NEUROSCIENCE

OVERVIEW
The Neuroscience Graduate Program is a university-wide, multidisciplinary, Ph.D. granting program that has more than 50 faculty mentors across 13 departments and 5 colleges. This program emphasizes rigorous training in neuroscience-related research, educates students about human health, and encourages interdisciplinary research projects.

DEGREES
- Neuroscience M.S.
- Neuroscience Ph.D.

FACULTY
Althoff, Robert; Associate Professor, Department of Psychiatry; MD, University of Illinois
Applebee, Angela; Associate Professor, Department of Neurological Sciences; MD, University of South Dakota School of Medicine, Vermillion
Ballif, Bryan A.; Associate Professor, Department of Biology; PHD, Harvard University
Berger, Christopher Lewis; Professor, Department of Molecular Physiology and Biophysics; PHD, University of Minnesota Twin Cities
Bongard, Joshua C.; Professor, Department of Computer Science; PHD, University of Zurich
Bouton, Mark Earhart; Professor, Department of Psychological Science; PHD, University of Washington
Brewer, Matthias; Professor, Department of Chemistry; PHD, University of Wisconsin Madison
Cannizzaro, Michael S.; Associate Professor, Department of Communication Sciences; PHD, University of Connecticut
Cipolla, Marilyn Jo; Professor, Department of Neurological Sciences; PHD, University of Vermont
Cornbrooks, Carson Justin; Associate Professor, Department of Neurological Sciences; PHD, Virginia Commonwealth University
Dabertrand, Fabrice; Assistant Professor, Department of Pharmacology; PHD, University of Bordeaux, France
Dostmann, Wolfgang R. G.; Professor, Department of Pharmacology; PHD, University of Bremen, MD, University of Munich
Dumas, Julie Anna; Associate Professor, Department of Psychiatry; PHD, University of North Carolina
Ebert, Alicia; Assistant Professor, Department of Biology; PHD, Colorado State University
Eppstein, Maggie; Professor and Chair, Department of Computer Science; PHD, University of Vermont
Erdos, Benedek; Assistant Professor, Department of Pharmacology; PHD, Semmelweis University
Falls, William A.; Dean, College of Arts and Science, Professor, Department of Psychological Science; PHD, Yale University
Flynn, Sean; Assistant Professor, Department of Neurological Sciences; PHD, University of Utah
Forehand, Cynthia Jean; Dean, Graduate College, Professor, Department of Neurological Sciences; PHD, University of North Carolina Chapel Hill
Franklyn, Christopher Steward; Professor, Department of Biochemistry; PHD, University of California Santa Barbara
Freeman, Kalev; Assistant Professor, Department of Surgery; MD/PHD, University of Colorado Boulder
Garavan, Hugh P.; Professor, Department of Psychiatry; PHD, Bowling Green State University
Green, John Thomas; Professor and Chair, Department of Psychological Science; PHD, Temple University
Hammack, Sayawong E; Associate Professor, Department of Psychology; PHD, University of Colorado
Henry, Sharon Margaret; Professor, Department of Rehabilitation and Movement Science; PHD, University of Vermont (Emeritus)
Holmes, Gregory; Professor and Chair, Department of Neurological Sciences; MD, University of Virginia
Howe, Alan K; Associate Professor, Department of Pharmacology; PHD, Northwestern University
Hudziak, James Joseph; Professor, Department of Psychiatry; MD, University of Minnesota Twin Cities
Jacobs, Jesse; Assistant Professor, Department of Rehabilitation and Movement Science; PHD, Oregon Health & Science University
Jaworski, Diane Marie; Professor, Department of Neurological Sciences; PHD, Texas Woman's University
Langevin, Helene M.; Professor, Department of Neurological Sciences; MD, McGill University
Li, Dawei; Assistant Professor, Department of Microbiology and Molecular Genetics; PHD, Shanghai Jiao Tong University
Lounsbury, Karen M.; Professor, Department of Pharmacology; PHD, University of Pennsylvania
Mackey, Michael Scott; Assistant Professor, Department of Psychiatry; PHD, McGill University, Montreal, Quebec
Mawe, Gary Michael; Professor, Department of Neurological Sciences; PHD, Ohio State University
May, Victor; Professor, Department of Neurological Sciences; PHD, Northwester University
McCarthy, Sarah A.; Assistant Professor, Department of Neurological Sciences; PHD, Pennsylvania State University, College of Medicine
Merrill, Liana; Assistant Professor, Department of Neurological Sciences; PHD, University of Vermont
Morielli, Anthony D.; Associate Professor, Department of Pharmacology; PHD, University of California at Santa Cruz
Naylor, Magdalena Raczkowska; Professor, Department of Psychiatry; MD/PHD, Warsaw Medical Academy
Nelson, Mark; Professor and Chair, Department of Pharmacology; PHD, Washington University in St Louis
Parsons, Rodney Lawrence; Professor, Department of Neurological Sciences; PHD, Stanford University
Potter, Alexandra S.; Assistant Professor, Department of Psychiatry; PHD, University of Vermont
Prelock, Patricia; Dean, College of Nursing and Health Sciences; PHD, University of Pittsburgh
Schmerhorn, Alice C; Assistant Professor, Department of Psychological Science; PHD, University of Notre Dame
Scott, Rodney; Professor, Department of Neurological Sciences; MD/PHD, University of Zimbabwe
Sibold, Jeremy S; Associate Professor, Department of Rehabilitation and Movement Science; EDD, West Virginia University
Spees, Jeffrey; Associate Professor, Department of Medicine-Cardiovascular; PHD, University of California Davis
Teuscher, Cory; Professor, Department of Medicine-Immunobiology; PHD, University of New Mexico
Toufexis, Donna J.; Associate Professor, Department of Psychological Science; PHD, McGill University
Van Houten, Judith; Professor, Department of Biology; PHD, University of California Santa Barbara
Vizzard, Margaret A.; Professor, Department of Neurological Sciences; PHD, Thomas Jefferson University
Wellman, George C.; Professor, Department of Pharmacology; PHD, University of Vermont
Weston, Matthew; Assistant Professor, Department of Neurological Sciences; PHD, Baylor College of Medicine
White, Sheryl; Assistant Professor, Department of Neurological Sciences; PHD, University of Vermont

