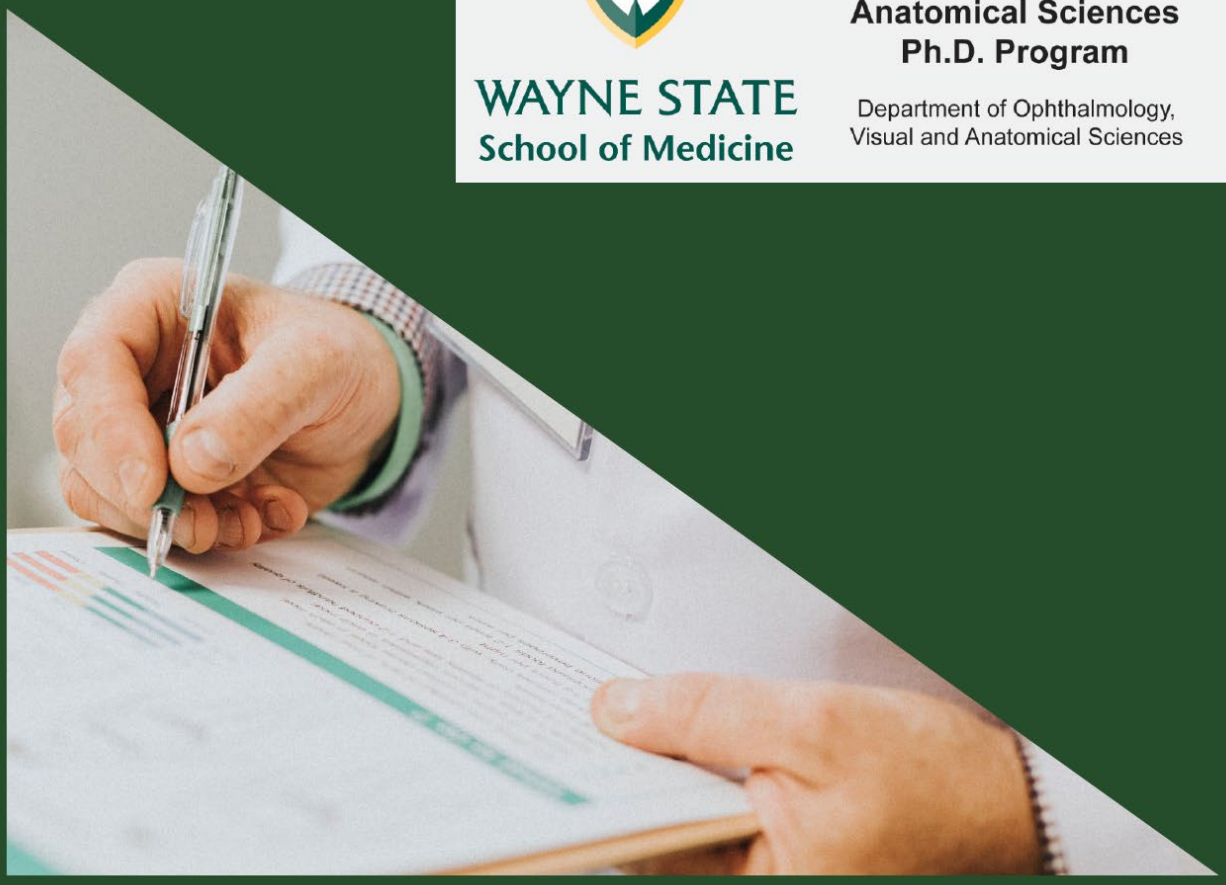
WAYNE STATE
School of Medicine

Ophthalmology, Visual and Anatomical Sciences Ph.D. Program

Department of Ophthalmology, Visual and Anatomical Sciences



DOCTOR of PHILOSOPHY

in Ophthalmology, Visual and Anatomical Sciences

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Highlighted rows represent faculty members accepting PhD students in the 2026-2027 Academic Year

*Note: the ability of a faculty member to accept a student in their lab is dependent on their research funding, which may fluctuate on a yearly basis. Therefore, the student should consult with the Graduate Director prior to making any final decisions in regards to joining a lab.

Mission Statement

The Doctor of Philosophy (PhD) Program in Ophthalmology, Visual and Anatomical Sciences prepares doctoral students for research and teaching careers in various areas encompassed by Ophthalmology, Visual and Anatomical Sciences. Goals include providing students with a basic background in biomedical science, expertise in multiple sub- disciplines of Ophthalmology, Visual and Anatomical Sciences, competence in a variety of experimental techniques, ability to read and understand current scientific literature, and experience in the development and implementation of experiments to test specific hypotheses. We are seeking undergraduate or master's degree level students who show potential for future success as independent researchers and educators at the highest academic levels.

