

Department of Cancer Biology

The Department of Cancer Biology is a recently developed basic science department in the School of Medicine at the University of Kansas Medical Center. The missions of our department are:

1. To build a strong team of basic researchers with a collaborative and translational mindset who will discover fundamental characteristics of cancer cells that can eventually lead to novel therapeutic and preventive approaches which reduce cancer incidence, morbidities and/or mortality;
2. To understand the molecular genetic and epigenetic, biochemical, cellular and physiologic bases of cancer etiology and progression;
3. To understand the interactions between tumor cells and the microenvironments in which they find themselves;
4. To educate the next generation of cancer researchers, clinicians and patients;
5. To apply, as quickly as possible, fundamental research discoveries to patient care.

Our department is funded by grants from the National Cancer Institute, National Institutes of Health, American Cancer Society, Susan G. Komen for the Cure, Department of Defense, V-Foundation, the National Foundation for Cancer Research and from generous donations from patients, family and friends of the KU Cancer Center.

The Department of Cancer Biology is the home department for multi-departmental and institutional MS and PhD graduate programs. Students can choose from any funded graduate faculty member whose lab is doing cancer research in the KU Cancer Center. Details regarding admission and degree requirements for the M.S. (<http://catalog.ku.edu/medicine/cancer-biology/ms/>) and Ph.D. (<http://catalog.ku.edu/medicine/cancer-biology/phd/>) programs can be found on their respective catalog pages.

Courses

CBIO 800. Mechanisms of Tumor Development and Progression: Colloquium Format. 3 Credits.

This 3 credit course is offered in the fall semester every year. This course examines the genetic alterations and cellular phenotypes involving cancer development in a practical manner. The course discusses the underlying molecular and biological principles that result from these genetic alterations and the methods/approaches to examine cancer phenotypes. By the end of the course, students should understand how cancer develops and how to design experiments to address different scientific hypotheses. In addition, students are expected to learn key points regarding how to prepare and give scientific presentation. The class will involve two, 1.5-hour lecture per week: one consists of didactic lecture by a faculty member and the other is student-led journal club related to the lecture topic. Prerequisite: College level biology.

CBIO 820. Cellular and Molecular Mechanisms of Signal Transduction in Cancer: Colloquium. 2 Credits.

This elective course will be offered in the spring semester every year. This course will be full of discussions on the importance of targeting signaling pathways in cancer through didactic teaching following student led discussion on the topic. The course discusses the underlying responses on signaling mechanisms in different cancers. The major theme is an

understanding of how cancer cells receive, transmit and respond to environmental signals. Topics will include different complexity in signal transduction in cancer. There will be a series of lectures on the topics of signal transduction, cell cycle regulation, apoptosis and cancer. Each topic series will be followed immediately by student presentations. The presentations will complement the lectures by providing an overview of a particular topic through the in depth examination of a current research publication.

CBIO 840. Tumor Microenvironment. 2 Credits.

This 2-credit course is offered every other year. This course is designed to achieve two goals. First, to learn about the role of tumor microenvironment in promoting tumor growth, metastasis and response to therapy. Emphasis is given to understand the complex nature of the tumor microenvironment and use examples from specific tumor types to illustrate how the various components of the microenvironment contribute to tumor progression. By the end of the course, students should understand the components of the tumor microenvironment and their effect on the clinical course of the cancer. In addition, they should be able to design experiments to tease out the importance of these components in tumor progression and response to therapy. Secondly, the course is designed to foster higher order thinking in learners, specifically pertaining to the development and application of new theories. The class will involve pre-work and in-class discussion for a total of 3 hours per week. Pre-work including podcast lectures, individual readiness assessment tests, and associated material will be made available to the students on Blackboard two weeks before each in-class session. Prerequisite: Permission of Instructor and College Level Biology.

CBIO 850. Cancer Center Seminar. 1 Credits.

Seminar series covering diverse topics in cancer research.

CBIO 860. Communicating Cancer Science. 1 Credits.

A weekly meeting where research presentations by pre-/post- doctoral fellows will be critiqued for content and presentation skills by peers and faculty.

CBIO 870. Analysis of Scientific Papers. 1 Credits.

Research articles are analyzed by the student with the guidance of an instructor in terms of quality of scientific content and mechanics of the presentation. One or more articles are discussed in each tutorial session. The research topics and the instructor are chosen in accordance with the research interest of the student.

CBIO 880. Advanced Topics in Cancer Research. 1-5 Credits.

Special study allowing a student to pursue a particular subject through readings, specialized laboratory work, writing, or conferences with a faculty member. Prerequisite: Consent of instructor.

CBIO 890. Master's Research in Cancer Biology. 1-10 Credits.

This course is designated for research leading to the master's degree. Independent laboratory investigation approved by and under the supervision of the student's advisor, and in partial fulfillment of the requirements for the M.S. degree. Prerequisite: Consent of advisor.

CBIO 899. Master's Thesis in Cancer Biology. 1-10 Credits.

This course is designated for thesis writing leading to a master's degree in Cancer Biology. The student prepares the formal thesis based upon independent research and in partial fulfillment of the requirements for the M.S. degree. The final defense of the thesis is scheduled only after the written thesis has been accepted by the student's thesis committee. Prerequisite: Consent of advisor.

CBIO 900. Carcinogenesis and Cancer Biology. 3 Credits.

This is a semester long course that presents a survey of core topics in cancer biology and builds upon core IGPBS courses. The survey includes topics of etiology, genetics, signaling, biochemistry, tumor

progression, metastasis, major treatment modalities and overviews of major cancer types. Students are assessed based upon class participation, presentations and examinations. Prerequisite: Completion of GSMC 850, GSMC 851, GSMC 853 and GSMC 854 or the equivalent or permission of instructor.

CBIO 990. Research for Ph.D. in Cancer Biology. 1-15 Credits.

Original and independent laboratory investigation, approved by and conducted under the supervision of the student's advisor and advisory committee, in partial fulfillment of the requirements for the Ph.D. degree. Prerequisite: Consent of Advisor.

CBIO 999. Dissertation for Ph.D. in Cancer Biology. 1-10 Credits.

This course is designated for dissertation writing leading to a Ph.D. degree in Cancer Biology. The student prepares the formal dissertation based upon independent research and in partial fulfillment of the requirements for the Ph.D. degree. The final defense of the dissertation is scheduled only after the written dissertation has been accepted by the student's thesis committee. Prerequisite: Consent of advisor.