, 368-2923
E-mail: xxz16@cwru.edu

Geotechnical earthquake engineering; centrifuge modeling; foundation vibration
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATORS: DEPARTMENT CHAIR:
George Ernst       B. Ross Barmish
508 Olin Bldg., 368-2839     407 Olin Bldg., 368-2802
E-mail: gwe@cwru.edu     E-mail: brb8@cwru.edu

Massood Tabib-Azar
517B Glennan Bldg., 368-6431
E-mail: mxt7@cwru.edu

Marc Buchner
707 Olin Bldg., 368-4096
E-mail: mxb11@cwru.edu

ASSOCIATE CHAIR FOR
UNDERGRADUATE STUDIES:
Frank Merat
518B Glennan Bldg., 368-6431
E-mail: flm@cwru.edu

ASSOCIATE CHAIR FOR
GRADUATE STUDIES:
Lee White
402 Olin Bldg., 368-3919
E-mail: ljw@cwru.edu

RESEARCH ACTIVITIES
The Electrical Engineering and Computer Science Department offers degree programs in Electrical Engineering, Computer Engineering, Computer Science, and Systems & Control Engineering.

Both the Computer Science and Computer Engineering programs give students a firm background in computing fundamentals: data structures, logic design, systems programming, operating systems and computer architecture.

Computer Engineering provides a solid engineering basics and perspective to the fundamentals of computing by a number of courses in hardware and software. The Computer Science program teaches the formal, mathematical basis of computing with classes such as algorithms and databases.

The Computer Science program teaches the formal, mathematical basis of computing with classes such as algorithms and databases.

Electrical Engineering provides a fundamental background in computer hardware and programming, analog and digital circuits, signals & systems, electromagnetic fields, and semiconductor electronic devices.

Systems and Control provides education in fundamental areas which include but are not limited to engineering optimization, computer simulation, systems modeling, control systems design and analysis, signal analysis, decision theory and engineering economics, as well as advanced mathematics and statistics courses.

All EECS engineering students participate in 1-2 semesters of Senior Project which may have a strong research and/or design component. Computer Science students may also take senior project as a technical elective.

RESEARCH/INDEPENDENT STUDY COURSES (Require consent of supervising faculty member)

EECS 290  Special Topics
EECS 396L  Special Topics
EECS 396M  Special Topics: Computer Science
EECS 396N  Special Topics
EECS 397L  Special Topics in Electrical Engineering

SAMPLE DEPARTMENT RESEARCH TOPICS:

Computer algorithms, bioinformatics
Database systems
Distributed computing, computer networks, high speed digital communications
Industrial control, manufacturing systems, automation, robotics
Intelligent systems, biorobotics, computational neuroscience
Robustness and simulation
Large-scale systems, world modeling for environmental policy
Micro-electromechanical systems, mixed-signal integrated circuits
Mixed-signal integrated circuits
Software engineering, software specifications and testing, program verification and design environments for software
VLSI CAD/embedded systems, design methodologies and design automation

FACULTY

Professor B. Ross Barmish
407 Olin Bldg., 368-2802
E-mail: brb8@cwru.edu

Control systems, robustness, probabilistic methods, Monte Carlo simulation

Professor Randall D. Beer
512 Olin Bldg., 368-2816
E-mail: rxb9@cwru.edu

Computational neuroscience, autonomous robotics

Assistant Professor Michael Branicky
515B Glennan Bldg., 368-6268
E-mail: msb11@cwru.edu

Intelligent systems and control; hybrid systems; learning; real-time and distributed control over networks; applications to robotics and flexible manufacturing

Associate Professor Marc Buchner
707 Olin Bldg., 368-4096
E-mail: mxb11@cwru.edu

Computer simulation of complex systems; control of industrial systems; analysis of discrete event and combined systems

Associate Professor Vira Chankong
708 Olin Bldg., 368-4054
E-mail: vxc2@cwru.edu

Large-scale and multi-objective optimization and its application to engineering problems; manufacturing and production systems; improvement of magnetic resonance imaging, decision theory; and risk analysis

Assistant Professor Ayse F. Ergun
509 Olin Bldg., 368-0356
E-mail: afe@cwru.edu

Program testing/verification, networking protocols, randomized algorithms, learning theory, cryptography

Associate Professor George W. Ernst
508 Olin Bldg., 368-2839
E-mail: gwe@cwru.edu

Learning problem solving strategies; artificial intelligence; expert systems; program verification

Associate Professor Steven L. Garverick
Glennan Bldg., 368-6435
E-mail: slg9@cwru.edu

Mixed-signal integrated circuit design, microelectromechanical system integration, sensor/actuator interfacing, data conversion, wireless communication, analog neural network circuits, medical instrumentation

Professor Dov Hazony
710A Glennan Bldg., 368-3937
E-mail: dxh2@cwru.edu

Network syntheses, ultrasonics, communications

Assistant Professor Vincenzo Liberatore
516 Glennan Bldg., 368-4089
E-mail: vxl11@cwru.edu

Distributed systems, Internet computing, randomized algorithms

Associate Professor Wei Lin
607 Olin Bldg., 368-4493
E-mail: wxl4@cwru.edu

Nonlinear dynamic systems and geometric control theory, discrete-time control systems; H-infinity and mixed H-2/H-infinity and robust control, adaptive control; system parameter estimation; adaptive and nonlinear control for robotics manipulators and induction motors; fault diagnosis and detection; control of nonholonomic mechanical systems and biomedical systems

Professor Kenneth A. Loparo
705 Olin Bldg., 368-4115
E-mail: kai4@cwru.edu

Stability and control of nonlinear and stochastic systems, analysis and control of discrete event systems, intelligent control systems and failure detection. Recent applications work focuses on the control and failure detection of rotating machines.

Professor Behnam Malakooti
611 Olin Bldg., 368-4462
E-mail: bxm4@cwru.edu

Industrial systems, manufacturing, production, management, and operational engineering. Multiple objective, decision making, and interactive optimization. AI, neural networks, clustering. Facility layout, group technology, machining.

Professor Mehran Mehregany
118 Bingham Bldg., 368-0755
E-mail: mxm31@cwru.edu
Silicon and silicon carbide microelectromechanical systems (MEMS), micromachining and microfabrication and related integrated circuits, materials, and modeling issues.

**Associate Professor Frank L. Merat**  
516 Glennan Bldg., 368-4572  
E-mail: flm@cwru.edu

Wireless networks; rf communications; optical MEMS devices; computer vision and image processing; neural networks

**Professor Mike D. Mesarovic**  
605 Olin Bldg., 368-4466  
E-mail: mdm5@cwru.edu

Complex systems theory; global issues and sustainable development

**Professor Wyatt Newman**  
510B Glennan Bldg., 368-6432  
E-mail: wsn@cwru.edu

Mechatronics; high-speed robot design; force and vision-based machine control; artificial reflexes for autonomous machines; rapid prototyping; agile manufacturing

**Professor Gultekin Ozsoyoglu**  
506 Olin Bldg., 368-5029  
E-mail: gxo3@cwru.edu

Databases; multimedia computing, digital libraries

**Professor Z. Meral Ozsoyoglu**  
511 Olin Bldg., 368-2818  
E-mail: mxo2@cwru.edu

Database theory; logic databases; database query and optimization

**Professor C. A. Papachristou**  
502 Olin Bldg., 368-5277  
E-mail: cap2@cwru.edu

VLSI design and CAD; computer architecture and parallel processing; design automation; embedded system design

**Associate Professor Stephen M. Phillips**  
517A Glennan Bldg., 368-6248  
E-mail: smp2@cwru.edu

Applications of control and signal processing to robotics and automation

**Assistant Professor Andy Podgurski**  
510 Olin Bldg., 368-6884  
E-mail: hap@cwru.edu

Software architecture and design; software engineering; distributed and real-time systems; flexible manufacturing systems; software testing and reliability assessment

**Associate Professor Daniel G. Saab**  
516 Olin Bldg., 368-2494  
E-mail: dgs3@cwru.edu

Computer architecture; VLSI system design and test; CAD design automation

**Assistant Professor Cenk Sahinalp**  
515 Olin Bldg., 368-6197  
E-mail: scs12@cwru.edu

Design, analysis and experimental evaluation of algorithms for pattern matching and indexing, data compression, communication networks and computational molecular biology

**Associate Professor N. Sreenath**  
608 Olin Bldg., 368-6219  
E-mail: nxs6@cwru.edu

Large scale systems; policy analysis; sustainable development; integrated assessment, global and environmental issues (water resources and global climate change); control theory applications and medical informatics

**Associate Professor Massood Tabib-Azar**  
517B Glennan Bldg., 368-6431  
E-mail: mxt7@cwru.edu

Semiconductor material and device characterizations; optical signal processing; novel high-frequency and high-power devices and circuits; spectroscopy and low temperature measurement; novel super-resolution near-field imaging probes; quantum computing

**Professor Lee J. White**  
402 Olin Bldg., 368-3919  
E-mail: jlw@cwru.edu

Software testing; current projects include regression testing, study of domain testing, specification-based testing and testing of object-oriented software

**Assistant Professor Darrin J. Young**  
516 Glennan Bldg., 368-8945  
E-mail: djy@cwru.edu

Micromachined sensors, high-Q passive components and integrated low power analog circuits for wireless communications

**Associate Professor Guo-Qiang Zhang**  
610 Olin Bldg., 368-0382  
E-mail: gxz11@cwru.edu

Programming languages, theory of computation, logic and topology in computer science
MACROMOLECULAR SCIENCE
(First updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR:  DEPARTMENT CHAIR:
John Blackwell  Alexander Jamieson
519 Kent Hale Smith Building, 368-6370  316 Kent Hale Smith Building, 368-4172
E-mail:  jxb6@cwru.edu  E-mail:  amj@cwru.edu

RESEARCH ACTIVITIES
Macromolecular Science is the study of the synthesis, structure and properties of polymers. These giant molecules are
the basis of synthetic materials including plastics, fibers, rubber, films, paints, membranes and adhesives. Research is
constantly expanding these applications through the development of new high-performance polymers, e.g. for engineering
composites, electronic, optical and biomedical uses. The research activities of the department span the entire scope of
macromolecular science and polymer technology: Synthesis, physical characterization, processing, biopolymers,
mechanical behavior and analysis, and materials development and design.

RESEARCH COURSES
EMAC 398, 399  Polymer Science and Engineering Project (Senior Project 1-9). Research under the guidance of staff,
culminating in a thesis.

EMAC 396, 397  Special Topics in Macromolecular Science (credit as arranged). Prerequisite: consent of instructor.

FACULTY

Professor Eric Baer
420 Kent Hale Smith Building, 368-4203
Irreversible microdeformation mechanisms; pressure
effects on morphology and mechanical properties; relationships between hierarchical structure and mechanical
function; mechanical properties of soft connective tissue; polymer composites and blends; polymerization and crystallization on crystalline surfaces; visco-elastic properties of polymer

Professor John Blackwell
316 Kent Hale Smith Building, 368-4172
E-mail:  jxb6@cwru.edu
Determination of the solid state of structure and morphology of polymers; X-ray studies of liquid crystalline polyesters, copolyaramids, polyurethanes, cellulose and cellulose derivatives; solution properties of polysaccharides; protein-polysaccharide interactions

Assistant Professor Elena Dormidontova
337 Kent Hale Smith Building, 368-6373
E-mail:  eed@cwru.edu
Statistical physics of macromolecules, phase behavior (phase stability and thermodynamic ordering) and properties of complex polymer and biopolymer systems: biocompatible and water-soluble polymers (their properties and applications for biomimetics and drug delivery), hydrogen bonded and associating polymers (reversibly associated living polymers), polymer/surfactant systems, polymer micelles (at thermodynamic equilibrium and micellization kinetics), polyelectrolytes and block copolymers.

Professor Anne Hiltner
423 Kent Hale Smith Building, 368-4186
Polymer blends and alloys; polymer composites; irreversible deformation and fracture of polymer blends
and composites; the polymer gel state; structure-function relationships in collagenous tissues; biodegradation of
biomaterials; halogenation of polyethylene

Professor Hatsuo Ishida
218 Kent Hale Smith Building, 368-4285
E-mail:  hxi3@cwru.edu
Molecular characterization of composite materials; polymer composite processing; synthesis and
colorization of new class of expanding polymers

Professor/Chair Alexander M. Jamieson
316 Kent Hale Smith Building, 368-4166
E-mail:  amj@cwru.edu
Physical chemical of macromolecules and biopolymers; laser light scattering and rheological characterization of
polymers in the solution, gel, liquid crystal and amorphous states

Professor Jack Koenig
212 Kent Hale Smith Building, 368-4176
E-mail:  jlk6@cwru.edu
Spectroscopic characterization of polymers
Professor Jerome B. Lando
321 Kent Hale Smith Building, 368-6366
E-mail: jbl2@cwru.edu

Organic reactions in the solid state; solid state polymerization; X-ray crystallography of polymers; ultrathin polymer films; electrical properties of polymers

Professor Morton H. Litt
512 Kent Hale Smith Building, 368-4174
E-mail: mhl2@cwru.edu

Conducting polymers; kinetics and mechanism problems; free volume in polymers; optimization in chemical problems; liquid crystal monomers and polymers

Assistant Professor Sergei Nazarenko
416 Kent Hale Smith Building, 368-6654
E-mail: sin@cwru.edu

Structure-property relationships in polymers, blends and composites; Diffusion and transport properties of polymeric materials; Macromolecular interdiffusion; Interfacial phenomena and adhesion; Nonequilibrium behavior of polymer glasses; Microlayer process technology

Professor Ica Manas-Zloczower
515 Kent Hale Smith Building, 368-3596
E-mail: ixm@cwru.edu

Dispersive mixing of solid additives into a polymeric matrix (mechanism and modeling); theoretical modeling of the blending process; design strategies and optimization for composite reactive polymer processing

Assistant Professor Stuart Rowan
522 Kent Hale Smith Building, 368-4242
E-mail: sjr4@cwru.edu

Organic chemistry, synthesis, supramolecular chemistry, conducting polymers, interlocked macromolecules (polyrotaxanes and polycatenanes), peptide nucleic acids, supramolecular polymerization, reversible ‘dynamic’ chemistry and combinatorial libraries

Associate Professor David Schiraldi
538 Kent Hale Smith Building, 368-4243
E-mail: das44@cwru.edu

Polymer synthesis and structure-property relationships, condensation polymers, polymer nanocomposites, polymerization catalysis, transport phenomena and packaging applications, polymer blends and complex polymer systems.

Assistant Professor Christoph Weder
416 Kent Hale Smith Building, 368-6374
E-mail: chw6@cwru.edu

Design, synthesis, structure-property relationship and application of novel functional polymer systems; advanced optical applications of polymers; anisotropic polymer systems; novel polymers for thin film and fiber applications
MATERIALS SCIENCE AND ENGINEERING
(Read updated 2003)

UNDERGRADUATE RESEARCH COORDINATOR:  DEPARTMENT CHAIR:
David H. Matthiesen      Gary M. Michael
420 White Building, 368-1366     500 White Building, 368-5070
E-mail:  dhm5@cwru.edu     E-mail:  gmm3@cwru.edu

RESEARCH ACTIVITIES
Materials Science and Engineering at Case Western Reserve University deals with the synthesis, structure, and processing of inorganic engineering materials. The department conducts research on metals, ceramics, composites, and electronic and biological materials. Current research activities in materials science and engineering are directed principally to the following areas: structure/property relationships, interfacial behavior, plastic flow and fracture, corrosion and oxidation, and materials processing. State-of-the-art instrumentation for study of these topics is available in the department.

RESEARCH/INDEPENDENT STUDY COURSES
EMSE 396, 397 Special Projects or Thesis (credit as arranged). Special research project or undergraduate thesis in selected material areas. Prerequisite: senior standing.

EMSE 398, 399 Materials Project Lab (3). Independent research project. Projects selected from those suggested by faculty; usually entail original research. Prerequisite: senior standing.

FACULTY

Professor James Cawley
412 White Building, 368-6482
E-mail:  jxc41@cwru.edu
Diffusion and solid state reaction; ceramic processings; microstructural design of composites

Associate Professor Mark De Guire
506 White Building, 368-4221
E-mail:  mrd2@cwru.edu
Electrical, optical and magnetic ceramics: synthesis, microstructural analysis, and property measurements on thin films and bulk materials

Professor Frank Ernst
414 White Building, 368-0611
Email:  fxe5@cwru.edu
Microstructure and microcharacterization of materials; photovoltaic materials; quantitative methods of transmission; electron microscopy.

University Professor and Kyocera Professor of Ceramics, Arthur H. Heuer
418 White Building, 368-3869
E-mail:  ahh@cwru.edu
Structure/property relationships in monolithic and biological ceramics; toughening mechanisms in ceramics; dielectric films for semiconductors; ceramics coatings; electron microscopy of ceramics; materials aspects of MEMS (microelectromechanical systems)

Professor Gerhard E. Welsch
514 White Building, 368-4236
E-mail:  gxw2@cwru.edu
Physical and processing metallurgy; oxidation and reduction; titanium alloy; materials for energy storage; high temperature materials.

Professor John J. Lewandowski
406 White Building, 368-4234
E-mail:  jjl3@cwru.edu
Microstructure/Mechanical property relationships in materials; deformation and fracture of composite materials; advanced composites; amorphous metals.

Associate Professor Peter K. Lagerlof
512 White Building, 368-6488
E-mail:  pxl4@cwru.edu
Mechanical properties of single and polycrystalline oxide ceramics; ceramic fibers, ceramics composites, mechanical properties of refractory metals electron microscopy

Professor David H. Matthiesen
402 White Building, 368-1366
E-mail:  dhm5@cwru.edu
Growth and characterization of electronic materials on earth and in space

Professor/Chair Gary M. Michal
500 White Building, 368-5070
E-mail:  gmm3@cwru.edu
Physical metallurgy; electron microscopy; surface science; composites; coatings
Professor Joe H. Payer
404 White Building, 368-4218
E-mail: jhp@cwru.edu

Corrosion; electrochemistry; reliability of electronic devices; biomedical corrosion; polymer/metal adhesion

Professor Pirouz Pirouz
510 White Building, 368-6486
E-mail: pxp7@cwru.edu

Defect structures in semiconductors and diamonds; transmission electron microscopy of materials; epitaxial growth
RESEARCH ACTIVITIES
The function of the mechanical engineer is to apply science and technology to the design, analysis, development, manufacture and use of machines (or other systems) that convert and transmit energy, or apply energy to the completion of useful operations. The research activities of the department include the study of the role of mechanics, thermodynamics, heat transfer and engineering design in a wide variety of applications such as aeronautics, astronautics, microgravity environments, energy, environment, materials, biological systems, machinery dynamics and tribology. Major research areas in the department include processes in microgravity environments, dynamics of rotating machinery, tribology, experimental fluid mechanics, manufacturing, nonlinear dynamic systems, robotics, experimental solid mechanics and failure mechanisms, orthopaedic biomechanics, molecular dynamics and kinetic theory.

