Department of Neuroscience

The structure of the human body is presented in two courses: Human Body: Anatomy, Embryology, Imaging (Neurosci 501B), offered in the first semester, and Histology and Cell Biology (Neurosci 502A), which extends over the first and second semesters. A third course, Neural Science (Neurol 554), is taught at the end of the second semester.

The Human Body: Anatomy, Embryology, Imaging is largely a laboratory course, and lectures deal with anatomical principles and human growth and development. Histology and Cell Biology focuses on cell and tissue biology, with laboratory sessions paralleling the lectures in these areas. Neural Science is an integrated course that deals with the structure, function and development of the nervous system from molecular, cellular and systems perspectives. Throughout all three courses, attention is paid to the results of recent investigations and to major developments in each field. In addition, the departmental faculty have a lead role in many graduate courses that may be taken as electives by students in any of the four years.

The department is well-equipped for specialized work in several areas, including gross anatomy, tissue culture and all aspects of neurobiology.

Website: [http://neurosci.wustl.edu](http://neurosci.wustl.edu)

Degrees & Requirements

While the Department of Neuroscience does not offer its own degree, some of the department's courses are open to students in the MD and MSTP (MD/PhD) programs. Further information about the MD and MSTP degrees can be found in the Degrees & Programs Offered ([http://bulletin.wustl.edu/medicine/degrees](http://bulletin.wustl.edu/medicine/degrees)) section of this Bulletin.

Research

**M05 Neurosci 900**

Cross-listed with L41 Biol 590

**Kari Allen, PhD**
North Building, 3rd Floor
Phone: 314-747-6572

**Martha Bagnall, PhD**
McDonnell Medical Sciences Building, 4th Floor
Phone: 314-362-9695
Molecular, electrophysiological, and behavioral analyses of neural circuits for vestibular control of spinal function.

**Amy Bauernfeind, PhD**
North Building, 3rd Floor
Phone: 314-747-6566
Biological bases of human cognition; comparative neurobiology of primates.

**Azad Bonni, MD, PhD**
McDonnell Medical Sciences Building, 8th Floor
Phone: 314-362-3033
Principles & mechanisms governing assembly & function of neural circuits, deregulation of mechanisms in neurological diseases.

**Paul Bridgman, PhD**
McDonnell Medical Sciences Building, 8th Floor
Phone: 314-362-3449
Cell biology of the developing nervous system.

**Andreas Burkhalter, PhD**
North Building, 4th Floor
Phone: 314-362-4068
Organization and function of neuronal circuits in mouse visual cortex.

**Harold Burton, PhD**
East McDonnell Building, 3rd Floor
Phone: 314-362-3556
Cortical functional reorganization in response to sensory changes due to unilateral deafness or strabismus.

**Valeria Cavalli, PhD**
McDonnell Medical Sciences Building, 9th Floor
Phone: 314-362-3540
Cellular, molecular and epigenetic mechanisms controlling axon regeneration.

**Krikor Dikranian, MD, PhD**
North Building, 3rd Floor
Phone: 314-362-3548
Development and morphology of the amyloid plaques in experimental animals, neuropathological changes after head trauma.

**James Fitzpatrick, PhD**
McKinley Research Building, Basement
Phone: 314-747-0838
Optical and charged particle multiscale microscopy application method development.

**Harrison Gabel, PhD**
McDonnell Medical Sciences Building, 8th Floor
Phone: 314-362-3531
Gene regulation in the developing nervous system; molecular mechanisms of neurodevelopmental disorders.

**Edward Han, PhD**
McDonnell Medical Sciences Building, 9th Floor
Phone: 314-747-2505
Learning-related hippocampal network activation.
Timothy E. Holy, PhD
North Building, 4th Floor
Phone: 314-362-0086
Mammalian pheromones: neural mechanisms of action.

Ilya Monosov, MS, PhD
East McDonnell Building, 2nd Floor
Phone: 314-362-3740
Neuronal mechanisms of voluntary behavior.

Ashley Morhardt, PhD
North Building, 3rd Floor
Phone: 314-273-1859
Evolution of neural diversity within and across non-mammalian vertebrate clades, especially dinosaurs.

Michael L. Nonet, PhD
McDonnell Medical Sciences Building, 9th Floor
Phone: 314-747-1176
Molecular genetic analysis of synaptic development and function.

Karen L. O’Malley, PhD
McDonnell Medical Sciences Building, 9th Floor
Phone: 314-362-7087
Molecular mechanisms underlying neurodegenerative processes. Signaling mechanisms associated with intracellular receptors.

Camillo Padoa Schioppa, PhD
East McDonnell Building, 3rd Floor
Phone: 314-362-3530
Neuronal bases of economic choice and decision making.

