CANCER BIOLOGY PROGRAM

Chair and Program Director: J. Martin Brown

Committee on Cancer Biology: J. Martin Brown (Professor of Radiation Oncology), Glenn Rosen (Associate Professor of Medicine), Jeffrey Axelrod (Assistant Professor of Pathology), Stanley Cohen (Professor of Genetics), Branimir Sikic (Professor of Medicine), Louie Naumovski (Assistant Professor of Pediatrics)

The Cancer Biology Program is designed to provide a framework for students with an interest in the understanding and control of neoplastic growth and to build a curriculum in varied biomedical areas relevant to that subject. Students in this program are based in departments appropriate to their specialty and are subject to the core requirements specified below. A Ph.D. is offered in Cancer Biology.

GRADUATE PROGRAM

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are described under the "Graduate Degrees" section of this bulletin.

A few well-qualified applicants are admitted to the program each year. Applicants should have completed an undergraduate major in the biological sciences; applicants with undergraduate majors in physics, chemistry, or mathematics may be admitted if they complete background training in biology during the first two years of study. During their first year, each student is required to constitute a three-person advising committee which assists with the development of an appropriate program of courses and provides advice and consultation on thesis-related research. The appointment of this committee is normally carried out in consultation with the student's research preceptor, who chairs the advising committee.

The requirements for the Ph.D. degree are as follows:

1. Training in biology equivalent to that of an undergraduate biology major at Stanford.
2. Completion of the following courses (or their equivalents, except for the Cancer Biology course):
   a) Biochemistry 201, Advanced Molecular Biology, *or* Structural Biology 241, Biological Macromolecules
   b) Molecular and Cellular Physiology 221, Cell Biology of Physiological Processes
   c) Cancer Biology 241, 242, 243, Molecular and Cellular Biology of Cancer
   d) Genetics 203, Advanced Genetics
   e) Cancer Biology 271, Frontiers in Cancer Research Seminar Series
   f) Medicine 255, Responsible Conduct in Research; with permission, may be audited.
   g) Cancer Biology 280, Cancer Biology Journal Club. Required for 1st and 2nd year graduate students.
3. At least 6 units of additional courses. Course work taken is determined in consultation with the student's Advising Committee.
4. Presentation of research results at the Cancer Biology annual retreat on at least three occasions.
5. Successful completion of a comprehensive qualifying examination in Cancer Biology is required for admission to Ph.D. candidacy. This examination must be completed by June (Part 1) and September (Part 2) of the second year of study in the program. The examination is set by the advising committee and consists of two parts. The first part is a written area proposal in a field of relevance to cancer biology not related to the student's thesis project or research in the adviser's laboratory. The subject of the proposal is chosen by the student in consultation with his/her advising committee. The second part is an oral presentation to the Advising Committee of dissertation research or proposed dissertation research. The advising committee is presented with a brief written description of this research prior to the oral examination.
6. The presentation of a Ph.D. dissertation, the result of independent investigation, and constituting a contribution to knowledge in the area of cancer biology.
7. The passing of the University oral examination which is taken only after the student has substantially completed his or her research. The examination is preceded by a public seminar in which the research is presented by the candidate. The oral examination is conducted by a five member dissertation reading committee.

COURSES

Course and lab instruction in the Cancer Biology Program conform to the "Policy on the Use of Vertebrate Animals in Teaching Activities," the text of which is available at http://www.stanford.edu/dept/DoR/rph/8-2.html.

241,242,243. Molecular and Cellular Biology of Cancer—Three quarters, covering cancer cell biology, carcinogenesis, and the fundamental principles of therapy. Comprehensive view of the major relevant scientific bases and advances in areas directly relating to the understanding and control of neoplastic growth. Organized/coordinated by Professor Brown.
3 units (Staff)

263. Apoptosis in Normal Development and Cancer—The importance of apoptosis (programmed cell death) in normal development and in formational progression. Apoptotic paradigms in hemopoetic, neurological, and cardiovascular tissues, contrasted with those in malignant transformation and progression. Organized/coordinated by Assistant Professor Giaccia.
4 units (Staff)

271. Frontiers in Cancer Research Seminar Series—Full-quarter course with different lecturers on topics of major importance in cancer research.
1-3 units (Staff)

299. Research—Students registered for the Ph.D. must register as soon as they begin dissertation-related research work.
1-15 units (Staff)

280. Journal Club—Students registered for the Ph.D. in their 1st and 2nd years must register, and present a paper with the assistance of a faculty mentor of their choice.
1-15 units (Staff)