Molecular Microbiology and Immunology Track

The primary objective of the track in Molecular Microbiology and Immunology is to provide graduates with advanced academic and research training in all aspects of Microbiology and Immunology, especially in those areas that pertain to infectious diseases. This track will provide expertise in bacteriology, virology, parasitology, mycology, immunology, vaccinology, biodefense, and molecular genetics. The information derived from research in this area has an enormous impact on biology and medicine.

Students in this track follow the regular core curriculum for the concentration in Cell and Molecular Biology; however, their Doctoral Dissertation topic, proposal and research need to be in an area related to Microbiology and Immunology. Likewise, students are also encouraged to select the majority of their elective courses and colloquia from those offered that are broadly related to the field of Microbiology and Immunology. The overall program of study for this track may differ by no more than 12 semester credit hours from the program of study for the regular concentration in Cell and Molecular Biology and must be approved by the student’s Dissertation Advisor and the Cell and Molecular Biology Doctoral Studies Committee.

Stem Cell Biology Track

Stem Cell Biology is a rapidly emerging field rooted in basic principles of Cell and Molecular Biology that has provided new avenues to investigate normal cellular and developmental processes as well as novel approaches to learning more about and/or treating complex diseases and other debilitating conditions. The Stem Cell Biology Track will allow students pursuing their doctoral degree in Cell and Molecular Biology the opportunity to focus on Stem Cell Biology, including topics related to the basic biology of stem cells (from any species) as well as those related to translational research involving potential contributions of stem cells to tissue engineering or other therapeutic approaches. This will include, but is not limited to, molecular biology of stem cells, cell biology of stem cells, epigenetic programming in stem cells, maintenance of genetic integrity in stem cells, and the use of stem cells to study disease etiology, and will be based on studies of embryonic stem cells, induced pluripotent stem cells, germline stem cells, neural stem cells, mesenchymal stem cells or other tissue-specific stem cells, as well as stem cells from non-mammalian organisms including lower vertebrates, microorganisms and/or plants.

Students in this track will follow the standard curriculum and program of study for the concentration in Cell and Molecular Biology; however, their Doctoral Dissertation topic, proposal and research must be in an area related to Stem Cell Biology. Among the three elective courses required for the standard Cell and Molecular Biology program of study, students in this track will be required to take two courses focused on Stem Cell Biology—Cell Biology of Stem Cells and Molecular Biology of Stem Cells. Finally, students in the Stem Cell Biology track will be required to enroll in colloquia that address topics related to Stem Cell Biology. The overall program of study for this track may differ by no more than 12 semester credit hours from the standard program of study for the concentration in Cell and Molecular Biology and must be approved by the student’s Dissertation Advisor, a subcommittee that will oversee the Stem Cell Biology Track, and the Cell and Molecular Biology Doctoral Studies Committee.