Department of Neuroscience

The structure of the human body is presented in two courses: Human Body: Anatomy, Embryology, Imaging (AnatNeuro 501B), offered in the first semester, and Microscopic Anatomy, 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 (AnatNeuro 502A) 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

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) section of this Bulletin.

Research

M05 AnatNeuro 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
Learning-related hippocampal network activation.

**Timothy E. Holy, PhD**
North Building, 4th Floor  
Phone: 314-362-0086  
Mammalian pheromones: neural mechanisms of action.

**Arthur D. Loewy, PhD**
McDonnell Medical Sciences Building, 9th Floor  
Phone: 314-362-3930  
Analysis of brain circuits controlling cardiovascular functions.

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

**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.

**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

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

**A**

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

**B**

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

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  
MS University of CA San Diego 1976  
BA University of San Diego 1974

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

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

C

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

D

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

F

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

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

G

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

H

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, PHD, MA
Professor of Neuroscience (primary appointment)
Alan A and Edith L Wolff Professor of Neuroscience
PHD Princeton University 1997
MA Princeton University 1992

BA Rice University 1991

M

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

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

N

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

O

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

P

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

R

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

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, PHD, MA
Associate Professor of Neuroscience (primary appointment)
PHD University of Chicago 1996
BA Niagara University 1985
MA San Jose State University 1990
Lawrence H Snyder, PHD, AB, MS, MD  
Professor of Neuroscience (primary appointment)  
Professor of Psychological & Brain Sciences  
PHD University of Rochester 1992  
AB Princeton University 1982  
MS University of Rochester 1992  
MD University of Rochester 1992  

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

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  

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

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

M05 AnatNeuro 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 AnatNeuro 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 (https://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 AnatNeuro 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.  

M05 AnatNeuro 900 Research Elective - Anatomy and Neuroscience  
Research opportunities may be available. If interested, please contact the Neuroscience Program.