Overview

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, 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. 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 are maintaining 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. Each student must submit a written dissertation on an original research project and successfully defend this dissertation in an oral examination. Interdisciplinary dissertation research involving more than one faculty member is encouraged. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Faculty

Kenneth M. Baldwin, Ph.D. University of Iowa, Professor Emeritus of Physiology and Biophysics

Tallie Z. Baram, M.D., Ph.D. University of Miami, 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

Ralph A. Bradshaw, Ph.D. Duke University, Professor Emeritus of Physiology and Biophysics

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

Vincent J. Caiozzo, Ph.D. University of California, Irvine, Adjunct Associate Professor of Orthopaedic Surgery; Environmental Health Sciences; Physiology and Biophysics

Philip Felgner, Ph.D. Michigan State University, Director of the Vaccine Research and Development Center and Adjunct Professor of Medicine; Physiology and Biophysics

John Jay Gargus, M.D. Ph.D. Yale University, Director of the Center for Autism Research and Translation and Professor 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

Steve A.N. Goldstein, M.D., Ph.D. Harvard University, Vice Chancellor for Health Affairs and Health Sciences Clinical Professor of Physiology and Biophysics

Milton Greenberg, Ph.D. University of California, Irvine, Medical Physiology Immunology Course Director and Assistant Adjunct Professor of Physiology and Biophysics

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

Todd 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 Pharmacology; 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; Physiology and Biophysics*

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

Frances A. Jurnak, Ph.D. University of California, Berkeley, *Professor Emerita of Physiology and Biophysics*

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

Janos K. Lanyi, Ph.D. Harvard University, *Professor Emeritus of Physiology and Biophysics*

Devon 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*

Jogeshwar Mukherjee, Ph.D. Jodhpur National University, *Professor in Residence of Radiological Sciences; Biomedical Engineering; Physiology and Biophysics*

Krzysztof Palczewski, Ph.D. Wroclaw University of Science and Technology, *Professor of Ophthalmology; 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*

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

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

Francesco Tombola, Ph.D. University of Padua, *Department Graduate Faculty Advisor and 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*

Albert Zlotnik, Ph.D. University of Colorado Health Sciences Center, *Professor Emeritus of 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 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 papers in the current literature and present ideas contained therein to other students. 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.

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. or Master of Science degree.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.