Neuroscience (A Graduate Group)

W. Martin Usrey, Ph.D., Chairperson of the Group

Group Office, 148 Center for Neuroscience
530-757-8845
http://neuroscience.ucdavis.edu/grad

Faculty

Leonard J. Abbeduto, Ph.D., Professor
(Psychiatry and Behavioral Sciences)
David Amaral, Ph.D., Professor
(Psychiatry and Behavioral Sciences)
Robert Berman, Ph.D., Professor
(Neurology)
Lauren Barondes, Ph.D., Associate Professor
(Pharmacology and Microbiology)
Kenneth H. Britton, Ph.D., Professor
(Neurobiology, Physiology, and Behavior)
Marie Burns, Ph.D., Professor
(Anesthesiology and Pain Medicine)
Stephen Noctor, Ph.D., Assistant Professor
(Psychiatry and Behavioral Sciences)
Alex Nord, Ph.D., Assistant Professor
(Neurobiology, Physiology, and Behavior)
Christine Nordahl, Ph.D., Assistant Professor
(Neurology & Neurosurgery)
John Olichney, M.D., Professor
(Neurology)
Isaac N. Pessah, Ph.D., Professor
(Molecular Biosciences)
David Pleasure, M.D., Professor
(Neurology and Pediatrics)
Edward N. Pugh, Ph.D., Professor
(Cell Biology and Human Anatomy)
J. Daniel Ragoné, Ph.D., Professor
(Psychiatry and Behavioral Sciences)
Charan Ranganath, Ph.D., Professor
(Psychology)
Gregg H. Recanzone, Ph.D., Professor
(Neurobiology, Physiology, and Behavior)
David Richman, M.D., Professor
(Neurology)
Susan Rivera, Ph.D., Professor
(Psychology)
Michael Rogawski, M.D., Ph.D., Professor
(Neurology)
Karen Ryan, Ph.D., Assistant Professor
(Neurobiology, Physiology, and Behavior)
Julie Schweitzer, Ph.D., Professor
(Psychiatry and Behavioral Sciences)
Kiarash Shafahi, M.D., Ph.D., Assistant Professor
(Neurology & Neurosurgery)
Frank Sharp, M.D., Professor
(Neurology)
Jill Silverman, Ph.D., Assistant Professor
(Psychiatry and Behavioral Sciences)
Sergi Simo, Ph.D., Professor
(Cell Biology and Human Anatomy)
Tony Simon, Ph.D., Professor
(Psychiatry and Behavioral Sciences)
Danielle Stolzenberg, Ph.D., Assistant Professor
(Psychology)
Mitchell L. Sutter, Ph.D., Professor
(Neurobiology, Physiology, and Behavior)
Diane Swick, Ph.D., Associate Adjunct Professor
(Neurology)
Li Tian, Ph.D., Assistant Professor
(Biochemistry and Molecular Medicine)
Brian Trainor, Ph.D., Assistant Professor
(Psychology)
James Trimmer, Ph.D., Professor
(Neurobiology, Physiology, and Behavior)
W. Martin Usrey, Ph.D., Professor
(Neurology & Neurobiology, Physiology, and Behavior)
John S. Werner, Ph.D., Professor
(Phthalotherapal and Vision Science)
Brian Willgen, Ph.D., Assistant Professor
(Psychology)
Yang (Kevin) Xiang, Ph.D., Associate Professor
(Pharmacology)
Andrew Yonelinas, Ph.D., Professor
(Psychology)
Konstantinos Zarbalis, Ph.D., Assistant Professor
(Pathology)
Min Zhao, M.D., Ph.D., Professor
(Department of Molecular and Cell Biology)
Chengji Zhou, Ph.D., Associate Professor
(Cell Biology and Human Anatomy)
Karen Zito, Ph.D., Associate Professor
(Neurobiology, Physiology, and Behavior)
Emeriti Faculty

Leo M. Chalupa, Ph.D., Professor
(Neurobiology, Physiology, and Behavior)
Edward G. Jones, M.D., Ph.D., Professor
(Physiology)
Brian Mullenoy, Ph.D., Professor
(Neurobiology, Physiology, and Behavior)
Karen Sigvardt, Ph.D., Adjunct Professor
(Physiology)
David Woods, Ph.D., Adjunct Professor
(Physiology)
Graduate Study.