Program Description

The Department of Ophthalmology, Visual and Anatomical Sciences offers training primarily in the broad research areas of vision science and neuroscience. Specific areas of vision research include mechanisms of immunity and inflammation during ocular infections; the physiology and neurochemistry of retinal neurons; and blood flow, oxygen transport, and intracellular signaling cascades in ocular tissues. Neuroscience research includes studies of neurodegeneration, mechanisms of neural signaling, neural circuit formation, auditory and vestibular dysfunction, and the development and function of glial cells.

Quick Facts

PhD students in program per year: 10-15
PhD students accepted/enrolled per year: 1-3
PhD students completed program per year: 1-3
Success rate (2006-2021): 76%
Average Time-to-Degree: 4.7 years

Progression through the PhD Program

Financial Support
PhD student appointments at the School of Medicine are designated Graduate Research Assistants (GRAs) and are administered by student's home department (OVAS). During the first 2 years, the GRA appointment is supported by the SOM Office of Biomedical Graduate Programs. It is important to understand that the student's permanent advisor provides significant financial support beyond the second year of training. As such, it is critical that the advisor has sufficient funding to support the GRA position and the overall research project. The Department is under no obligation to provide any financial support for the student's GRA position or research project. Finally, there are no teaching obligations associated with the GRA appointment.

First Year Coursework
During the Fall of the first year, all PhD students enroll in the core course of the School of Medicine's Interdisciplinary Biomedical Sciences (IBS) curriculum (IBS 7015, Cr. 6) a course in the Responsible Conduct of Research (GS 0900, Cr. 0). 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, PhD students can enroll in courses within the OVAS department (OVA courses) or outside of the department. In addition, students can enroll in OVA 7890 (Cr.1) to participate in the seminar series and OVA 7996 (credits vary) to complete their laboratory rotations.

Departmental Requirements
PhD students are required to attend the OVAS Department Seminar Series and attend organized lunches with outside seminar speakers. In off-weeks with no seminar, students are required to attend scheduled professional development workshops, and student-led journal clubs in lieu of a seminar. In addition, students are required to attend Integrative Ophthalmology Grand Rounds presentations, which will be scheduled once a month during the academic year. These enrichment opportunities are considered essential training experiences for PhD students in OVAS and are therefore requirements for not only students directly enrolled in OVA 7890 (Seminar), but also students enrolled in OVA research courses, including OVA 7996, OVA 9990, OVA 9991, OVA 9992, and OVA 9995.

Laboratory Rotations
Typically starting in the Winter of the first year, students are given the opportunity of three laboratory rotations (8-16 weeks each) prior to the selection of the permanent advisor. Depending upon the student's coursework load and advisor availability, the rotation schedule can be made flexible but should be completed by the end of the student's first appointment year (August). Laboratory rotations allow both student and potential faculty advisor to determine if the selection is a good match. Students must consult with the Graduate Director to plan each rotation since financial support is a critical factor to the student's success. At the beginning of each rotation, the student and rotation advisor should discuss expectations as well as the research grading policy (see below).

Selecting a Permanent Advisor
This is the most important decision of a student's graduate career. The advisor shapes the direction of the student's career and provides the environment for the PhD research project. Each advisor has a unique approach to the training of PhD students and it is the student's responsibility to discover the advisor's philosophy of mentorship during the laboratory rotations. Final approval of the permanent advisor is granted by the Departmental Chair in consultation with the Graduate Director after evaluation of resources needed to support the student's GRA appointment and overall PhD research project.

Plan of Work
The PhD program requires completion of 60 graduate credits. This total must include 18 credits of OVA dissertation research. Students may not take more than 30 credits of OVA 7996 (Research) without a special override.

The Plan of Work (PoW) provides the student and graduate school with an official outline of the planned coursework that will satisfy 60 graduate credits. The PoW must be completed prior to completing 40 credits of coursework but ideally should be submitted at the end of the first year of the PhD program. When selecting courses for each semester, students must be enrolled in a minimum of 8 credits in the Fall and Winter semesters and 2 credits in the Spring/Summer semester. Students should also be careful not to exceed the maximum number of credit hours covered by their appointment for tuition scholarship. This number may differ according to the student's funding source and semester enrolled but is typically 10 credits for Fall and Winter semesters and 2 credits for the Spring/Summer semester. Students that exceed the maximum number of credits covered by their agreement or who take a course outside of the approved PoW will be held responsible for tuition payments. After consultation and approval by the PhD advisor and the Graduate Director, students submit the PoW to the graduate school via the following link.
https://gradschool.wayne.edu/students/phd/forms

Selecting a Dissertation Committee
During the Fall semester of the second year of the program, the student should assemble a Dissertation Committee to assist and advise the student through the remainder of the PhD. The committee is composed of the PhD advisor, two additional faculty from the department, and one faculty member who is external to the department. Note that all faculty members must have Graduate Faculty status. The student should consult with their advisor to select faculty members who have complementary expertise in the student's research and who are willing to serve on the committee.

