

# BIOMEDICAL SCIENCES

## Leadership

Daniela Salvemini, Ph.D.

*Pharmacology and Physiology Chairperson*

Enrico Di Cera, M.D.

*Biochemistry and Molecular Biology Chairperson*

Willis K. Samson, Ph.D., D.Sc.,

*Biomedical Science Graduate Program Director*

Katherine Robbins, M.D.,

*Pathology Chairperson*

William S. M. Wold, Ph.D.

*Molecular Microbiology & Immunology Chairperson*

## Overview

In addition to contributing strongly to the first two years of the Doctor of Medicine degree curriculum, the pre-clinical, medical-science departments offer post-baccalaureate work leading to the Ph.D. degree. Four offerings, each affiliated with an individual department or center, are available; however, most students admitted for direct Ph.D.-degree study take a common, first-year core in the basic biomedical sciences. Furthermore, studies toward the Ph.D. degree in a medical-science field may be combined with the M.D.-degree curriculum, and the two degrees pursued concurrently by selected students. M.S. (research or non-research) and Ph.D. degrees are offered by the Center for Anatomical Science and Education. M.A. (research or non-research and Ph.D. degrees are offered by the Medical Family Therapy Program.

Approximately 90 faculty members in the programs of biochemistry and molecular biology, molecular microbiology and immunology, pharmacology and physiology and pathology provide an almost unlimited variety of research project choices for students. In recognition that successful graduates need a broad background in biomedical science and flexible skills, the first year also includes interdisciplinary lecture courses, small-group discussions and participation in a colloquium series where contemporary developments in the biomedical sciences are presented and discussed. Informed by their experiences in this first year, students then select a Ph.D. mentor in a specific program, such as biochemistry and molecular biology, and continue with their Ph.D. training in that specific program.

Admission to the four Ph.D. degree programs in the biomedical sciences is by application to the core program in basic biomedical science. This interdisciplinary offering is intended for all students who are interested in biomedical research and/or teaching careers. Its objectives are to provide students with a strong foundation in all aspects of basic biomedical science and the freedom to explore diverse research opportunities during the first year of training.

The first-year curriculum combines lectures, small group discussion sessions, and seminars to develop self-confidence and familiarity with a breadth of biomedical science and technology that spans the disciplines of anatomical, biochemical, cellular, molecular, developmental, genetic, and physiological sciences.

At the end of this integrated first-year program, students select a dissertation research topic and mentor, and enter into one of four departmental programs in the School of Medicine: biochemistry and molecular biology; molecular microbiology and immunology; pathology; pharmacology and physiology.

The subsequent requirements for completion of the Ph.D. degree vary with the individual program and include specialized advanced courses and the performance of original research leading to completion of the dissertation.

## Programs

- Biochemistry and Molecular Biology, Ph.D.
- Biochemistry and Molecular Biology, Ph.D. & Medicine, M.D. Dual Degree
- Molecular Microbiology and Immunology, Ph.D.
- Pathology, Ph.D.
- Pharmacology and Physiology, Ph.D.

## Faculty

### Biochemistry and Molecular Biology

Yuna Ayala, Ph.D.  
 Ángel Baldán, Ph.D.  
 Yie-Hwa Chang, Ph.D.  
 Yoonsang Cho, Ph.D.  
 Carmine Coscia, Ph.D.  
 Enrico Di Cera, M.D.  
 Dale Dorsett, Ph.D.  
 Joel Eissenberg, Ph.D.  
 David A. Ford, Ph.D.  
 Susana Gonzalo, Ph.D.  
 Tomasz Heyduk, Ph.D.  
 Jung San Huang, Ph.D.  
 Claudette Klein, Ph.D.  
 Sergey Korolev, Ph.D.  
 Alireza Rezaie, Ph.D.  
 James Shoemaker, M.D., Ph.D.  
 Dorota Skowrya, Ph.D.  
 William S. Sly, M.D.  
 Alessandro Vindigni, Ph.D.  
 Mee-Ngan Yap, Ph.D.

### Molecular Microbiology and Immunology

Rajeev Aurora, Ph.D.  
 James Brien, Ph.D.  
 Govindaswamy Chinnadurai, Ph.D.  
 Richard DiPaolo, Ph.D.  
 Duane Grandgenett, Ph.D.  
 David Griggs, Ph.D.  
 Daniel Hawiger, M.D., Ph.D.  
 Lynda Morrison, Ph.D.  
 Amelia Pinto, Ph.D.  
 John Tavis, Ph.D.  
 Ryan Teague, Ph.D.  
 William Wold, Ph.D.

### Pathology

Anping Chen, Ph.D.  
 T. Scott Isbell, Ph.D., DABCC, FACB  
 Grant R. Kolar, M.D., Ph.D.  
 Jacki Kornbluth, Ph.D.  
 Jane McHowat, Ph.D.  
 Nancy Phillips, M.D.  
 Ratna B. Ray, Ph.D.  
 Cirilo Sotelo-Avila, M.D.

MariaTeresa Tersigni-Tarrant, Ph.D.

## **Pharmacology and Physiology**

John C. Chrivia, Ph.D.

Ian M. de Vera, Ph.D

Terrance M. Egan, Ph.D.

Colin A. Flaveny, Ph.D.

Mark M. Knuepfer, Ph.D.

Andrew J. Lechner, Ph.D

Heather Macarthur, Ph.D.

Daniela Salvemini, Ph.D.

Willis K. Samson, Ph.D., D.Sc.

Mark M. Voigt, Ph.D.

John K. Walker, Ph.D.

Gina L. Yosten, Ph.D.

Daniel Scott Zahm, Ph.D.

Jinsong Zhang, Ph.D.