DEPARTMENT OF CELL AND CANCER BIOLOGY

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The Cell and Cancer Biology track within the Biomedical Science Program at the University of Toledo fosters young scientists to become independent investigators with a focus on cell and cancer biology, who understand the molecular and genetic basis of cancer and have the knowledge cell biology to develop improved therapies for human cancer. Students in the Cell and Cancer Biology track develop critical and logical thinking and laboratory skills to approach cancer research questions in ways that will best lead to success. The Cancer Biology program graduates move on to become successful scientists and leaders in academic, government, and industrial settings. CCB students may pursue the Doctor of Philosophy (PhD) degree or, after acceptance into the medical school, a combined MD/PhD degree. The Masters' degree in Cancer Biology is also currently offered.

The CCB program faculty research interests and areas of expertise are: 1) Control of tumor cell growth and death, 2) Signal transduction, 3) Mechanisms of cancer cell motility and chemotaxis, 4) Invasion and metastasis, 5) Molecular genetics of cancer risk, 6) Influence of tumor microenvironment on cancer progression and metastasis, 7) Drug resistance, 8) Chromatin remodeling and epigenetic regulation of oncogenes and drug resistance. 9) DNA damage signaling and repair, 10) Drug discovery and delivery, 11) Autophagy and cancer metabolism, and 12) Aging and cancer.

Cell and Cancer Biology PhD students enroll in a first-year core curriculum that is designed to provide a foundation of knowledge for cutting edge research. The first-year curriculum provides students with a comprehensive overview of molecular and cellular biology, systems pathophysiology, modern research methodology, and statistical analysis. In addition, students complete laboratory rotations during the first two semesters to identify a Cell & Cancer Biology major advisor and laboratory for their dissertation research project. PhD students complete three rotations and then may join a Cancer Biology laboratory in the spring semester of their first year. Doctoral students in good academic standing may be supported financially by a tuition scholarship and stipend during their academic training. This financial assistance does not require the student to be a Teaching Assistant for undergraduates, thus enabling the student to more fully concentrate on his/her graduate program.

Admission Requirements:

- An earned degree: Baccalaureate (e.g., B.S., B.A.) or graduate degree (e.g. M.S) granted by an accredited college or university.
- GPA: A 3.0 GPA (on 4.0 Scale) or higher from an institution granting the baccalaureate or graduate degree.
- Coursework: Prior coursework should at least have some relevance to graduate studies in cell and cancer biology, including courses in biology, biochemistry, cell and molecular biology, physiology, statistics, genetics, etc.
- Letters of Recommendation: Three or more letters of recommendation are required. Recommendation letters must be signed by the letter writer and full contact information for the letter writer must be provided. The letter should highlight the professional relationship between the applicant and/or academic preparations, and the intellectual contributions to the research project, if applicable.
- Statement of purpose: Applicants are required to provide a Statement of Purpose, which highlights academic and research training prior to application, CCB faculty and projects that are particular interest, and future career goals.
- Resume/CV: Applicants are required to submit a resume/curriculum vitae.
  - TOEFL (or IELTS) is required for all international students. The following exceptions apply:
  - Proof of citizenship from one of these countries (https://www.utoledo.edu/graduate/admission/requirements/english-test-exempt.html).
  - Successful completion of a US Bachelor's or Master's degree.
  - Successful completion of at least 24 credit hours of academic study at a US college or university.

Please note that students accepted into our program do not need to find a mentor before or immediately after they matriculate. All students undergo laboratory rotations during their first year and then make a mutual decision with a mentor for their dissertation research.

Excitingly, if you are an outstanding applicant, you are eligible to compete for University Fellowships after being admitted to our program. Please click search now (http://www.utoledo.edu/financialaid/scholarships/search/?utm_source=programs&utm_campaign=scholarship) for more information. Applications generally open in October and close at the beginning of March. https://www.utoledo.edu/graduate/scholarships/

The CCB graduate track uses a holistic approach to assess and evaluate applicants. The CCB graduate Admissions Committee carefully considers each applicant's GPA, college/university where previous degrees were awarded, previous coursework, letters of recommendation, previous research experience, publications/presentations (if applicable), statement of purpose, and resume/CV. A virtual interview (e.g., Zoom, WebEx) will be conducted for top applicants.

Degrees Offered

- Biomedical Sciences: Cancer Biology, MSBS
- Biomedical Science: Cancer Biology, PhD

CABP 6250 Scientific Communication Skills and Career Goals
[2 credit hours]
Three-fourths of the course will be focused on individual, small group, and whole class participation in communication skills. One fourth of the class will be devoted to information and assessment of individual career options. Web based assessment tools and outside expertise will be recruited for this portion of the class.
Term Offered: Spring

CABP 6270 Advanced Cancer Biology
[3 credit hours]
A comprehensive examination of the cellular and molecular foundation of cancer. Topics to be covered include: neoplasia; epidemiology and etiology; the role of causative agents such as chemicals, radiation, and viruses; cell proliferation, injury, and death; oncogenes; tumor suppressor genes; and an overview of cancer therapy.
Term Offered: Spring, Fall

CABP 6560 Readings in Cancer Biology
[1 credit hour]
A readings and discussion course that will examine classic and current research publications from within the broad realm of cancer biology.
Term Offered: Spring

CABP 6730 Research in Cancer Biology
[1-15 credit hours]

CABP 6890 Ind Study in Cancer Biology
[1-15 credit hours]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 6990 Thesis Research in Cancer Biol
[1-15 credit hours]

CABP 8250 Scientific Communication Skills and Career Goals
[2 credit hours]
Three-fourths of the course will be focused on individual, small group, and whole class participation in communication skills. One fourth of the class will be devoted to information and assessment of individual career options. Web based assessment tools and outside expertise will be recruited for this portion of the class.
Term Offered: Spring

CABP 8270 Advanced Cancer Biology
[3 credit hours]
A comprehensive examination of the cellular and molecular foundation of cancer. Topics to be covered include: neoplasia; epidemiology and etiology; the role of causative agents such as chemicals, radiation, and viruses; cell proliferation, injury, and death; oncogenes; tumor suppressor genes; and an overview of cancer therapy.
Term Offered: Spring, Fall

CABP 8560 Readings in Cancer Biology
[1 credit hour]
This course is designed for Ph.D students to develop professional skills in seminar comprehension, critical peer review, scientific presentation, and communication.
Term Offered: Spring, Fall

CABP 8730 Research in Cancer Biology
[1-15 credit hours]

CABP 8890 Ind Study in Cancer Biology
[1-15 credit hours]
Intensive study in the field of cancer biology including theoretical and experimental work. May be repeated for credit.
Term Offered: Spring, Summer, Fall

CABP 9990 Dissertation Research CABP
[1-15 credit hours]