Once assembled, the student should hold an initial meeting with the committee in the Fall or Winter semester of the second year of the program. This meeting introduces the committee to your project, which will assist your committee in choosing appropriate topics for your Written Qualifying Exam (see below). At least one meeting should be held prior to the Prospectus Oral Exam. The student will likely not have a clearly focused project or a large amount of preliminary data to share with the committee at the initial meeting. However, student progress should improve over time, which will be assessed in subsequent meetings. From the date of the first meeting, students must meet with their dissertation committee once every 6-months in order to review progress made on the project. During each meeting, the student provides an oral presentation that reviews the central hypothesis and specific aims of the project and shows data obtained for each specific aim. The student answers questions posed by the committee as well as discusses the interpretation of the data. During the meeting, the advisor should not attempt to speak on behalf of the student. The dissertation committee may make suggestions designed to strengthen the project and it is the student's responsibility to respond to all suggestions. The Graduate Director (or another member of the Graduate Program Committee) will attend these meetings and record committee suggestions and the student's progress.

Individual Development Plan (IDP)
The PhD Annual Review and IDP is a general requirement for all PhD students at Wayne State University. It should be filled out each year between April and October to reflect work completed during the prior academic year. The student should fill out the student sections of the IDP form, including their career objective, self-assessment, areas for development, and action plan. These sections should serve as a foundation for annual review and feedback from the PhD advisor. Following the review, the advisor should fill out the Advisor's Comments section of the form. The Graduate Director will also comment on the student's progress and goals for the future. Finally, the form should be submitted to the Graduate School via the following link.
https://gradschool.wayne.edu/students/phd/forms

Written Qualifying Exam
The Written Qualifying Exam must be passed prior to filing for PhD Candidacy (see below) and should be completed prior to entering year three of the Program. The format of the exam is as follows. The written qualifying examination will be based on research papers/articles given to the student by his/her committee members. A total of four research articles (one from each committee member) will be given to the student six weeks prior to the date of examination. The paper should deal with subjects that fall reasonably within the scope of the student's project. The exam questions will be based on material presented in the research articles. The student will have access to the research articles at the time of the written examination. The benefit of this format is that it will help students learn to interpret and critically evaluate scientific data. Each committee member (including the advisor) will submit two questions based on the chosen research articles. Out of the eight questions, the student must answer six questions (one question from the advisor and five of the other six questions). The student will be given a maximum of three hours to complete the written qualifying examination. Following the exam, each committee member will evaluate the response(s) to his/her question(s) and assign a numerical grade to each question. The student will need to receive an overall average of 75% to successfully pass the exam. If the student fails the exam the first time, he/she can retake the exam after four months have passed. During this period, it is expected that the student's graduate committee members will provide feedback/advice to the student. If the student fails the written exam twice, he/she will be expelled from the PhD program.

Prospectus
The University requires that each PhD student pass an Oral Qualifying Exam prior to obtaining PhD Candidacy status. Our program makes the Oral Qualifying Exam part of the Prospectus. The Prospectus can be administered after completion of 30 credits of coursework and normally takes place at the end of the second year in the program or the beginning of the third year. Prior to taking the Prospectus, the student must have an approved Plan of Work and have passed the Written Qualifying Exam.

The written form of the Prospectus is the Dissertation Proposal. The student should consult with their advisor to construct a proposal based on their research project. The proposal should contain scientific background and significance of the project, a clear central hypothesis, specific aims, supportive preliminary data, experimental approaches, anticipated outcomes, and potential pitfalls and alternative strategies. The document must demonstrate the student's depth of knowledge about the overall project. It should be broad enough to test the student's general knowledge of their research area as well as specific enough to focus on underlying mechanisms that will be later studied. Do not exceed 50-pages excluding References. The usual size of the document is 20-30 pages. When the advisor is satisfied with the document, the student will submit it to all members of the dissertation committee for approval two-weeks prior to the scheduled oral exam portion of the Prospectus. Committee members will give the student feedback on the written document at the oral exam portion of the Prospectus.