Graduate Medical Courses

GRMD 353. Medical Fdns of Medicine. 3 Credits.
Fundamental vocabulary, concepts, and methods of molecular genetics, cell physiology, biochemistry and metabolism including cell-cell and cell-environment communication, cell proliferation and cell death. Pre/co-requisite: Graduate standing; permission of the Instructor; six credits coursework plus two credits lab in Biology, general chemistry, organic chemistry and Physics.

GRMD 354. Medical Human Struc & Fnction. 4-8 Credits.
Combination of gross anatomy, histology, embryology, physiology and medical imagine to present an integrated overview of the human body. Pre/co-requisites: Graduate standing; Instructor permission; six credits coursework plus two credits lab in Biology, general chemistry, organic chemistry and Physics; graduate coursework in Cell Biology or Biochemistry.

GRMD 355. Medical Attacks & Defenses. 4 Credits.
Principles of hematology, immunology, microbiology, toxicology, pathology, pharmacology, and neoplasia as a foundation to pathophysiology and therapeutics. Pre/co-requisite: Graduate standing; Instructor permission; six credits coursework plus two credits lab in Biology, general chemistry, organic chemistry and Physics; graduate coursework in Cell Biology or Biochemistry and Anatomy & Physiology.

GRMD 356. Medical Nutr, Metab, & GI Syst. 5 Credits.
Organizes studies in nutrition, organ systems metabolism and the gastrointestinal and endocrine systems through integrated lessons in cell biology, biochemistry, normal and pathologic anatomy, pharmacology, physiology, pathophysiology and microbiology. Pre/co-requisite: Graduate standing; permission of the Instructor; six credits coursework plus two credits lab in Biology, Anatomy & Physiology, and an introduction to immunology, microbiology, toxicology, pathology and pharmacology.

GRMD 357. Medical Neural Science. 6 Credits.
Organize study of the human nervous and behavioral system through lessons that integrate cell metabolism, endocrinology, normal and pathologic anatomy, pharmacology, physiology, pathophysiology and psychopathology. Pre/co-requisite: Graduate standing; permission of the Instructor; six credits coursework plus two credits lab in Biology, general chemistry, organic chemistry and Physics; Graduate coursework in Cell biology or Biochemistry, human anatomy & physiology, and an introduction to immunology, microbiology, toxicology, pathology and pharmacology.

GRMD 358. Medical Connections. 1 Credit.
Introduction to musculoskeletal and integumentary systems that integrates cell metabolism, endocrinology, normal and pathologic anatomy, physiology and pathophysiology, and pharmacology. Pre/co-requisite: Graduate standing; Instructor permission; six credits coursework plus two credits lab in Biology, general chemistry, organic chemistry and Physics; graduate coursework in cell biology or biochemistry, human anatomy and physiology, and an introduction to immunology, microbiology, toxicology, pathology, and pharmacology.

