Experimental Pathology

Building D, Room D440, Medical Sciences I; (949) 824-5367
http://www.pathology.uci.edu/
Edwin S. Monuki, Acting Department Chair and Graduate Program Director

The Department of Pathology and Laboratory Medicine offers a Ph.D. in Biomedical Sciences with a concentration in Experimental Pathology. The graduate program emphasizes experimental approaches to better understand the molecular and cellular mechanisms of disease, particularly human disease. Students work in laboratories studying topics ranging from infectious processes such as malaria and the acquired immune deficiency syndrome to innate immunity. The principal areas of research investigated by faculty in the Experimental Pathology concentration range from developmental neurobiology to cancer, including prostate cancer.

The Department offers graduate study under the auspices of the School of Medicine and in conjunction with the program in Cellular and Molecular Biosciences (CMB), which is described in the School of Biological Sciences (catalogue.uci.edu/previouseditions/2013-14/schoolofbiologicalsciences/#graduatetext) section. Students are eligible to enter the Department program after meeting the specific requirements of the CMB gateway curriculum or by direct application to the Department. The Department program leads to the M.S. or Ph.D. degree in Biomedical Sciences, awarded after successful completion of all requirements. Students admitted into the program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the start of their second year.

Experimental pathology makes extensive use of both animal models of human disease and studies on human tissues from human subjects. Therefore, the curriculum is heavily weighted on experimental models, including animal models, of human disease. The didactic teaching components of the track are supplemented by a Pathology research conference, in which faculty, postdoctoral fellows, and graduate students present seminars or “research in progress” talks. This seminar series allows trainees the opportunity to gain invaluable experience in presenting their research to other scientists and provides a mentoring process through which students gain insights from diverse scientific viewpoints.

Students should advance to candidacy by the end of their third year. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Faculty

Jefferson Y. Chan: Regulation of genes associated with oxidative stress
K. George Chandy: Molecular biology and structure of ion channels; novel therapeutic agents
Dongbao Chen: Angiogenesis, endothelial, and placental biology
Luis M. de la Maza: Chlamydia trachomatis vaccines and sexually transmitted diseases
Robert A. Edwards: Mucosal immunology, inflammatory bowel disease, G-proteins, prostaglandins, and chemokines
Mark Fisher: Mechanisms of stroke, vascular neurobiology, blood-brain barrier

Anthony A. James: Malaria parasite development; genetic manipulation of insect vectors
J. Lawrence Marsh: Regulation of growth factor signaling in patterning, regeneration and oncogenesis
Dan Mercola: Translational cancer biology
Edwin S. Monuki: Forebrain development and stem cell applications
Ellena M. Peterson: Chlamydia vaccine development
W. Edward Robinson: Pathogenesis of retrovirus infections; molecular mechanisms of integration
Sandor Szabo: Pathogenesis of gastrointestinal ulceration, duodenal ulcer
Andrea J. Tenner: Innate immunity; the roles of complement and phagocytes in health and disease
Ping H. Wang: Molecular hormone actions in the normal and diseased heart

Courses

PATH 200A. Research in Experimental Pathology. 2-12 Units.
Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.
Corequisite: PATH 203A.
Repeatability: Unlimited as topics vary.

PATH 200B. Research in Experimental Pathology. 2-12 Units.
Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.
Corequisite: PATH 203B.
Repeatability: Unlimited as topics vary.

PATH 200C. Research in Experimental Pathology. 2-12 Units.
Independent research for the Ph.D. program within the laboratories of graduate training faculty in Experimental Pathology.
Corequisite: PATH 203C.
Repeatability: Unlimited as topics vary.

PATH 200R. Research in Experimental Pathology for First-Year Students. 2-12 Units.
Independent research within the laboratories of graduate training faculty in Experimental Pathology for first-year Ph.D. students.
Grading Option: Satisfactory/unsatisfactory only.
Repeatability: May be taken for credit 3 times.

PATH 203A. Advanced Studies in Experimental Pathology. 1 Unit.
A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.
Corequisite: PATH 200A.
Repeatability: May be repeated for credit unlimited times.
PATH 203B. Advanced Studies in Experimental Pathology. 1 Unit.
A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200B.

Repeatability: May be repeated for credit unlimited times.

PATH 203C. Advanced Studies in Experimental Pathology. 1 Unit.
A tutorial course for Ph.D. students in Experimental Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature.

