# 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 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; 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

**Brieant, Alexis;** Assistant Professor, Department of Psychological Science; PHD, Virginia Tech

**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

**Coderre, Emily;** Assistant Professor; Department of Communication Sciences and Disorders; PHD, University of Nottingham

**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

**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 Emerita, Graduate College, Professor, Department of Neurological Sciences; PHD, University of North Carolina Chapel Hill Francklyn, 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 Green, John Thomas; Professor, Department of Psychological Science; PHD, Temple University Hammack, Sayamwong E; Professor, Department of Psychological Science; PHD, University of Colorado Harraz, Osama F.; Assistant Professor, Department of Pharmacology; PHD, University of Calgary Herrera, Gerald M.; Assistant Professor, Department of Pharmacology; PHD, University of Vermont Higgins, Stephen Thomas; Professor, Department of Psychiatry; PHD, University of Kansas 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 Jangraw, David; Assistant Professor, Department of Biomedical Engineering, PHD, Columbia University Koide, Masayo; Research Assistant Professor, Department of Pharmacology; PHD (medicine) University of Hamamatsu School of Medicine; PHD (pharmacology), University of Shizuoka Krementsov, Dimitry; Assistant Professor; Department of Biomedical and Health Sciences; PHD University of Vermont Lavoie, Brigitte; Assistant Research Professor, Department of Neurological Sciences; PHD, Université Laval Lounsbury, Karen M.; Professor, Department of Pharmacology; PHD, University of Pennsylvania May, Victor; Professor, Department of Neurological Sciences; PHD, Northwestern University Morelli, Kathryn; Assistant Professor, Department of Neurological Sciences; PHD, The Jackson Laboratory & University of Maine Morielli, Anthony D.; Associate Professor, Department of Pharmacology; PHD, University of California Santa Cruz Mughal, Amreen; Assistant Professor, Department of Pharmacology; PHD, North Dakota State University Nelson, Mark; Professor, Department of Pharmacology; PHD, Washington University in St Louis **Ou, Yangguang;** Assistant Professor, Department of Chemistry; PHD, University of Pittsburgh 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; Provost and Senior Vice President; Professor, Department of Communication Sciences; Professor, Department of Medicine-Pediatrics; PHD, University of Pittsburgh
Quénet, Delphine; Assistant Professor, Department of Biochemistry, PHD; University of Strasbourg, France
Ricci, Anna; Assistant Professor, Department of Neurological
Sciences; PHD, Penn State College of Medicine
Salogiannis, John; Assistant Professor, Department of Molecular
Physiology and Biophysics; PHD, Harvard University
Schermerhorn, Alice C; Associate Professor, Department of
Psychological Science; PHD, University of Notre Dame
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 **Stanley, Molly;** Assistant Professor, Department of Biology; PHD, Washington University

Teuscher, Cory; Professor, Department of Medicine-Immunobiology; PHD, University of New Mexico Thrailkill, Eric A.; Research Assistant Professor, Department of Psychological Science; PHD, Utah State University Todd, Travis; Research Assistant Professor, Department of Psychological Science, PHD, University of Vermont 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

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

# Courses

# NSCI 5220. Advanced Cellular Neurophysiol. 3 Credits.

Discusses in detail, on both the cellular and molecular level, the physiological properties of cells within the nervous system. Focuses not only on the specific details of neuronal physiology, but also on the scientist, hypothesis, and experimental paradigm that validated the foundational ideas and concepts of this field.

# NSCI 5230. 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: Instructor permission.

### NSCI 5300. Gr Comparative Neurobiology. 3 Credits.

Many biological adaptations involve unique sensory and/or motor system skills that enable successful prey detection, predator avoidance, or mate location. Explores ways in which the nervous systems of a wide variety of animals are uniquely adapted for their survival challenges.

# NSCI 5990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

### NSCI 6010. Intr Functional Neuroimaging 2. 3 Credits.

Part One will offer lecture-based technical background on in vivo brain-imaging techniques (e.g.MRI, PET; MEG; EEG; TMS). Part Two will focus on hands-on fMRI data processing including data collection at UVMMC research MRI unit and in-class analysis instruction. Pre/Co-requisites: Basic statistics and/or introductory physics helpful.

### NSCI 6020. 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 Graduate student or Instructor permission.

### NSCI 6030. Human Gross and Microanatomy. 3 Credits.

Combination of gross anatomy, histology, embryology, physiology and medical imaging to present an integrated overview of the human body. Emphasis on peripheral nervous system including autonomic nervous system and cranial nerves. Cadaver dissection laboratory combined with lecture and/or content modules and research and teaching presentations. Pre/Co-requisites: Six credits coursework, plus two credits lab in biology, general chemistry, organic chemistry and physics; Neuroscience Graduate student or Instructor permission.

# NSCI 6071. Medical Neuroscience Part 1. 2-6 Credits.

Explores the nervous system through integrative study of behavior, cellular and systems neurobiology, neuroanatomy, neuroethics, neuropharmacology, neurophysiology, pathophysiology, and psychopathology. Several instructional methods support learning in this course, including lecture, online independent study modules, laboratory sessions, team-based learning and case and problem based discussions. Prerequisites: Neuroscience Graduate student; Instructor permission.

# NSCI 6072. Medical Neuroscience Part 2. 2-6 Credits.

Explores the nervous system through integrative study of behavior, cellular and systems neurobiology, neuroanatomy, neuroethics, neuropharmacology, neurophysiology, pathophysiology, and psychopathology. Several instructional methods support learning in this course, including lecture, online independent study modules, laboratory sessions, team-based learning and case and problem based discussions. Prerequisites: Neuroscience Graduate student; Instructor permission.

# NSCI 6270. 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 6391. Master's Thesis Research. 1-18 Credits.

Research for the Master's Thesis.

# NSCI 6820. Seminar in Neuroscience. 1 Credit.

Research presentations and critical review of the literature in various areas of anatomical and neurobiological sciences.

# NSCI 6990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles. Prerequisite: Instructor permission.

# NSCI 6991. Internship. 1-18 Credits.

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

# NSCI 6993. Independent Study. 1-18 Credits.

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

# NSCI 6995. Graduate Independent Research. 1-18 Credits.

Graduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

NSCI 7491. Doctoral Dissertation Research. 1-18 Credits. Research for the Doctoral Dissertation.

# NSCI 7990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

# NSCI 7991. Internship. 1-18 Credits.

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

# NSCI 7995. Graduate Independent Research. 1-18 Credits.

Graduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.