



Molecular and Cellular Pathology Graduate Program
Department of Pathology and Laboratory Medicine
The University of North Carolina at Chapel Hill

Graduate Student Handbook

Version 8.2013

The purpose of this *Graduate Student Handbook* is to provide students in the Molecular and Cellular Pathology Ph.D. program with specific information and guidance related to progression through our training program. This Handbook is not intended to replace *The Graduate School Handbook* (<http://handbook.unc.edu/pdf/handbook.pdf>) that is provided by the UNC Graduate School (<http://gradschool.unc.edu/>). Students should refer to *The Graduate School Handbook* for basic information related to graduate education at UNC, general academic requirements, and detailed degree requirements for the Doctor of Philosophy.





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2013-2014 Academic Year

Mission Statement of the University of North Carolina at Chapel Hill

The University of North Carolina at Chapel Hill has existed for two centuries as the nation's first state university. Through its excellent undergraduate programs, it has provided higher education to ten generations of students, many of whom have become leaders of the state and the nation. Since the nineteenth century, it has offered distinguished graduate and professional programs. The University is a doctoral/research-extensive university. Fundamental to this designation is a faculty actively involved in research, scholarship, and creative work, whose teaching is transformed by discovery and whose service is informed by current knowledge. The mission of the University is to serve all the people of the state, and indeed the nation, as a center for scholarship and creative endeavor. The University exists to teach students at all levels in an environment of research, free inquiry, and personal responsibility; to expand the body of knowledge; to improve the condition of human life through service and publication; and to enrich the culture.

To fulfill this mission, the University must: (i) acquire, discover, preserve, synthesize, and transmit knowledge; (ii) provide high quality undergraduate instruction to students within a community engaged in original inquiry and creative expression, while committed to intellectual freedom, to personal integrity and justice, and to those values that foster enlightened leadership for the state and nation; (iii) provide graduate and professional programs of national distinction at the doctoral and other advanced levels; (iv) extend knowledge-based services and other resources of the University to the citizens of North Carolina and their institutions to enhance the quality of life for all people in the state; and (v) address, as appropriate, regional, national, and international needs.

The Current Version (Approved by the UNC Board of Governors, November 2009)

The University of North Carolina at Chapel Hill, the nation's first public university, serves North Carolina, the United States, and the world through teaching, research, and public service. We embrace an unwavering commitment to excellence as one of the world's great research universities.

Our mission is to serve as a center for research, scholarship, and creativity and to teach a diverse community of undergraduate, graduate, and professional students to become the next generation of leaders. Through the efforts of our exceptional faculty and staff, and with generous support from North Carolina's citizens, we invest our knowledge and resources to enhance access to learning and to foster the success and prosperity of each rising generation. We also extend knowledge-based services and other resources of the University to the citizens of North Carolina and their institutions to enhance the quality of life for all people in the State.

With lux, libertas - light and liberty - as its founding principles, the University has charted a bold course of leading change to improve society and to help solve the world's greatest problems.



Molecular and Cellular
Pathology
Graduate Program

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Mission Statement of the Graduate Program in Molecular and Cellular Pathology

The mission of the Graduate Program in Molecular and Cellular Pathology is to provide opportunities for students to (i) acquire knowledge and advance their understanding of the origins and pathogenesis of human disease, and the consequences of pathology on human physiology, (ii) develop basic methodological skills, state-of-the-art investigative techniques, and advanced experimental approaches to enable them to elucidate mechanisms of disease, (iii) harness their laboratory skills in experimental pathology to generate new scientific knowledge related to mechanisms of disease and human pathology, (iv) gain experience in the practical aspects of scientific writing as it relates to dissemination of scientific knowledge and generation of scientific proposals, and (v) prepare for future careers in science, including but not limited to basic scientific research, translational research, industrial research and development, biotechnology, governmental research and regulation, and teaching of undergraduate, graduate, medical, or allied health students.