RESEARCH/INDEPENDENT STUDY COURSES
EMCH 396, 397 Special Topics in Mechanical and Aerospace Engineering I & II (credit as arranged). Prerequisite: consent of instructor.

EMCH 398 Senior Project I (3). Individual or team design or experimental project under faculty supervision. Prerequisite: senior standing and consent of instructor.

FACULTY
Professor Isaac Greber
417 Glennan Building, 368-6451
E-mail: ixg2@cwru.edu

Fluid dynamics, molecular dynamics and kinetic theory

Associate Professor Roger D. Quinn
616 Glennan Building, 368-3222
E-mail: rdq@cwru.edu

Structural dynamics and control, robotics, manufacturing, space structures, vehicle dynamics
RESEARCH ACTIVITIES
The programs of the department provide the student with the basic concepts, analytical tools and methodology useful in the design, analysis and control of systems. Systems may be composed of technological, biological, industrial, environmental, social, political, economic and other components. General areas of current research include the following: control theory, control of industrial systems, mathematical systems theory, adaptive control of physiological systems, control of neuroprosthetic devices, fault diagnosis, medical decision analysis, and the application of computer-oriented technology to production and manufacturing problems.

RESEARCH/INDEPENDENT STUDY COURSES
ESCI 396 Special Topics in Systems Engineering (credit as arranged). Prerequisite: consent of department chair.

ESCI 398 Engineering Projects Laboratory I (3). Elective projects with emphasis on research and design.

ESCI 399 Engineering Projects Laboratory II (3) Continuation of elective project started in ESCI 398. Prerequisite: ESCI 398.

FACULTY
Associate Professor Marc Buchner
707 Olin Building, 368-4096
E-mail: mxb11@cwru.edu

Computer simulation of complex systems; control of industrial systems; and analysis of discrete event and combined systems

Associate Professor Vira Chankong
708 Olin Building, 368-4054
E-mail: vxc2@cwru.edu

Large-scale optimization; multiobjective optimization and its application to engineering problems and improvement of magnetic resonance imaging decision theory; and risk analysis

Assistant Professor Wei Lin
607 Olin Building, 368-4493
E-mail: wxl4@cwru.edu

Nonlinear dynamic systems and geometric control theory, $H$-infinity and mixed $H_2/H$-infinity and Robust Control, Adaptive control system parameter estimation, and adaptive and nonlinear control for robotic manipulators

Professor Kenneth A. Loparo
705 Olin Building, 368-4115
E-mail: kal4@cwru.edu

Stability and control of nonlinear and stochastic systems, analysis and control of discrete event systems, and intelligent control systems and failure detection. Recent applications work focuses on the control and failure detection of rotating machines

Professor Behnam Malakooti
611 Olin Building, 368-4462
E-mail: bxm4@cwru.edu

Industrial engineering, computer-aided manufacturing, man-machine systems, multiple-criteria decision making and optimization

Professor Mihajilo D. Mesarovic
609 Olin Building, 368-4466
E-mail: mdm5@cwru.edu

Research interests include large-scale systems theory, multilevel systems, and world and regional modeling

N. Sreenath
608 Olin Building, 368-6219
E-mail: nxs6@cwru.edu

Nonlinear systems theory, modeling, stability, and control; multibody systems; symbolic computation; large scale systems and applications of control theory global climate change problems
RESEARCH ACTIVITIES

The Department of Anatomy offers many opportunities for undergraduate students to gain experience in research topics ranging from anthropology and evolutionary theory to biochemical mechanisms and microscopic imaging techniques. Our faculty are affiliated with the CWRU School of Medicine Departments of Neurology and Orthopaedics, the CWRU Dental School, CWRU School of Engineering, Cleveland Institute of Art, and the Cleveland Museum of Natural History. These affiliations provide students with modern biomedical and imaging methods within the medical school environment or with the extensive osteological and hominid and non-hominid cast collections of the DMNH. Specific topics of study can be undertaken in investigations addressing the progression of myocardial and cerebral ischemic injury (‘heart attack’, ‘stroke’): membrane signal transduction, cellular electrolyte and pH regulation, cerebral blood flow and angiogenesis, microfluorometric imaging and confocal microscopy, immunofluorescent localization of calcium pumps and channels, phospholipase-mediated membrane injury, cartilage matrix proteins, gene expression, structure, and regeneration, hepatic mitochondrial injury by heavy metals, regulation of uterine hormone system, pancreatic endocrinology, glucose and insulin receptor regulation, or cerebral and spinal cord development; or, studies addressing human anatomy and evolution: dental development, locomotor and musculoskeletal systems, or morphometrics and medical imaging.

RESEARCH/INDEPENDENT STUDY COURSES

ANAT 399 Independent Study in Anatomy (credit as arranged). Limited to undergraduates. Prerequisite: Students must obtain approval of a supervising professor before registration and list the professor’s name on the schedule card.

FACULTY

**Assistant Professor Donald Ferguson**
WG34/GW1 School of Medicine, 368-1977/1973
E-mail: dgf4@cwru.edu

*Developmental expression of calcium channels in airway smooth muscle*

**Assistant Professor Thomas M. Hering** (Adjunct/Joint Faculty)
1024 Biomedical Research Building, 368-1375
E-mail: tmh@cwru.edu

*Cartilage extracellular matrix molecular biology*

**Associate Professor Ita Kaiserman-Abramof**
W514 School of Medicine, 368-2446
E-mail: irk@cwru.edu

*Uterine cycle hormonal control mechanisms*

**Assistant Professor Hue-Lee C. Kaung** (Adjunct/Joint Faculty)
Pediatrics, Rainbow Babies and Children’s Hospital, 368-8561
E-mail: hck2@cwru.edu

*Development of pancreatic islet cells*

**Professor/Acting Chair Joseph C. LaManna**
525 Biomedical Research Building, 368-1112
E-mail: jcl4@cwru.edu

*Cerebral blood flow and metabolism during cerebral ischemia (stroke) and hypoxia*

**Assistant Professor Bruce Latimer**
CMNH, 231-4600
E-mail: bxl14@cwru.edu

*Human evolution: Biomechanics of the human locomotor skeleton*

**Assistant Professor Charles Maier**
EA13 School of Medicine, 368-8629/6170
E-mail: cxm11@cwru.edu

*Glial cell pattern formation during spinal cord development in Xenopus*

**Professor Charles J. Malemud** (Adjunct/Joint Faculty)
1025 Biomedical Research Building, 368-1372
E-mail: cjm4@cwru.edu

*Regulation of cartilage matrix protein gene expression*
Assistant Professor Joseph C. Miller
EG11 School of Medicine, 368-1905/1115
E-mail: jcm18@cwru.edu

Biochemical mechanisms of cell injury during myocardial ischemia

Assistant Professor Anna-Lisa Nieminen
525 Biomedical Research Building, 368-3430
E-mail: aln33@cwru.edu

Mitochondrial function in toxic injury

Assistant Professor Scott W. Simpson
EG11 School of Medicine, 368-1946
E-mail: sws3@cwru.edu

Human evolution: dental development in humans, apes, and fossil hominids

Associate Professor Ronald Przybylski
W525A School of Medicine, 368-2389/2388
E-mail: rjp@cwru.edu

Heart attacks—mechanisms regulating ATP metabolism and secretion. Intact hearts and isolated myocytes are used in these studies correlating morphology, physiology and biochemistry
RESEARCH ACTIVITIES
The Department of Anesthesiology offers the opportunity for either basic science or clinical research for undergraduates. In the basic science arena, the mechanism of action of volatile anesthetics is being explored at the molecular level. In the clinical arena, multiple studies are being conducted in the areas of pain research, obstetrical anesthesia, informatics and quality assurance in patient care.

FACULTY

Dr. Evan Goodman
3611 Humphrey Building, 844-1657
E-mail: evan.goodman@uhhs.com

Multiple aspects of clinical care of the patient undergoing anesthesia, or of laboring patients receiving analgesia for childbirth.

Dr. Gary Kantor
2400 Bolwell Building, 844-7340
E-mail: gary.kantor@uhhs.com

Quality improvement of patient care; informatics/computer systems; clinical decision support; medical errors

Dr. Paul Tripi
2400 Bolwell Building, 844-7340
E-mail: paul.tripi@uhhs.com

Clinical research in children examining the psychosocial impact of anesthesia and surgery

Dr. Joel Zivot
2500 Lakeside Building, 844-8077
E-mail: joel.zivot@uhhs.com

Potential for a variety of clinical studies of patients in the Surgical Intensive Care Unit. Multiple aspects of patient care, including respiratory physiology, cardiac support, and sepsis, are available for study.

Dr. Philip Morgan
2400 Bolwell Building, 844-7334
E-mail: philip.morgan@uhhs.com

Pharmacogenetic studies of the sensitivity of an animal model to volatile anesthetics

Dr. Margaret Sedensky
2400 Bolwell Building, 844-7334
E-mail: margaret.sedensky@uhhs.com

Mutational analysis of mitochondrial proteins to the response to volatile anesthetics and aging

Dr. James Rowbottom
2400 Bolwell Building, 844-7334
E-mail: james.rowbottom@uhhs.com

The spectrum of patient care throughout the perioperative process. The development of projects which deal with perioperative issues, OR administration / efficiency, and critical care.

Dr. Donald Voltz
2400 Bolwell Building, 844-7340
E-mail: donald.voltz@uhhs.com

Multiple aspects of patient care in the operating room.
RESEARCH ACTIVITIES
Research interests within the Department of Biochemistry include a broad spectrum of modern biochemical topics. The department's research facilities include major special equipment and special facilities needed for research in modern biochemistry.

RESEARCH COURSES
BIOC 391 Research (credit as arranged)
Prerequisite: consent of instructor.

BIOC 371 Undergraduate Biochemistry Seminar (1). Discussion of selected topics of current interest based on appropriate literature. Prerequisite: BIOC 307, 308, or equivalent. Offered on pass/fail basis only.

FACULTY
Professor Vernon Anderson
368-2599
E-mail: vea@cwru.edu

Enzyme reaction mechanisms; protein-protein interactions

Professor Paul R. Carey
368-0031
E-mail: carey@biochemistry.cwru.edu

Raman spectroscopy of enzyme-substrate intermediates

Associate Professor Cheng-Ming Chiang
368-8550
E-mail:cmc23@cwru.edu

Mechanisms of transcriptional regulation in mammalian cells and their associated viruses

Professor Pieter L. deHaseth
368-3684
E-mail: pld2@cwru.edu

Protein-DNA interactions; regulation of gene expression

Professor Richard W. Hanson
368-3344
E-mail: rwh@cwru.edu

Hormonal regulations of gene expression

Assistant Professor Eckhard Jankowsky
368-3336
E-mail: exj13@cwru.edu

Measuring dynamics of ribonucleoprotein complexes using single molecule fluorescence techniques

Assistant Professor Hung-Ying Kao
Wearn 406, 844-7572
E-mail: hxk43@cwru.edu

Characterization of transcriptional co-repressor complex(es) and their roles in nuclear hormone receptors-related diseases

Associate Professor Ganesh Kumar
W457 Wood Building, 368-3348
E-mail: kgk@cwru.edu

Structure/function analysis of proteases and peptidases; EM crystallography; oxygen sensor mechanisms; neuropeptide metabolism

Assistant Professor David McPheeters
E-mail: dsm10@cwru.edu

Nuclear pre-messenger RNA splicing

Professor William C. Merrick
W469 Wood Building, 368-3578
E-mail: wcm2@cwru.edu

Studies on the enzymology/protein chemistry of eukaryotic protein synthesis

Assistant Professor Narendra Narayana
W502 Wood Building, 368-8740
E-mail: narayana@cwru.edu

X-ray crystallographic studies of biological molecules
Associate Professor Bryan L. Roth  
368-2730  
E-mail: roth@biocserver.cwru.edu  
Molecular pharmacology; structure-function studies of serotonin receptors; regulation of G-protein coupled receptors

Professor David R. Samols  
368-3520  
E-mail: drs10@cwru.edu  
Molecular biology; regulation of gene expression and structure/function relationships in proteins

Professor W. David Sedwick  
510 University Circle Research Center #2, 844-7525  
E-mail: wds@cwru.edu  
Genetic approaches to the study of chemotherapeutic agents at the DNA sequence level

Associate Professor Menachem Shoham  
368-4665  
E-mail: mxs10@cwru.edu  
Crystallization of proteins; x-ray crystallography of proteins; model building by computer graphics

Associate Professor Martin D. Snider  
368-5572  
E-mail: mds5@cwru.edu  
Biochemistry and cell biology of animal cells; synthesis and secretion of glycoproteins by these cells; machinery in cells for uptake of surface and extracellular molecules

Professor Edward Stavnezer  
368-3354  
E-mail: exs44@cwru.edu  
Role of ski oncogene in cell differentiation and transformation

Professor/Chair Michael A. Weiss  
368-3344  
E-mail: maw21@cwru.edu  
Structure of protein-nucleic acid complexes
DERMATOLOGY
(Last updated 1998)

UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:
Hasan Mukhtar       Kev in D. Cooper
521 Biomedical Research Building, 368-1127   531 Biomedical Research Building, 368-0237
E-mail:  hxm4@cwru.edu     E-mail:  kdc@cwru.edu

RESEARCH ACTIVITIES
The Department of Dermatology is recognized for its research and a National Institutes Health supported Center for Skin Diseases Research. The department recognizes its responsibility to provide for the growth of knowledge in medicine in general and in dermatology and cutaneous biology in particular. The department is committed to offering educational opportunities for basic scientists and physician-scientists whose research will eventually further our understanding of skin disease.

FACULTY

Assistant Professor Rajesh Agarwal
536 Biomedical Research Building, 368-1131
E-mail:  rxa8@cwru.edu
Mechanism of skin carcinogenesis and cancer chemoprevention employing state-of-the-art methods of molecular biology, cell biology and biochemistry

Professor Kevin D. Cooper
531 Biomedical Research Building, 368-0237
E-mail:  kdc@cwru.edu
Role of immune system in epidermal growth regulation and function; translational research in psoriasis, eczema, environmental skin injury, and immune regulation of skin cancer; photobiology/photoimmunology

Associate Professor Mahmoud Gannoum
3rd Floor Wearn Bldg., Mycology Laboratory, 844-8313
E-mail:  mag3@cwru.edu
Fungi, virulence, mechanisms of pathogenesis

Assistant Professor Anita Gilliam
529 Biomedical Research Building, 368-0236
E-mail:  acg@cwru.edu
Molecular biology, immunodermatology and dermatopathology, immunopathology of autoimmune diseases (scleroderma) with cutaneous manifestations

Associate Professor Kefei Kang
528 Biomedical Research Building, 368-0234
E-mail:  kxk9@cwru.edu
Mechanisms of immunosuppression by ultraviolet light, modulation of immunoregulatory cytokines in cutaneous antigen-presenting cells; interigin and cytokine-mediated monocyte/macrophage activation; cutaneous macrophage interaction with pathogenic fungi

Assistant Professor Neil J. Korman
3516 Lakeside Hospital, 844-3177
E-mail:  njk2@cwru.edu
Immunochemical and molecular biological characterization of autoantigens defined by autoantibodies in the autoimmune blistering diseases pemphigus and bullous pemphigoid

Professor Hasan Mukhtar
521 Biomedical Research Building, 368-1127
E-mail:  hxm4@cwru.edu
Mechanisms of skin carcinogenesis by ultraviolet light and chemicals; oncogenes and skin cancer; mechanisms of cancer chemoprevention; biochemical pharmacology and toxicology; photodynamic therapy of cancer

Assistant Professor Seth R. Stevens
533 Biomedical Research Building, 368-0209
E-mail:  srs@cwru.edu
Cellular immunology of T cell activation by skin antigen presenting cells. Clinical assessment tools in the evaluation of skin disease

Assistant Professor Gary S. Wood
K207 Veterans Administration Medical Center, 231-3240
E-mail:  gsw@cwru.edu
Molecular biology and immunopathology of cutaneous lymphomas and Langerhans cells
ENVIRONMENTAL HEALTH SCIENCES

UNDERGRADUATE RESEARCH COORDINATOR:

Martina L. Veigl
Univ. Circle Rsrch. Ctr., Bldg. 2, Suite 200, 844-7525
E-mail: mlv2@cwru.edu

DEPARTMENT CHAIR:

G. David McCoy (Acting Chair)
WG19, School of Medicine, 368-5963
E-mail: gdm@cwru.edu

RESEARCH ACTIVITIES

The goal of the Department of Environmental Health Sciences is to study the effects and define the mechanisms of action of the harmful physical and chemical agents in the environment that threaten human health and well-being. We define the discipline of Environmental Health Sciences as the investigation of factors, both intrinsic and extrinsic, which affect the quality of health, combining diverse fields such as chemistry, biochemistry, microbiology, genetics, molecular biology and computer sciences to study the mechanisms of cellular damage, toxicity, mutagenesis and carcinogenesis. Offices and laboratories for the faculty in the Environmental Health Sciences Graduate Program are located in the medical school and affiliated hospitals. Since most of the faculty maintain fully-funded research laboratories, the student will conduct research with the most modern and state-of-the-art equipment and techniques.

