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. This program aims 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 that 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 unmet clinical challenges drive scientific research.

The core course in Cancer Biochemistry and Molecular Biology is a prerequisite for all CAB courses. Other required courses include Tumor Biology, Translational to Clinical Research, Student Seminars, 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 the 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.)

Contact Information

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- Admission Requirements

Applicants to biomedical programs should have a bachelor's 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
- 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
- GRE is no longer required. Competitive GRE scores (top 50th percentile) can be submitted through BiomedCAS as additional information

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).

Doctoral Programs

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

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: SUS.
Typically Offered: Fall & Spring.

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 & Spring.

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: SUS.
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: SUS.
Typically Offered: Spring.

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

This module explains the goals and techniques of researchers in the fields of bio-behavioral oncology and cancer epidemiology. The following themes in bio-behavioral oncology are explored: health behavior change in persons at risk for and diagnosed with cancer; adaptation to cancer diagnosis and treatment, psychosocial intervention, bio-behavioral processes, and quality of life (QOL); translation of behavioral and psychosocial intervention to the community; predictors of QOL and late effects of cancer treatment and development of preventative interventions.

The themes for cancer epidemiology and prevention include understanding the genetic, environmental, social, and biological reasons for cancer disparities among different populations. Cancer epidemiologists seek to define the molecular and genetic mechanisms of cancer risk and progression with the aim of developing predictive models in cancer risk and treatment response.

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

CAB 715. Special Topics in Cancer Research - Breast and Genitourinary Cancers Module. 2 Credit Hours.

This module highlights key aspects of the cellular and molecular mechanisms of breast, prostate, renal and bladder cancers as well as providing an overview of cancer detection, diagnosis, and therapy. Emerging research opportunities are identified. Topics include estrogen receptor and androgen receptor signaling, cancer progression, endocrine therapies and resistance. Key signaling pathways and the biology of metastasis will be discussed.
Components: LEC.
Grading: SUS.
Typically Offered: Spring.

CAB 720. Dialogues with Cancer Clinicians (PIBS Module). 1 Credit Hour.

This module features physician mentors of the Cancer Biology Graduate Program who will discuss clinical aspects of cancer treatment with an emphasis on continuity of care of newly diagnosed patients between disciplines and will articulate unmet clinical needs and research. Mentors will provide clinical perspectives on their areas of specialization as it relates to patient care including diagnosis, staging, therapy, and outcomes.
Components: LEC.
Grading: SUS.
Typically Offered: Spring.

CAB 750. Logic and Reasoning in Translational Cancer Research: Bench to Bedside Part 1. 3 Credit Hours.

An important facet of the Cancer Biology Ph.D. Program is the training of students in the interrelationships between basic research and clinical medicine, i.e., translational research. The goal of this advanced course is to expose students to the scientific reasoning and logic underlying problem solving in clinical cancer research. This course is designed to help students integrate information and develop the thought processes necessary to critically evaluate information in the literature and experimental approaches, conceptualize problems in the field and identify areas for scientific exploration. Students learn how the knowledge obtained from basic research laboratories is applied to clinical problems including prevention, diagnosis, prognosis, and therapeutic treatment of cancer. Specific examples of translational research, i.e., laboratory to clinic are emphasized. Students also learn the key role of clinical observation in identifying basic research problems.
Components: LEC.
Grading: SUS.
Typically Offered: Fall.

CAB 830. Dissertation Research - Pre Candidacy. 2 Credit Hours.

Required of all candidates for the Ph.D. The student will enroll for credits as determined by the Office of Graduate Studies but not less than a total of 24. Not more than six in the summer. If a student has a)passed qualifying exam(s) and (b) is engaged in an assistantship, he/she may still take the maximum allowable credits.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.

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.