The Graduate Group in Neuroscience offers programs of study leading to the Ph.D. degree. Neuroscience is a broad, interdepartmental program with faculty interests ranging from molecular biology, cellular organization and cognition. A major goal of the program is to prepare students for careers as research scientists. Details of the program may be obtained from the Graduate Office.

Graduate Advisers.

R. Berman (Neurological Surgery), E. Diaz (Pharmacology), A. Ishida (Neurobiology, Physiology, and Behavior), W.M. Usrey (Neurobiology, Physiology, and Behavior), W.B. Will- gen (Psychology)

Courses in Neuroscience (NSC)

Upper Division

160. Molecular and Cellular Neurobiology (3)

Lecture—1.5 hours, discussion—1.5 hours. Prerequi- site: Neuroscience 100. Introduction to the laboratory of a faculty member. Topics in neurobiology. Topics include channel biophysics, action potential propagation, intra- cellular signal transduction pathways, synaptic physiology and quantal analysis, cellular mecha- nisms of synaptic plasticity, and neuromodulation of synaptic circuitry. (Same course as Neuroscience, Psychology, and Behavior 160.) (S/U grading only.)—S. (S) Burns

Graduate

200.A. Laboratory Methods in Neurobiology (6)

Lecture—2 hours, laboratory/discussion—1 hour. Prerequisite: consent of instructor. Limited enrollment. Mix of lectures, demonstrations, and discussions, emphasizing functional significance of neuroanatom- omy from a biological perspective, with comparisons between human and non-human brains. Emphasis placed on functional anatomy of the nervous system, integrated with cellular, molecular, cognitive, and developmental concepts. —F. (F) Amal

211. Advanced Topics in Neuroimaging (2)

Seminar—2 hours. Prerequisite: Psychology 210 or consent of instructor. Restricted to 16 students. Critical presentation and discussion of the most impor- tant advances in neuroimaging, emphasizing fMRI design/analysis and the integration of fMRI with EEG/MEG. (Same course as Neuroscience, Psychology, and Behavior 211.11 and Psychology 211.) (S/U grading only.)—W. (W) Miller

220. How to Give a Scientific Seminar (3)

Lecture/discussion—3 hours. Prerequisite: consent of instructor. Presentation of effective seminars. Student presentations of selected neuroscience topics in sem- inar format. Must be taken in two consecutive quar- ters. Offered in alternate years. —F. (F) S. (F, S)

DeBello, McAllister

221. Cellular Neurophysiology (4)

Lecture—4.5 hours. Prerequisite: graduate standing or consent of instructor. Physiological aspects of cell- lular and subcellular organization of the nervous sys- tem. Neuronal cell biology, the structure and function of ion channels, electrical excitability, signaling cas- cades, sensory transmission, and mechanisms of syn- aptic transmission, and the cellular basis of learning and memory. —F. (F) Burns, Chen

222. Systems Neurosciences (5)

Lecture—4 hours, discussion—1 hour. Prerequisite: graduate standing or consent of instructor. Integra- tive and information-processing aspects of nervous system organization. Topics include sensory systems, motor function, sensory-motor integration, the limbic system, and the neurobiology of learning and mem- ory. (Same course as Neuroscience, Physiology, and Behavior 222.)—W. (W) DeBello, Ditricher, Usrey
223. Cognitive Neuroscience (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing in Psychology or Neuroscience, or consent of instructor. Graduation core course for neuroscience. Neurobiological basics of higher mental function including attention, memory, language, and consciousness. One of three in three-quarter sequence. (Same course as Psychology 261.) —S. (S.) Swaab

224A. Molecular and Developmental Neurobiology (2)
Lecture/discussion—2 hours. Prerequisite: consent of instructor. Key issues in developmental and molecular neurobiology. Discussion emphasis on critical evaluation of the experiments and methods described in research papers. Readings of seminal, primary research papers, reviews, and book chapters. Exam materials will be distributed one week in advance. —W. (W) Cheng, Diaz