FACULTY

Professor Helen H. Evans
Radiation Biology
325 Biomedical Research Building, 368-1099
E-mail: hhe@cwru.edu

Radiation effects, DNA damage & repair, radon lethality, mechanisms of mutagenesis, genomic instability, radiation-induced signal transduction

Professor Stanton L. Gerson
Medicine
329 Biomedical Research Building, 844-1176
E-mail: slg5@cwru.edu

Transgenic mouse models of chemical carcinogenesis; retroviral gene therapy, DNA repair, hematopoietic stem cells

Professor Gilles Klopman
Chemistry
311SB Millis Science Center, 368-3622
E-mail: gxk6@cwru.edu

Development of structure-toxicity relationship and application of computer-based predictions of toxicity of chemicals, artificial intelligence programs

Associate Professor G. David McCoy
Acting Chairman, Environmental Health Sciences
WG-19, School of Medicine, 368-5963
E-mail: gdm@cwru.edu

Tobacco carcinogenesis, nicotine metabolism, nitric oxide

Professor Hasan Mukhtar
Dermatology
521 Biomedical Research Building, 368-1127
E-mail: hmx4@cwru.edu

Photodynamic therapy of cancer, onogenes and cancer, skin carcinogenesis, cancer chemoprevention, cytochrome P450, apoptosis, prostate cancer

Professor Nancy L. Oleinick
Radiation Biology
324 Biomedical Research Building, 368-1117
E-mail: nlo@cwru.edu

Signal transduction following oxidative stress induced by photodynamic therapy (a cancer therapy modelled by treatment of cells with a photosensitizer and light). Subcellular targets of damage from photodynamic therapy

Associate Professor Theresa P. Pretlow
Pathology - University Hospitals
B30 Institute of Pathology, 844-8583
E-mail: tpp3@cwru.edu

Carcinogenesis, colon cancer; premalignant alterations

Professor Norman Robbins
Neurosciences
Rm. 728 School of Medicine, 368-2194
E-mail: nxr@cwru.edu

Work with members of the public to develop more rational environmental health policy, regional environmental priorities, lead poisoning-policy and monitoring

Assistant Professor Ellen A. Rorke
Environmental Health Sciences
EB04G School of Medicine, 368-5410
E-mail: ear4@cwru.edu

Role of toxicants and antineoplastic agents on cervical cell differentiation and transformation; studies utilize both molecular and biochemical approaches

Professor Lawrence Sayre
Chemistry
414SA Millis Science Center, 368-3704
E-mail: lms3@cwru.edu

Enzymology and bioorganic chemistry of metabolic toxic activation
**Associate Professor David Sedwick**  
Medicine  
University Circle Research Center, Bldg. 2, Suite 200,  
844-7525  
E-mail: wds@cwru.edu

*Molecular, genetic, and enzymatic studies of mutations at the DNA sequence level, genetic susceptibility to cancer, DNA damage and drug access*

**Associate Professor Marie Varnes**  
Radiation Biology  
327 Biomedical Research Building, 368-1133  
E-mail: mxv2@cwru.edu

*Radiation biology, oxidative stress, role of intracellular pH, GSH & GHS transferase*

**Associate Professor Maritna L. Veigl**  
Cancer Center  
University Circle Research Center, Bldg. 2, Suite 200,  
844-7525  
E-mail: mlv2@cwru.edu

*DNA repair, mutation analysis in bacterial and mammalian gene targets, mutagenic effects in nucleotide pool imbalance, environmental mutagens*
RESEARCH ACTIVITIES

The Department of Epidemiology and Biostatistics includes the disciplines that form the scientific foundation for public health research and education, including: 1) Biostatistics: the design and analysis of biomedical research in humans and in laboratory experiments. Biostatistical theory forms the basis for the analysis of data in experiments for selected human populations and the generalization of the results to all human beings; 2) Epidemiology: the search for factors causing disease in humans and the study of the occurrence and distribution of diseases in human populations. The field of epidemiology is also concerned with the education of the public and strategies for adopting good health behavior practices. A relevant subspecialty is infectious disease epidemiology where the impact of infections and immunization on populations and the importance in preventing diseases is studied. The results of large epidemiological studies have formed the basis of intervention programs that have reduced the incidence of disease, increased the quality of life and extended life; 3) Genetic and Molecular Epidemiology: the study of genetic factors that determine the distributions and dynamics of disease in populations. Genetic epidemiology is an emerging field that synthesizes epidemiologic, quantitative genetic and molecular approaches to the study of disease; and 4) Health Services Research: the description, analysis, and evaluation of the organization, staffing, financing, utilization, and delivery of health care, with an emphasis on equity of access, cost effectiveness, and quality of care to populations and patients.

RESEARCH/INDEPENDENT STUDY COURSES

- **EPBI 471** Special Topics in Biostatistics (3)
- **EPBI 472** Special Topics in Statistical Genetics (1.0—4.0)
- **EPBI 499** Independent Study (credit as arranged)

FACULTY

**Assistant Professor Roger A. Bielefeld**
Wood Building WG72A, School of Medicine, 368-3195
E-mail: rab@hal.cwru.edu

Medical informatics; applications of fuzzy set theory, artificial neural networks, and evolutionary computation to biomedical research; computer simulation; statistical computing

**Professor Robert H. Binstock**
Wood Building, WG43, School of Medicine, 368-3725
E-mail: rhb3@cwru.edu

Geriatrics and gerontology; health care delivery; cost containment; public policy and aging

**Assistant Professor Gregory S. Cooper**
Wearn 247, University Hospitals, 844-5386
E-mail: gxc12@cwru.edu

Large database research to study quality of care and health care outcomes

**Associate Professor Neal V. Dawson**
Rammelkamp R222, MetroHealth Medical Center, 778-3902
E-mail: nvd@cwru.edu

Clinical epidemiology; health services research; physician and patient judgment; medical decision making; end of life care

**Associate Professor Paul K. Jones**
WG74A, School of Medicine, 368-3893
E-mail: pkj@hal.cwru.edu

Logistic regression; discriminant analysis; health care and health services research

**Professor Emeritus Edward A. Mortimer, Jr.**
WG57 School of Medicine, 368-5957
E-mail: eam7@cwru.edu

Causative epidemiology, especially infectious and child health; vaccines

**Assistant Professor Jane M. Olson**
Rammelkamp Building R258, MetroHealth Medical Center, 778-4057
E-mail: olson@darwin.cwru.edu

Genetic mapping of human diseases; inheritance of genetic traits; Crohn’s disease, intracranial aneurysms

**Assistant Professor Ashwini Sehgal**
Rammelkamp 228A, MetroHealth Medical Center, 778-7728
E-mail: sehgal@hal.cwru.edu

Dialysis; kidney transplantation; cognitive impairment; decision making for mentally incompetent patients; racial differences in access to health care; patient perceptions of illness
Assistant Professor Mendel Singer
Rammelkamp 229A, MetroHealth Medical Center, 778-3903
E-mail: mes12@cwru.edu

Cost-effectiveness analysis in health care; pharmacoeconomics; health-related quality of life

Associate Professor Kathleen A. Smyth
Fairhill Center for Aging, C220, 844-6414
E-mail: kxs11@cwru.edu

Computer-mediated education and support; impact of dementia care on family caregivers; use of formal services by persons with dementia and their families

Adjunct Assistant Professor George D. Weiner
K148 MetroHealth Medical Center, 778-5019
E-mail: gweiner@metrohealth.org

Health sciences research; health care utilization and access; demography

Assistant Professor John S. Witte
Rammelkamp Building, R237A, MetroHealth Medical Center, 778-8523
E-mail: witte@darwin.cwru.edu

Statistical methods in epidemiology and genetics; hierarchical modeling; study design, cancer research
RESEARCH ACTIVITIES

The Division of General Medical Sciences is an organizational unit formed to encompass interdisciplinary research and educational objectives. Special centers, each with individual directors and missions, are based in the Division. At present three centers function within the Division: the Center for Bioarchitectonics, the Center for Biomedical Ethics and the Cancer Research Center. Research in the laboratory of the Center for Bioarchitectonics has been focused on the kinetics and molecular mechanisms of axonal transport and growth associated with neuronal development, nerve regeneration and changes associated with aging. The research in the Center for Biomedical Ethics centers around a variety of issues in biomedical ethics, and research projects in the Cancer Research Center includes studies in both basic and clinical areas.

FACULTY

Associate Professor Stephen Post
T5 School of Medicine, 368-6205
GENETICS  
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:  
Marcelo Jacobs-Lorena  
631 Biomedical Research Bldg., 368-2791  
E-mail: mxj3@cwru.edu

DEPARTMENT CHAIR:  
Terry J. Hassold, Interim Co-Chair  
724 Biomedical Research Bldg., 368-3433  
E-mail: tjh6@cwru.edu

Patricia A. Hunt, Interim Co-Chair  
625 Biomedical Research Bldg., 368-3458  
E-mail: pah13@cwru.edu

Joseph H. Nadeau, Interim Co-Chair  
624 Biomedical Research Bldg., 368-0581  
E-mail: jhn4@cwru.edu

RESEARCH ACTIVITIES
The Department of Genetics embraces a unified program devoted to outstanding research and teaching in all areas of genetics, with a particular emphasis on human genetics. Research programs in the department concentrate on classical and modern genetic approaches to gene and chromosome structure and function. Specific areas include the genetic control of development processes in *Drosophila*, *Caenorhabditis elegans*, mouse and man, and the molecular and genetic basis of inherited human disease. Genetics underlies the basis of efforts to diagnose, understand, and develop advanced therapeutic approaches for an increasingly large number of human disease states. Close liaisons with medical research teams through the Center for Human Genetics provide many opportunities for students to utilize human material in genetic studies.

RESEARCH/INDEPENDENT STUDY COURSES
**GENE 399** Independent Study in Genetics (credit as arranged). Limited to undergraduates. Students must obtain approval of a supervising professor before registration and list the professor's name on the schedule form.

FACULTY (See faculty websites for more in-depth description of research: genetics.cwru.edu)

Assistant Professor Evan Eichler  
720 Biomedical Research Building, 368-4883  
E-mail: eee@cwru.edu

Genome structure and evolution; segmental duplications and recurrent chromosomal rearrangements; centromere organization; bioinformatics and computational biology

Associate Professor Peter Harte  
627 Biomedical Research Building, 368-6417  
E-mail: pjh3@cwru.edu

Transcriptional regulation; gene silencing; chromatin structure; homeotic genes; genetic control of development

Associate Professor James Jacobberger  
B41 Biomedical Research Building, 368-4645  
E-mail: jwj@cwru.edu

Analysis of cell regulatory networks; biological correlates in clinical trials; analytic cytology

Assistant Professor Bruce Lamb  
622 Biomedical Research Building, 368-2979  
E-mail: btl@cwru.edu

Animal models of neurodegenerative diseases; transgenic approaches to understanding Alzheimer's disease

Professor Marcelo Jacobs-Lorena  
631 Biomedical Research Building, 368-2791  
E-mail: mxj3@cwru.edu

Gene expression in insects of medical importance; interactions between the mosquito and the malaria parasite

Associate Professor Greg Matera  
727 Biomedical Research Building, 368-4922  
E-mail: gxm26@cwru.edu

Functional organization of the mammalian nucleus; control of gene expression; RNA processing; Spinal Muscular Atrophy

Professor Phil Morgan  
W154 School of Medicine, 368-3747  
E-mail: pgm2@cwru.edu

Genes involved in C.elegans nervous system development and membrane trafficking

Associate Professor Helen Salz  
626 Biomedical Research Building, 368-2879  
E-mail: hks@cwru.edu

Genetic control of RNA splicing in *Drosophila* development
Associate Professor Stuart Schwartz
725 Biomedical Research Building, 368-1255
E-mail: sxs95@cwru.edu

Chromosome structure and function; karyotype/phenotype correlation

Assistant Professor Matthew Warman
719 Biomedical Research Building, 368-4919
E-mail: mlw14@cwru.edu

Development and homeostasis of the skeletal system

Assistant Professor Michiko Watanabe
8316 and 8611 Rainbow Babies and Children’s Hospital, 844-7361
E-mail: mxw13@cwru.edu

Apoptosis in heart development; animal models of congenital heart disease; development of the cardiac conduction system

Assistant Professor Georgia Wiesner
630 Biomedical Research Building, 368-1197
1519 Lakeside, University Hospitals of Cleveland, 844-7236
E-mail: glw2@cwru.edu

Familial cancer; colon cancer; breast cancer

Assistant Professor Pete Zimmerman
W153 School of Medicine, 368-0508
E-mail: paz@cwru.edu

Genetic epidemiology of infectious diseases
RESEARCH ACTIVITIES
The medical education program of the Department of Medicine is designed to encourage the thoughtful and humanistic application of medical science to the care of patients with a wide variety of medical problems. In addition, the Department of Medicine has a large and active research program in which undergraduates may participate with the permission of the faculty involved. Areas of research in the department are: Asthma and allergic disorders, Cardiology, Hypertension, Infectious Diseases, Molecular Endocrinology, Nephrology, Pulmonary medicine and Rheumatology. Students should contact the division chief in the research area of interest.

RESEARCH/INDEPENDENT STUDY COURSES
BIOL 388  Undergraduate Research (1-3). Guided laboratory research under the sponsorship of a biology faculty member. May be carried out within the biology department or in associated departments. May be taken only one semester during academic career. Prerequisite: consent of department chair.

BIOL 390  Advanced Undergraduate Research (credit as arranged). Offered on a credit-only basis. Students may carry out research in biology or related departments, but a biology sponsor is required. Prerequisite: consent of department chair.
DIVISION OF CARDIOLOGY

Division Chief: Marc D. Thames
Division Manager: Joan Langan
3113 Lakeside Hospital, 844-8940
844-8952

FACULTY

Associate Professor John Hodgson
3113 Lakeside Hospital, 844-8970

Digital image processing of coronary angiograms; coronary flow and physiology; intravascular ultrasound

Ravi Nair, Acting Director, Cardiac Catheterization Laboratories
3113 Lakeside Hospital, 844-5170

Coronary angioplasty; intravascular ultrasound
DIVISION OF CLINICAL AND MOLECULAR ENDOCRINOLOGY

Division Chief: Faramarz Ismail-Beigi
432 Biomedical Research Building, 368-6129
E-mail: fxi2@cwru.edu

Division Manager: To Be Announced
Carrel #3,
4 W. Biomedical Research Bldg., 368-6129

FACULTY

Associate Professor Baha M. Arafah
3128 Lakeside, 844-3142
Pathophysiology of hypopituitarism in patients with hypothalamic/pituitary dysfunction; pituitary dynamic studies in patients with functioning and non-functioning pituitary adenomas

Professor David C. Aron
110 Veterans Administration Medical Center, 431-3032
Structure and function of insulin-like growth factor binding proteins in red blood cell production

Professor Faramarz Ismail-Beigi
432 Biomedical Research Building, 368-6129
E-mail: fxi2@cwru.edu
Regulation of Na,K-ATPase and glucose transporter gene expression

Professor Timothy S. Kern
434 Biomedical Research Building, 368-0800
E-mail: tsk@cwru.edu
Study of the biochemical mechanisms leading to long-term complications of diabetes (such as diabetic retinopathy), and development of therapies to inhibit those complications

Professor Bernard R. Landau
B08 School of Medicine, 368-4958
Tracing of carbohydrate and lipid metabolism in humans with special emphasis on diabetes mellitus

Assistant Professor Zuhayr T. Madhun
3128 Lakeside, 844-3142
Drug comparison trials in clinical diabetes mellitus; clinical thyroid screenings.

Professor Marc Thibonnier
431 Biomedical Research Building, 368-2910
E-mail: mxt10@cwru.edu
Study of the molecular pharmacology and genetics of human vasopressin receptors
DIVISION OF CLINICAL PHARMACOLOGY

Division Chief:        Division Manager:
Charles L. Hoppel     Donna Morrison
VA Medical Center B-18, 421-3221   844-5359

FACULTY

Professor Charles L. Hoppel
VA Medical Center B-18, 421-3221
Characterization of inhibitors of mitochondrial energy metabolism; regulation of mitochondrial fatty acid oxidation; molecular and cellular biology of carnitine palmitoyltransferase; development of analytical methods for acylcarnitines, drugs and antineoplastic agents

Assistant Professor Kou-Yi Tserng
VA Medical Center B-18, 371-7900, Ext. 4630
E-mail: kxt3@cwru.edu
Metabolic pathways of unsaturated fatty acids; alternate pathways of fatty acid oxidation; use of stable isotopes and gas chromatography/mass spectrometry in metabolic studies
DIVISION of GASTROENTEROLOGY

Division Chief: Michael V. Sivak
Division Manager: Avery Gottfried
253 Wearn Building, 844-7344

FACULTY

Assistant Professor Shukti Chakravarti
423 Biomedical Research Building, 368-1828
E-mail: sxc76@cwru.edu

Study of extracellular matrix biology in health and inflammatory diseases using biochemical and molecular genetic tools

Assistant Professor Gregory S. Cooper
249 Wearn Building, 844-5386
E-mail: gxc12@cwru.edu

Application of health services research to gastrointestinal disorders including colon cancer, cirrhosis and gastrointestinal bleeding, through the use of large databases, survey research and chart review studies

Professor of Medicine and Head, Gastroenterology
Research Glaudio Fiocchi
4 Biomedical Research Building, 368-1669
E-mail: cxf18@cwru.edu

Inflammatory bowel disease; Crohn’s disease; ulcerative colitis; mucosal immunity; cytokines; mucosal cell-cell interaction; immune cell gene regulation

Assistant Professor Joseph A. Izatt
246 Wearn Building, 844-7928
E-mail: jai3@cwru.edu

Biomedical optics and spectroscopy; laser-tissue interactions; novel techniques for endoscopic tissue characterization and early cancer detection in the gastrointestinal tract

Associate Professor Alan D. Levine
424 Biomedical Research Building, 368-1668
E-mail: adl4@cwru.edu

Mucosal immunity; T cell activation and signaling; Cytokines; Animal models of inflammatory bowel disease; Apoptosis; epithelial cells an antigen present cells
DIVISION OF GENERAL INTERNAL MEDICINE
AND HEALTH CARE RESEARCH

Division Chief:
C. Kent Kwoh, Director
WG-29, School of Medicine, 368-0728
E-mail: ckk8@cwru.edu

Institute Administrator:
Barb Juknialis
844-3309

FACULTY

Professor David C. Aron, M.D., M.S.
VA Medical Center, Room 2334, 421-3032
E-mail: dca2@cwru.edu

Medical decision making; curbside consultation; health services utilization

Assistant Professor Rebecca J. Beyth, M.D.
School of Medicine, WG-29B, 368-0740
E-mail: rjb16@cwru.edu

Risks and benefits of long-term anticoagulant therapy in elders; intervention strategies to prevent complications of anticoagulant therapy; multigenerational program to prevent substance abuse; polypharmacy and adverse drug reactions in older patients; physician-patient interactions and changing behaviors

Assistant Professor Gregory S. Cooper, M.D.
School of Medicine, WG-38C, 368-0736
E-mail: gxc12@cwru.edu

Use of large national and regional data bases to study medical practice; cancer screening and colon cancer incidence and mortality; variations in and effectiveness of treatment of patients with gastrointestinal hemorrhage; quality of disease management

