NEUROSCIENCE

CHAIR, GRADUATE PROGRAM
Ege T. Kavalali, Ph.D.

DEGREE OFFERED
Doctor of Philosophy

FACULTY

PROFESSORS
Hyla B. Bezprozvanny
Ph.D., Institute of Cytology, Russian Academy of Sciences, 1992

Stephen C. Cannon
M.D., Ph.D., Johns Hopkins University, 1986

Jeffrey Elliott
M.D., Washington University, St. Louis, 1988

Joel Elmquist
D.V.M., Ph.D., Iowa State University, 1992, 1993

Mark Goldberg
M.D, Columbia University College of Physicians and Surgeons, 1984

Carla Green
Ph.D., University of Kansas Medical Center, 1991

Robert Greene
Ph.D., George Washington University, 1982; M.D., University of Maryland, 1983

Mark J. Henkemeyer
Ph.D., University of Wisconsin, Madison, 1990

Donald W. Hilgemann
Ph.D., University of Tübingen, Germany, 1989

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Ege T. Kavalali
Ph.D., University of Washington, 1988

Robert V. Kostecki
Ph.D., University of Tübingen, Germany, 2000

Michael Rugg
Ph.D., University of Tübingen, 2000

Jennifer Hsieh
Ph.D., Johns Hopkins University, 2000

Kimberly M. Huber
Ph.D., UT Graduate School of Biomedical Sciences at Houston, 1993

Weichun Lin
Ph.D., State University of New York, 1996

Qing “Richard” Lu
Ph.D., Rutgers University Robert Wood Johnson Medical School, 1997

Lisa Monteggia
Ph.D., University of California, San Diego, 1998

Craig Powell
M.D., Ph.D., University of Michigan, 2002

James M. Pascual
Ph.D., University of Chicago, 2002

Ege T. Kavalali, Ph.D.
Chair, Graduate Program

David W. Self
Ph.D., University of California, Irvine, 1992

Dean P. Smith
M.D., University of Utah, 1986; Ph.D., University of California, San Diego, 1992

Joseph Takahashi
Ph.D., University of Oregon, 1981

Carol A. Tamminga
M.D., Vanderbilt University Medical School, 1971

Masashi Yanagisawa
M.D., Ph.D., National Institute of Neuroscience, Japan, 1985, 1988

ASSOCIATE PROFESSORS
James A. Bibb
Ph.D., State University of New York at Stony Brook, 1994

Amelia Eisch
Ph.D., University of California, Irvine, 1997

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Ph.D., Albert-Ludwigs University, Freiburg, Germany, 2000

Jennifer Hsieh
Ph.D., Johns Hopkins University, 2000

Kimberly M. Huber
Ph.D., UT Graduate School of Biomedical Sciences at Houston, 1993

Weichun Lin
Ph.D., State University of New York, 1996

Qing “Richard” Lu
Ph.D., Rutgers University Robert Wood Johnson Medical School, 1997

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Ph.D., Chicago Medical School, 1998

Craig Powell
M.D., Ph.D., Baylor College of Medicine, 1994

Jonathan Terman
Ph.D., Ohio State University, 1997

Gang Yu
Ph.D., University of Calgary, Canada, 1996

ASSOCIATE PROFESSORS
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Ph.D., University of Milan, Italy, 2002

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Ph.D., University of Rochester, 1995

Matthew Goldberg
Ph.D., Yale University, 1998

Ryan Hibbs
Ph.D., University of California, San Diego, 2006

Taekyung Kim
Ph.D., University of Medicine and Dentistry of New Jersey, 2000

Genevieve Konopka
Ph.D., Harvard University, 2004

Julian Meeks
Ph.D., Washington University, 2006

Juan M. Pascual
M.D., Universidad de Granada, Spain, 1990; Ph.D., Baylor College of Medicine, 1993

Janine Prange-Kiel
Ph.D., University of Tübingen, Germany, 1998

Adrian Rothenfluh
Ph.D., Rockefeller University, 1999

Ann Stowe
Ph.D., University of Kansas Medical Center, 2006

Jiang Wu
Ph.D., UT Austin, 2001

Chun-Li Zhang
Ph.D., UT Southwestern Medical Center, 2002

OBJECTIVES

The Neuroscience Graduate Program focuses on cellular and molecular neurobiology. Topics of particular interest include synaptic physiology and synaptic plasticity; membrane biophysics, especially receptors and ion channels; neuronal organelle traffic, particularly the biogenesis and exo- and endocytosis of synaptic vesicles; neurogenetics of invertebrates and vertebrates; development of neural systems; and molecular and cellular basis of complex behavior.

SPECIAL REQUIREMENTS FOR ADMISSION

Students wishing to join the Neuroscience Graduate Program must be enrolled in the Division of Basic Science and be in good standing academically. Usually students seek enrollment in the Program toward the end of their first year of study following completion of the set of research rotations and selection of a mentor. Prospective students should note that the diverse research topics in the field make neurobiology an appropriate doctoral subject for those with undergraduate degrees in physics, chemistry, engineering, mathematics, and psychology, as well as in biological disciplines.