Terry Ritzman, PhD
North Building, 3rd Floor
Phone: 314-273-1861
Comparative anatomy of the skull in primates as it relates to human evolution.

Lawrence B. Salkoff, PhD
McDonnell Medical Sciences Building, 9th Floor
Phone: 314-362-3644
The roles of ion channels in neuronal long-term excitability changes.

Paul J. Shaw, PhD
McDonnell Medical Sciences Building, 9th Floor
Phone: 314-362-2703
Molecular genetics of sleep and circadian rhythms.

Lawrence H. Snyder, MD, PhD
East McDonnell Building, 3rd Floor
Phone: 314-747-3530
Computational and cognitive issues in cortical control of eye and arm movement: electrophysiology and imaging.

Paul H. Taghert, PhD
McDonnell Medical Sciences Building, 9th Floor
Phone: 314-362-3641
Neurobiology of circadian rhythms and neurobiology of peptidergic neurotransmission.

David C. Van Essen, PhD
East McDonnell Building, 2nd Floor
Phone: 314-362-7043
Organization, function, and development of primate cerebral cortex, especially in humans; generation and utilization of neuroinformatics tools for data mining.

Jason Yi, PhD
McDonnell Medical Sciences Building, 8th Floor
Phone: 314-273-1664
Molecular pathways shaping nervous system development and function.

Faculty

Department Chair
Azad Bonni, PhD, MD

Visit our website for more information about our faculty (http://neurosci.wustl.edu/People/Faculty) and their appointments.

A

Kari Leigh Allen, MA, PHD
Assistant Professor of Anatomy (primary appointment)
Assistant Professor of Anthropology (Courtesy)
BA State Univ of NY Potsdam 2005
MA New Mexico St University 2008
PHD Duke University 2014

B

Amy Lynn Bauernfeind, M PHIL, PHD
Assistant Professor of Anatomy (primary appointment)
Assistant Professor of Anthropology (Courtesy)
BS Vanderbilt University 2004
M PHIL George Washington University 2011
PHD George Washington University 2014

Azad Bonni, PhD, MD
Edison Professor of Neurobiology (primary appointment)
Head of the Department of Neuroscience
PHD Harvard University 1996
MD Queen's University 1986

Paul C Bridgman, PHD, MS
Professor of Neuroscience (primary appointment)
Associate Professor of Biomedical Engineering
PHD Purdue University 1980
BA University of San Diego 1974
MS University of CA San Diego 1976

Andreas H Burkhalter, PHD, MS
Professor of Neuroscience (primary appointment)
Associate Professor of Biomedical Engineering
Associate Professor of Neurobiology in Neurological Surgery
PHD University of Zurich 1977
MS University of Zurich 1973

Harold Burton, PHD
Professor of Neuroscience (primary appointment)
Professor of Biomedical Engineering
Professor of Cell Biology and Physiology
Professor of Radiology
BA University of Michigan 1964
PHD Univ of Wisconsin Madison 1968

Valeria Cavalli, MS, PHD
Associate Professor of Neuroscience (primary appointment)
MS University of Geneva 1992
BS University of Geneva 1991
PHD University of Geneva 2000

Yao Chen, MS, PHD
Assistant Professor of Neuroscience (primary appointment)
MS Cambridge University 2006
BS Cambridge University 2002
PHD Harvard University 2009

Krikor T Dikranian, PHD, MD
Professor of Anatomy (primary appointment)
Professor of Physical Therapy
PHD Medical University - Sofia 1992
MD Medical University - Varna 1978

Susan M Fitzpatrick, PHD
Adjunct Associate Professor of Neuroscience (primary appointment)
Adjunct Associate Professor of Occupational Therapy
PHD Cornell University 1984
BS St Johns University 1978

James Alexander John Fitzpatrick, PHD
Associate Professor of Neuroscience (primary appointment)
Associate Professor of Cell Biology and Physiology
BS King's College London 2000
PHD University of Bristol 2003

Harrison W. Gabel, PHD, AB
Assistant Professor of Neuroscience (primary appointment)
PHD Harvard University 2008
AB Princeton University 2001

Edward B. Han, PHD
Assistant Professor of Neuroscience (primary appointment)
Assistant Professor of Anesthesiology
BS Cornell University 1995
PHD University of CA San Diego 2004

Martha B. Han, PHD
Assistant Professor of Neuroscience (primary appointment)
PHD University of CA San Diego 2008
BS Yale University 2000

Timothy E. Holy, MA, PHD
Professor of Neuroscience (primary appointment)
Alan A and Edith L Wolff Professor of Neuroscience
MA Princeton University 1992
PHD Princeton University 1997
BA Rice University 1991

