

Physiology and Biophysics

Michael D. Cahalan, Department Chair

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The Department of Physiology and Biophysics offers research opportunities in molecular biophysics of membranes and proteins, ion channels and signal transduction, molecular and cell biology, structural biology, proteomics, physiological genomics, neuroscience, developmental neurobiology, stem cell biology, endocrinology, cardiac and exercise physiology, GI pathophysiology, immunology, cancer biology, and vision science.

The Department offers graduate study under the auspices of the School of Medicine and in conjunction with the graduate program in Cellular and Molecular Biosciences (CMB) and the Interdepartmental Neuroscience Program (INP), which are described in the School of Biological Sciences section (<http://catalogue.uci.edu/schoolofbiologicalsciences/#graduatetext>). Students are eligible to enter the Department program after meeting the specific requirements of the CMB or INP gateway curriculum or by direct application to the Department. The Department program leads to an M.S. or Ph.D. in Biomedical Sciences, awarded after successful completion of all requirements. Students admitted through either gateway program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

The faculty conducts quarterly reviews of all continuing students to ensure that they maintain satisfactory progress within their particular academic program. Students participate in a literature review course designed to strengthen research techniques and presentation skills, and attend the monthly Department Colloquium. Students advance to candidacy during the third year; each student presents a seminar on their research projects in preparation for their Ph.D. dissertation. The candidacy committee examines the student's qualifications for the successful conduct of doctoral dissertation research. The students submit a written dissertation on an original research project and defend it in an oral final exam. The normative time for completion of the Ph.D. is five years. Students who make exceptional progress on their thesis projects are encouraged to complete the Ph.D. sooner. The maximum time permitted is seven years.

Faculty

Geoffrey W. Abbott, Ph.D. University of London, *Senior Associate Dean for Academic Personnel and Vice Dean for Basic Science Research and Professor of Physiology and Biophysics; Physiology and Biophysics*

Tallie Z. Baram, M.D., Ph.D. University of Miami, *Weizmann Institute of Science and Danette "Dee Dee" Shepard Chair in Neurological Studies and Distinguished Professor of Pediatrics; Anatomy and Neurobiology; Neurology; Physiology and Biophysics*

Kevin T. Beier, Ph.D. Harvard University, *Assistant Professor of Physiology and Biophysics; Biomedical Engineering; Pharmaceutical Sciences*

Amanda Burkhardt, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Physiology and Biophysics*

Michael D. Cahalan, Ph.D. University of Washington, *Department Chair and Distinguished Professor of Physiology and Biophysics*

David Huw Davies, Ph.D. University College London, *Assistant Adjunct Professor of Physiology and Biophysics*

Philip Felgner, Ph.D. Michigan State University, *Director of the Vaccine Research and Development Center and Professor in Residence of Physiology and Biophysics*

John Jay Gargus, M.D. Ph.D. Yale University, *Director of the Center for Autism Research and Translation and Professor Emeritus of Physiology and Biophysics; Genetic Counseling; Pediatrics*

Alan L. Goldin, M.D. Ph.D. University of Michigan, *Professor of Microbiology and Molecular Genetics; Anatomy and Neurobiology; Physiology and Biophysics*

Steven A.N. Goldstein, M.D., Ph.D. Harvard University, *Vice Chancellor for Health Affairs and Distinguished Professor of Physiology and Biophysics; Pharmaceutical Sciences*

Milton Greenberg, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Physiology and Biophysics*

James E. Hall, Ph.D. University of California, Riverside, *Professor Emeritus of Physiology and Biophysics*

Todd C. Holmes, Ph.D. Massachusetts Institute of Technology, *Department Vice Chair and Professor of Physiology and Biophysics*

Naoto Hoshi, Ph.D. Kanazawa University, *Associate Professor of Pharmaceutical Sciences; Physiology and Biophysics*

Lan Huang, Ph.D. University of Florida, *Professor of Physiology and Biophysics; Biological Chemistry; Biomedical Engineering; Pharmaceutical Sciences*

Autumn S. Ivy, M.D., Ph.D. University of California, Irvine, *Assistant Professor of Pediatrics; Neurology; Physiology and Biophysics*

Rongsheng Jin, Ph.D. Columbia University, *Professor of Physiology and Biophysics*

Philip D. Kiser, Pharm.D. Ph.D. Case Western Reserve University, *Assistant Professor of Physiology and Biophysics; Ophthalmology*

Devon A. Lawson, Ph.D. University of California, Los Angeles, *Assistant Professor of Physiology and Biophysics*

Kenneth J. Longmuir, Ph.D. University of Oregon, *Professor Emeritus of Physiology and Biophysics*

Francesco Marangoni, Ph.D. Vita-Salute San Raffaele University, *Assistant Professor of Physiology and Biophysics*

Krzysztof Palczewski, Ph.D. Wroclaw University of Science and Technology, *Irving H. Leopold Chair of Ophthalmology and Professor of Ophthalmology; Chemistry; Physiology and Biophysics*

