CANCER BIOLOGY

http://biomed.med.miami.edu/

Overview
The Sheila and David Fuente Graduate Program in Cancer Biology is a University-wide interdisciplinary training program that involves faculty from the basic science and clinical departments of the University of Miami. The objective of this program is to provide a unique multidisciplinary training environment for highly qualified individuals that will prepare them for independent research and teaching careers. The overall philosophy of the program is to integrate basic and clinical research. The scientific focus is on the biology of cancer and the development of novel diagnostic and therapeutic approaches.

The program emphasizes a multidisciplinary approach which incorporates concepts and state-of-the-art techniques from molecular biology, biochemistry, cell biology, biostatistics, genetics, genomics, immunology, proteomics, structural biology, clinical oncology, and translational research programs at the Sylvester Comprehensive Cancer Center. An important goal of the program is to provide students with a strong background in basic biomedical research coupled with an understanding of clinical aspects of cancer including diagnostic, prognostic, and therapeutic intervention. To achieve this goal, the program utilizes a unique program of study that includes lectures from both basic and clinical researchers. In addition, the program has a two-tier mentoring system in which students receive guidance from both a research mentor and a physician mentor. The research mentor is the dissertation advisor, while the physician mentor will provide the student with a clinical perspective in oncology. Through this dual mentorship, students conduct their doctoral research and obtain clinical knowledge in their area of study. The program aims to instill in students the ability to design multidisciplinary research programs in which scientific research is driven by unmet clinical challenges.

Courses in Cancer Biochemistry and Molecular Biology are prerequisites for all CAB courses. Required courses are Tumor Biology, Student Seminars, Tumor Boards, Special Topics in Cancer Research, Dialogues with Cancer Clinicians, and Logic and Reasoning in Translational Cancer Research. (Students can also choose electives in cancer epidemiology, cellular and molecular biology, immunology, pharmacology, and microbiology with permission of the CAB Director. After joining the program and choosing a research mentor, students formulate a proposal and take a qualifying exam. Their subsequent research is guided by an individually tailored dissertation committee, including the research advisor and physician mentor.)

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Admission Requirements
Applicants to biomedical programs should have a bachelor degree in a biological or related discipline (e.g., psychology, chemistry, engineering, physics). Although there are no prerequisite requirements, courses in general biology, cell/molecular biology, calculus, general physics, organic chemistry, physical chemistry, and biochemistry are encouraged. Applications are generally accepted from September to December for fall entry only. Select applicants will be offered an interview.

COMPETITIVE CANDIDATES WILL HAVE THE FOLLOWING:
• Excellent academic record
• Competitive GRE exam scores
• Research experience in a laboratory setting
• Publications of abstract and / or papers
• Co-authorship in a peer-reviewed journal is recommended
• Strong letters of recommendation from research scientists who know the candidate well
• Motivation to pursue state-of-the-art biomedical research

APPLICANTS MUST SUBMIT THE FOLLOWING:
• Online Application
• Application Fee
• Official Academic Transcripts
• GRE General Test
• English Proficiency Exam (non-native speakers)
• Statement of Purpose
• Resume / CV

Full application instructions can be found online (http://biomed.med.miami.edu/apply).

Doctoal Programs
• Ph.D. in Cancer Biology (http://bulletin.miami.edu/graduate-academic-programs/medicine/cancer-biology/cancer-biology-phd)

Course Descriptions (Per Subject)
CAB 701. CAB Student Seminar. 1 Credit Hour.
This course (required of 2nd and 3rd year students) offers instruction on the fundamental elements of scientific speaking. The ability to communicate effectively is essential for scientists. All CAB students are required to present their research each year as a 25 min (2nd year students) or 55 min seminar (3rd year and above). Students who are 4th year+ give seminars but are not enrolled.
Components: LEC.
Grading: GD.
Typically Offered: Fall.

CAB 705. Translational to Clinical Research. 1.00 Credit Hour.
Beginning in the fall of their second year, students participate in "Translational to Clinical Research", which spans years two through four of the program. Students are introduced to clinical trials, pathology reviews, tumor boards, the protocol review process and have an opportunity to interact with physicians who care for cancer patients and conduct clinical trials. The student’s Physician Mentor advises and directs the student in the most relevant activities to attend and discusses
the student’s experience with them every semester. Students are required
to attend 2 meetings each semester for a total of 12 meetings in addition
to discussion with their Physician Mentors. A short written report of each
review meeting of the student’s experience is required. Didactic seminars
are not accepted.

Components: DIS.
Grading: SUS.
Typically Offered: Fall.

CAB 710. Cancer Biochemistry & Molecular Biology. 3 Credit Hours.

This is an entry-level lecture course designed to introduce students to the
major concepts and principles of cell growth deregulation in cancer with
a major emphasis on molecular mechanisms. Topics include: oncogenes,
tumor suppressors, mechanisms of uncontrolled cell growth, receptors
and intracellular signal transduction pathways.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CAB 712. Special Topics in Cancer Research - Viral Oncology and Tumor
Immunology Module. 2 Credit Hours.

This module emphasized state of the art knowledge of each discipline,
student participation in a problem based learning context. Topics
include viral carcinogenesis and epidemiology, Hepatitis, Herpes, Epstein
Barr and Human Papilloma Viruses, Kaposi’s Sarcoma, viral induced
lymphomas, viral oncolysis, and mechanisms of anti-tumor immunity.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CAB 713. Special Topics in Cancer Research - Molecular Cancer
Therapeutics Module. 2 Credit Hours.

This module explores the signal transduction pathways critical for cancer
cell proliferation and survival that may provide new therapeutic targets,
approaches for identification and validation of molecular targets within
these pathways. Students are introduced to the strategies used in the
discovery and design of biological and drug based therapies, and the
implementation of clinical trials.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CAB 714. Cancer Epidemiology, Prevention and Biobehavioral Oncology.
2 Credit Hours.

The overall philosophy of this module is to introduce students to the
basic principles of biobehavioral oncology and cancer epidemiology
and cancer prevention and control. The course will explore cancer
epidemiology approaches used to identify the molecular and genetic
mechanisms of cancer risk and progression and how these are used
to develop predictive models in treatment response. Methods for
identifying social, environmental, and biological reasons for cancer
disparities among different populations will also be covered. Sections
on bio-behavioral oncology include: health behavior change processes
in persons at risk for and diagnosed with cancer; methods to improve
adaptation to cancer diagnosis and treatment, psychosocial intervention
research techniques and bio-behavioral processes explaining their
effects on health and quality of life (QOL), translation of behavioral and
psychosocial intervention to the community, symptom/treatment side
effects management approaches, predictors of late effects of cancer
treatment and development of preventative interventions.
CAB 840. Doctoral Dissertation- Post Candidacy. 1-12 Credit Hours.

Required for all Ph.D. candidates. Grade will remain IP until student dissertation is accepted by Graduate School.

Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.

CAB 850. Research in Residence. 1 Credit Hour.

Used to establish research in residence for the Ph.D., after the student has been enrolled for the permissible cumulative total in appropriate doctoral research. Credit is not granted. May be regarded as full-time residence as determined by the Dean of the Graduate School.

Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.