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Introduction

The Department of Pathology and Laboratory Medicine offers a predoctoral training program in *Molecular and Cellular Pathology*. The objective of the Graduate Training Program is to ensure that the student who receives the Ph.D. from this Department is a highly trained, competitive scientist capable of pursuing a productive career in experimental pathology. The student will acquire a broad background of knowledge in the biomedical sciences, detailed knowledge of his or her research area, the ability to pose scientific questions, the skills to seek answers in the laboratory, the ability to present concisely his or her research in written form, the ability to carry out a critical analysis of the scientific literature, and the ability to prepare and present formal seminars.

Program Objectives

Pathology is the study of disease (abnormal biology), and stands at the interface between medicine and biology. Classical pathology focuses mainly on the diagnosis and the status of disease. Its resources are the microscopic examination of cells and tissues, and the utilization of clinical laboratory methodologies, such as chemical, molecular, immunological, and microbiological analyses of body fluids or tissue biopsies. In contrast, contemporary *experimental pathology* is concerned with the laboratory investigation of disease mechanisms. Experimental pathologists apply methods of cellular and molecular biology to study interactions of etiologic agents with cellular macromolecules. They are also interested in how these interactions lead to the expression of disease at the molecular, cellular, tissue, and organismic levels. To the interested student, training in experimental pathology provides the biological background and opportunity for development of basic research in areas at the forefront of medicine. Our program emphasizes the inquiry into human disease processes by using a multilevel approach to research and state-of-the-art techniques. Graduates of this training program should be able to fill positions within academia, industry, and government that are concerned with human health, and the cause and prevention of human illness.

Training Objectives

The Department of Pathology and Laboratory Medicine, along with the Faculty of the Molecular and Cellular Pathology graduate program, provide students with mentoring, resources, and research opportunities, creating a unique environment for learning about mechanisms of disease and approaches to the study of these diseases. The educational goals and philosophy of the graduate program are to provide training in experimental pathology by allowing our students to participate in a specific research laboratory, offering appropriate coursework so that students are successfully trained and exposed to the most recent elements of molecular and cellular biology, pathophysiology and its broad implication in abnormal biology. The major training objectives for students in Molecular and Cellular Pathology are (i) to advance their knowledge of the origins and consequences of human disease pathogenesis, (ii) to develop the basic methodological skills as well as the latest investigative techniques to enable them to elucidate mechanisms of disease, and (iii) to prepare them for future careers in academic medicine, scientific research, and biotechnology.

Molecular and Cellular Pathology emphasizes the inquiry into human disease processes by using a multi-level approach to research and state-of-the-art techniques. The core of our research program consists of basic science and translational research in cancer biology, vascular biology, hemostasis/thrombosis, infectious diseases, and genetic diseases. Our graduate students are trained in contemporary experimental pathology, specifically, the laboratory investigation of disease mechanisms. This is vital because experimental pathology stands at the interface between clinical medicine and basic biology, and the Program provides graduate students with the ideal biological background for the development of basic research in areas at the forefront of medicine. One remarkable example of this is the abundant use of genetically engineered mice, and mouse models of disease. Furthermore, the remarkable growth of molecular and cellular biology enables our students to make advances in many different fields, especially as it relates to disease biology. The training of experimental pathologists can provide the expertise for detection of alterations in various mouse models of disease and a comparison of these animal models of disease to their human counterparts. Graduates of the training program have filled positions in academia, industry, private sector, and government, which are concerned with human health and the cause and prevention of human illness. Those with the Ph.D. degree, after further postdoctoral training, are expected to fill senior staff positions in these institutional domains. Our past graduates have fulfilled these expectations and we continue to see a need for graduate training in Molecular and Cellular Pathology.

Overview of the Training Program

Synopsis. The Molecular and Cellular Pathology Graduate Program is dedicated to the development of biomedical scientists with the appropriate knowledge base and strong research skills to investigate mechanisms of disease. Upon earning the Ph.D. degree, these investigators are well prepared for professional careers in a variety of job settings. In the last 20 years, the program has evolved a flexible structure that consists of formal course work and research as the primary focus of training. The first year of training (which includes laboratory research rotations and some course work) is governed by the Biological and

Biomedical Sciences Program (BBSP). Students matriculating to the Molecular and Cellular Pathology program at the end of the first year complete required and elective courses during the second year. Pre-doctoral students must pass two formal examinations before achieving the status of candidate for a Ph.D. A comprehensive written exam is taken at the end of the second year. Following this is the writing and oral defense of the doctoral research proposal. The completion of course work and successfully passing the two written examinations along with a research project presented in a Dissertation will take the student on average 5 years (total).

