NEUROSCIENCE
http://www.uvm.edu/neurosciencegrad

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 five 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; PHD, University of Illinois Urbana-Champaign
Ballif, Bryan A.; Professor, Department of Biology; PHD, Harvard University
Barry, Jeremy; Assistant Professor, Department of Neurological Sciences; PHD, SUNY Downstate
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 and Disorders; PHD, University of Connecticut
Cipolla, Marilyn Jo; Professor, Department of Neurological Sciences; PHD, University of Vermont
Cornbrooks, Carson Justin; Associate Professor Emeritus, Department of Neurological Sciences; PHD, Virginia Commonwealth University
Coderre, Emily; Assistant Professor; Department of Communication Sciences and Disorders; PHD, University of Nottingham
Coutinho-Budd, Jaeda; Assistant Professor, Department of Biology; PHD The University of North Carolina at Chapel Hill
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; Associate Professor, Department of Biology; PHD, Colorado State University
Eppstein, Margaret Jean; Professor Emerita, Department of Computer Science; PHD, University of Vermont
Erdos, Benedek; Assistant Professor, Department of Pharmacology; MD, PHD, Semmelweis University, School of Medicine, Budapest, Hungary
Falls, William A.; Dean, College of Arts and Science, Professor, Department of Psychological Science; PHD, Yale University
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, Kyle; 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, Department of Psychological Science; PHD, Temple University
Hammack, Sayamwong E; Professor, Department of Psychological Science; PHD, University of Colorado
Henry, Sharon Margaret; Professor Emerita, Department of Neurological Sciences; PHD, University of Vermont
Holmes, Gregory; Professor, 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
Jaworski, Diane Marie; Professor, Department of Neurological Sciences; PHD, Texas Woman's University
Krementsov, Dimitry; Assistant Professor; Department of Biomedical and Health Sciences; PHD University of Vermont
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
Mohapatra, Sambit; Assistant Professor; Department of Rehabilitation and Movement Science; PHD University of Illinois, Chicago
Mahoney, John Matthew; Assistant Professor, Department of Neurological Sciences; PHD, Dartmouth College
Mawe, Gary Michael; Professor, Department of Neurological Sciences; PHD, Ohio State University
May, Victor; Professor, Department of Neurological Sciences; PHD, Northwestern University
Morielli, Anthony D.; Associate Professor, Department of Pharmacology; PHD, University of California Santa Cruz
Nelson, Mark; Professor, Department of Pharmacology; PHD, Washington University in St Louis
Peters, Denise; Assistant Professor; Department of Rehabilitation and Movement Science; PHD, DPT, University of South Carolina
Potter, Alexandra S.; Associate Professor, Department of Psychiatry; PHD, University of Vermont
Prelock, Patricia A.; Dean, College of Nursing and Health Sciences; Professor, Department of Communication Sciences and Disorders; Professor, Department of Medicine-Pediatrics; PHD, University of Pittsburgh

Quénét, Delphine; Assistant Professor, Department of Biochemistry, PHD; University of Strasbourg, France

Schermernhorn, Alice C.; Associate Professor, Department of Psychological Science; PHD, University of Notre Dame

Scott, Rodney; Professor, Department of Neurological Sciences; PHD, University of London

Sibold, Jeremy S.; Associate Professor, Department of Rehabilitation and Movement Science; EDD, West Virginia University

Spees, Jeffrey; Professor, Department of Medicine-Cardiovascular; PHD, University of California Davis

Stafford, James; Assistant Professor; Department of Neurological Sciences; PHD Oregon Health and Science University

Teuscher, Cory; Professor, Department of Medicine-Immunobiology; PHD, University of New Mexico

Toufexis, Donna J.; Associate Professor, Department of Psychological Science; PHD, McGill University

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; DHSC, Baylor College of Medicine

Whitaker, Emmett; Assistant Professor; Department of Anesthesiology; MD, University of Rochester School of Medicine and Dentistry

White, Sheryl Lynne; 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 & Fntctn. 4-8 Credits.
Combination of gross anatomy, histology, embryology, physiology and medical image 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 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 222. Cellular Neurophysiology. 3 Credits.
Fundamentals of cellular neurophysiology through lecture, independent student reading and faculty-led group discussions of journal articles. Prerequisites: NSCI 110 or, NSCI 111 and NSCI 112, or Instructor Permission.

NSCI 225. Human Neuroanatomy. 0 or 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 230. 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. Prerequisite: ASCI 141 or BIOL 106 or NSCI 111 or PSYS 115 or Instructor permission.

NSCI 280. Glia: Not Just Neuron Glue!. 3 Credits.
Interdisciplinary course in which students engage in a focused, in-depth exploration of how glial cells contribute to neurological and psychiatric disorders. Prerequisites: NSCI 111; Course director approval. Pre/Co-requisites: NSCI 111; Course Director permission.

NSCI 300. Intro Functional Neuroimaging. 3 Credits.
Functional neuroimaging may be the most exciting recent development in cognitive neuroscience. Students will learn about neuroimaging, and work in small groups to develop experiments, acquire and analyze functional MRI data an MRI scanner.

NSCI 302. Neuroscience. 3 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 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. Advanced Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles. Prerequisite: Instructor permission.

NSCI 491. Doctoral Dissertation Research. 1-18 Credits.
NSCI 496. Advanced Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.