224B. Molecular and Developmental Neurobiology (2)
Lecture/discussion—2 hours. Prerequisite: course 224A or consent of instructor. Continuation of course 224A. Key issues in developmental and molecular neurobiology, focusing on developmental topics. Discussion emphasis on critical evaluation of experiments and methods described in associated literature. Offered in alternate years. —S. Cheng, Diaz

225. Translational Research in the Neurobiology of Disease (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: Past or concurrent enrollment in Neuroscience courses 221, 222, 223, or permission of instructor; restricted to current graduate student enrollment or permission of instructor. This course will provide an overview of major neuropsychiatric and neurological disorders from both the clinical and fundamental science perspectives. Offered in alternate years. —W. Carter, McAllister

226. Molecular and Developmental Neurobiology (4)
Lecture/discussion—4 hours. Prerequisite: consent of instructor. Introduction to molecular and developmental neurobiology. Topics range from neurotrophin to development of sensory systems and include modern molecular methods and their application in developmen
tal neuroscience. —W. (W) McAllister

243. Topics in Cellular and Behavioral Neurobiology (2)
Discussion—1 hour; seminar—1 hour. Prerequisite: consent of instructor. An advanced examination of several current problems in neurobiology. Topics will vary in different years; may be repeated for credit. (S/U grading only.) —S. (S.) Ishida

247. Topics in Functional Neurogenomics (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing or consent of instructor. The theory, methods, and principles of functional neurogenomics with emphasis on the relationship to molecular mechanisms involved in development and disease of the nervous system. (Same course as Neurobiology, Physiology, and Behavior 247.) Offered in alternate years. —W. Choudary

250. Biology of Neurogia (2)
Lecture/discussion—1.5 hours. Prerequisite: consent of instructor. The properties and functions of non-neuronal cells in the mammalian central nervous system with relevance to neuronal development, physiology and injury response. Offered in alternate years. (S/U grading only.) —S. (S.) Ishida

261. Topics in Vision: Eyes and Retinal Mechanisms (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing, Neurobiology, Physiology, and Behavior 100 or 112 or the equivalent. Structure and function of the visual system with an emphasis on the eye and retina, including optics, anatomy, transduction, retinal synapses, adaptation, and parallel processing. (Same course as Neurobiology, Physiology, and Behavior 261A; Molecular, Cellular, and Integrative Physiology 261A.) (S/U grading only.) Offered in alternate years. —F. Ishida

261B. Topics in Vision: Systems, Psychophysics, Computational Models (2)
Lecture/discussion—2 hours. Prerequisite: consent of instructor, course 261A and 261B. Functions of the central visual pathways and their underlying mechanisms. Recent research on aspects of anatomy, biochemistry, psychophysics, development, and genetics of the visual system. (Same course as Neurobiology, Physiology, and Behavior 261B and Molecular, Cellular, and Integrative Physiology 261B.) (S/U grading only.) Offered in alternate years. —W. Britten

261C. Topics in Vision: Clinical Vision Science (2)
Lecture/discussion—2 hours. Prerequisite: courses 261A and 18, or consent of instructor. Causes and mechanisms of common retinal diseases. Recent research on aspects of anatomy, biochemistry, electrophysiology, psychophysics, and development, and genetics of the visual system related to disease. (Same course as Neurobiology, Physiology, and Behavior 261C and Molecular, Cellular, and Integrative Physiology 261C.) (S/U grading only.) Offered in alternate years. —S. Ishida

267. Computational Neuroscience (5)
Lecture—4 hours; lecture/laboratory—3 hours. Prerequisite: one course in general neuroscience at the level of course 100; one year college-level Calculus at level of Math 21A, B, C; one year Physics at the level of Physics 7A, B, C, strongly recommended; students from other departments should contact the instructor. Mathematical models and data analysis techniques used to describe computations performed by nervous systems. Lecture topics include single-neuron biophysics, neural coding, network dynamics, memory, plasticity, and learning. Lab topics include programming of mathematical models and data analysis techniques in MATLAB. Offered in alternate years. (Same course as Neurobiology, Physiology & Behavior 267.) —F. (F.) Goldman

283. Neurobiological Literature (1)
Seminar—1 hour. Prerequisite: consent of instructor. Critical presentation and analysis of recent journal articles in neurobiology. May be repeated for credit. (S/U grading only.) —F, W. (F, W, S.)