Corequisite: PATH 200C.

Repeatability: May be repeated for credit unlimited times.

PATH 204A. Experimental Pathology Research Seminar. 1 Unit.
Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

PATH 204B. Experimental Pathology Research Seminar. 1 Unit.
Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

PATH 204C. Experimental Pathology Research Seminar. 1 Unit.
Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

PATH 212. Signal Transduction and Growth Control. 4 Units.
Covers various eukaryotic signaling pathways (tyrosine kinase, ras-raf-MAPK, TGF-ß, wnt, JAK-STAT, and FAS) with an emphasis on the experimental underpinnings. The material is covered in lectures and discussions of pertinent papers.

Same as BIOCHEM 212.

PATH 221. Immunopathogenic Mechanisms of Disease. 3 Units.
Examination of the mechanisms underlying disease states mediated by immune dysregulation. Topics include innate and adaptive immunity, autoimmunity, immunodeficiency, inflammatory disorders, and certain infectious diseases. Emphasis on biological basis of immunopathologies taught from reports in the original scientific literature.

Prerequisite: M&MG 215.

Same as M&MG 221.

Restriction: Graduate students only.

PATH 222. Topics in Experimental Pathology. 4 Units.
Select topics related to principles of experimental pathology including normal host responses to disease are presented. Animal models of human disease are emphasized. Material includes both lectures and critical review of the primary literature.

Gradual-level course, which is open to all years, will involve the reading and discussion of papers, preferably written by the invited seminar speaker. Discussions will cover advanced topics in experimental pathology as related to an understanding of human disease.

Corequisite: PATH 204A and PATH 204B and PATH 204C.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

PATH 230D. Principles of Experimental Pathology. 4 Units.
Introduces graduate students to the general pathologic processes that mediate disease. Topics include cell injury and repair, inflammation, immunopathology, neoplasia, and genetic diseases. Combines lecture, small group discussion, and oral presentations.

PATH 231A. Pathology of Cardiovascular Diseases. 2 Units.
For graduate students interested in human cardiovascular disease. Students receive training in physiology, anatomy, and pathologic processes of the heart and blood vessels. Experimental approaches to study such processes are emphasized.

PATH 232A. Pathology of Pulmonary Diseases. 1.5 Unit.
For graduate students interested in pulmonary disease. Students receive training in physiology, anatomy, and pathologic processes of the lungs and airways. Experimental approaches to study such processes are emphasized.

PATH 233A. Pathology of Renal Diseases. 1 Unit.
For graduate students interested in renal disease. Students receive training in physiology, anatomy, and pathologic processes of the kidneys. Experimental approaches to study such processes are emphasized.

PATH 234A. Pathology of Gastrointestinal Diseases. 0 Units.
For graduate students interested in gastrointestinal disease. Students receive training in physiology, anatomy, and pathologic processes of the gastrointestinal tract. Experimental approaches to study such processes are emphasized.

Grading Option: In progress only.

PATH 234B. Pathology of Gastrointestinal Diseases. 2 Units.
For graduate students interested in gastrointestinal disease. Students receive training in physiology, anatomy, and pathologic processes of the gastrointestinal tract. Experimental approaches to study such processes are emphasized.

Prerequisite: PATH 234A.
PATH 235A. Pathology of Genitourinary Tract Disease. 0 Units.
For graduate students interested in genitourinary tract or breast disease. Students receive training in physiology, anatomy, and pathologic processes of the breast and genitourinary tract. Experimental approaches to study such processes are emphasized.

Grading Option: In progress only.

PATH 235B. Pathology of Genitourinary Tract Disease. 2 Units.
For graduate students interested in genitourinary tract or breast disease. Students receive training in physiology, anatomy, and pathologic processes of the breast and genitourinary tract. Experimental approaches to study such processes are emphasized.

Prerequisite: PATH 235A.

PATH 236B. Graduate Neuropathology. 1 Unit.
For graduate students interested in diseases of the nervous system. Students receive training in physiology, anatomy, and pathologic processes of the central and peripheral nervous system. Experimental approaches to study such processes are emphasized.

PATH 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.

PATH 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.

PATH 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.

PATH 299. Dissertation in Experimental Pathology. 1-12 Units.
Provided for the preparation and completion of the dissertation required for the Ph.D. degree.

Repeatability: May be repeated for credit unlimited times.