Assistant Professor Kenneth E. Covinsky, M.D., M.P.H.
School of Medicine, WG-29C, 368-0724
E-mail: kec5@cwru.edu

Functional outcomes in older and chronically ill patients; impact of depression on health outcomes; patient perceptions of quality of life; ethnic/cultural differences in management of patients with osteoarthritis

Associate Professor Amy C. Justice, M.D., M.P.H.
School of Medicine, WG-29C, 368-0724
E-mail: kec5@cwru.edu

Outcomes of elders with HIV, with a focus on quality of life and mortality; quality of peer review; barriers and mediators of patient-provider communication regarding end-of-life care; prognostic modeling

Associate Professor C. Kent Kwoh, M.D., Director
School of Medicine, WG-23B, 368-0723
E-mail: ckk8@cwru.edu

Outcome assessment and health services rehabilitation for orthopedic procedures; intervention strategies in osteoporosis, population-based registries and risk factors for development of rheumatic disease

Associate Professor Susan Redline, M.D., M.P.H.
VA Medical Center, Room 2327, 791-3800 X5175
E-mail: sxr15@cwru.edu

Epidemiology of chronic lung diseases, particularly sleep-disordered breathing and chronic airway disease; Genetic epidemiology of sleep-disordered breathing; Health impact of sleep-disordered breathing and intervention studies in sleep-disordered breathing

Associate Professor Gary E. Rosenthal, M.D.
School of Medicine, WG-37D, 368-0726
E-mail: ger@cwru.edu

Evaluation of hospital and provider performance; Severity of illness and case-mix adjustment; use of patient satisfaction and other patient-centered outcome measures; organizational interventions to improve quality and efficiency of care

Associate Professor Laura A. Siminoff, Ph.D.
School of Medicine, WG-37B, 368-0669
E-mail: las5@cwru.edu

Organ procurement; medical decision making; bioethics; qualitative and survey research methods; quality of care; doctor-patient communications; doctor-patient relationship
DIVISION OF GEOGRAPHIC MEDICINE

Division Chief:
James W. Kazura
W137 School of Medicine, 368-4810
E-mail: jxk14@cwru.edu

Division Manager:
Kathy Pilny
368-4822
E-mail: kfp@cwru.edu

FACULTY

Associate Professor Ronald E. Blanton
W127A School of Medicine, 368-4814
E-mail: reb6@cwru.edu

The molecular biology of schistosomes and echinoccoccus (human parasites); immunology, development and molecular genetics

Associate Professor Frederick P. Heinzel
W127 School of Medicine, 368-1859
E-mail: fxh10@cwru.edu

Lymphokine biology of chronic infectious diseases

Professor James W. Kazura
W137 School of Medicine, 368-4810
E-mail: jxk14@cwru.edu

Vaccine development; immunology; helminthic infections; tropical diseases

Associate Professor Christopher L. King
W137B School of Medicine, 368-4817
E-mail: exk21@cwru.edu

Assistant Professor Eric Pearlman
W127B School of Medicine, 368-1856
E-mail: exp2@cwru.edu

T Cell immunology; eye disease

Associate Professor Nelson F. B. Phillips
W127C School of Medicine, 368-4816
E-mail: nfp@cwru.edu

Pyrophosphate/polyphosphate enzymes in giardia and mycobacterium structure-function

Assistant Professor Peter A. Zimmerman
W147 School of Medicine, 368-0508
E-mail: paz@cwru.edu

Identification of genetic factors that promote infection and pathogenesis in malaria
The Division of Geriatric Medicine is involved in three major areas of research. These include: Basic Biomedical Research - blood pressure regulation and aging; aging effects in adrenal function, and mechanisms of antibiotic resistance in the nursing home; Clinical Research in Aging - Ethics, interventional studies in acute care and long term care settings, and infectious diseases and aging; and Social/Behavioral Research - interactions between patients and health care professionals - oncology patients, evaluative research - primary care case management, social support and cancer, coping mechanisms, health psychology and human development, quality assurance in long term care settings, incontinence in post menopausal women, menopause; patients and their physicians, and process and outcome studies.

FACULTY

Assistant Professor Robert A. Bonomo
Geriatric CARE Center
B215 Fairhill Center for Aging, 844-7249
E-mail: rab14@cwru.edu
Epidemiology of Antibiotic resistance in nursing home and hospital settings; structure-function studies of beta-lactamase enzymes in Gram negative bacteria beta-lactamase inhibitors

Assistant Professor Patricia Campbell
Geriatric CARE Center
Fairhill Center for Aging, 844-7248
E-mail: pdm2@cwru.edu
Alcoholism in the elderly, especially diagnostic screening tools; long-term care of the elderly

Senior Instructor Teresa Dolinar
Geriatric CARE Center
Fairhill Center for Aging, 844-6305
E-mail: tmd8@cwru.edu
Palliative and hospice care of the elderly

Assistant Professor Thomas R. Hornick
VA Medical Center, 231-3439
E-mail: trh@cwru.edu
Steroidogenesis and aging adrenal cells

Assistant Professor Elizabeth O'Toole
Geriatric CARE Center
B203C Fairhill Center for Aging, 844-7229
E-mail: exo5@cwru.edu
Ethical health care decision-making in the care of the elderly, including end of life decision-making, attitudes about artificial provision of fluids and nutrition

Assistant Professor Julia Rose
Geriatric CARE Center
Fairhill Center for Aging, 368-5433
E-mail: jhr8@cwru.edu
Interactions between patients and health care professionals - oncology patients, evaluative research, primary care case management, social support and cancer, coping mechanisms, health psychology and human development, quality assurance in long term care settings, incontinence in post menopausal women, menopause; patients and their physicians, and process and outcome studies

Professor Jerome Kowal
Geriatric CARE Center
B222 Fairhill Center for Aging, 844-7246
E-mail: jxk9@cwru.edu
Steroid and cholesterol metabolism in the aging adrenal cortex; mechanisms of lipofuscin accumulation; geriatric training
DIVISION OF HEMATOLOGY/ONCOLOGY

Division Chief:  **Stanton Gerson**  
301A Biomedical Research Building, 368-1176  
E-mail: slg5@cwru.edu

RESEARCH ACTIVITIES

Prospective students (undergraduate, medical and housestaff) will have the opportunity to participate in clinically oriented research projects. Electives will usually entail a clinical research project involving some aspect in HIV infection/AIDS with an emphasis on AIDS-related neoplasia, developmental therapeutics, and general medical oncology. The student will likely interact/collaborate with other faculty/personnel in pathology, biostatistics, tumor registry, and other individuals as necessary. The student will become familiar with clinical research techniques, phase I-III clinical trial design, and come knowledgeable with the medical literature on the topic. Elective periods usually span several months and some projects may evolve over a couple years. Successful candidates will often present clinical research results at a scientific meeting/conference and submit a manuscript suitable for publication in a refereed medical/scientific journal. Please do not hesitate to contact Dr. Remick for any questions.

FACULTY

**Professor Nathan A. Berger**  
301A Biomedical Research Building, 368-1175  
Study of DNA damage and repair processes using in vivo and in vitro techniques. Studies at the molecular and cellular levels are focused on understanding the role of DNA repair processes in chemical carcinogenesis, chemo-prevention and chemotherapy of cancer

**Assistant Professor Mark J Cooper**  
301 Biomedical Research Building, 368-1176  
E-mail: mjc7@cwru.edu  
Identification of genetic aberrations important in the transformation and progression of cancer cells utilizing gene transfer technologies to screen cDNA libraries for genes able to deregulate tumor cell growth. There are opportunities for undergraduate students to be involved in these studies and to learn a number of molecular biology techniques, including DNA transfection; construction of cDNA libraries; DNA sequencing; polymerase chain reaction-based assays; Northern, Southern, and Western blotting; subcloning, etc.

**Professor Clark W. Distelhorst**  
309 Biomedical Research Building, 368-1176  
*Mechanism of steroid hormone action in malignant cells*

**Professor Stanton L. Gerson**  
309A Biomedical Research Building, 368-1176  
E-mail: slg5@cwru.edu  
*Tumor drug resistance; expression of genes in transgenic animals; retroviral gene transfer and gene therapy; mechanisms of carcinogenesis*

**Associate Professor W. David Sedwick**  
University Circle Research Center, Building 2, Room 200, 844-7525  
E-mail: wds@cwru.edu  
*Genetic approaches to the study of chemotherapeutic agents at the DNA sequence level*
DIVISION OF HYPERTENSION

Division Chief: Janice G. Douglas  
W165 School of Medicine, 368-4744  
E-mail: jgd3@cwru.edu

Office Manager: Irene Clayborn  
368-4747

FACULTY

Assistant Professor Liliana Berti-Mattera  
W149 School of Medicine, 368-4760

Molecular mechanisms by which vasoactive agonists influence peripheral nerve function and the changes that occur during diabetes. To identify, in immortalized Schwann cells, the receptor-mediated signaling pathways involved in myelination and maintenance of nerve function and the role of these cells in the development of diabetic neuropathy

Associate Professor Chung-Ho Chang  
W153 School of Medicine, 368-4749  
E-mail: cxc13@cwru.edu

Signal transduction of ANF (atrial natriuretic factor) receptor and antioxidants; Molecular cloning and characterization of regulatory proteins for guanylate cyclase. Structure-function studies of guanylate cyclase; regulation of hypoxia-inducible genes

Professor Janice G. Douglas  
W161 School of Medicine, 368-4744  
E-mail: jgd3@cwru.edu

The cellular and molecular mechanisms of angiotensin action involved in ion transport by the kidney and blood pressure regulation. Clinical studies are being conducted to investigate the mechanism of salt-sensitive African-American hypertension

Associate Professor Paul Ernsberger  
Nutrition, Dental School Rm. 201, 368-4738  
E-mail: pre@cwru.edu

The research focuses on the role of neurotransmitter receptors in the control of the sympathoadrenal system by the medulla oblongata. Neurotransmitter receptors in cardiovascular regions are studied by direct test-tube assays and by autoradiographic mapping in intact tissue slices. The test-tube assays have the advantage of being rapid and relatively easy to perform (200 samples can be run in a day), while autoradiographic assays have the advantage of precise anatomical and histological localization of receptors. A variety of receptors are under investigation, including adrenergic receptors, muscarinic acetylcholine receptors, and receptors for peptides such as angiotensin II, substance P, and endothelin. A special interest of my laboratory is a novel receptor, termed the “I1-imidazoline receptor” which recognizes clonidine and other related centrally-acting antihypertensive agents. This newly-discovered receptor is present in cardiovascular regions of the medulla oblongata and may participate in the control of blood pressure

Professor Jackson T. Wright, Jr.  
W165 School of Medicine, 844-1109  
E-mail: jxw20@cwru.edu

Clinical evaluations of new therapies to treat hypertension, evaluation of therapies to prevent complications of hypertension in African-Americans, and evaluation of mechanisms of salt sensitivity
DIVISION of INFECTIONOUS DISEASES

Acting Division Chief:        Division Manager:
Robert A. Salata      Debbie Ferrato
10 West Biomedical Research Building, 368-4844  368-4910

FACULTY
Professor Eric Arts
10 West Biomedical Research Building, 368-4844
E-mail:  eja3@cwru.edu

Analysis of drug resistance variants of HIV-1

Assistant Professor W. Henry Boom
10 West Biomedical Research Building, 368-4844
E-mail:  whb@cwru.edu

T-cell immunology of infectious diseases such as tuberculosis and HIV-1

Professor Jerrold Ellner
10 West Biomedical Research Building, 368-4845
E-mail:  jje@cwru.edu

Regulation of the cellular immune response in infectious diseases (tuberculosis, HIV)

Assistant Professor Sally L. Hodder
3555 Lakeside, 844-7421
E-mail:  slh3@cwru.edu

Respiratory infections in the elderly

Associate Professor Michael Lederman
Foley Building, 844-8786
E-mail:  mxl6@cwru.edu

Interaction of HIV and selected HIV genes in function of immunocompetent cells

Associate Professor Stuart F. J. Le Grice
10 West Biomedical Research Building, 368-6989
E-mail:  sfl@cwru.edu

Structure function relationships of the several enzymatic activities encoded by the HIV-1 and HIV-2 polymerase genes

Assistant Professor Phil Rather
School of Medicine WG15
E-mail:  pxr17@cwru.edu

Regulation of bacterial gene expression

Assistant Professor Louis Rice
Veterans Administration Medical Center, 791-3800
E-mail:  lbr@cwru.edu

Mechanisms of antibiotic resistance, specifically the molecular mechanisms of beta lactamase gene dissemination among enterococci

Associate Professor Robert A. Salata
10 West Biomedical Research Building, 368-4844
E-mail:  ras7@cwru.edu

Nosocomial, intraabdominal, musculoskeletal and transplant-associated infections; travelers' medicine; immunology

Associate Professor Zahra Toossi
10 West Biomedical Research Building, 368-4844
E-mail:  zxt2@cwru.edu

Cell-mediated immune responses, particularly the mechanisms of regulation of expression of cytokines such as IL-2, interferon gamma, and their receptors in antigen-drive cell systems. The main focus is on identification of mechanisms of immunosuppression during active tuberculosis

Assistant Professor Robert S. Wallis
10 West Biomedical Research Building, 368-4844
E-mail:  rsw2@cwru.edu

Microbial targets of the immune response in human tuberculosis
The role of the peritoneal macrophage and its immune modulating products, cytokines and eicosanoids dialysis; in the laboratory we study proliferation of, and stimulated cytokine and eicosanoid production by, peripheral blood mononuclear cells, monocytes and macrophages

The role of protein kinase C in the regulation of mesangial development and phenotype

Changes of immune regulation responsible for interstitial nephritis

Transcripitional and translational regulation of nonreceptor protein kinases stimulated by endothelin
FACULTY

Professor Murray D. Altose
Chief of Staff, A104 Veterans Administration Medical Center, 421-3030
E-mail: mda2@cwru.edu

Control of breathing; mechanisms of dyspnea

Professor Emeritus Thomas M. Daniel
Director, Center for International Health, 368-6321

Markov modeling and decision analysis to assess strategies for tuberculosis control

Professor Musa A. Haxhiu
EB54 or EB56, School of Medicine, 368-8630 or 368-8632
E-mail: mah10@cwru.edu

Central regulation of airway tone and airway secretion; neural transmitters involved in reflex responses of airways to stimulation of bronchial pulmonary sensory nerve endings; effects of intermittent and chronic exposure to environmental toxicants, like ozone and cigarette smoke, on phenotype expression of substance-P and galanin in the brainstem neurons; reorganization of neural circuitry as a base of airway hyperexcitability

Assistant Professor Mary B. Mazanec
934 Biomedical Research Building, 368-1272

The mucosal immune response to respiratory pathogens especially viruses; development of effective protective mucosal immunization protocols

Assistant Professor Jams R. Panuska
Airway Disease Center, 616 Wean Building, 844-7504
E-mail: jrp5@cwru.edu

Immunological mechanisms regulating the lung response to respiratory virus; the role of the human alveolar macrophage in the pathogenesis of respiratory viral infections; the mechanism by which oxygen regulates macrophage cytokine expression

Associate Professor Elizabeth A. Rich
1034 Biomedical Research Building, 368-1219

Immunopathogenesis of HIV disease and tuberculosis in the lung

Associate Professor Erik van Lunteren
K201 Veterans Administration Medical Center, 371-7900

Control of breathing; respiratory muscle contractility and endurance; ion channel properties of neurons
DIVISION of RHEUMATOLOGY

Division Chief: Roland W. Moskowitz
Division Manager: Christine Kehoe
201 Foley Building, 844-3168
844-1272

FACULTY

Associate Professor Tariq Haqqi
1040 Biomedical Research Building, 368-1379
E-mail: txh5@cwru.edu
Cytokine and T-cell receptor expression in murine collagen-induced arthritis/cloning of genes by differential display of mRNAs

Associate Professor Thomas Hering
1024 Biomedical Research Building, 368-1375
E-mail: tmh@cwru.edu
Cartilage extracellular matrix molecular biology

Associate Professor C. Kent Kwoh
201 Foley Building, 844-1011
E-mail: ckk8@cwru.edu
Racial differences in outcome in juvenile rheumatoid arthritis, and systemic lupus erythematosus, functional outcomes in total joint replacement

Professor Charles J. Malemud
1025 Biomedical Research Building, 368-1372
E-mail: cjm4@cwru.edu
Studies of the alterations in the large chondroitin-sulfate proteoglycan in human osteoarthritis, utilizing biochemical and immunochemical techniques; specific interest in the knowledge of whether chondrocytes within the affected cartilage or isolated from cartilage synthesize the proteoglycans found resident within the tissue

Professor Roland W. Moskowitz
201 Foley Building, 844-3168
Cartilage responses in experimentally induced osteoarthritis; studies of Type II collagen mutations in human familial osteoarthritis
RESEARCH ACTIVITIES

The Department of Molecular Biology, in association with the Center for RNA Molecular Biology, offers a program of study that emphasizes direct research participation under the guidance of a faculty mentor. There is no formal undergraduate program; however, a research course, MBIO 399 is offered so that qualified undergraduates can become familiar with an active research laboratory while learning advanced techniques. The department is well equipped for state-of-the-art research in molecular biology and microbiology. Current research programs include: RNA synthesis and post-transcriptional modification of RNA and its role in gene expression; mechanisms of RNA processing; regulation of viral and cellular oncogene expression and tumorigenesis by oncogenes; RNA/protein interactions involved in eukaryotic gene regulation; signal transduction; cell adhesion and actin organization; cell surface biochemistry and vesicular transport; yeast molecular biology and genetics; bacterial cell division and cell-cell communication; and mechanisms of bacterial pathogenesis. Extensive interdepartmental collaborations ensure that a broad range of resources are available to every student.

RESEARCH/INDEPENDENT STUDY COURSES

MBIO 399  Undergraduate Research in Molecular Biology and Microbiology (credit as arranged). Permits qualified undergraduates to work in a faculty member’s laboratory and learn modern molecular biological techniques. Prerequisite: consent of instructor.