Mitradas M. Panicker, Ph.D. Carnegie-Mellon University, *Associate Adjunct Professor of Physiology and Biophysics*

Ian Parker, Ph.D. University College London, *Professor of Neurobiology and Behavior; Physiology and Biophysics*

Medha Pathak, Ph.D. University of California, Berkeley, *Assistant Professor of Physiology and Biophysics; Biomedical Engineering*

Eric Pearlman, Ph.D. University of Texas Health Sciences Center at San Antonio, *Director of the Institute for Immunology and Chancellor's Professor of Physiology and Biophysics; Ophthalmology*

Hamid M. Said, Pharm.D., Ph.D. Baghdad University, Aston University, *Distinguished Professor of Medicine; Physiology and Biophysics*

Dorota Skowronska-Krawczyk, Ph.D. University of Geneva, *Assistant Professor of Physiology and Biophysics*

Francesco Tombola, Ph.D. University of Padua, *Associate Professor of Physiology and Biophysics*

Nosratola D. Vaziri, M.D. University of Tehran, *Professor Emeritus of Medicine; Physiology and Biophysics*

S. Armando Villalta, Ph.D. University of California, Los Angeles, *Assistant Professor of Physiology and Biophysics; Neurology*

Ping H. Wang, M.D. Harvard University, *Professor of Medicine; Physiology and Biophysics*

Stephen H. White, Ph.D. University of Washington, *Professor Emeritus of Physiology and Biophysics*

Qin Yang, M.D. Ph.D. Nanjing University of Chinese Medicine, Osaka University, *Associate Professor of Medicine; Physiology and Biophysics*

Courses

PHYSIO 200. Research in Physiology and Biophysics. 2-12 Units.

Individual research directed toward doctoral dissertation and supervised by a particular professor.

Repeatability: May be repeated for credit unlimited times.

PHYSIO 200R. Research in Physiology and Biophysics for First-Year Students. 2-12 Units.

Independent research within the laboratories of graduate training faculty in the Department of Physiology and Biophysics for first-year Ph.D. students.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit 3 times.

PHYSIO 201. Introduction to Physiology Research. 1-4 Units.

Introduction to research in physiology and related sciences. Concentrates on techniques emphasized in the various laboratories of the Department of Physiology and Biophysics.

Repeatability: May be repeated for credit unlimited times.

PHYSIO 204. Concepts of Biophysics. 3 Units.

Principles of crystallography; introduction to time-resolved absorption and fluorescence spectroscopy; the concepts of kinetic order and kinetic rate theory.

Restriction: Graduate students only.

PHYSIO 205. Electronics for Biologists. 4 Units.

Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences.

Same as NEURBIO 249.

PHYSIO 206A. Introduction to Medical Physiology. 5 Units.

Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function.

Prerequisite: A biochemistry course.

Restriction: Graduate students only.

PHYSIO 206B. Introduction to Medical Physiology. 6 Units.

Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function.

Prerequisite: PHYSIO 206A

Restriction: Graduate students only.

PHYSIO 212. Medical Immunology. 1.5 Unit.

One of the cornerstones of the MS1 Molecular Basis of Medicine block. Includes temporal coordination of lecture material, regular course director meetings, and combined exams with PHYSIO 544: Medical Immunology.

Restriction: Graduate students only.

PHYSIO 215. Integrative Immunology . 4 Units.

Provides an introduction to immunology, but focuses on providing in-depth analysis of selected topics within the broader field of immunology, including relevant research techniques, while improving critical thinking skills.

Restriction: Graduate students only.

PHYSIO 232. The Physiology of Ion Channels. 4 Units.

Discusses how ion channels work (molecular/structural biophysics level) and what ion channels do in diverse cell types (cell physiology level).

Restriction: Graduate students only.

PHYSIO 252. Introduction to Proteomics. 4 Units.

Introduces students to concepts and methods of proteomics including protein identification, expression proteomics, and protein-protein interactions.

Repeatability: May be taken for credit 2 times.

PHYSIO 272. Eye: Health and Disease. 3 Units.

Introduces the anatomic and physiological basis of vertebrate vision and disease states in which the structure and function of the eye is disrupted with emphasis on current and developing research areas.

Restriction: Graduate students only.

PHYSIO 290. Topics in Physiology. 3 Units.

Contemporary research problems in physiology. Students review research articles in current literature and present ideas contained therein, focusing on groundbreaking discoveries and methodologies. Students present results of their own research and attend presentations given by other students and departmental researchers.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

PHYSIO 292A. Scientific Communication. 2 Units.

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

PHYSIO 292B. Scientific Communication. 2 Units.

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

PHYSIO 292C. Scientific Communication. 2 Units.

Small group meetings for graduate students to practice scientific writing, debate, and presentation skills.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

PHYSIO 299. Dissertation in Physiology and Biophysics. 2-12 Units.

Preparation and completion of the dissertation required for the Ph.D.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.