Ilya E. Monosov, MS, PHD
Assistant Professor of Neuroscience (primary appointment)
MS NewSchool Architecture Design 2005
PHD Brown University 2009
BS University of CA San Diego 2004

Ashley C. Morhardt, PHD, MS
Assistant Professor of Anatomy (primary appointment)
PHD Ohio University 2016
BS Illinois College, Jacksonville 2006
MS Western Illinois University 2009

Michael L Nonet, PHD
Associate Professor of Neuroscience (primary appointment)
BS University of CA Davis 1984
PHD Mass Inst of Technology (MIT) 1989

Karen Laurel O'Malley, PHD, MS
Professor of Neuroscience (primary appointment)
BA Sonoma State University 1971
PHD University of Texas Austin 1980
MS Portland St University 1973

Camillo Padoa-Schioppa, MS, PHD
Associate Professor of Neuroscience (primary appointment)
Associate Professor of Economics (Courtesy)
MS La Sapienza University 1996
PHD Mass Inst of Technology (MIT) 2002

Thomas J Papouin, MS, PHD
Assistant Professor of Neuroscience (primary appointment)
BS Ecole Normale Superieure Lyon 2005
MS Ecole Normale Superieure Lyon 2007
PHD University of Bordeaux 2 2011

Carlos Ramon Ponce, MD, PHD
Assistant Professor of Neuroscience (primary appointment)
BS University of Utah 2001
MD Harvard University 2010
PHD Harvard University 2008

R

Terrence Bradley Ritzman, PHD, MA
Assistant Professor of Anatomy (primary appointment)
Assistant Professor of Anthropology
BA University of Illinois 1999
PHD Arizona State University 2014
MA Colorado St University 2005

S

Lawrence B Salkoff, PHD
Professor of Neuroscience (primary appointment)
Professor of Genetics
PHD University of CA Berkeley 1979
BA University of CA Los Angeles 1967

Paul Joseph Shaw, MA, PHD
Associate Professor of Neuroscience (primary appointment)
BA Niagara University 1985
MA San Jose State University 1990
PHD University of Chicago 1996

Lawrence H Snyder, MS, AB, MD, PHD
Professor of Neuroscience (primary appointment)
Professor of Psychological & Brain Sciences
MS University of Rochester 1992
AB Princeton University 1982
MD University of Rochester 1992
PHD University of Rochester 1992

T

Paul H Taghert, PHD
Professor of Neuroscience (primary appointment)
PHD University of Washington 1981
BA Reed College 1975

V

David C Van Essen, PHD
Alumni Endowed Professor of Neurobiology (primary appointment)
Professor of Biomedical Engineering
BS California Institute Technolo 1967
PHD Harvard University 1971

Y

Jason Yi, PHD
Assistant Professor of Neuroscience (primary appointment)
BS Dickinson College 2001
PHD Duke University 2009

Z

Guoyan Zhao, PHD, MS

Assistant Professor of Neuroscience (primary appointment)
BS School Not Listed 1995
PHD Washington Univ in St. Louis 2003
MS School Not Listed 1998

Courses

Visit online course listings to view offerings for M05 Neurosci (https://courses.wustl.edu/CourseInfo.aspx?sch=M&dept=M05).

M05 Neurosci 501B Human Body: Anatomy, Embryology, Imaging
The course is primarily lab-based, focusing on dissection of the human body. Lectures on functional and topographic anatomy emphasize the principles of organization of the various systems of the body. Lectures on developmental anatomy stress organogenesis as an adjunct to understanding the normal and abnormal anatomy. Small group discussions emphasize radiological anatomy and clinical correlations. Frequent use of CT, MRI, and X-ray images aid in the synthesis of knowledge gained through dissection. Cross-listed with L41 (Biol) 501.
Credit 140 units.

M05 Neurosci 502A Histology and Cell Biology
The structures of cells, tissues, and major organ systems are studied in relationship to their functions. Lectures integrate histology with cell biology and physiology. The laboratories consist of the study of prepared slides and electron micrographs using an iBook or eBook (ePub) guide. An extensive online digital annotated atlas (slide-atlas.org) and a video library are used to supplement the slides and electron micrographs. Presentations of case studies provide examples of clinical relevance. A dual-view microscope and slide set will be issued for each pair of students. Limited space is available for non-medical students, who must have permission from the course director to enroll. The topics in this course are timed to integrate with the physiology course and span the fall and winter semesters.
Credit 66 units.

M05 Neurosci 810 Advanced Dissection
Different regions of the body will be dissected in detail. A period of four weeks should be allowed for each region: head and neck, thorax and abdomen, and superior and inferior limbs. Surgical approaches, cross-sections, X-rays, and CT scans can be studied.