FACULTY

Assistant Professor Eric Arts
BRB, 368-8904
Infectious Diseases
eja3@po.cwru.edu

Assistant Professor Joseph A. Bokar
BRB 301A School of Medicine, 368-5363
E-mail: jab5@cwru.edu

Study of post-transcriptional modifications of eukaryotic mRNA, with emphasis on formation and function of the modified nucleoside, N6-methyladenosine

Assistant Professor Susan Brady-Kalnay
W250 School of Medicine, 368-0330
E-mail: smb4@cwru.edu

Receptor protein tyrosine phosphatases; and cell adhesion

Assistant Professor James P. Bruzik
W103 School of Medicine, 368-3529
E-mail: jxb83@cwru.edu

Different aspects of RNA processing in eukaryotes including trans-splicing, splice site association and protein splicing factors

Assistant Professor Mark G. Caprara
W106 School of Medicine, 368-4757
E-mail: mgc3@cwru.edu

RNA/protein interactions; RNA folding and catalysis; intron transposition

Professor Lloyd A. Culp
W210 School of Medicine, 368-3407
E-mail: lac7@cwru.edu

Relationships between levels of expression of specific oncogenes during metastasis; adhesion changes of fibrosarcomas and neuroblastoma tumors

Professor Pamela B. Davis
BRB-8 School of Medicine, 368-4370
E-mail: pbd@cwru.edu

Structure-function studies of the cystic fibrosis transmembrane conductance regulator; gene therapy directed at airway and other epithelial cells

Associate Professor Piet A. J. De Boer
W276 School of Medicine, 368-1697
E-mail: pad5@cwru.edu

Molecular basis of bacterial cell division
Associate Professor Jonatha M. Gott
W272 School of Medicine, 368-3930
E-mail: jmg13@cwru.edu

Mitochondrial RNA synthesis and editing in Physarum

Associate Professor Michael E. Harris
W110 School of Medicine, 368-4779
E-mail: meh2@pop.cwru.edu
www://biocserver.bioc.cwru.edu/RNAP/harrispage/frame.html
Structure and enzymology of catalytic RNA; ribozymes

Professor Faramarz Ismail-Beigi
BRB-432 School of Medicine, 368-6129
E-mail: fxi2@cwru.edu

Regulation of Na, K-ATPase and control of glucose transporter expression and function

Jonathan Karn
W235 School of Medicine, 368-3915
E-mail: jxk153@cwru.edu

Professor Sanford Markowitz
UCRC 200-2, School of Medicine, 844-8237

Colon cancer; oncogenes and suppressor genes in sporadic and inherited colon cancer

Professor Timothy W. Nilsen
W203 School of Medicine, 368-3913
E-mail: majournal@cwru.edu

RNA processing; trans and cis splicing in vitro

Assistant Professor Richard A. Padgett
NC20 Cleveland Clinic, 445-2692
E-mail: padgetr@cesmtp.ccf.org

Mechanisms of RNA splicing

Associate Professor Philip Rather
WG15 School of Medicine, 368-0733
E-mail: pxr17@cwru.edu
www.cwru.edu/med/microbio/rather.htm

Bacterial genetics; transcriptional regulation in prokaryotes; control of bacterial gene expression by cell-to-cell communication

Assistant Professor Rolf Renne
BRB-3 School of Medicine, 368-1190
E-mail: rfr3@cwru.edu

The biology of human herpesvirus type 8, a virus linked to Kaposi’s sarcoma

Associate Professor Jo Ann Wise
W259 School of Medicine, 368-1876
E-mail: jaw17@cwru.edu

Genetic and genomic analyses of premessenger RNA splicing
NEUROLOGICAL SURGERY
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR: Shenandoah Robinson, M.D.
Rainbow Babies & Children's Hospital B501, 844-5741
E-mail: shenandoah.robinson@uhhs.com

DEPARTMENT CHAIR: Robert A. Ratcheson, M.D.
Hanna House 5th Flr., 844-3004
E-mail: robert.ratcheson@uhhs.com

RESEARCH ACTIVITIES
The Department of Neurological Surgery offers basic science, translational, and clinical research opportunities that focus on understanding the pathophysiology of neurosurgical problems and developing innovative treatments. Student research projects are developed individually to accommodate the student's interests and level of experience and commitment, and coordinate with ongoing research projects.

RESEARCH/INDEPENDENT STUDY COURSES
Independent Study (1-6). Students may propose topics for independent reading and research. Prerequisite: Consent of instructor.

FACULTY

Associate Professor Alan R. Cohen
Rainbow Babies & Children's Hospital B501, 844-5741
E-mail: alan.cohen@uhhs.com

Minimally invasive neurosurgery, endoscopy, hydrocephalus, pediatric neurosurgery

Assistant Professor David Dean
Biomedical Research Building 5th Flr., 368-1975
E-mail: dxd@cwru.edu

Medical imaging, computer graphics, surgical guidance

Professor W. David Lust
Biomedical Research Building 5th Flr., 368-1108
E-mail: wdl@cwru.edu

Cerebral ischemia, stroke, brain metabolism, brain injury

Professor Robert J. Macuinas
Hanna House 5th Flr., 844-3004
E-mail: Robert.macuinas@uhhs.com

Movement disorders, brain mapping, image guidance, interventional MRI, epilepsy

Assistant Professor Andrew K, Metzger
Hanna House 5th Flr., 844-5776
E-mail: Andrew.Metzger@uhhs.com

Brain tumors, gene expression, microarray analysis, gene chips, cancer genetics

Professor/Chair Robert A. Ratcheson
Hanna House 5th Flr., 844-3004
E-mail: Robert.ratcheson@uhhs.com

Assistant Professor Shenandoah Robinson
Rainbow Babies & Children's Hospital B501, 844-5741
E-mail: Shenandoah.robinson@uhhs.com

Cerebral palsy, spasticity, epilepsy, tumors, glial development, pediatric neurosurgery

Professor Warren R. Selman
Hanna House 5th Flr., 844-5745
E-mail: warren.selman@uhhs.com

Stroke, cerebral ischemia, brain metabolism, brain injury
NEUROLOGY
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:  DEPARTMENT CHAIR:
Henry J. Kaminski      Dennis Landis
E705 School of Medicine, 368-0250    Hanna House 5, 844-3193
E-mail: hjk3@cwru.edu

RESEARCH ACTIVITIES
The major objectives of the Department of Neurology are the education of medical students and house staff in clinical
neurology and neurosciences as well as the advancement of clinical and basic neuroscience through research. The
faculty consists of clinicians and scientists with clinical and research interests in a variety of fields. These include stroke,
dementia, behavioral neurology, Parkinson's and related diseases, myasthenia gravis, muscular dystrophy, headaches,
sleep disorders, chronic pain, autonomic disturbances, epilepsy, and neuro-opthalmology.

FACULTY
Francisco H. Andrade, Ph.D.
Wearn 650, University Hospitals of Cleveland, 844-4793
E-mail: fha@cwru.edu

Functional properties, biochemistry and cell biology of
skeletal muscles

Thomas C. Chelimsky, M.D.
Bolwell 3 Autonomic Laboratory, University Hospitals of
Cleveland, 844-3495

Autonomic physiology and the physiology of pain

Henry J. Kaminski, M.D.
E705 School of Medicine, 368-0250
E-mail: hjk3@cwru.edu

Muscle physiology, myasthenia gravis, nitric oxide
influences on muscle function

Robert L. Ruff, M.D., Ph.D.
Louis Stokes Veterans Affairs Medical Center, 421-3040
E-mail: Robert.Ruff@med.va.gov

Neurorehabilitation of stroke

John S. Stahl, M.D., Ph.D.
Cleveland VA Medical Center & University Hospitals of
Cleveland
E-mail: jss6@cwru.edu

The laboratory attempts to understand the neuronal
circuitry used to control movement of the eyes, and to
apply this knowledge to the diagnosis and treatment of
neurologic disease. These goals are reached through
recordings of eye movements in humans and mice,
using analytical techniques drawn from control systems
engineering.

Barbara Swartz, M.D., Ph.D.
University Hospitals of Cleveland, 844-3714
E-mail: Barbara.Swartz@uhhs.com

Cognitive functions assessed during intracarotid amytal
studies, parietal lobe seizure disorders

Osama Zaidat, M.D.
University Hospitals of Cleveland, 844-3193
E-mail: ozaidat@hotmail.com

Cerebrovascular disease outcome research, spinal cord
injury, cardiac arrest, sleep and stroke
RESEARCH ACTIVITIES

Research interests within the Department of Neurosciences include mechanisms of development of sensory and motor systems, regeneration, axon pathfinding, synaptic function and plasticity, neurotrophic regulation, systems neuroscience, neuropharmacology, neuron-glial interactions, expression and regulation of neurotransmitters and receptors and neurogenetics.

RESEARCH/INDEPENDENT STUDY COURSES

Students who wish to pursue research in Neurosciences generally sign up for research in their home department (eg. BIOL 390).

FACULTY

**Associate Professor Evan Deneris**  
E732 School of Medicine, 368-8725  
E-mail: esd@cwru.edu  
Regulation and expression of neuronal nicotinic acetylcholine receptors

**Assistant Professor David Friel**  
E610 School of Medicine, 368-4930  
E-mail: ddf2@cwru.edu  
Voltage- and ligand-gated calcium channels and their role in stimulus-response coupling

**Assistant Professor Alison Hall**  
E709 School of Medicine, 368-6711  
E-mail: axh8@cwru.edu  
Influence of cell lineage and environmental cues on peripheral nervous system differentiation

**Assistant Professor Stefan Herlitze**  
E604 School of Medicine, 368-1804  
E-mail: sxh106@cwru.edu  
Function of presynaptic Ca^{2+} channels and their modulation by G proteins

**Professor Karl Herrup**  
E504 School of Medicine, 368-6100  
E-mail: kkh@cwru.edu  
Molecular genetic analysis of central nervous system development: Alzheimer's disease

**Associate Professor David Katz**  
EB05G School of Medicine, 368-6116  
Growth factor regulation of neuronal survival; molecular mechanisms of transmitter development in sensory neurons

**Professor Diana Kunze**  
R326/R334 Rammelkamp Center for Education & Research, MHMC, 778-8967  
E-mail: dkunze@research.mhmc.org  
Role of ion channels in the neural regulation of cardiovascular and respiratory function

**Professor/Chair Lynn Landmesser**  
839 Biomedical Research Building, 368-3996  
E-mail: ltl@cwru.edu  
Mechanisms of specific axon guidance and synapse formation

**Professor Gary Landreth**  
E531 School of Medicine, 368-6101  
E-mail: gel2@cwru.edu  
Mechanism of action of nerve growth factor

**Professor Vance Lemmon**  
E661 School of Medicine, 368-3039  
E-mail: vxl@cwru.edu  
Cell recognition in the developing nervous system; molecular probes for specific neuronal classes

**Professor Robert Miller**  
E728 School of Medicine, 368-6269  
E-mail: rhm3@cwru.edu  
Lineage and function of glial cells

**Professor Jerry Silver**  
E728 School of Medicine, 368-2150  
The role of glial cells in the development and regeneration of neural circuits
Assistant Professor Ben Strowbridge
E653 School of Medicine, 368-6974
E-mail: bxs48@cwru.edu

Physiology of synaptic connections in olfactory bulb and hippocampus

Professor Richard Zigmond
E701 School of Medicine, 368-4614
E-mail: rez@cwru.edu

Biochemical plasticity in mature neurons; role of nerve activity and cytokines in the regulation of neural gene expression
RESEARCH ACTIVITIES

The focus of the Department of Nutrition is on human nutrition and metabolism. Biochemical and molecular methods are being used to study Metabolic Regulations. The overall goal is the application of the science of nutrition to the maintenance and improvement of health.

RESEARCH/INDEPENDENT STUDY COURSES

NTRN 371, 372 Special Problems (1-3 credit hours). Independent reading and research, or special projects supervised by a member of the nutrition faculty. Prerequisite junior or senior standing and approval by supervising professor before registration.

FACULTY

Assistant Professor Hope Barkoukis
201 School of Dentistry, 368-2441
E-mail: hdb@cwru.edu

Nutritional management of cirrhosis of the liver

Professor/Chair Henri Brunengraber
201 School of Dentistry, 368-2440
E-mail: hxb8@cwru.edu

Development of new compounds for intravenous nutrition; regulation of ketone body metabolism; gluconeogenesis; use of stable isotopes for metabolic studies

Associate Professor Paul Ernsberger
108B Pathology Building, 368-4738
E-mail: pre@cwru.edu

Genetic obesity; hypertension and diabetics; Drug-Nutrient interactions

Associate Professor Karen Fiedler
201 School of Dentistry, 368-6631
E-mail: kmf3@cwru.edu

Food systems management; school nutrition services

Associate Professor Maria Hatzoglou
W503 Medical School, 368-3012
E-mail: mxh8@cwru.edu

Hormonal regulation of genes involved in aminoacid metabolism and gene therapy of metabolic diseases

Assistant Professor Janos Kerner
Veterans Affairs Medical Center, 791-3800 ext. 4630
E-mail: jxk81@cwru.edu

Mitochondrial fatty acid oxidation and the regulation of the pathway by malonyl-CoA

Associate Professor Edith Lerner
201 School of Dentistry, 368-2443
E-mail: exl2@cwru.edu

Factors affecting pregnancy outcome; zinc metabolism and assessment during pregnancy; trace mineral interactions

Associate Professor Duna Massilion
W501 School of Medicine, 368-2135
E-mail: dxm71@cwru.edu

Nutrient regulation of gene expression; glucose signaling pathway in the liver

Associate Professor Laura Nagy
201 School of Dentistry, 368-6625
E-mail: len2@cwru.edu

Dietary control of cellular signal transduction mechanisms

Assistant Professor Stephen Previs
201 School of Dentistry, 368-4958
E-mail: sxp29@cwru.edu

Metabolism of carbohydrate, lipid and protein

Associate Professor Kou-Yi Tserng
Veterans Affairs Medical Center, 791-3800 ext. 4630
E-mail: kxt3@cwru.edu

Metabolism of polyunsaturated fatty acid
OPHTHALMOLOGY
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:
Ram H. Nagaraj, Ph.D.
Wearn Bldg., Rm. 647, 844-1132
E-mail: nhr@cwru.edu

DEPARTMENT CHAIR:
Jonathan H. Lass, M.D.
Lakeside 4126, 844-8590
E-mail: jhl7@cwru.edu

RESEARCH ACTIVITIES
The Department of Ophthalmology has an outstanding research program that covers both clinical and basic science aspects of eye disorders. The department is the center for the Visual Science Research Center of CWRU, which is supported by a NIH Core Grant and an unrestricted grant from Research to Prevent Blindness. The department offers a number of opportunities for undergraduate students for research in the areas of extra ocular muscle biology, visual processing, neuroscience, cataract, diabetic retinopathy and corneal infection.

FACULTY
Jonathan H. Lass, M.D.
4126 Lakeside, 844-8590

Immune-mediated onchocerchal Keratitis; corneal endothelial image analysis; in vitro corneal epithelial toxicity model

John D. Porter, Ph.D.
Wearn 6th Floor, 844-7053

Cellular and molecular diversity of extraocular muscle; developmental regulation of the extraocular muscle phenotype by genetic and epigenetic factors

Ram H. Nagaraj, Ph.D.
Wearn 6th Floor, 844-1132

Role of sugars in protein modifications in aging and diabetes and the role of oxidative stress in protein damage; protein modification by sugars and dicarbonyl compounds; human and experimental cataract; diabetic retinopathy; protein aging; oxidative damage to proteins and lipids

Eric Pearlman, Ph.D.
School of Medicine, W137, 368-1856

Understanding the molecular events that mediate attachment of inflammatory cells to the vascular endothelium and their migration into the tissues; studies focus on recruitment of inflammatory cells to the cornea, which results in loss of corneal clarity and impairment of vision; river blindness

Timothy Kern, Ph.D.
434 Biomedical Research Bldg., 368-0800

Investigating the mechanisms by which diabetes mellitus causes complications in the eye, kidney, and nerve; role of hyperglycemia in the development of microvascular lesions in the retina

Susanne Mohr, Ph.D.
4th Floor Biomedical Research Building, 368-0503

Retinal cell apoptosis in diabetes

Edward Medof, M.D., Ph.D.
Pathology, 368-5434

Compliment regulatory proteins

Paco Andrade, Ph.D.
Wearn 6th Floor, 844-4793

The lab studies the functional properties, biochemistry and cell biology of the extraocular muscles, the small muscles that move the eyes. Keywords: muscle, extraocular muscle, free radicals, fatigue, muscular dystrophy, calcium homoeostasis
ORTHOPAEDICS

(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:
Thomas M. Hering, Ph.D.     Victor M. Goldberg
1024 Biomedical Research Building, 368-1375     Lakeside Hospital
E-mail: tmh@cwru.edu 844-3044

RESEARCH ACTIVITIES

The Department of Orthopaedics has a multifaceted goal encompassing the broad spectrum of education including the education of medical students, orthopaedic residents in both the local community of orthopaedic surgeons and the national orthopaedic community in knowledge and progress in orthopaedic surgery. In addition, the department endeavors to maintain both basic science and clinical research activity contributing to the advancement of orthopaedic knowledge.