The oral exam portion of the Prospectus is an oral defense of the Dissertation Proposal. During this meeting, the student gives a 45-50 minutes seminar that outlines the scientific background and rationale of the project, the specific aims, experimental design, preliminary studies, and predicted outcomes. The talk is immediately followed by a question-and-answer session between members of the dissertation committee and the student. The Graduate Director (or another member of the Graduate Program Committee) also attends this meeting and usually acts as the mediator and student advocate. The Graduate Director is also afforded an opportunity to ask questions. This part of the meeting can last 1-2 hours and is probably the most intense experience the student will have in graduate school. After the question period is over, the committee decides whether the student has demonstrated sufficient mastery of the scientific background, experimental design and methods of their research project based upon the oral presentation and response to committee questions.
If the student passes the exam, the student progresses into PhD Candidacy status. The Recommendation for Candidacy Status form should be signed by all the committee members and submitted to the graduate school. The Conflict of Interest form must also be submitted following the Prospectus. These forms can be found via the following link.
https://gradschool.wayne.edu/students/phd/forms

If the student fails, a second exam will be scheduled at a later date, but it cannot occur within the same semester as the first exam. Failure of the student to pass on second attempt is grounds for dismissal from the program.

Doctoral Dissertation Credits
The obtainment of PhD Candidacy status allows the student to register for Doctoral Dissertation credits during the third and fourth year of the program. Students need 18 Doctoral Dissertation credits to achieve the PhD degree. These are typically obtained in two 9 credit blocks (Doctoral Candidate Status I, II), which much be taken and provide the students with full-time status. An override is required to register for these courses, which is done via the following link.
Graduate School Override Request - Wayne State University

These courses are typically taken during the Fall and Winter semesters of Years 3 as follows:
Fall Semester (Year 3) OVA 9991 (9 cr) Winter Semester (Year 3) OVA 9992 (9 cr)

The student can enroll in OVA 9991 during the semester in which they plan to take the oral exam portion of the Prospectus and obtain Candidacy. However, in order to register for OVA 9992, the approved PhD Candidacy form must be on file with the university.

Finally, if the student achieves ≥60 credits prior to the dissertation defense, they can continue to register for OVA 9995 (Maintenance Status, 0 cr). This allows the student's status to remain active at minimum cost while they are finishing their research project.

PhD Dissertation Defense
When the dissertation committee and student have come to an agreement that the student can proceed to the final defense, the student should plan sufficient time to flush out important matters concerning the final defense. A 3-4 month period is strongly recommended to satisfy the following issues:

1. The student must adhere to the completion deadlines, guidelines, and forms that are required by the Graduate School. These can be found at the following link:
   Completion deadlines and graduation for Ph.D. students - Graduate School - Wayne State University
   Note that a format check of the written dissertation is required and must occur by a specific deadline established by the Graduate School for each particular semester.

2. It is important to understand that the committee shall have a minimum of 2 weeks to read the written document AFTER it has been approved by the PhD advisor. Note that this would be a minimum of 4 weeks before a tentatively scheduled defense date to meet the requirements outlined below. It is common for a student to take several months to write the document and go through multiple rounds of revisions with their advisor prior to having the final version ready for submission to the committee. Guidelines for formatting the dissertation are found here:
   Microsoft Word - Complete Format Guidelines 6 2012.docx (wayne.edu)

3. Once each committee member has read and approved the contents of the dissertation, the Final Defense Report and Conflict of Interest forms must be submitted to the Graduate School. These forms can be found via the following link. https://gradschool.wayne.edu/students/phd/forms
   Note that these forms must be submitted two weeks prior to the dissertation defense. It is highly recommended that the final defense date not be scheduled prior to the approval of the written document and submission of these forms.

4. After all of the above issues are addressed, the student schedules the public defense. The oral lecture is presented in front of a public audience. Following the public lecture, the audience can ask questions to the student. Following these questions, the audience is dismissed and the student answers questions posed by the dissertation committee in a closed-door meeting. If the student passes this portion of the exam, as per University policy, the PhD degree is awarded.

Academic Standing and Grading Policy for Coursework

GRAs must maintain a minimum grade point average of 3.0 in order to continue their assistantship appointments. If GPA drops below 3.0, the student is placed on Academic Probation and has one semester to bring overall GPA above 3.0. Failure to improve GPA above 3.0 after the probationary semester is grounds for dismissal from the program.

According to the Academic Regulations stated by the Graduate School, a final grade of B-minus or below in a graduate course is considered “Below Graduate Standards.” If a student receives a grade below a B-minus in a course, the credits for this course will not be counted towards the total credit requirement for their PhD degree and cannot be listed on the Plan of Work. In the event of a B-minus grade of below in a course, the student may need to adjust their Plan of Work to ensure all degree requirements are met. A grade of B-minus or below in more than one course is considered grounds for dismissal from the program.