Program Events. The Department of Pathology and Laboratory Medicine provides ample opportunities for seminars, including Pathology Grand Rounds, the Molecular and Cellular Pathology Seminar Series (for predoctoral students and postdoctoral fellows), and the Annual Fall Research Symposium. The Molecular and Cellular Pathology Seminar Series occurs twice each month during the Winter semester of each year, for a total of 8-10 seminars per year (all graduate students are expected to present in this seminar). At the Annual Fall Research Symposium, invited faculty members and selected advanced graduate students present research seminars. All other students and most postdoctoral fellows participate in poster presentations.

Specific Degree/Program Requirements for the Ph.D. in Molecular and Cellular Pathology

The Molecular and Cellular Pathology graduate program has designed a course of study that supports our training goals and also retains a certain degree of flexibility to accommodate specific needs of individual graduate students. All graduates of this program are expected to acquire basic knowledge of major mechanisms underlying disease pathogenesis and to develop specific expertise in their chosen area of research. Besides the required Pathology courses, students must take basic science courses to better experience research in experimental pathology and they must also focus their attention on courses in the research area of their own laboratories.

North Carolina State Residency. Once admitted into the program, all students who are U.S. citizens are expected to apply for in-state residency after the first year. Students can apply on-line every semester, and should appeal negative decisions. Guidelines for application for in-state residency for tuition purposes, as well as the application form, can be found at <http://gradschool.unc.edu/student/residency/>.

Family and Medical Leave. The Graduate School allows 8 years to complete the Ph.D. degree. Students may stop the clock for up to one year for various reasons, including maternity leave. The request can be for as little as a few weeks. The student's physician completes a UNC-CH medical certification form indicating the diagnosis and indicates the time the student is expected to be out of work. The Department abides by the doctor's date to return to work.

Modification of Course Requirements. In exceptional circumstances, the Director of Graduate Studies in consultation with either the Graduate Education Committee or the Department

Chair when necessary may modify the formal course requirements of the Department. Individual students may initiate requests for course requirement modification through consultation with the Director of Graduate Studies.

Financial Assistance. Students who matriculate from the BBSP into the Molecular and Cellular Pathology graduate program typically receive an appointment as a graduate assistant, graduate research assistant, or fellow/trainee. Appointees are provided a stipend, which includes an allowance for tuition and fees, and medical insurance (the summer access fee to Student Health Services is reimbursed to each graduate student when applicable). All graduate students in the biomedical sciences at UNC-CH receive the same stipend and benefits, and these are approved by the Basic Science Chairs, which includes our Department Chair.

Students are generally supported by funds from the Department, the Principal Investigator of their chosen laboratory, from scholarships, from faculty research grants or from funds at the disposal of the Department Chair. No student should select an adviser who cannot clearly identify at least two years of financial support. Exceptions to this policy will be granted only with the approval of the Department Chair after consulting with the Director of Graduate Studies and the putative advisor for the student. Since 1987, student stipends are fully taxable including that part of a service award (e.g. teaching or research assistantships) designated for tuition and fees.

Course Registration. Every student in our program is expected to devote full time to research and graduate studies, 12 months per year. For this reason students do not undertake regular outside employment. Students should be aware that their stipend level might be reduced if dropping a course reduces the level of registered course hours below the minimum required for full-time student, and the Director of Graduate Studies and dissertation research advisor should be consulted before dropping any course.

The program requires up-to-date information on each student's course registration. If a student wishes to change course registration via drop-add, the student should consult with his or her adviser, the course instructor, and, if necessary, the Director of Graduate Studies. The student must then inform the Student Services Manager. If, at the time a student drops a course, performance in that course is judged by the instructor to be failing, a grade of "F" is assigned on the student's permanent record and the student becomes ineligible for further registration.