FACULTY

Assistant Professor R. Tracy Ballock
337F Rainbow Babies and Children’s Hospital, 844-5416

Regulation of bone growth in children; genetic mutations resulting in abnormal bone growth

Professor Dwight Davy
615 Glennan Building, 368-6443
E-mail: dtd@cwru.edu

Biomechanics of bone and joints; mechanics of implants; biological interactions in tissues

Assistant Professor Edward M. Greenfield
1028 Biomedical Research Building, 368-1331
E-mail: emg3@cwru.edu

Cell-cell interactions in bones, particularly cytokine production by osteoblasts that regulate activity of osteoclasts; cellular mechanisms of orthopaedic implant loosening

Associate Professor Thomas M. Hering
1023 Biomedical Research Building, 368-1375

Cartilage extracellular matrix molecular biology; regulation of gene expression during chondrogenesis; mechanisms of degradation of cartilage extracellular matrix

Assistant Professor Brian Johnstone
1026 Biomedical Research Building, 368-1335

In vitro chondrogenesis of bone marrow cells

Assistant Professor Michael W. Keith
2500 MetroHealth Drive, 459-4399

Spinal cord injury; functional electrical stimulation; hand trauma

Assistant Professor Matthew J. Kraay
5th Floor Bowell Building, 844-8372

Clinical results of total joint replacement; biomechanics of joint replacements; biologic fixation of joint replacements

Professor John T. Makley
6th Floor Lakeside Hospital, Musculoskeletal Tumor Center
844-3033

Clinical research in metastatic bone disease over the last 30 years - effects of treatment, time of diagnosis, time to death

Professor E. Byron Marsolais
Lakeside Hospital, 844-3042

Functional electrical stimulation research and application in paralyzed patients

Professor Clyde L. Nash, Jr.
MetroHealth Medical Center, 459-3890

Spinal deformity; intraoperative neurophysiological monitoring

Professor P. Hunter Peckham
MetroHealth Medical Center, 459-3480

Control of the musculoskeletal system by electrical stimulation; neuroprosthesis; upper extremity disorders

Associate Professor Clare M. Rimnac
620 Glennan Building, 368-6442
E-mail: cmr10@cwru.edu

Mechanical performance of implant materials; design and development of implants; implant retrieval analysis; mechanical performance of bone tissue and whole bone structures
Professor John W. Shaffer  
Veterans Administration Hospital, 791-3800

Orthopaedic hand and microvascular research

Clinical Instructor John K. Sontich  
MetroHealth Medical Center, 459-4294

Clinical research in multiple trauma patients to include complicated intra-articular fractures and the response of adult articular cartilage to traumatic injury; clinical research to include Ilizarov bone lengthening device

Assistant Professor Matthew Stewart  
1022 Biomedical Research Building, 368-1371

Regulation of the proliferation and hypertrophic differentiation of chondrocytes

Instructor Jean F. Welter  
1048a Biomedical Research Building, 368-1326  
E-mail: jfw2@cwru.edu

Regulation of gene expression by mechanical loads in skeletal cells, transcriptional regulation during mesenchymal stem cell differentiation
RESEARCH ACTIVITIES

The educational mission of the Department of Pathology is directed primarily to providing students with a framework for understanding the origins, nature, mechanisms and manifestations of disease. In so doing, the department attempts to integrate pathology with the other basic sciences and with clinical medicine. The department’s research facilities are commensurate with the needs of the most contemporary of laboratories. The department has particular commitments to immunology, cancer biology, tissue injury and healing, biomaterials and biocompatibility, neurobiology, and aging. Members of the faculty are specialists in immunology, molecular biology, virology, carcinogenesis, and vesicular traffic in the cell cytoplasm.

RESEARCH/INDEPENDENT STUDY COURSES

PATH 390  Undergraduate Research in Cancer Biology, Immunology or Pathology (1-3). A student undertakes a research project directly related to an ongoing project in a faculty investigator's laboratory. A written proposal is prepared by the student in consultation with the instructor prior to registration for course credit. Prerequisite: one year college credit in chemistry and prior approval of instructor.

PATH 395  Relevant readings and literature search on particular topic(s) chosen by the student are directed by the instructor(1-3). A written proposal is prepared by the student in consultation with the instructor prior to registration for course credit. Prerequisite: one year college credit in chemistry and prior approval of instructor.

FACULTY

Assistant Professor Craig Atwood
511 Institute of Pathology, 368-5903
E-mail: csa4@cwru.edu
Endocrinological and oxidative mechanisms of aging and neurodegeneration

Professor James M. Anderson
208 Institute of Pathology, 844-1012
E-mail: jma6@cwru.edu
Blood/materials interactions; cell and tissue/materials interactions; implant retrieval and evaluation

Professor Steven N. Emancipator
108A Institute of Pathology, 844-3970
E-mail: sne@cwru.edu
In vitro and in vivo studies on the mechanisms of immune complex glomerulonephritis; immunopathology in general, especially hypersensitivity disease

Professor Pierluigi Gambetti
419 Institute of Pathology, 368-0587
E-mail: pxg13@cwru.edu
Molecular pathology of Alzheimer and Prion diseases

Professor Neil S. Greenspan
927 Biomedical Research Building, 368-1280
E-mail: nsg@cwru.edu
Molecular basis of immunological recognition; bacterial vaccines and immunity to bacteria; humoral autoimmunity

Professor Clifford Harding
925 Biomedical Research Building, 368-5059
E-mail: cvh3@cwru.edu
Immunology, antigen processing, major histocompatibility complex, tumor immunity, microbial immunity, tuberculosis immunity, vaccine, adjuvant, cell biology, endocytosis, phagocytosis

Associate Professor Yung T. Huang
519 Institute of Pathology, 844-8611
E-mail: yth@cwru.edu
Study of the molecular biology of RNA; study of the role of IgA in prevention of SIV/HIV infection

Professor David R. Kaplan
926 Biomedical Research Building, 368-1279
E-mail: drk5@cwru.edu
Flow cytometric analysis, detection of viral products and cytokines

Professor Michael E. Lamm
924 Biomedical Research Building, 368-1265
E-mail: mel6@cwru.edu

**Mucosal immunity**

**Professor Paul V. Lehmann**
929 Biomedical Research Building, 368-1297
E-mail: pvl2@cwru.edu

T cell immunology; T cell-mediated autoimmune disease

**Professor M. Edward Medof**
301 Institute of Pathology, 368-5434
E-mail: mxm16@cwru.edu

Molecular biology/protein chemistry of decay accelerating factor (DAF), membrane cofactor protein (MCP), CD59 and C3b receptor (CR1), cell membrane self-recognition and pathogen binding proteins. Analyses of the molecular defect in paroxysmal nocturnal hemoglobinutia (PNH) and the GPI anchoring pathway. Regulation of inflammation in the eye.

**Professor Vincent M. Monnier**
Institute of Pathology, 368-6613
E-mail: vmm3@cwru.edu

Basic mechanisms of aging, in particular the role of reducing sugars in the complications of diabetes and aging

**Professor John G. Nedrud**
919 Biomedical Research Building, 368-1201
E-mail: jgn@cwru.edu

Helicobacter pylori pathogenesis and immunology including vaccines. Mucosal immunology of respiratory viral infections and mechanisms of action of mucosal adjuvants such as cholera toxin

**Assistant Professor Clara Pelfrey**
The Cleveland Clinic Foundation, Lerner Research Institute
Department of Neurosciences, NC30, 444-9184
E-mail: pelfrec@ccf.org

Immunology of the human autoimmune disease multiple sclerosis (MS) by examining lymphocyte responses in peripheral blood; examining gender differences in immune responses in MS; monitoring immunologial effects of therapy in clinical trials in MS.

**Professor and Interim Chair George Perry**
403 Institute of Pathology, 368-2488
E-mail: gxp7@cwru.edu

Cell biology of neurodegenerative diseases, particularly Alzheimer disease with a focus on cytoskeleton, amyloidosis and oxidative stress

**Associate Professor Robert Petersen**

401 Institute of Pathology, 368-6709
E-mail: rbp@cwru.edu

**Professor Sanjay Pimplikar**
923 Biomedical Research Bldg., 368-1282
E-mail: swp@cwru.edu

**Professor Theresa P. Pretlow**
B30 Institute of Pathology, 368-8702
E-mail: tpp3@cwru.edu

**Professor Thomas G. Pretlow**
B30 Institute of Pathology, 844-8583
E-mail: tgp3@cwru.edu

**Associate Professor Neena Singh**
Institute of Pathology, 368-2617
E-mail: nx2@cwru.edu

**Professor Mark A. Smith**
501 Institute of Pathology, 368-3670
E-mail: mas21@cwru.edu

**Professor Man-Sun Sy**
933 Biomedical Research Building, 368-1268
E-mail: mxs92@cwru.edu

**Professor Alan M. Tartakoff**
Institute of Pathology, 368-5544
E-mail: amt10@cwru.edu

**Assistant Professor Magdalena Tary-Lehmann**
928 Biomedical Research Building, 368-1298
E-mail: mxt27@cwru.edu

*T cell immunology, tumor immunology, T cell biology in HIV disease*

**Associate Professor Scott Vande Pol**
922 Biomedical Research Building, 368-1679
E-mail: sbv@cwru.edu

*Molecular biology of DNA tumor Viruses; cell cycle regulation*

**Assistant Professor Nicholas P. Ziats**

E-mail: npz@cwru.edu

*303 Institute of Pathology, 368-5176*

Vascular pathobiology; extracellular matrix proteins; vascular cell biology; blood-biomaterial interactions
RESEARCH ACTIVITIES
Research activities in the Department of Pediatrics are focused on issues which have major impact on child health and disease. Undergraduates may participate in a number of laboratory and clinical research projects with faculty supervision. The areas of research include: host-defense mechanisms with particular areas of emphasis on pulmonary and gastrointestinal infections, basic biology of the innate and specific immune processes, cystic fibrosis, control of respiration in the newborn, perinatal and neonatal metabolism, inborn errors of metabolism, perinatal and childhood endocrine disorders, polycystic kidney disease, language and learning disorders, the effect of substance abuse on childhood development, and developmental genetics. Many of the research programs within the department are focused on translational issues, the interface between the basic science and the clinical disease. Many studies involve questions about genetic predispositions for the development of diseases.

RESEARCH/INDEPENDENT STUDY COURSES
EPBI 499 Independent Study (credit as arranged).

FACULTY

Professor Ellis D. Avner
784 Rainbow Babies and Childrens Hospital, 844-3884
E-mail: eda@cwru.edu

Polycystic kidney disease

Associate Professor Cynthia F. Bearer
4024 Rainbow Babies and Childrens Hospital, 844-5249
E-mail: cfb3@cwru.edu

Developmental neurotoxicity, fetal brain reaggregating tissue culture, fat metabolism of CNS

Professor Melvin Berger
594 Rainbow Babies and Childrens Hospital, 844-3237
E-mail: mxb12@cwru.edu

Cytokines and inflammation in the lung in CF; receptor trafficking in human blood neutrophils

Associate Professor Calvin Cotton
825 Biomedical Research Building, 368-4603
E-mail: cuc@cwru.edu

Ion transport; pH regulation; cystic fibrosis

Professor Leona Cuttler
790 Rainbow Babies and Childrens Hospital, 844-3661
E-mail: lxc15@cwru.edu

Growth hormone studies

Professor Steven Czinn
706 Rainbow Babies and Childrens Hospital, 844-1765
E-mail: sjc3@cwru.edu

Helicobacter pylori in gastrointestinal disorders

Professor Pamela B. Davis
831 Biomedical Research Building, 368-4370
E-mail: pbd@cwru.edu

Gene transfer to respiratory epithelial cells

Associate Professor Dorr G. Dearborn
824 Biomedical Research Building, 368-4518
E-mail: dxd9@cwru.edu

Nucleotide regulation of cystic fibrosis protein (CFTR); protein structure and function, pulmonary hemosiderosis

Professor Claire M. Doerschuk, M.D.
787 Rainbow Babies & Children's Hospital, 844-3669
E-mail: cmd22@cwru.edu

Pulmonary infections and regulation of host defense

Professor Dennis Drotar, Ph.D.
Mather House, rainbow Babies & Children's Hospital, 844-3230
E-mail: dxd3@cwru.edu

Assessment of the quality of life of children with chronic health conditions and interventions to promote adherence to treatment and improve the functioning of children with chronic health conditions and their families

Professor Maureen Hack
3106 Rainbow Babies and Childrens Hospital, 844-3387
E-mail: mxh7@cwru.edu

Mortality and later outcome of very low birthweight children
Assistant Professor Howard Hall
1100 Rainbow Babies and Childrens Hospital, 844-3760
E-mail: hrh@cwru.edu

Hypnosis and the immune system; self-regulation of physiologic processes

Associate Professor Michael Infeld
829 Biomedical Research Building, 368-6894
E-mail: mdi@cwru.edu

Development of the lung; lung extracellular matrix

Assistant Professor Barbara A. Lewis
109F Biomedical Research Building, 368-3594
E-mail: bxl@cwru.edu

Genetic and familial basis of speech, language and learning disabilities

Professor Richard J. Martin
3100 Rainbow Babies and Childrens Hospital, 844-3387
E-mail: rxm6@cwru.edu

Development of respiratory control mechanisms; neonatal apnea; regulation of airway contractile responses during development

Associate Professor Lolita McDavid
790 Rainbow Babies and Childrens Hospital, 844-3886
E-mail: lmm7@cwru.edu

Child maltreatment: effectiveness of multidisciplinary teaching strategies

Associate Professor Stephanie Orellana, Ph.D.
8318 Horvitz Pediatric Research Center, Rainbow Babies & Children's Hospital, 844-7360
E-mail: sao3@cwru.edu

The cellular mechanisms underlying the development of kidney disease in children

Assistant Professor Tonya Palermo, Ph.D.
Mather House, Rm. 215, Rainbow Babies & Children's Hospital, 844-3230
E-mail: txm36@cwru.edu

Recurrent and chronic pain in children

Professor Susan Redline, M.D., MPH
790 Rainbow Babies & Children's Hospital, 844-4997
E-mail: sxr15@cwru.edu

The epidemiology of chronic respiratory diseases, including asthma and sleep apnea

Professor Mark S. Scher, M.D.
Mather House, Rm. 330, Rainbow Babies & Children's Hospital, 844-5344
E-mail: mss20@cwru.edu

Neonatal neurology and developmental sleep in children

Professor John R. Schreiber
4007 Rainbow Babies and Childrens Hospital, 844-3645
E-mail: jrs3@cwru.edu

Molecular biology of immunoglobulin function; knock-out mouse model of immunoglobulin deficiency

Professor Lynn Singer, Ph.D.
Triangle Building, Ste. 250-A, 844-6212
E-mail: lxs5@cwru.edu

Family adaptation to developmental and psychological sequelae of high-risk conditions of infancy

Associate Professor Ronald W. Walenga
822 Biomedical Research Building, 368-4558
E-mail: rxw13@cwru.edu

Regulation of prostaglandin synthesis, and cyclooxygenase expression

Associate Professor Michiko Watanabe
468 Rainbow Babies and Childrens Hospital, 844-3212
E-mail: mxw13@cwru.edu

The role of cell adhesion molecules in cardiogenesis: Septation and Development of the Cardiac Conduction System

Associate Professor Martha S. Wright
1105 Rainbow Babies and Childrens Hospital, 844-8716
E-mail: msw5@cwru.edu

Epidemiology of violent injury in children; prevention of injuries in children
RESEARCH ACTIVITIES
CWRU undergraduates are encouraged to contact any faculty member directly whose research interests them if they would like to consider undergraduate research during the academic year. At least half of the faculty have one or more undergraduates working in their labs. In addition, our Summer Undergraduate Research Program provides "hands on" research experience for sophomores and juniors in the area of molecular pharmacology. Although the projects will vary, each is related to a common theme: elucidation of the molecular mechanisms underlying the interaction of chemical agents such as drugs, hormones and neurotransmitters with biological systems. Students spend at least ten weeks working on a research project in a lab selected according to their interests. In addition to research, weekly seminars are presented to acquaint the students with the broad range of research projects in the Pharmacology Department. Summer undergraduate researchers receive a stipend if admitted to the formal SURP class for that summer.

RESEARCH COURSES
PHRM 301 Undergraduate Research (credit as arranged). Prerequisite: one year of undergraduate study as a science major.

FACULTY

Assistant Professor Anthony J. Berdis
W343 School of Medicine, 368-4723
E-mail: ajb15@cwru.edu
Mechanistic studies of the enzymes and protein complexes involved in DNA replication and DNA methylation

Assistant Professor Diane R. Dowd
W334 School of Medicine, 368-4076
E-mail: dxd57@cwru.edu
Mechanisms of Ca\(^{2+}\)-induced gene expression

Professor Charles L. Hoppel
Wade Park VA Hospital, 791-3800 x5657
E-mail: clh5@cwru.edu
Role of carnitine in the control of fatty acid oxidation; carnitine biosynthesis and metabolism at the cellular and clinical levels

Assistant Professor Ruth A. Keri
W343 School of Medicine, 368-3495
E-mail: rak5@cwru.edu
Hormonal control of mammary gland development and construction of transgenic mouse models of breast cancer; functional genomics of mammary gland development and cancer

Associate Professor Paul N. MacDonald
W334 School of Medicine, 368-2466
E-mail: pnm2@cwru.edu
Vitamin D-mediated transcription, nuclear receptor coactivators and corepressors

Professor Michael E. Maguire
W367 School of Medicine, 368-6186
E-mail: mem6@cwru.edu
Role of Mg\(^{2+}\) and Mn\(^{2+}\) in bacterial pathogenesis; physiological and biochemical roles of Mg\(^{2+}\); characterization and regulation of plasma membrane Mg\(^{2+}\) and Mn\(^{2+}\) transport systems

Professor John J. Mieyal
W348 School of Medicine, 368-3383
E-mail: jjm5@cwru.edu
Enzymatic reaction mechanisms involved in intracellular sulfhydryl homeostasis, drug and xenobiotic metabolism, and cancer chemotherapy

Professor/Chair John H. Nilson
W319 School of Medicine, 368-4497
E-mail: jhn@cwru.edu
Mechanisms governing hormonal regulation and tissue-specific gene expression of glycoprotein hormones;
construction of transgenic mouse models that mimic human reproductive disorders

Assistant Professor David C. Schultz
W348 School of Medicine, 368-5116
Email: dsc17@cwru.edu

Epigenetic regulation of gene expression.

Professor Ruth E. Siegel
W374 School of Medicine, 368-5554
E-mail: res7@cwru.edu

Developmental expression and regulation of the GABA_A receptor gene family; gene expression in the differentiating cerebellum

Assistant Professor Amy Wilson-Delfosse
W304 School of Medicine, 368-3494
E-mail: axw41@cwru.edu

Elucidation of the mechanisms underlying the upstream regulation of Cdc42Hs, a GTPase that plays a critical role in mediating processes associated with cell growth

Professor Yu-Chung Yang
W353 School of Medicine, 368-6931
E-mail: ycy36@cwru.edu

Cytokine signal transduction; transcription factors; hematopoiesis
New discoveries which influence our health and life are being made in the biomedical sciences at an ever-increasing rate. To provide undergraduates interested in a biomedical research career with an opportunity for firsthand knowledge of how new data are obtained and interpreted in major research laboratories, the Department of Physiology & Biophysics offers summer research traineeships to approximately 20-30 undergraduate students. The students are assigned laboratories and work together with faculty to obtain hands-on research experience in the life sciences.

The Summer Undergraduate Research Program (SURP) is designed for outstanding students with majors in biology, chemistry, physics or related disciplines. Students will carry out a research project under the close guidance of a faculty member during the summer months (8-10 weeks). Stipends in the amount of $2500 and on-campus housing are provided for out-of-state participants only.

Decisions on acceptance into the program will be made on a continuous basis. However, most decisions for acceptance are made by March 31. Letters of inquiry should be directed to: Arminta Thompson, Coordinator, SURP, Department of Physiology and Biophysics, School of Medicine, Case Western Reserve University, Cleveland, OH 44106-4970: (216) 368-2084.

