OPHTHALMOLOGY, VISUAL AND ANATOMICAL SCIENCES (PH.D.)

The Department of Anatomy and Cell Biology offers training for the investigation of biological and biomedical problems using molecular, cellular, and morphological approaches. Faculty members are active in a diversity of research areas, including cell and developmental biology, neuroscience, vision research, and immunology. Study for the Ph.D. degree includes dissertation research in the laboratory of a faculty member and can generally be completed in four to five years. Students who have also been admitted as medical students can typically complete both M.D. and Ph.D. degrees in six to seven years.

Admission Requirements

Admission is contingent upon admission to the Graduate School (https://bulletins.wayne.edu/graduate/general-information/admission/) and the graduate programs of the School of Medicine (https://bulletins.wayne.edu/graduate/school-medicine/programs/), respectively. Applicants must have an undergraduate degree. A minimum grade point average of 3.0 is required for admission to the Ph.D. program. An interview with the Graduate Committee Chairperson or designated representative is desirable. The Graduate Record Examination is required for admission. Foreign students must be proficient in English as determined by satisfactory performance on the standardized TOEFL English proficiency examination.

Academic Scholarship

All course work must be completed in accordance with the regulations of the Graduate School (https://bulletins.wayne.edu/graduate/general-information/academic-regulations/) and the School of Medicine (https://bulletins.wayne.edu/graduate/school-medicine/programs/) governing graduate scholarship and degrees.

Assistantships and Research

The Department has graduate research assistantships available for a number of qualified students. All students accepted into the doctoral degree program are considered for financial assistance, and no application forms are necessary for this purpose. Students on assistantships are advised to elect no more than ten credits in a given semester. Two credits are covered during spring/summer semester. All students, whether or not they hold a fellowship or assistantship, are required to assist the graduate faculty in research activities as a component of their educational experience.

The major emphasis of the Doctoral program is in the acquisition of research expertise designed to prepare graduates to become principal investigators in their own laboratories as well as educators in the academic setting. During the first two years of study, students learn fundamentals of molecular and cellular biology at the graduate level, as well as receive advanced instruction in the areas of anatomical sciences, vision sciences, and neurosciences. They also perform laboratory rotations that lead to the selection of the permanent advisor who will guide the Ph.D. research project. The third and fourth years are devoted to the completion of the research project in consultation with the advisor and dissertation committee.

This is a 4-step process that includes: 1) The development of a testable hypothesis and research plan; 2) implementation of experiments; 3) critical analysis of the data; and 4) the assembly of the data and conclusions in the format of a Ph.D. dissertation.

Opportunities are provided for the student to become acquainted with the diverse research interests of the faculty and to obtain hands-on experience in selected techniques. Seminars and elective courses broaden the exposure to clinically-relevant areas of research. In the second year, students may select advanced courses in several areas of Ophthalmology, Visual and Anatomical Sciences and choose an advisor to assist in development and implementation of a dissertation research project. The graduate program is flexible and allows for continuing interdisciplinary training; emphasis is placed on designing a program which is tailored to the student's particular goals. In addition to developing research competence, individuals interested in pursuing teaching as part of a career will be able to achieve competence in neuroscience, embryology, and microscopic or gross anatomy.

First Year Coursework

During the Fall of the first year, all Ph.D. students enroll in the core course of the School of Medicine's Interdisciplinary Biomedical Sciences (IBS) curriculum (IBS 7015) and a course in the Responsible Conduct of Research (GS 0900). Students will also enroll in 1-2 additional courses in order to reach a total of 10 credits. During the Winter of the first year, Ph.D. students can enroll in courses within the OVAS department (OVA courses) or outside of the department as electives to reach a total of 8-10 credits. In addition, students will enroll in OVA 7890 to participate in the seminar series and OVA 7270 to complete their laboratory rotations. In the Spring/Summer semester, students enroll in OVA 7996 for 2 credits as they undertake pre-candidacy research in their chosen research lab.

Second Year Coursework

Ph.D. students can enroll in courses within the OVAS department (OVA courses) or outside of the department as electives, along with undertaking pre-candidacy research while enrolled in OVA 7996. Students should consult with their research advisor in selecting courses that will best complement their research efforts and overall education. However, students should note that only courses with 7000 or higher will count towards their 60 total credits needed to complete the Ph.D. program. In addition, all Ph.D. students in our program are required to take one of the following:

Code	Title	Credits
OVA 7010	Human Gross Anatomy	8
OVA 7030	Human Microscopic Anatomy	4
OVA 7055	Biology of the Eye	3
OVA 7130	Neuroanatomy	4

The program offers two subdisciplines: Neurobiology and Vision Science. Ph.D. students interested in the Neurobiology subdiscipline should take one of the following: OVA 7010, OVA 7030 or OVA 7130. Ph.D. students interested in the Vision Science subdiscipline should take OVA 7055. If warranted, students in this subdiscipline can also take OVA 7065 Mechanisms of Ocular Disease I and OVA 7075 Mechanisms of Ocular Disease II.

Students will complete 42 credits of study at the conclusion of their first two years in the program with a combination of required ANA courses, electives suited to meet the student's training goals, and pre-candidacy research.

Dissertation

Eighteen credits in dissertation credits are required in the Ph.D. program. To meet this requirement, students register for the course OVA 9991 (3-9 credits), and OVA 9992 (1-15 credits) in consecutive academic year semesters. Students are required to write an original research

dissertation, which generally includes one or more peer-reviewed publications, have it approved by a dissertation committee, and present it in a public defense.