Timeframe for Ph.D. Training in the Molecular and Cellular Pathology Graduate Program

Students matriculate from the BBSP to the Molecular and Cellular Pathology program at the end of the first year of training. Given that individual students will have pursued varied coursework during the first year, the nature and number of courses to be completed during the second (and subsequent years) will also vary. A general outline of the second and subsequent years of training is given below:

Year 2

- Work on generating data and planning your Dissertation research project;
- Completion of required coursework
- Elective courses in pathology or other disciplines (basic science courses related to your dissertation research)
- Fulfill teaching assistant requirement (Fall or Winter)
- Comprehensive Written Examination (in May)

Year 3

- Write and defend your dissertation proposal by December (ideal scenario) or the following May (next best case scenario)
- Dissertation research begins as a candidate for the Ph.D.

Year 4

- Dissertation research continues (yearly committee meetings are required, but may be more frequent depending on the student and committee)

Year 5 (and hopefully no later than Year 6)

- Dissertation research continues (yearly committee meetings are required, but may be more frequent depending on the student and committee)
- Write dissertation and defend the research in a public seminar

Specific Degree Requirements

The following sections outline the course requirements for BBSP students joining the program after their 1st year in the BBSP program. Any student can petition the Director of Graduate Studies to waive certain courses in which they have a good undergraduate background. When doing so, the student should include in their petition information about the course already taken (e.g., syllabus, reading assignments, exams, transcript, etc.).

1. **Residency requirements.** As described in the Graduate School Handbook, each student must complete a minimum of four full semesters within his or her graduate program. This is accomplished when the student enrolls in formal graduate courses (lecture-based and lecture/laboratory-based) and in research courses (dissertation research). By definition, a full semester of residence requires 9 credit hours of coursework, with 6-8 credits corresponding to one half of a semester, and 3-5 credits yielding one-fourth of a semester. According to the Handbook, “...*Doctoral students are required to complete a minimum residence credit of four full semesters, either by full-time registration, or by part-time registration over several semesters. At least two of the required four semesters of residence must be earned in contiguous registration of no fewer than six credit hours at UNC-Chapel Hill...*”

2. **Coursework.** The curriculum designed for each student reflects both individual career goals and previous educational background. The courses taken by each student is chosen with input from the Director of Graduate Studies and the dissertation research advisor to support a foundation in the biomedical sciences and to maximize the research experience in

experimental pathology. Students who already have a professional degree, or who have taken satisfactory introductory courses in undergraduate or master's programs may matriculate to more advanced topics in the first year. By contrast, students with recognized deficiencies may require additional course work to be supplemented during the first year. Each student's curriculum includes elective courses in the area of the student's research topic.

Students entering Molecular and Cellular Pathology through the BBSP – Students that matriculate from the BBSP will take the required pathology courses (PATH 713, PATH 714, PATH 715, PATH 716, PATH 723, and PATH 801), and elective courses in Pathology or other disciplines related to their dissertation research. Students must be registered for a “minimum” of 9.0 credit hours the first two semesters after joining department. A coursework outline based on program year is presented below.

FIRST (BBSP) and SECOND YEAR COURSEWORK:

PATHOLOGY REQUIRED COURSES to be taken during the: FIRST YEAR (BBSP) and/or SECOND YEAR (Pathology)			
Fall Semester	Hr	Winter Semester	Hr
PATH 713 Mechanisms of Disease	3	PATH 715 Systemic Pathology	3
PATH 714 Mechanisms of Disease Lab	2	PATH 716 Systemic Pathology Lab	2
PATH 801 Scientific Critical Thinking	3	PATH 723 Translational Pathology & Laboratory Medicine	2
PATHOLOGY ELECTIVE COURSES (Elective coursework during the first and second year may include courses from other disciplines related to the student's dissertation research)			
Fall Semester	Hr	Winter Semester	Hr
PATH 426/BIOL 426 Biology Blood Diseases	3		
		PATH 464 Light Microscopy	3
		PATH 725 Cancer Pathobiology	3
PATH 726 Human Environmental Disease	1-3		
PATH 766 Current Topics in Cardiovascular Biology	3	PATH 767 Cardiovascular Disease	3
		PATH 792/TOX 292 Seminar in Carcinogenesis	2