FACULTY

Associate Professor Meredith Bond
Lerner Research Institute, Cleveland Clinic 444-3734
E-mail: bondm@ccf.org

Regulation of cardiac contractility-fatty acid and protein kinase modulated pathways

Assistant Professor Frank Brozovich
E648 School of Medicine, 368-1643
E-mail: fxb9@cwru.edu

Regulation of the cross-bridge cycle in smooth muscle, 2nd messenger signal transduction

Associate Professor Cathleen Carlin
E542 School of Medicine, 368-8939
E-mail: cxc39@cwru.edu

Polypeptide growth factors; protein tyrosine kinases; epidermal growth factor receptor; DNA tumor viruses

Professor Pamela Davis
Rainbow Babies & Childrens Hospital, 844-3267
E-mail: pbd@cwru.edu

Molecular biologic studies of cystic fibrosis, the protein which is defective in the disease (called CFTR) and methods of treating the disease, including gene therapy

Professor Paul DiCorleto
Cleveland Clinic, 444-5849
E-mail: dicorlp@ccf.org

Vascular cell gene expression and intracellular signalling pathways; vascular cell growth

Professor George Dubyak
E555 School of Medicine, 368-5523
E-mail: gxd3@cwru.edu

Biochemistry of hormone receptors, transmembrane signaling and intracellular messengers

Professor Richard Eckert
E544 School of Medicine, 368-5530
E-mail: rle2@cwru.edu

Biochemistry and molecular biology of differentiation of skin and other epithelial cells; cell culture

Associate Professor Thomas Egelhoff
E650 School of Medicine, 368-6971
E-mail: tte@cwru.edu

Cellular signaling and regulation of the cytoskeleton; cell and molecular biology of myosin in Dictyostelium

Associate Professor Edward Greenfield
Biomedical Research Building 1028, 368-1331
E-mail: emg3@cwru.edu

Regulation of bone turnover, Osteoblast-osteoclast interactions, cytokines, G-protein signaling

Associate Professor Robert Harvey
E554 School of Medicine, 368-5521
E-mail: rdh3@cwru.edu

Cellular cardiac electrophysiology; ion channels
Professor Ulrich Hopfer  
E556 School of Medicine 368-2878  
E-mail: uxh@cwru.edu  
Structure and function of cell membranes; cell physiology and biochemistry of epithelial transport; imaging of live cells

Professor Masao Ikeda-Saito  
E543 School of Medicine, 368-3178  
E-mail: mis2@cwru.edu  
Protein chemistry, spectroscopy of proteins; structure and function of iron proteins; hemoglobin, myeloperoxidase and cytochrome oxidase

Professor Faramarz Ismail-Beigi  
Biomedical Research Bldg. 432, 368-6129  
E-mail: fxl2@cwru.edu  
Regulation of Na+,K-ATPase expression and function

Assistant Professor Jian-Ping Jin  
E521 School of Medicine, 368-5525  
E-mail: jxj12@cwru.edu  
Molecular biology of cytoskeletal proteins in muscle

Associate Professor Stephen Jones  
E540 School of Medicine, 368-5527  
E-mail: swj@cwru.edu  
Neurophysiology; synaptic transmission and ion channels

Associate Professor Jianjie Ma  
E643 School of Medicine, 368-2684  
E-mail: jxm63@cwru.edu  
Ca channels and excitation-contraction coupling in skeletal muscle

Assistant Professor Maureen McEnery  
E649 School of Medicine, 368-3377  
E-mail: mwm4@cwru.edu  
Neuropharmacology and neurobiology; the role of synaptic vesicle proteins in the modulation of neuronal voltage-gated ion channels; molecular biochemistry of transport proteins

Assistant Professor Christine Moravec  
Cleveland Clinic, 445-5045  
E-mail: moravec@ccf.org  
Cardiac contractility and Ca^{2+} homeostasis in pathophysiological states; effects of disease process on sarcoplasmic reticulum function

Professor Thomas Nosek  
E625 School of Medicine, 368-3443  
E-mail: tmn2@cwru.edu  
Diaphragmatic fatigue, aging, and reactive oxygen species

Assistant Professor Stephanie Orellana  
Rainbow Babies & Childrens Hospital, Pediatrics, 844-7360  
E-mail: sao3@cwru.edu  
Signal transduction mechanisms involved in kidney development and in renal development diseases

Professor Nanduri Prabhakar  
E644 School of Medicine, 368-8636  
E-mail: nrp@cwru.edu  
Neurotransmitters in control of breathing

Assistant Professor Andrea Romani  
E542 School of Medicine, 368-1625  
E-mail: amr5@cwru.edu  
Ion transport and regulation in cardiac and liver cells; liver metabolism; mitochondrial and cell bioenergetics

Assistant Professor Michael Romero  
E545 School of Medicine, 368-3180  
E-mail: mfr2@cwru.edu  
Molecular biology & cell physiology of Na HCO_3 cotransporters (NBC); electrophysiology/ion transport; genetics of Na HCO_3 cotransporters

Associate Professor Charles Sanders  
E646 School of Medicine, 368-8651  
E-mail: crs4@cwru.edu  
Membrane enzyme structure and mechanism

Professor/Chair Antonio Scarpa  
E541 School of Medicine, 368-5298  
E-mail: axs15@cwru.edu  
Cardiovascular cell physiology; calcium metabolism, cell physiology and biochemistry of ion transport and neurotransmitter metabolism

Assistant Professor Frank Sönnichsen  
E645 School of Medicine, 368-5405  
E-mail: fds@cwru.edu  
Protein structure, dynamic and function studies by NMR spectroscopy. Current focus is on antifreeze proteins from fish and carboxylases

Assistant Professor William Stanley  
E534A School of Medicine, 368-5585  
E-mail: wcs4@cwru.edu  
Regulation of metabolism during stress in the normal and diabetic heart
Assistant Professor Luke Szweda
E647 School of Medicine, 368-0035
E-mail: lxs54@cwru.edu

Cardiac reperfusion injury: Aging, lipid peroxidation, and mitochondrial dysfunction

Associate Professor Ronald Walenga
Biomedical Research Bldg. 8th Flr., 368-4558
E-mail: rxw13@cwru.edu

Regulation of arachidonic acid metabolism in airway
A primary goal of the Department of Psychiatry has been to establish an educational climate and program that will provide a background in psychiatry and behavioral science for medical students, residents in psychiatry, residents from other fields who choose to study with the department, predoctoral interns in psychology, and social work students. In addition, research in the Department of Psychiatry is centered on the biological correlates of schizophrenia, mood disorders and personality disorders. Research in animal models is conceptually integrated with clinical research and is focused on the mechanisms of action of psychotropic drugs.

**FACULTY**

**Professor Joseph Calabrese**  
University Hospitals, 200 Triangle Building, 721-4600  
E-mail: jrc8@cwru.edu  
Phenomenology of depression and manic depression; development of new medications for treatment of depression, manic depression, and mood disorders comorbid with borderline personality disorder; phenomenology and treatment of rapid cycling manic depression

**Assistant Professor Lee Friedman**  
University Hospitals, Hanna Pavilion, HP5533, 844-7485  
E-mail: lx5@cwru.edu  
Brain imaging and eye tracking studies in psychiatric patients

**Associate Professor Atwood D. Gaines**  
205 Mather Memorial Building, 368-2257  
E-mail: axg10@cwru.edu  
Medical anthropology (ethnomedicine, ethnopsychiatry); urban anthropology; anthropology of religion; ethnicity; psychiatric classification; French biomedicine

**Assistant Professor Corinne Hagger**  
University Hospitals, B68 Hanna Pavilion, 844-8750  
Learning and memory in schizophrenia and affective disorders

**Research Associate Leslie Matuszevich**  
University Hospitals, B58, 844-5198  
Role of neurotrophic factors in animal models of depression

**Assistant Professor Ellen Rosenblatt**  
University Hospitals, Robb House, 844-7410  
Effects of gender on theory and practice of psychiatry; sexuality and schizophrenia

**Associate Professor Bryan Roth**  
University Hospitals, B58 Hanna Pavilion, 844-8929  
E-mail: bxr7@cwru.edu  
Molecular biology of neurotransmitter receptors

**Assistant Professor William Semple**  
University Hospitals, S64 Wearn Building, 844-3486  
Brain imaging in normals and psychiatric patients using computers

**Associate Professor Craig A. Stockmeier**  
University Hospitals, B55 Hanna Pavilion, 844-8930  
Regulation of monoamine neurotransmitter receptors in brain and functions associated with those receptors; mechanisms whereby electroconvulsive shock and antidepressant drugs affect brain chemistry; biochemical and psychiatric correlates of suicide

**Assistant Professor Paul A. Thompson**  
University Hospitals, B12 Hanna Pavilion, 944-8946  
E-mail: pat@cwru.edu  
Methods of psychiatric research using statistics to examine psychiatric data to understand drug effects

**Associate Professor Bryan Yamamoto**  
University Hospitals, B68 Hanna Pavilion, 844-5849  
Neurochemistry of mental disorders; neuropharmacology of drug therapy for psychosis and of drugs of abuse; how neurotransmitters control movement
RESEARCH ACTIVITIES
The objective of the Department of Radiology is to maintain excellence in patient care, teaching and research. The department offers numerous undergraduate research opportunities in the areas of biochemical oncology, computer imaging, interventional radiology, magnetic resonance imaging, neuroradiology, positron emission tomography, radiation biology and radiation physics. Credit for undergraduate research may be applied for throughout the Departments of Biology, Chemistry or Biochemistry.

FACULTY
Assistant Professor Lee P. Adler
B-918 Bishop Building, University Hospitals, 844-8142
E-mail: lpa@cwru.edu
Positron emission tomography for the study of human tumors; medical imaging processing; cardiac magnetic resonance imaging

Senior Research Associate George Bakale
B-31 Wearn Laboratory, University Hospitals, 844-3547
E-mail: gxb2@cwru.edu
Transport and reaction properties of excess electrons in model and biomimetic systems; screening chemical carcinogens using physico-chemical techniques; improving efficacy of radon-sampling methods

Associate Professor Marc S. Berridge
S-110 Bolwell Health Center, University Hospitals, 844-7350
E-mail: msb5@cwru.edu
Organic chemistry, synthesis of new radio pharmaceuticals for positron tomography; preparation and labeling of diagnostically useful radioisotopes

Associate Professor Jeffrey L. Duerk
B121 Bolwell Building, University Hospitals, 844-7794
E-mail: jld3@cwru.edu
Research in magnetic resonance physics

Professor Helen H. Evans
325 Biomedical Research Building, 368-1099
E-mail: hhe@cwru.edu
Mutation and cell death resulting from DNA lesions induced in cultured cells by X-radiation, radon and other environmental agents; comparison of effects and the molecular nature of lesions in cells which differ in DNA repair capabilities
Professor Nancy L. Oleinick
324 Biomedical Research Building, 368-1117
E-mail: nlo@cwru.edu

Mechanisms of chromosome damage by gamma-radiation; biochemical characterization of DNA and DNA-protein lesions; mechanisms of cell death following photodymanic therapy

Assistant Professor Cheryl A. Petersilge
B-120 Bolwell Building, University Hospitals, 844-7968

Studies correlating the pathology, anatomy and imaging of the musculoskeletal system

Assistant Professor Pejavar S. Rao
S623 Bishop Building, University Hospitals, 844-1295
E-mail: psr@cwru.edu

Radiation dosimetry for x-rays and radionuclides

Assistant Professor Jana S. Rice
B-017 MacDonald House, University Hospitals, 844-1356

Efficacy and accuracy of stereotactic biopsy in evaluation of non-palpable, mammographically detected breast lesions

Assistant Professor Robert W. Tarr
B-333 Bishop Building, University Hospitals, 844-5722

Cerebrovascular disease

Associate Professor Marie E. Varnes
327 Biomedical Research Building, 368-1133

Effects of drugs and metabolic conditions on the radiation and heat response of human tumor cells
REPRODUCTIVE BIOLOGY
(_LAST UPDATED 1998)

UNDERGRADUATE RESEARCH COORDINATOR: Leon Sheean
University MacDonald Womens Hospital, Rm. 8101, 844-3317

DEPARTMENT CHAIR: Wulf H. Utian, Director
University MacDonald Womens Hospital, 844-3334

RESEARCH ACTIVITIES
The Department of Reproductive Biology strives to provide the highest quality of health care to patients within an effective resource management system in a setting which encourages medical education and research. Laboratory experiences within experimental animal systems in vitro to define culture conditions for early mammalian embryo development, and implantation. Other laboratories provide opportunities to investigate hormone synthesis and metabolism by the reproductive system. Student training in the laboratories will focus on experimental design, experimental methods and data analysis of "affectors of reproduction". Students finishing their junior year and interested in a career in the biomedical sciences are encouraged to apply.

CLINICAL ACTIVITIES
Several members of our department also address mental health issues of men, women, and couples. Studies are varied and examine emotional issues from adolescence to menopause.

FACULTY
Judith Ilan
University MacDonald Womens Hospital, Rm. 8108, 844-1269
Molecular aspects of reproduction

Sheryl A. Kingsberg
University MacDonald Womens Hospital, Rm. 7131, 844-5078
Women's health issues; psychological aspects of pregnancy, sexuality, infertility, the new reproductive technologies, menopause and other life cycle health issues; post partum depression; behavioral interventions for medical noncompliance

Robert A. Meigs
University MacDonald Womens Hospital, Rm. 8122, 844-1268
Biochemical and metabolic processes involved in the production and transformation of steroid hormones. Enzymology of mixed-function oxidase systems involved in reproductive processes

Miriam B. Rosenthal
University MacDonald Womens Hospital, Rm. 7120, 844-3331
Women's health issues; psychological aspects of pregnancy, sexuality, infertility, the new reproductive technologies, menopause and other life cycle health issues; post partum depression

Leon Sheen
University MacDonald Womens Hospital, Rm. 8101, 844-3317
Factors (natural and induced) which compromise fertilization, early development and the establishment of pregnancy. Utilization of preimplantation mouse embryos for cytotoxicity testing, microsurgical techniques will further define the maternal-fetal relationship

Laszlo Sogor
University MacDonald Womens Hospital, Rm. 7017, 844-1692
Semen evaluation, development of quantitative methods; permeability studies of human chorioamnion
UNDERGRADUATE RESEARCH COORDINATOR AND CHAIR

Martin I. Resnick, M.D.
University Hospitals of Cleveland, 844-3011

RESEARCH ACTIVITIES

The Department of Urology has active research programs in kidney stone disease, prostate cancer, benign prostatic hyperplasia, prostatitis, and impotence.

FACULTY

Stanley E. Althof, Ph.D.
University Hospitals of Cleveland, 844-3009
E-mail: sxa6@cwru.edu
Sexual and Marital problems

Donald R. Bodner, M.D.
University Hospitals of Cleveland, 844-7668
E-mail: dxb36@cwru.edu
Bladder function, Spinal cord injuries, Urolithiasis

Kurt H. Dinchman, M.D.
Metro Health Medical Center, 459-4257
E-mail: kxd19@cwru.edu
Genitourinary trauma, Female urology

Jack S. Elder, M.D.
Rainbow Babies & Children’s Hospital, 844-8455
E-mail: jse@cwru.edu
Pediatric Urologic

Howard B. Goldman, M.D.
University Hospitals of Cleveland, 844-7667
E-mail: hbg@cwru.edu
Female urology, Voiding dysfunction, Pelvic floor reconstruction

Sanjay Gupta, Ph.D.
School of Medicine, 368-6162
E-mail: gxs44@cwru.edu
Mechanism(s) of prostate carcinogenesis, Biomarker(s) for detection of prostate cancer, Chemoprevention of prostate cancer by naturally occurring and/or synthetic compounds

Christopher A. Haas, M.D.
Metro Health Medical Center, 459-4250
E-mail: cxh82@cwru.edu
Prostate Cancer, Trauma, Stones, Voiding dysfunction

Nehemia Hampel, M.D.
University Urologist Inc., 381-5888
E-mail: nxh9@cwru.edu
Laparoscopic surgery, Pelvic surgery

Susan Marengo, Ph.D.
School of Medicine, 368-8732
E-mail: srm10@cwru.edu
Urolithiasis, Prostatitis

Michael G. Oefelein, M.D.
University Hospitals of Cleveland, 844-7668
E-mail: mgo3@cwru.edu
Urological oncology, Post-prostatectomy incontinence

Jeffery S. Palmer, M.D.
Rainbow Babies & Children’s Hospital, 844-8455
E-mail: jspalmer@cwru.edu
Pediatric urology, Reconstructive urology, Minimally invasive urologic surgery, Endourology

Martin I. Resnick, M.D.
University Hospitals of Cleveland, 844-7667
E-mail: mir@cwru.edu
Urologic oncology, Imaging of urologic disorders, Urolithiasis

Allen D. Seftel, M.D.
University Hospitals of Cleveland, 844-7632
E-mail: ads6@cwru.edu
Male sexual dysfunction and male infertility

Patrick J. Spirnak, M.D.
Metro Health Medical Center, 459-4257
E-mail: jps6@cwru.edu
Prostate cancer, Endourology, Impotence

Mark D. Stovsky, M.D.
University Hospitals of Cleveland, 844-3009
E-mail: mds19@cwru.edu
Urooncology, Minimally invasive surgery, Endourology, Brachytherapy
WEATHERHEAD SCHOOL OF MANAGEMENT

ACCOUNTANCY
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR AND DEPARTMENT CHAIR:
Timothy J. Fogarty
663 Enterprise Hall, 368-3938
E-mail: tjf@cwru.edu

RESEARCH ACTIVITIES
The Department of Accountancy prepares students for professional careers in public accountancy, financial management and higher education. Like the professions of architecture, law, engineering and medicine, accountancy demands of its students both a high degree of technical training, a broad knowledge of the fundamentals of economics and business and a commitment to public service. The principal research activities of the faculty relate to the applied and professional fields of accountancy, auditing and taxation.

