

# BIOMEDICAL SCIENCES, PH.D.

The School of Medicine Biomedical Sciences Ph.D. program provides extensive educational opportunities with the ultimate goal of training the next generation of biomedical researchers and educators. Biomedical science is a multidisciplinary field of study encompassing biological and chemical disciplines focused on medical issues including enhanced understanding, detection and treatment of human disease. Scientists working in the School of Medicine Biomedical Sciences program have diverse interests ranging from the study of molecular and subcellular processes to the study of organ systems and whole organism functions. This interdisciplinary program prepares students for careers in biomedical research (both in academia and industry), by providing a broad foundation of knowledge in the basic medical sciences with expanded focus in a specific discipline that is emphasized in the dissertation research. This is accomplished through extensive didactic courses, development of career skills and training in research laboratories involved in diverse areas of biomedical science. The Biomedical Sciences Ph.D. program is administered by a Graduate Director with the consultation of the Graduate Curriculum Committee and the Graduate Advisory Committee. These committees have representatives from the three basic science departments in the School of Medicine.

The School of Medicine also participates in the Integrated Biomedical Science Program. This program is composed of faculty from across the University of South Carolina and includes departments from the School of Medicine, the College of Arts and Sciences and the School of Public Health. Students in this program take a common core curriculum in the first year of the Ph.D. The students subsequently select a mentor and join one of the participating departments.

## Learning Outcomes

1. Scientific Method - Students will be able to evaluate scientific literature, formulate ideas/ hypotheses, solve problems, carry out critical evaluations and arrive at conclusions
2. Biomedical Ethics - Students will demonstrate an understanding of ethical issues related to biomedical research including animal use, human subjects in research, authorship and plagiarism.
3. Oral Presentation Skills - Students will be able to organize and deliver an oral presentation summarizing relevant literature and/or research data.

## Curriculum (62 Post-Baccalaureate Hours)

The curriculum includes multiple training components designed to prepare students for their dissertation research and for a career in biomedical science. The curriculum includes the following components:

- A core of basic science courses including advanced biochemistry, molecular biology and cell biology. The student can follow two tracks in the first year: basic molecular and cellular biology or neuroscience. The tracks are sufficiently similar in content such that a student may switch tracks, if required.
- A multidisciplinary laboratory course that exposes the student to research methods, facilities, and major equipment.
- An ethics course which addresses topics important in biomedical research including human subjects, animals in research, authorship, plagiarism and others.

- Advanced graduate course work in specific areas of specialization such as neuroscience, developmental biology, immunology, molecular biology and cancer, reproductive biology, and cardiovascular sciences.

The Biomedical Sciences Ph.D. degree requires a minimum of 62 credit hours beyond the baccalaureate and a minimum of 30 hours beyond the master's degree, including at least 12 credit hours of dissertation preparation. Course work includes 12 or more hours of a core curriculum and at least 9 elective credit hours in specific content areas of the concentration.

Transfer of graduate credits earned prior to admission into the doctoral program will be determined by the Graduate Advisory Committee within limits determined by The Graduate School.