PATH 920 Interdisciplinary Vascular Biology (seminar)	1	PATH 920 Interdisciplinary Vascular Biology (seminar)	1
PATHOLOGY RESEARCH COURSE (prior to passing the comprehensive written examination in May of the second year)			
Fall Semester	Hr	Winter Semester	Hr
PATH 900 Pre-Doctoral Dissertation	variable	PATH 900 Pre-Doctoral Dissertation	variable

THIRD, FOURTH AND FIFTH YEARS COURSEWORK:

PATH 994 (three hours per Fall and Winter semester): Dissertation Research culminating with the final defense.

Progress through the graduate program requirement is tied to student grades. One failing grade (F) or nine credit hours with low passing grade (LP) results in loss of the student's eligibility to continue in Graduate School. In extenuating circumstances, students dismissed for academic deficiencies may be reinstated after appeal by the student to the Graduate School. In the case of reinstatement, the program designs appropriate remediation steps (including tutorials) to maximize the likelihood of future success. The student must repeat the course in which a failing grade was originally received and earn a passing grade (P). Any additional grade below P received by a reinstated student will result in dismissal from graduate school.

3. Teaching Assistant Requirement. Students are required to teach at least one semester. Opportunities for fulfilling the teaching requirement include participation in DENT 104, PATH 714, PATH 716, PATH 426, and some other courses taught in the Graduate and Undergraduate Schools. The Director of Graduate Studies supervises the assignment of teaching duties each semester.

4. Doctoral Written Examination. At the end of their second year in the program, students are required to pass a comprehensive written examination. The date of the examination is dictated by the Graduate School academic calendar and is typically in mid-May. The examination includes questions that are designed to measure the knowledge of the student in important concepts in experimental pathology. The exam also measures the student's ability to understand basic scientific problems and principles related to genetics, cell and molecular biology, biochemistry, and other scientific areas used in experimental pathology, to analyze data, and to propose a hypothesis and support it by designing experimental protocols based on published literature. Thus, the overall objective of this exam is to gauge the student's potential to proceed successfully toward completion of the doctoral degree. The Examination Committee is chosen from members of the pathology graduate faculty, selecting both basic scientists and clinical pathologists. They are appointed to serve in this committee typically for 3 years of service. The committee either creates or selects questions solicited from the graduate faculty in the Department, and to prepare a fair and

comprehensive examination that achieves the objectives of the examination. This is a take-home exam consisting of 5 questions to be answered in the course of four consecutive days. The Chair of the committee is responsible for delegating the task of grading the examinations. Two faculty members grade individual questions with a grading scale of 0-100. If an examination question grade differs by more than 20 points then a third faculty member is asked to grade that specific question. A score of 70 or higher is considered passing for each individual question. An overall average score of 70 is required to pass the examination. A student may make less than 70 on 1 of 5 questions and still pass the examination as long as the average score of all five questions is ≥ 70 . However, if the student fails two or more questions, regardless of the overall average score, the student fails the examination. If the student fails the written examination on the first attempt, he/she may take it the following year. A second failure automatically results in loss of eligibility to continue in the Ph.D. Program. Special consideration from the Executive Committee and the Chair of the Department to proceed in the Graduate Program is required following an appeal directly to the Graduate School.