GRMD 359. Medical Cardio,Resp,Renal Syst. 6 Credits.
Organizes studies in the cardiovascular, respiratory and renal system through lessons that integrate cell metabolism, endocrinology, normal and pathologic anatomy, pharmacology, physiology and pathophysiology. Pre/co-requisite: graduate standing; permission of the Instructor; six credits coursework plus two credits lab in biology, general chemistry, organic chemistry and Physics; graduate coursework in cell biology or biochemistry, human anatomy and physiology, and an introduction to immunology, microbiology, toxicology, pathology, and pharmacology.

GRMD 360. Medical Generations. 5 Credits.
Organizes studies in reproduction, development and aging through lessons that integrate behavioral development, cell and molecular biology, endocrinology, normal and pathologic anatomy, pharmacology, physiology and pathophysiology. Pre/co-requisite: Graduate standing; permission of the Instructor; six credits coursework plus two credits lab in biology, general chemistry, organic chemistry and Physics; graduate coursework in cell biology or biochemistry, human anatomy and physiology, and an introduction to immunology, microbiology, toxicology, pathology, and pharmacology.
Neuroscience Courses

NSCI 225. Human Neuroanatomy. 0-3 Credits.
Functional anatomy of the human nervous system and its cells. Focus on both peripheral and central nervous system. Lectures and laboratory (gross and microscopic anatomy). Prerequisite: Instructor permission.

NSCI 302. Neuroscience. 4 Credits.
Functional anatomy of the human nervous system. Lectures and laboratory providing learning experience with dissected specimens, gross and microscopic anatomy. Incorporates clinical information from physician-scientists. Prerequisite: Physical Therapy major or Instructor permission.

NSCI 306. Techniques in Neurobiology. 3 Credits.
Discussion of techniques used to study the nervous system. Experience with light, fluorescence, electron microscopy; microsurgical procedures; electrophysiological stimulating, recording techniques; neuronal tracing techniques. Prerequisite: Permission of the Instructor.

NSCI 320. Developmental Neurobiology. 3 Credits.
Provides fundamental knowledge of cell-to-cell interactions necessary for proper development and organization of the nervous system. Topics include pattern formation, neuronal differentiation, axon guidance, and target interactions. Prerequisite: Permission of the Instructor. Alternate years.

NSCI 323. Neurochemistry. 3 Credits.
Biochemistry of the nervous system. Topics include ion channels, synaptic function, neurotransmitters and neuropeptides, signal transduction, and hormones in brain function. Prerequisite: Permission of the Instructor.

NSCI 326. Basic Sci-Neurologic Disease. 3 Credits.
In-depth examination of basic mechanisms and clinical aspects of a related subset of neurological disorders, e.g. neurodegenerative disease or disorders of neurotransmission. Disease group changes every year. Prerequisite: Advanced Graduate Students, Neuroscience Faculty and Residents in Neurology, Neurosurgery and Psychology.

NSCI 327. Resp Conduct in Biomed Rsch. 1 Credit.
Topics in Scientific Integrity surrounding responsible conduct and practices in biomedical research. Prerequisites: Advanced Graduate students, postdoctoral fellows and assistant professors in the biological or biomedical sciences.

NSCI 328. Techniques in Microscopy. 3 Credits.
Topics shall include practical background in microscopy, including brightfield, epifluorescence, confocal, multi-photon, deconvolution, atomic force and electron microscopy. Prerequisite: Instructor permission.

NSCI 329. Topics in Excitable Membranes. 2 Credits.
This course is a graduate course designed to introduce the fundamentals of cellular electrophysiology through independent student reading and faculty-led group discussions of journal articles. Prerequisite: Instructor permission.

NSCI 330. Comparative Neurobiology. 3 Credits.
Examination of the cellular mechanisms that underlie selective motor and sensory abilities, and unique behaviors that have evolved in various species. Discussion and student presentations. Pre/co-requisite: Instructor permission.

NSCI 381. Seminar in Neuroscience. 1 Credit.
Research presentations and critical review of the literature in various areas of anatomical and neurobiological sciences.

NSCI 382. Seminar in Neuroscience. 1 Credit.
Research presentations and critical review of the literature in various areas of anatomical and neurobiological sciences.

NSCI 391. Master's Thesis Research. 1-18 Credits.
NSCI 395. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles. Prerequisite: Instructor permission.

NSCI 491. Doctoral Dissertation Research. 1-18 Credits.