

The Doctoral Program

The Department of Cell Biology and Molecular Medicine ("the Department") in the Graduate School of Biomedical Sciences (GSBS) offers a comprehensive doctoral training program for graduate students, preparatory to careers in research, teaching, and industry. The following departmental regulations and policies supplement those of the [Graduate School of Biomedical Sciences](#):

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Admission and Entry: Admission is made through application to the [Graduate School of Biomedical Sciences](#). Deadline for applications is February 1. Prospective students are evaluated primarily on the strength of past academic achievement, GRE scores, research experience, and letters of recommendation. Interviews are conducted whenever possible. Entry into the program is usually in the fall semester. Upon entrance, each student is assigned an Academic Advisor who provides guidance about course work and academic scheduling.

Financial Support: Fellowships are currently awarded by the GSBS for two years to incoming full time students, providing tuition and a stipend. After the second year, students are expected to obtain support from their Thesis Advisor, the Department, external agencies, or other sources. It is the policy of the Department to assist students in finding sources of support. Some students may also be admitted without financial support.

Academic Requirements

1. A total of 40 credits of course work is required. GSBS requires a full time load of at least 20 credit hours per year during the first two years. The 40 credits of course work must be completed prior to taking the qualifying exam (see below).
2. A minimum of 16 credits must be completed in the Department and a minimum of 12 credits outside the Department. Required courses are: Molecular and Cellular Biology (Core Curriculum Course), Cell and Tissue Biology, Advanced Cell Biology, and four semesters of Departmental Seminar.
3. Laboratory rotations are selected by the student, and will generally be in the Department. Three laboratory rotations are required (1 credit each; rotations may be either 6-8 weeks, full-time in a summer or a part time equivalent during a single semester per rotation). Rotations must be completed by the end of the fall semester of the 2nd year). Each rotation features hands-on research experience and requires the submission of a written report to the principal investigator of the laboratory.
4. A maximum of 12 credits may be transferred from other institutions towards the Ph.D. degree. The grade received for such transfers must be at least 3.0 (B). Requests for transfer of credits must be submitted to the GSBS Dean's office within 18 months of matriculation, and must also be approved by the Department and the GSBS.
5. With regard to transfer credits for the obligatory Medical School Departmental course (Cell and Tissue Biology), the following policy applies: Students will be granted exemption upon satisfactory performance (B or better) on comprehensive course test, which must be completed by the end of their first semester in the program.
6. An overall GPA of 3.0 (B) is required by the GSBS. The Department requires a grade of 3.0 or better in the Cell and Tissue Biology course and the Advanced Cell Biology course. Make up examinations or the opportunity to repeat a course can be given at the discretion of the Course Director. The performance and progress of each student will be evaluated after every semester by the graduate program director in consultation with the academic advisor. Failure to maintain these standards may result in loss of stipend, academic probation, or dismissal from the program, subject to the rules of the GSBS.

7. All students are required to attend and participate in departmental seminars and journal clubs throughout their graduate training.
8. Students are required to participate in the Departmental teaching program as a laboratory instructor for 2 units of Cell and Tissue Biology.

Advancement to Candidacy: A student becomes eligible for advancement to candidacy for the Ph.D. upon satisfactory completion of all course requirements, laboratory rotations, and a qualifying examination administered by the Department. Prior to taking the qualifying examination a student must be in good academic standing as defined by GSBS, and must obtain the formal approval of the Graduate Program Director (GPD) and the Department Chairperson.

Qualifying Examination: The examination consists of three components: (a) a written portion, comprehensive in scope; (b) a research proposal, patterned after NIH applications; (c) an oral examination, to allow follow up questioning on the above two components.

As specified by GSBS guidelines, the purpose of the qualifying exam is to assess the student's general knowledge in biomedical sciences, and ability to reason and communicate. As such, it is intended to be interdisciplinary; it should be separate from, and not based upon, the thesis proposal. This examination is usually taken within 4 months after completion of the required coursework.

1. Selection of the Qualifying Examination Committee.

The GPD, in consultation with the student, Academic Advisor and Department Chairperson, will select a committee consisting of at least five members, two of whom shall be from outside the Department. The chair of the committee is usually the Academic Advisor.

2. Guidelines for the Qualifying Examination.

(a) The written, comprehensive examination will focus mainly on subjects covered by the student's graduate courses. However, the questions can encompass any relevant aspects of basic knowledge in biomedical sciences. This portion of the examination will be coordinated by the GPD. Each member of the committee will contribute one research-oriented question. The student will answer four of these five questions. Pass/fail decisions will be made by majority vote of the committee. In the case of unsatisfactory performance, the committee will make recommendations to the GPD and the Department Chairperson regarding the possibility of retaking the written exam.

(b) The research proposal will be selected by the GPD from a list of at least three topics submitted by the student. The proposal cannot be on the thesis topic per se, although it can have some bearing on the thesis. The purpose of this exam is to evaluate the student's ability to identify a significant research problem, formulate a hypothesis, and design a logical series of experiments. The student should also demonstrate an understanding of the broader biomedical significance of the project. The proposal must be written independently by the student. The completed proposal must be submitted within three weeks of its assignment. Approval of the proposal will be decided by majority vote of the committee. In the case of disapproval, the committee will make recommendations to the GPD and the Department Chairperson regarding an appropriate course of action.

