

# Molecular Pathology

OFFICE: 1012 Basic Science Building,  
School of Medicine

## Professors

Stephen Baird, M.D., *Pathology (Academic Senate Distinguished Teaching Award)*

Roland C. Blantz, M.D., *Medicine*

Colin M. Bloor, M.D., *Pathology, Director*

Laurence L. Brunton, Ph.D., *Pharmacology/ Medicine*

Kenneth R. Chien, M.D., *Medicine*

Lynette B. Corbeil, D.V.M., Ph.D., *Pathology*

Daniel J. Donoghue, Ph.D., *Chemistry and Biochemistry*

Marilyn G. Farquhar, M.D., *Cellular and Molecular Medicine*

James Feramisco, Ph.D., *Medicine/Pharmacology*

Joshua Fierer, M.D., *Medicine/Pathology (In-Residence)*

Frances D. Gillin, Ph.D., *Pathology*

Martin F. Kagnoff, M.D., *Medicine*

Michael Karin, Ph.D., *Pharmacology*

Michael J. Kelner, M.D., *Pathology*

Theo N. Kirkland, M.D., *Pathology/Medicine*

Thomas A. Lane, M.D., *Pathology*

Eliezer Masliah, M.D., *Neurosciences/Pathology*

Katsumi Miyai, M.D., Ph.D., *Pathology (Academic Senate Distinguished Teaching Award)*

Michael N. Oxman, M.D., *Medicine/Pathology*

Henry C. Powell, M.D., *Pathology*

C. Ann Rearden, M.D., *Pathology*

Douglas Richman, M.D., *Pathology/Medicine (In-Residence)*

Michael G. Rosenfeld, Ph.D., *Medicine*

Deborah H. Spector, Ph.D., *Biology*

David Tarin, M.D., Ph.D., *Pathology*

Ajit P. Varki, M.D., *Medicine*

Gernot Walter, Ph.D., *Pathology*

## Associate Professors

Nigel Calcutt, Ph.D., *Pathology*

Mark P. Kamps, Ph.D., *Pathology*

Andrew Mizisin, Ph.D., *Pathology*

## Assistant Professor

Steffan Ho, Ph.D., *Pathology*

## Adjunct Professors

Floyd Bloom, M.D., *Neurosciences/Psychiatry*

Jane Burns, Ph.D., *Pediatrics*

Kathryn Ely, Ph.D., *Pathology*

Eva Engvall, Ph.D., *Pathology*

Minoru Fukuda, Ph.D., *Pathology*

Martin Haas, Ph.D., *Biology*

Mike Kalichman, Ph.D., *Pathology*

Stuart Lipton, M.D., *Neurosciences*

Rich Maki, Ph.D., *Pathology*

Robert Oshima, Ph.D., *Pathology*

Elena Pasquale, Ph.D., *Pathology*

Manuel Perucho, Ph.D., *Medicine and Pathology*

John Reed, M.D., Ph.D., *Pathology*

Erkki Ruoslahti, M.D., *Pathology*

Ian Wilson, Ph.D., *Pathology*

## Associate Adjunct Professors

Gen-Sheng Feng, Ph.D., *Pathology*

Steven Frisch, Ph.D., *Pathology*

Guy Salvesen, Ph.D., *Pathology*

Jeff Smith, Ph.D., *Pathology*

## Associate Clinical Professor

H. Elizabeth Broome, M.D., *Pathology*

## The Graduate Program

The goal of the molecular pathology Ph.D. program is to provide research training in the pathobiology of disease for physicians, health scientists, and biologists. The program is interdepartmental in nature. It is centered in the Department of Pathology, but faculty members are also drawn from other departments and institutions. The program provides a comprehensive knowledge of normal and abnormal biological processes, with particular emphasis on the molecular mechanisms of human diseases.

## Course Work

The course requirements are designed to ensure that all students acquire competence in cellular and molecular pathology. The requirements are flexible in order to allow students from various backgrounds to join the program. Students holding a bachelor's degree in one of the biological sciences are required to take the introductory course in pathology taught for medical students. This requirement may be waived for students holding medical graduate degrees (M.D. or D.V.M.). All students must take five of seven core courses offered by faculty members from the Department of Pathology. These courses cover topics in molecular pathology, cancer, infectious

disease, human genetic disease, nervous system disease, and developmental disorders.

## Examinations

### First Qualifying Examination (Minor Proposition)

The purpose of this examination is to test the student's ability to choose a research problem in molecular pathology and to propose an experimental approach to its solution. The problem should be unrelated to the student's thesis project. The student is expected to demonstrate knowledge in molecular biology and basic pathology. The first qualifying examination will be taken by the end of the fall quarter of the second year.

### Second Qualifying Examination (Major Proposition)

The second qualifying examination, a university requirement, consists of an oral report by the student about research accomplished and the goals to be achieved for completion of the thesis. Upon successful completion of the examination, the student will advance to candidacy. The second qualifying examination has to be taken by the end of the fourth year.

## Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

## COURSES

### PATH 208G. Human Disease (8)

An integrated consideration of the general principles of pathology and microbiology, epidemiology, and medical therapeutics of the important diseases. An example of their application to a specific organ system will be included.

### PATH 220. Molecular Pathology of Disease (4)

This course will explore the molecular pathology associated with various diseases other than cancer. Emphasis will be placed on understanding the aberrant cellular processes, caused by mutation or environmental factors, that are associated with the disease state. Cardiovascular, neurological, immunological, and other diseases will be investigated.

### PATH 221. Molecular Pathology of Cancer (4)

The purpose of this course is to present exciting new developments in molecular carcinogenesis, with particular emphasis on oncogene expression and functions of oncogenic proteins. The relevance of

molecular mechanisms for understanding human cancer will be discussed.

**PATH 222. Microbial Pathogenesis (3)**

Topics covered in this course include molecular and cellular mechanisms of viral, bacterial, and protozoan pathogenesis. Host response and microbial mechanisms of host defense will also be discussed. Sessions will consist of faculty and student presentations of current literature.

**PATH 225. Molecular Pathology Research Seminar (2)**

Group and individual discussion of current literature and ongoing research activities. The format of SOM 225 will encourage student participation. Students are to present on their rotation work or current research project.

**PATH 230G. Molecular Biology of the Cell (6)**

An integrated consideration of the general principles of molecular pathology. This course will provide the basic foundation of the molecular biology of the cell for graduate students as a prerequisite for Pathology 208G. This course is for graduate students only.

**PATH 231. Modern Methods in Cellular and Molecular Pathology (4)**

This course presents key concepts and methodologies used in cellular and molecular pathology research. Topics will include cell membrane transport, protein purification, recombinant DNA techniques, DNA sequencing, and PCR technology. The relevance of these methods for investigating human disease will be discussed.

**PATH 232. Statistical Methods and Experimental Design**

This course will emphasize the relationships between experimental design, statistical methods, and biomedical research. The content of the course will include basic issues in experimental design and commonly used statistical methods. The assumptions behind the statistical tests, their appropriate use, and examples of misuse will be discussed.

**PATH 296. Directed Reading (1-4)**

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases.

**PATH 299. Independent Study or Research (1-12)**

Independent study or research.

**SOM 213. Histology (2)**

This course teaches the structural basis of normal and abnormal function at the cellular and tissue levels. Emphasis is based on microscopic study conducted in small laboratory groups under close faculty supervision.