Cell Regulation

Chair, Graduate Program
Paul C. Sternweis, Ph.D.

Degree Offered
Doctor of Philosophy

Faculty

Professors
Joseph P. Albanesi
Ph.D., Duke University, 1980
Michael S. Brown
M.D., University of Pennsylvania, 1966
Cheng-Ming Chiang
Ph.D., University of Rochester, 1991
Melanie H. Cobb
Ph.D., Washington University, St. Louis, 1976
Joseph L. Goldstein
Ph.D., University of California, San Diego, 1992
Joel M. Goodman
M.D., UT Southwestern Medical Center, 1966
Jer-Tsong “J.T.” Hsieh
Ph.D., University of California, San Diego, 1992
Steven Kliewer
Ph.D., UT Southwestern Medical Center, 1966
Mark A. Lehrman
Ph.D., Duke University, 1982
David J. Mangelsdorf
Ph.D., University of Texas, 1987
Carole R. Mendelson
Ph.D., Rutgers University, 1970
John D. Minna
M.D., Stanford University, 1967
Rama Ranganathan
Ph.D., University of California, San Diego, 1992
Elliott M. Ross
Ph.D., Cornell University, 1975
Michael G. Roth
Ph.D., University of Alabama at Birmingham, 1982

Assistant Professors

David W. Russell
Ph.D., University of North Carolina at Chapel Hill, 1980
Philipp E. Scherer
Ph.D., University of Basel, Switzerland, 1992
Dean P. Smith
M.D., University of Utah, 1986; Ph.D., University of California, San Diego, 1992
William J. Snell
Ph.D., Yale University, 1975
Paul C. Sternweis
Ph.D., Cornell University, 1977
Lance Terada
Ph.D., University of Hawaii, Honolulu, 1983
Michael A. White
Ph.D., University of North Carolina at Chapel Hill, 1992
Helen L. Yin
Ph.D., Harvard University, 1976
Hongtao Yu
Ph.D., Harvard University, 1995

Associate Professors

Steven J. Altsheuler
Ph.D., University of California, San Diego, 1990
James A. Bibb
Ph.D., State University of New York at Stony Brook, 1994
Russel Debose-Boyd
Ph.D., University of Oklahoma Health Science Center, 1998
Katherine Phelps
Ph.D., University of Colorado at Boulder, 1981
Joachim Seemann
Ph.D., Max Planck Institute for Biochemistry, Germany, 1996
Ron Taussig
Ph.D., Stanford University, 1988
Lani Wu
Ph.D., University of California, San Diego, 1990
Gang Yu
Ph.D., University of Calgary, Canada, 1996

Assistant Professors

Neal Alto
Ph.D., Oregon Health & Science University, 2003
Kathlyn Brown
Ph.D., UT Austin, 1994
Franklin Hamra
Ph.D., University of Missouri-Saint Louis, 1995
Jun-Shen “Lily” Huang
Ph.D., University of California, San Diego, 1997
Michele Hutchison
M.D., Ph.D., UT Southwestern Medical Center, 1999
Jen Liou
Ph.D., University of California, San Francisco, 2001
Denise Marciano
M.D., Cornell University Medical College, 2001; Ph.D., Rockefeller University, 1999
Ryan Potts
Ph.D., UT Southwestern Medical Center, 2007
Daniel Rosenbaum
Ph.D., Harvard University, 2005

Description of the Discipline

The faculty of the Cell Regulation Program provides a wide range of training opportunities for students interested in the study of signal transduction mechanisms that facilitate intracellular and intercellular communication. Students in the Program explore the regulatory mechanisms by which cells interpret and respond to signals generated by nutrients, hormones, neurotransmitters, physical stimuli, and specialized cell-to-cell contact systems. Current research within the Cell Regulation Program focuses on:

- The structures and functions of important molecules such as receptors, second messengers, adhesion proteins, and cytoskeletal elements.
- Cellular organelles, including the nucleus, endoplasmic reticulum, Golgi apparatus, peroxisome, lysosome, and plasma membrane.
- Sorting and processing of secretory and membrane-associated proteins.
- Identification of novel signaling pathways, their functions, and how they integrate with other signaling pathways.

The Cell Regulation Program has a strong emphasis on interdisciplinary research, including an emphasis on pharmacological sciences. Participation in advanced courses, journal clubs, and works-in-progress seminars, as well as intensive training in the development and performance of independent research projects, contributes to each student’s success.

Objectives

The Program strives to offer the highest-quality training for students who wish to pursue a Ph.D. and maintain active careers in research and teaching. In addition to course work, intensive training in the development of independent research projects is stressed.

Special Requirements for Admission

Students wishing to join the Cell Regulation Graduate Program must be enrolled in the Division of Basic Science and be in good standing academically. Usually students seek enrollment at
the beginning of their second semester, following completion of a set of research rotations and selection of a mentor who will assist in the development of the research project for the Ph.D. While most students do their doctoral research with a faculty member of the Program, Cell Regulation students may do their doctoral research with suitable mentors from other programs. Prior to formal entry, the Graduate Program Chair will sometimes encourage a student to consult with faculty members to ensure that the Cell Regulation Graduate Program is the most appropriate for the student’s interests.

**CURRICULUM**

All students in the Cell Regulation Graduate Program must complete satisfactorily the core curriculum offered in the fall term including the cell thread and three laboratory rotations. In the rest of the first year, students are expected to complete eight credit hours of advanced coursework, which require a grade average of B or better. Five credit hours consist of three required courses; the additional three hours may be selected from offerings by other programs within the Division of Basic Science. Course descriptions are located in the Division of Basic Science section. For exceptional reasons, these course requirements may be altered with permission of the Program Chair. In addition, students participate in a student seminar and journal club each semester.

Near the end of the second year, students take a qualifying examination that consists of an oral defense of an original written proposal. Admission to candidacy for the Ph.D. degree requires satisfactory performance in the core and advanced courses and on the qualifying examination.

**REQUIRED COURSES**

- Regulation of Cellular Architecture and Dynamics (2 hours)
- Signal Transduction I (1.5 hours)
- Signal Transduction II (1.5 hours)

**ELECTIVES**

In addition, students take three hours of electives, which may include the following Program course offerings:

- Advances in Germ and Stem-Cell Biology (1.5 hours)
- Quantitative Modeling of Biochemical Signaling Systems (1.5 hours)
- Mechanisms of Drug Action (3 hours)
- Optical Microscopy for Biomedical Research (1.5 hours)