(c) The oral examination will be given after satisfactory completion of exam components (a) and (b). This exam will involve detailed questioning in specific areas suggested by the first two components; it will also test general knowledge and ability to think scientifically. A brief oral presentation of the research proposal (part b) may be requested by the committee. Satisfactory performance on this part, as determined by a majority vote of the committee, will result in advancement to candidacy. For students for whom additional coursework or tutorial sessions in a particular area is deemed necessary, the committee may also decide on a conditional pass; a student in this category will be admitted to candidacy once the required remedial steps have been taken.

Thesis Advisor and Thesis Advisory Committee: Students will select their Thesis Advisor on the basis of lab rotations. Following successful completion of the qualifying examination, a Thesis Advisory Committee will be nominated by the thesis advisor according to GSBS guidelines in consultation with the student. The Thesis Advisor will chair the Thesis Advisory Committee. The Thesis Advisory Committee will meet formally with the student at least once every semester and will submit a written report to the GPD, Department Chairman, and GSBS. Students are encouraged to consult with members of the advisory committee for guidance at any time.

Preparation of Thesis Proposal: The purpose of the thesis proposal is to outline the general direction of the student's research project. Within three months after successfully completing the qualifying examination, each student must prepare a written proposal that outlines the nature of the doctoral research project. The length of the proposal cannot exceed 25 double spaced pages, including references.

The proposal should include the following sections:

- Question(s) and hypothesis to be addressed by the proposed research.
- Specific aims of the research project.
- Introduction and background information concerning the nature of the problem to be investigated. This should include a relevant, but not exhaustive, review of the literature.
- Plan of study providing an outline of the experimental approach and the proposed sequence of experiments to be performed.
- Methods, describing in general terms the nature of the proposed methods.
- Experimental techniques need not be described in great detail.
- Significance, giving a brief description of potential importance for biomedical science.
- References

The thesis proposal requires approval by majority vote of the Thesis Advisory Committee; the Department Chairman then will notify the GSBS of approval.

Presentation of Research Seminars: Within one year after approval of the thesis proposal, and yearly thereafter, each student will present a seminar to the Department on his/her ongoing research. The purpose of these seminars is for students to obtain feedback from the department faculty on their research.

Final Stages: Preparation of the dissertation, appointment of the examination committee, and the thesis defense proceed strictly according to GSBS guidelines (see Student's Handbook).

The Master of Science Program

While all students are admitted to the Department only as potential candidates for the Ph.D. degree, it is recognized that under some circumstances it may be necessary to consider awarding the M.S. degree. The requirements for the M.S. degree are specified by the GSBS. The departmental requirements include:

1. Satisfactory completion of Cell & Tissue Biology, and two advanced graduate courses currently offered by the Department. The student must maintain a 3.0 grade average for the three courses.
2. Students are required to attend all departmental seminars and journal clubs.

Ph.D. Program for Postdoctoral Clinical Residents

The Department of Cell Biology and Molecular Medicine offers a Ph.D. program to physicians (M.D.) in residencies at the New Jersey Medical School-Newark and its affiliated institutions. The goal of this program is to allow the academically oriented clinical specialist to earn an advanced degree in a basic science discipline dealing with fundamental problems in his or her field of endeavor.

Relevant course credits (up to 28) earned during the first two years of medical school can be applied to the 40 credits necessary for the Ph.D. degree. Any credits applied to the Ph.D. degree in the Department must be approved by the Department's Graduate Program Committee and by the GSBS. Additional course work requirements include between 12 and 16 credits in the basic sciences. The student's thesis advisory committee must approve the selection of courses for credit. Laboratory rotations are not a requirement since the host laboratory and thesis research should have already been identified. The majority of the course work should be completed in the first year. Upon completion of the required coursework, the resident is eligible to take the Qualifying Exam at the end of the first year of Ph.D. training. The student will begin the thesis research during the first year in a basic sciences laboratory in the Department.

The minimum time required for completion of the thesis research is two years. Students must be aware of the intense nature of this accelerated program, and both the residents and their clinical Department Chairpersons must appreciate the total dedication that is required to complete this program in the time frame outlined above. However, additional time devoted to research may be required if the student is either not able to devote his/her full time and energy to the thesis research due to clinical commitments, or if adequate progress has not been made. The Ph.D. thesis must be completed and approved within two years after the thesis advisory committee approves the completion of the research project, unless an application made to the GSBS and Department Graduate Committee for an extension is approved.

The Thesis Advisory Committee should include a minimum of three (3) faculty, of whom at least two are to be members from the Department of Cell Biology and Molecular Medicine. At least one member of the Committee is from outside the Department. The Committee will determine if the thesis work satisfies the criteria for awarding a Ph.D. degree. The Thesis Advisory Committee members should meet at least twice yearly. All other GSBS guidelines pertaining to the Ph.D. candidates will apply, including the seven-year limit.

Research Program for Clinical Residents

The Department offers the opportunity for clinical residents to undertake research projects in a non-degree awarding program, under the supervision of a Department faculty member. This program is arranged by mutual agreement between the resident, his/her Department Chairperson, and the faculty member in the Department of Cell Biology and Molecular Medicine. This program will provide a strong, laboratory-based training opportunity for residents who are interested in acquiring and developing research experience in relation to a fundamental problem in their field of endeavor. It is expected that these research activities will result in publication. Residents in this program will not be awarded a degree. This opportunity is open to all enrolled in accredited residency programs.

The M.D.-Ph.D. Program

The M.D.-Ph.D. Program is regulated by the GSBS (see GSBS guidelines).