284. Development of Sensory Systems (1)
Seminar—1 hour. Prerequisite: consent of instructor. Presentation and discussion of recent literature on the development of sensory systems. May be repeated for credit. (S/U grading only.) —F, S. (F, S.) Cheng

285. Literature in Visual Neuroscience (2)
Seminar—2 hours. Critical presentation and discussion of current literature in visual neuroscience. (Same course as Neurobiology, Physiology, and Behavior 285.) May be repeated for credit. (S/U grading only.) —F, W. (F, W, S.) Britten, Goldman, Usrey

287A. Topics in Theoretical Neuroscience (2)
Seminar—2 hours. Prerequisite: consent of instructor. In-depth exploration of topics in theoretical neuroscience. Topic varies each year. Fall quarter (287A): foundational material from books and review articles. Spring quarter (287B): continuation of year's topic through readings of seminal articles from the primary literature. May be repeated for credit. (S/U grading only.) —F, W. (F, W, S.) Britten, Goldman, Usrey

287B. Topics in Theoretical Neuroscience (2)
Seminar—2 hours. Prerequisite: consent of instructor. In-depth exploration of topics in theoretical neuroscience. Topic varies each year. Fall quarter (287A): foundational material from books and review articles. Spring quarter (287B): continuation of year's topic through readings of seminal articles from the primary literature. May be repeated for credit. (Same course as Neuroscience, Physiology & Behavior 287A.) (S/U grading only.) —F, W. (F, W, S.) Ditterich, Goldman

289. Topics in Molecular and Developmental Neurobiology (2)
Seminar—2 hours. Analysis and discussion of seminal and current research papers in molecular and developmental neurobiology. Different topics will be covered each quarter. In the past topics have included, "Synaptic vesicle dynamics," "Neuromodulator polarity," and "Gluamter receptors." May be repeated ten times for credit when topic differs. (S/U grading only.) —F, S. (F, S.) Diaz, Zito

290C. Research Conference in Neurobiology (1)
Discussion—1 hour. Prerequisite: graduate standing in Neuroscience or consent of instructor; course 299 (concurrently). Presentation and discussion of faculty and graduate student research in neurobiology. May be repeated for credit. (S/U grading only.) —W, S. (F, W, S.)

299. Research (1-12)
(S/U grading only.)

Neurology
See Medicine, School of, on page 427.

Neurosurgery
See Medicine, School of, on page 427.

Nursing, Betty Irene Moore School of
Heather M. Young, Ph.D., R.N., F.A.A.N.; Associate Vice Chancellor for Nursing, UC Davis, and Dean, Betty Irene Moore School of Nursing Theresa A. Harvath, Ph.D., R.N., F.A.A.N.; Associate Dean for Academics, Director for Clinical Education and Clinical Professor Jill G. Joseph, M.D., Ph.D., M.P.H.; Associate Dean for Research and Professor 4610 X St., Suite 4202, Sacramento, CA 95817 916-734-2145, http://nursing.ucdavis.edu

Mission Statement
The Betty Irene Moore School of Nursing at UC Davis cultivates academic excellence through immersive, interdisciplinary education and research while enhancing the communities served. Faculty, staff and students discover and disseminate knowledge to advance health, improve quality of care and shape policy.

Nursing Science and Health-Care Leadership Graduate Degree Program
Hosted by the Betty Irene Moore School of Nursing at UC Davis, the Nursing Science and Health-Care Leadership Graduate Degree Programs prepare nurse leaders, physician assistants, nurse practitioners, researchers and faculty in a unique interdisciplinary and interprofessional environment. The full-time, academic, doctoral program prepares gradu-