CURRICULUM

Neurobiology is a field defined not by a specific intellectual approach or experimental technique but by its subject matter: the cells of the nervous, sensory, and muscular systems. Because of the variety of methods that must be brought to bear in studies of these systems, the optimal training for a career in neurobiological research includes an in-depth exposure to the principles of biochemistry, biophysics, cell and molecular biology,
developmental biology, genetics, immunology, pharmacology, and physiology, as well as behavioral neuroscience.

**Core Course**

By providing a solid background in the above areas, the first-year Core Course offers appropriate training for first-year students who elect to join the Neuroscience Graduate Program. The first-year course also provides 15 hours of course credit toward the minimum 24 hours required for graduation.

**Laboratory Rotations**

First-year students participate in three laboratory rotations. Insofar as possible, students with an interest in neurobiology should seek rotations that expose them to a wide variety of technical approaches, including anatomy, behavior, biochemistry, biophysics, cell biology, genetics, molecular biology, and physiology. At the end of the first year of study, students choose a mentor for dissertation research.

**Advanced Topics in Neuroscience**

Each student in the Neuroscience Graduate Program is required to accrue at least nine hours of credit from the advanced courses offered within the Division of Basic Science. Three of these credit hours come from Fundamentals of Neuroscience, and at least three more come from the advanced courses given by the Neuroscience Graduate Program. (See list below.) Although the third and subsequent years will be devoted largely to research on a dissertation topic, students may take additional graduate seminar courses.

The Neuroscience Graduate Program offers the neuroscience core course, Fundamentals of Neuroscience, and a series of advanced graduate seminar courses. Advanced courses are intended not only to offer knowledge about a given topic but also to confer a detailed understanding of experimental procedures and to promote clear presentation of ideas and arguments. The advanced courses given each year by the Neuroscience Graduate Program are meant to offer students a balanced perspective on molecular, cellular, developmental, and integrative neurobiology. New topics are selected yearly to reflect the evolution of research in the field.

**Neuroscience Courses**

Course descriptions are listed in the Division of Basic Science chapter of the catalog.

Fundamentals of Neuroscience
Heritable Neurological Diseases of Mice and Men
Neurobiology of Drug Addiction
Neurobiology of Mental Illness

**Neuroscience Journal Club**

The Neuroscience Journal Club offers students an opportunity to keep abreast of recent research results, to sharpen critical acumen, and to develop speaking skills. Every student in the Graduate Program is expected to attend a journal club and to participate actively. In addition, each student is required to make at least one journal club presentation per year.

**Neuroscience Seminar**

Weekly neuroscience seminars hosted by the Departments of Psychiatry, Neurology and Neurotherapeutics, and Neuroscience are held to present current advances in all areas of modern neurobiology. One or two seminars are organized by the students of the Neuroscience Graduate Program. Furthermore, numerous scientific presentations of interest to neurobiologists occur each year in seminar series offered by the Departments of Cell Biology, Molecular Biology, Pharmacology, and Physiology, among others. The University Lecture Series often deals with the nervous system and related topics.

**Works in Progress**

Students, postdoctoral fellows, faculty, and other interested individuals meet on a biweekly basis to discuss current research carried out by students of the Neuroscience Graduate Program. The student presentations are made in a setting that fosters spontaneity and exchange of ideas.

**Annual Neuroscience Retreat**

Once a year, students, postdoctoral fellows, and faculty members gather for an all-day meeting to present current work and exchange research ideas. This meeting is held off campus in a setting where participants have the opportunity to present their research in a manner similar to the annual meeting of the Society for Neuroscience. All students in the Neuroscience Graduate Program are expected to attend, and advanced students are required to present their research in a formal setting.

**Qualifying Examination**

The qualifying examination comprises a written and an oral component, each of which must be passed as part of the qualifications for admission to Ph.D. candidacy. Unless a prior extension is granted by the Steering Committee, each student must complete the qualifying examination by the end of September of his or her second year of graduate enrollment. Those students in the Medical Scientist Training Program who initially take two years of medical training may defer the qualifying examination per approval of the Program Chair.

The written component is a research proposal dealing with a group of related scientific problems in an area of study different from that in which the student expects to conduct his or her dissertation. The oral examination ordinarily is given in a single closed session lasting from one to two hours. The student is expected to answer questions relating to material in courses that he or she has taken, to the subject matter in the written proposal, and to general information in the field of neurobiology.

**Dissertation Defense**

A complete copy of the dissertation must be approved by the dissertation committee before a public dissertation defense can be scheduled. The defense is composed of a public lecture describing the main observations of the research, followed by an oral examination by the dissertation committee. Attendance during the oral examination is restricted to faculty members of the Graduate School, and participation is restricted to the examination committee.