FACULTY
Professor Timothy J. Fogarty
638 Enterprise Hall, 368-3938
E-mail: tjf@cwru.edu
Taxation; auditing; organizational behavior; accounting education, regulation

Associate Professor Larry M. Parker
650 Enterprise Hall, 368-2069
E-mail: lmp3@cwru.edu
Theory, regulation, professional specialization, complexity theory

Associate Professor Julia E. Grant
642 Enterprise Hall, 368-4158
E-mail: jsg2@cwru.edu
Information economics; valuation issues; social dilemma settings
BANKING AND FINANCE

(Last updated 1998)

UNDERGRADUATE RESEARCH COORDINATOR:    DEPARTMENT CHAIR:

David A. Bowers
Enterprise Hall, Rm. 686, 368-2165
E-mail: dab5@cwru.edu

David A. Bowers
Enterprise Hall, Rm. 686, 368-2165
E-mail: dab5@cwru.edu

RESEARCH ACTIVITIES:
The faculty of the Department of Banking and Finance have research interests in all aspects of the financial services
industry and the financial market. The undergraduate students are introduced to the field in Money and Banking course
(BAFI 341) and the course on Corporation Finance (BAFI 355).

RESEARCH/INDEPENDENT STUDY COURSES

BAFI 356  Investments (3).  Financial problems of individuals in purchasing stocks and bonds. Attention to current
problems. Prerequisite.:  BAFI 355

BAFI 360  Independent Study (credit as arranged).  For candidates undertaking reading in a field of special interest.
Prerequisite.:  Permission of department chair.

FACULTY

Thomas F. Morrissey
Enterprise Hall, Rm. 616, 368-2079

Financial institutions, investments, money and capital
markets
ECONOMICS
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR AND DEPARTMENT CHAIR:
William T. Bogart
401 Wickenden Building, 368-4296
E-mail: wtb@cwru.edu

RESEARCH ACTIVITIES:
Opportunities for research in economics are available through Independent Study projects (ECON 399) or Honors Theses for students who are admitted to the Honors Program in Economics (ECON 397 and ECON 398). Students who are interested in these courses should contact the faculty member whose field of research coincides with the student's intended research project.

Economics studies how people can use their scarce time and other limited resources to get more of the good things they want. Students of economics gain an understanding of how consumers, producers, and governments make decisions affecting the allocation of resources. These decisions determine how wealthy people will be and how the economy as a whole will perform. The faculty’s research is focused primarily on applied microeconomics, dealing with both the domestic and international aspects of industrial economics. Other special areas of research include urban economics, international economics, and economics of behavior and organizations.

RESEARCH/INDEPENDENT STUDY COURSES
ECON 397 Honors I (3). Honors thesis research. Prerequisite: consent of chair.
ECON 398 Honors II (3). Honors thesis research. Prerequisite: consent of chair.
ECON 399 Individual Readings and Research (3). Intensive examination of a topic selected by the student. Prerequisite: consent of instructor.

FACULTY
Assistant Professor Eric Bettinger
400 Wickenden Building, 368-2184
E-mail: epb4@cwru.edu
School choice, vouchers, labor markets

Associate Professor/Chair William T. Bogart
413B Wickenden Building, 368-4296
E-mail: wtb@cwru.edu
Zoning, housing markets, urban sprawl, intra- and intermetropolitan trade

Professor Bo Carlsson
413A Wickenden Building, 368-4112
E-mail: bxc4@cwru.edu
Topics in industrial and managerial economics, such as firm strategy and organization; the role of technology in the evolution of firms and industries; productivity analyses

Assistant Professor David Cooper
400 Wickenden Building, 368-4294
E-mail: djc13@cwru.edu
Experimental economics, game theory

Professor Avi Dor
450B Enterprise Hall, 368-0208
E-mail: axd9@cwru.edu
Health economics; insurance; economics of contracts; bargaining

Associate Professor Robin A. Dubin
417 Wickenden Building, 368-3981
E-mail: rad4@cwru.edu
Urban economics; application of statistical methods to economic problems

Professor Asim Erdilek
405 Wickenden Building, 368-4271
E-mail: axe3@cwru.edu
International economics, focusing on the activities of multinational corporations both in the United States and abroad

Professor Michael S. Fogarty
405 Wickenden Building, 368-4271
E-mail: msf3@cwru.edu
Regional economics growth and development; economics of cities; urban and regional development policy
Associate Professor Susan Helper  
414 Wickenden Building, 368-5541  
E-mail: sxh23@cwru.edu  
Economics of the firm; technological change; supplier/customer relations; auto industry

Senior Lecturer Richard Shatten  
311 Wickenden Building, 368-5538  
E-mail: rxs90@cwru.edu  
Public private partnerships; regional economic strategy

Assistant Professor Robert Slonim  
400 Wickenden Building, 368-5681  
E-mail: rls18@cwru.edu  
Experimental economics, behavioral economics

Assistant Professor Marcus Stanley  
400 Wickenden Building, 368-2046  
E-mail: mms24@cwru.edu  
Education, labor markets, regulation
INFORMATION SYSTEMS
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR: Woo Young Chung
678 Enterprise Hall, 368-3854
E-mail: wxc24@cwru.edu

DEPARTMENT CHAIR: Fred Collopy
693 Enterprise Hall, 368-2144
E-mail: Collopy@cwru.edu

RESEARCH ACTIVITIES
The Department of Information Systems is engaged in a range of research projects covering both technical and behavioral aspects of the use of information technology in the management of organizations.

RESEARCH/INDEPENDENT STUDY COURSES
MIDS 360 Independent Study (3). Special topics or research projects in information and decision systems. Prerequisite: Consent of department chair.

FACULTY
Assistant Professor Michel Avital
668 Enterprise Hall, 368-0789
E-mail: mpa2@cwru.edu

Design and use of web-based information environments; application of Appreciative Inquiry to information systems research and practice

Professor Richard J. Boland, Jr.
696 Enterprise Hall, 368-6022
E-mail: rjb7@cwru.edu

Interpretive studies of the process of designing and using information technologies; group problem solving; problem formulation and sense making

Professor/Chair Fred L. Collopy
693 Enterprise Hall, 368-2048
E-mail: flc2@cwru.edu

Visual programming languages, business forecasting, organizational impacts of information technology, objective setting in organizations, design

Assistant Professor Michel Avital
668 Enterprise Hall, 368-0789
E-mail: mpa2@cwru.edu

Design and use of web-based information environments; application of Appreciative Inquiry to information systems research and practice

Professor Kalle Lyytinen
697 Enterprise Hall, 368-5353
E-mail: kjl13@cwru.edu

Systems design methods and design methodologies, IS research strategy, computer-aided systems engineering environments, computer-supported cooperative work, diffusion and innovation theory

Assistant Professor Julie Rennecker
692 Enterprise Hall, 368-6385
E-mail: jar27@cwru.edu

Strategic use of information technology to virtual collaborative work

Professor Paul Stork
682 Enterprise Hall, 368-3914
E-mail: pxs23@cwru.edu

e-commerce, technology architectures, database management, object-oriented programming

Associate Professor Betty Vandenbosch
613 Enterprise Hall, 368-2120
E-mail: bmv@cwru.edu

Ownership and responsibility, mental models, impact of technology on learning and ideas

Assistant Professor Youngjin Yoo
695 Enterprise Hall, 368-0790
E-mail: yxy23@cwru.edu

Collaborative technology; the role of information technology in learning; virtual team management; information technology and organizational transformation
MARKETING AND POLICY STUDIES
(Last updated 2002)

UNDERGRADUATE RESEARCH COORDINATOR:
David Deeds, Assistant Professor
Lewis Building, Rm. 238, 368-6008

RESEARCH ACTIVITIES
The Department of Marketing and Policy Studies consists of four divisions: Labor and Human resources, Marketing, Management Policy and Entrepreneurship. The faculty support a B.S. in Management and a minor in entrepreneurship. The faculty of the department are involved in a range of research projects reflecting the diversity of the department's four divisions.

FACULTY

Labor and Human Resources
- Paul Gerhart, Professor and Division Head
- Melissa Cardon, Assistant Professor
- Gil Preuss, Assistant Professor
- Paul Salipante, Professor

Marketing
- Mohan Reddy, Associate Professor & Division Head
- Stanton Cort, Associate Professor
- Ellen Garbarino, Assistant Professor
- Tripat Gill, Assistant Professor
- Detelina Marinova, Assistant Professor
- Jose A. Rosa, Assistant Professor
- Jagdip Singh, Professor
- Deepak Sirdeshmukh, Visiting Professor

Management Policy and Entrepreneurship
- Robert Hisrich, Professor and Division Head
- John Aram, Professor
- Sayan Chatterjee, Professor
- David Deeds, Assistant Professor
- Jay Dial, Assistant Professor
- Steven Feldman, Associate Professor
- Moren Levesque, Assistant Professor
- Leonard Lynn, Professor and Department Chairman
- Richard Osborne, Professor for the Practice of Management
- Ernesto Poza, Professor for the Practice of Management
- Vasudan Ramanujam, Associate Professor
- William Schulze, Assistant Professor
THE FRANCES PAYNE BOLTON SCHOOL OF NURSING  
(Last updated 2001)

UNDERGRADUATE RESEARCH COORDINATOR:   ASSOCIATE DEAN FOR RESEARCH:  
Marilyn Lotas      Shirley Moore  
Room NOA1610, School of Nursing, 368-5129   Room NOA1130, School of Nursing, 368-5978  
E-mail:  mjl25@cwru.edu    E-mail:  smm8@cwru.edu

RESEARCH ACTIVITIES  
The Frances Payne Bolton School of Nursing has a faculty involved in a wide variety of research projects. The areas of research in the School of Nursing are related to the programs of study. A number of faculty have received funding through the National Institute for Nursing Research, the National Institute of Mental Health, the National Institute on Aging, foundations, and professional organizations. Students are encouraged to participate in ongoing research through independent study. Some of the possible avenues that students can participate in are: data collection, data coding, data entry, data analysis, literature search and review and in preparing manuscripts for publication.

RESEARCH/INDEPENDENT STUDY COURSES  
**NURS 320**  Nursing Research (3) Introduction to Scientific Inquiry and Research Process in Nursing. Discussion of issues and problems in systematically evaluating reports of empirical research on nursing phenomena. Appropriate use of the nursing research literature and research findings in clinical practice are discussed.

FACULTY  
**Assistant Professor Kimberly Adams Tufts**  
Room NOA302F, School of Nursing, 368-3108  
E-mail:  kba2@cwru.edu  
*Health promotion; disease strategies for the prevention of STDs*

**Professor Gene Cranston Anderson**  
Edward J. and Louise Mellen Professor of Nursing  
Room NOA219B, School of Nursing, 368-3343  
E-mail:  gca@cwru.edu  
*Kangaroo care with pre-term infants; effects of perinatal care on physiologic and behavioral development across the life span*

**Associate Professor Claire Andrews**  
Room NOA3140, School of Nursing, 368-5992  
E-mail:  cma4@cwru.edu  
*Maternal posturing & fetal position/presentation*

**Assistant Professor Mary Anthony**  
Room NO3090, School of Nursing, 368-0462  
E-mail:  mxa25@cwru.edu  
*Systems care delivery; nursing practice models; outcomes*

**Professor John Clochesy**  
Independence Foundation Professor  
Room NOA3280, School of Nursing, 368-5976  
E-mail:  jmc@cwru.edu  
*Weaning patients from long term ventilator use; acute lung injuries and biorhythms in critically ill patients*

**Associate Professor Barbara J. Daly**  
Room NOA3110, School of Nursing, 368-5994  
E-mail:  bjd4@cwru.edu  
*Outcomes and systems of care for chronically ill patients, ethical aspects of end-of-life decision-making and care*

**Assistant Professor Elizabeth Damato**  
Room NOA302C, School of Nursing, 368-2597  
E-mail:  egd@cwru.edu  
*Maternal attachment to twins*

**Assistant Professor Donna Dowling**  
Room NOA3060, School of Nursing, 368-1869  
E-mail:  dad10@cwru.edu  
*Supplementary breastfeeding of pre-term infants; feeding for term and pre-term infants*

**Assistant Professor Carol Epstein**  
Room NOA3270, School of Nursing, 368-6327  
E-mail:  cde2@cwru.edu  
*Oxygen transport in patients with multiple traumas; circadian variation in biological rhythms in critically ill patients*

**Professor Joyce Fitzpatrick**  
Elizabeth Brooks Ford Professor  
Room NOA 1430, School of Nursing, 368-2543  
E-mail:  jif4@cwru.edu  
*Health policy; experience of dying and relationships to aging; lifespan development during crisis experiences; relaxation; geriatric mental health; suicide among elderly*
Assistant Professor Marion P. Good
Room NOA304E, School of Nursing, 368-5975
E-mail: mpg@cwru.edu

Pharmacologic and non-pharmacologic management of pain by nurses; effects of music on pain

Assistant Professor Marion Hemstrom-Krainess
Room NOA3120, School of Nursing, 368-6335
E-mail: mxh@cwru.edu

Community competence; well elderly in communities

Assistant Professor Patricia Higgins
Room NOA3130, School of Nursing, 368-8850
E-mail: pxg3@cwru.edu

Psychophysiologic and biobehavioral characteristics in adults with chronic illness; adult failure to thrive and weaning patterns of long-term ventilator patients; adult failure to thrive in long term rehabilitation patients

Assistant Professor Chris Hudak
Room NOA230D, School of Nursing, 368-6315
E-mail: cah16@cwru.edu

Organization factors in implementation of end-user computing systems in health care; aging and technology: well adults responses to web based activities; OASIS and OMAHA system implementation and use

Associate Professor Marilyn Lotas
Room NOA1610, School of Nursing, 368-5129
E-mail: mj125@cwru.edu

Effects of pre-term infant care on infant development

Associate Professor Elizabeth Madigan
Room NOA230C, School of Nursing, 368-8532
E-mail: eam13@cwru.edu

Home health care outcomes and resource consumption; health services research issues surrounding rehospitalization of home care patients

Associate Professor Judith Maloni
Room NOA315B, School of Nursing, 368-2912
E-mail: jam44@cwru.edu

Physiological and psychosocial side effects of antepartal bedrest in high risk women and their families

Assistant Professor Jenifer Markowitz
Room NOA3070, School of Nursing, 368-3082
E-mail: jxm12@cwru.edu

Forensic nursing, including intimate partner and sexual assault and youth violence; adolescent resiliency

Assistant Professor Patricia E. McDonald
Room NOA3345, School of Nursing, 368-3330
E-mail: pxm9@cwru.edu

Care of African-Americans with diabetes; acceptance of chronic illness

Associate Professor Shirley Moore
Room NOA1130, School of Nursing, 368-5978
E-mail: smm8@cwru.edu

Recovery following cardiac events; exercise following cardiac events; interventions for cardiac recovery

Assistant Professor Carol M. Musil
Room NOA318D, School of Nursing, 368-8775
E-mail: cmm4@cwru.edu

Health, stress and coping of grandmothers by caregiver status; stress, mental and physical health of community dwelling older adults by caregiver status

Associate Professor Georgia Narsavage
Room NOA1540, School of Nursing, 368-6304
E-mail: gln2@cwru.edu

Outcomes of patients with Chronic Obstructive Lung Disease (COPD); factors that explain referral process for elderly patients

Associate Professor Beverly L. Roberts
Room NOA1060, School of Nursing, 368-2541
E-mail: blr4@cwru.edu

Aging; functional health; stress in the elderly; exercise

Assistant Professor Theresa Standing
Room NOA1500, School of Nursing, 368-5990
E-mail: tss2@cwru.edu

Women’s health at midlife; qualitative approaches

Assistant Professor Chris Winkleman
Room NOA302E, School of Nursing, 368-0700
E-mail: cxw26@cwru.edu

Positioning and activity in the critically ill and neurotrauma patients

Associate Professor Ronald Wright
Room NOB090, School of Nursing, 368-0614
E-mail: erw@cwru.edu

Research areas of pathogens; epidemiology of infections and infection control; measures of ultraviolet sterilization

Professor May L. Wykle
Florence Cellar Professor
Room NOA1140, School of Nursing, 368-2545
E-mail: mlw4@cwru.edu

Caregiving across the life span; selfcare activities of caregivers and elders, including health promotion; mental and physical health, and spirituality among older adults
Professor JoAnne M. Youngblut  
Room NOA322D, School of Nursing, 368-5988  
E-mail: jmy3@cwru.edu

Family relationships; maternal employment; follow-up of critically ill children

Associate Professor Jaclene A. Zauszniewski  
Room NOA318C, School of Nursing, 368-3612  
E-mail: jaz@cwru.edu

Promoting resourcefulness in maintaining health and functioning of elders; preventing and treating depression across the life span; instrument development and psychometrics
RESEARCH ACTIVITIES
The School of Dentistry has research activities focused in the following areas: histopathology of calcified tissues (teeth and bone); craniofacial development; dental materials; dental caries and calculus; periodontal disease; and dental educational/behavioral science. Student research presentations are given each spring on "Professionals Day". Limited opportunities for undergraduate research exist with a preference given for those students with a commitment to a career in dentistry and/or dental research.

FACULTY
Professor/Chair Nabil Bissada
Department of Periodontics
1210 Dental School, 368-3277
Prevention and treatment of periodontal diseases

Professor/Chair Jerold S. Goldberg
Department of Oral and Maxillofacial Surgery
A53C Dental School, 368-2538
E-mail: jsg@cwru.edu
TMJ-related function; pathology; surgical techniques; facial growth and development

Assistant Professor/Director of Graduate Program, Mark G. Hans
Department of Orthodontics
3150 Dental School, 368-4649
Preventative dentistry, fluoridation, sealants
Craniofacial biology including cephalometric assessment of obstructive sleep apnea; biochemical differences among craniofacial cartilages and functional electrical stimulation of the muscles of mastication

Associate Dean/Associate Professor Stanley A. Hirsch
Department of Oral Pathology
1130 Dental School, 368-4262
E-mail: sah4@cwru.edu
Head and neck cancer; oral disease; epidemiology and diagnosis

Assistant Clinical Professor Roma Jasinevicius
2040 Dental School, 368-2486
E-mail: trj2@cwru.edu
Behavior patterns in dental education and practice; gender influence on dental student views of achievement

Assistant Professor James A. Lalumandier
Department of Community Dentistry
Dental School, 368-3276
E-mail: jal10@cwru.edu
Ultrastructure of calcified tissues; histopathology of dental caries; defective enamel development; dental enamel as a developmental and environmental marker; forensic odontology
Assistant Professor Russell Wang  
Department of Restorative Dentistry  
A280 Dental School, 368-3473  
E-mail: rxw26@cwru.edu  

Dental materials/titanium interfaces; implantology

Professor Stephen Wotman  
Department of Community Dentistry  
Dental School, 368-6840  
E-mail: sxw2@cwru.edu  

Dental health policy; the health care system; preventive dentistry