Graduate School Academic policies can be found here: https://bulletins.wayne.edu/graduate/general-information/academic-regulations/

Grading Policy for Research Credits

Expectations of both student and advisor should be discussed at the beginning of each research experience, whether a laboratory rotation or research conducted in the laboratory of the primary advisor. The below grading scale used by the advisor to assign grades:

A (outstanding). The student exceeded expectations and significant progress was made towards the goals of the research project. Interpretable results were generated that considerably advanced scientific understanding. Effort and time devoted to the project were considered exceptional.

A- (excellent). The student met expectations, and progress was made towards the goals of the research project. Interpretable results were generated that advanced scientific understanding. Effort and time devoted to the project were considered excellent.

B+ (above average). The student met expectations, and partial progress was made towards the goals of the research project. Minor technical weaknesses or lack of conceptual understanding were apparent, and the student addressed these shortcomings. Effort and time devoted to the project were considered very good.

B (average). The student partially met expectations, but limited progress was made towards the goals of the research project. Technical weaknesses or lack of conceptual understanding were apparent, but the student tried to address these shortcomings. Effort and time devoted to the project were considered satisfactory.

B- (needs improvement). The student did not meet expectations. No progress was made towards the goals of the research project. Technical weaknesses or lack of conceptual understanding were apparent, and the students did little to address these shortcomings. Effort devoted to the project was considered sufficient, but less than satisfactory.

C (failure). The student did not meet expectations. No progress was made towards the goals of the research project. Technical weaknesses or lack of conceptual understanding were apparent, and the student did nothing to address these shortcomings. Effort devoted to the project was deemed unsatisfactory.

Learning Outcomes (LO) and Assessments (bullets) for the PhD Program

<u>LO1: Produce an original significant contribution to scientific knowledge.</u>

- The ability to develop and execute an original research project that makes a significant contribution to scientific knowledge will be assessed by the dissertation advisory committee during semi-annual committee meetings. The dissertation advisory committee will evaluate the soundness of the research design, the quality and rigor of the scientific data, and the proficiency of the data analysis. Direct feedback from committee members will be provided at these meetings to suggest improvements to the research project.
- At a final dissertation defense, the dissertation advisory committee will evaluate the completeness of the research project. This includes assessing the depth and analysis of the scientific data produced from the student's dissertation research and appraising the originality of the scientific contribution.
- The primary advisor will complete a series of evaluations documenting student progress in mastering research techniques and methodologies, as well as all necessary background knowledge pertaining to the dissertation project.
- External evidence of success will be assessed by original research publications, securement of post-graduate employment, and honors/awards relevant to the student's professional career path.

<u>LO2: Understand and critically evaluate subject material related to the program curriculum and dissertation project.</u>

- Course-based performance and assignment review in required and elective coursework.
- Mastery of subject material related to the research area and dissertation project will be assessed by dissertation committee members at semi-annual meetings through evaluation of the quality and depth of literature review.

- Mastery of subject material related to the research area and dissertation project will be assessed by dissertation committee members at the final defense of the dissertation through evaluation of the quality of literature review in the written document and oral defense.
- The ability to critically read and evaluate pertinent literature will be assessed by course-based performance in the seminar course (OVA 7890), which includes presentation and participation in presentations of scientific articles in journal club.
- The ability to critically evaluate subject material related to the dissertation project will be assessed with the successful completion of the written qualifying exam, which includes written feedback from faculty members on the student's dissertation advisory committee and a pass/fail recommendation.

LO3: Conduct scholarly activities in an ethical manner, following the principles of the scientific process.

- Course-based performance and assignment review in BMS6010- Responsible Conduct in Biomedical Research.
- Course-based performance in OVA 7890, which includes instructional workshops on the proper use of the scientific method and statistics in the biological sciences.

LO4: Effectively communicate scientific material publicly in both written and oral formats.

- Demonstration of proficiency in scientific writing will be assessed by performance in written qualifying exams, primary authorship of original manuscripts, and the final dissertation document.
- The dissertation advisory committee evaluates the proficiency of the oral defense of the prospectus exam and provides feedback, including a pass/fail recommendation.
- The dissertation advisory committee evaluates the quality of communication in the oral presentations at semi-annual committee meetings and provides feedback to the student.
- The dissertation advisory committee evaluates the quality of communication in the oral presentation at the final dissertation defense and gives a pass/fail recommendation.
- External evidence of success in orally communicating scientific material will be assessed by selection for presentations of the student's dissertation research, either internally at Wayne State University academic events or at external academic conferences.