5. *Doctoral Oral Examination.* The Doctoral Oral Exam corresponds to the defense of the student's research proposal, which serves as the basis for the final dissertation project. The written document is structured in the format of an NIH NRSA-style grant application, where the student states the goals and significance of their proposed project, reviews relevant literature, develops a strategic plan to approach the problem, and discusses the implications of the expected results. Accomplishing this step requires of the student to have already developed strong working knowledge in the area of study, conducted exploratory/preliminary experiments, and identified the hypothesis (or hypotheses) to be investigated. After consultation with the student and the student's advisor, a Dissertation committee is formally nominated by the Director of Graduate Studies and approved by the Graduate School. This committee is composed of at least five faculty members, including the student's research advisor, and at least one member with a faculty appointment outside the Department of Pathology and Laboratory Medicine. This extra-departmental member, chosen on the basis of expertise on the topic of the dissertation, is included in order to add an independent viewpoint from outside the pathology graduate faculty. According to the Handbook, "...*A committee of at least five members is required. A majority of the members of a doctoral committee (and a majority of the people passing the student on an examination or approving a doctoral dissertation) must be regular members of the UNC-Chapel Hill Graduate Faculty from the student's major academic program. Other members may be special appointees to the Graduate Faculty. Doctoral programs are encouraged to include scholars from outside the program to serve as members of doctoral committees. The outside members may be selected from among scholars from other academic programs or from other institutions where scholarly work is conducted....*" Based on this wording, a student may also select 3 faculty members from the Department and 2 from outside the Department. The written proposal is distributed to the members of the dissertation committee for review 2 weeks prior to the formal examination. At a pre-determined date, the student presents the project to the committee in a seminar setting and defends the research plan during an oral examination, which may also include questions concerning knowledge the student is expected to have in order to develop the project successfully. The doctoral committee has the authority to require additional courses be taken to remedy any deficiency in knowledge detected during the oral examination. If the research proposal is

not approved, it must be revised and resubmitted to the committee. When the research prospectus is approved, the student is allowed to proceed with the doctoral studies. Each doctoral student is expected to consult with members of the dissertation committee at least once a year. These meetings with the dissertation committee are scheduled by the candidate and are essential for the timely completion of the doctoral research. The Report of Doctoral Committee Composition and Report of Approved Dissertation Project Form should be submitted to The Graduate School before or filed concurrently with any action reflecting prospectus approval. Students are encouraged to publish their research findings in a timely fashion. Students must be registered for a minimum of three credit hours of dissertation (PATH 994) during the semester in which the dissertation prospectus is approved.

6. **Admission to Candidacy.** As specified by the Graduate School, the doctoral student applies for admission to candidacy after he/she has (1) completed all required coursework, (2) passed the written examination, (3) passed the doctoral oral examination, including the approval of the dissertation prospectus, and (4) has satisfied the residency requirement. The University now officially recognizes the student as a doctoral candidate (“ABD” or all but Dissertation). The statement “Candidate in Philosophy” is inserted in the student’s official transcript.

7. **Dissertation Defense.** Once both the candidate and the research advisor consider the dissertation research complete, the experimental data and their interpretation are presented in the form of a dissertation to the student’s dissertation committee. The Graduate School will accept only dissertations produced according to the standards in *A Guide to Theses and Dissertations* (electronic submissions). Furthermore, the student and committee must carefully adhere to the submission dates of dissertations as specified in the University Registrar’s Calendar. The student must be registered for Dissertation Research (PATH 994) when defending a dissertation. The dissertation is defended by the candidate in a public and announced Department seminar setting before the committee and an audience of interested persons. After a session of private examination of the candidate, the committee approves (or disapproves) the final version of the dissertation. The committee may require changes or corrections in the dissertation before granting final approval. The committee then forwards the signed report of the final oral examination, and recommends that the Graduate School confer on the student the degree of Ph.D. in Molecular and Cellular Pathology. The degree is awarded only after the candidate submits the final dissertation document to the Graduate School.

Other Recommended Training

In addition to research requirements for the Ph.D. degree, students will be encouraged to develop and utilize teaching and writing skills. Practical experience should include presentation of their research at national meetings and may include presentation of formal lectures in a course offered by the Department, and participation in the writing of a formal research grant application.

Duties of the Dissertation Research Advisor

1. Assist the student in conducting dissertation committee meetings (to be held annually or at shorter intervals as decided by the committee). Verify that summaries of committee meetings prepared by the student are accurate and complete. Keep summaries of the meetings and records of decisions made by the committee.
2. Make sure that the dissertation proposal is a feasible plan leading to a defensible dissertation within the appropriate timeline.
3. Evaluate the student's progress towards completion of the dissertation research. Urge the student to refine the goals of the dissertation when necessary. Be an effective communicator with the student's dissertation committee, the Director of Graduate Studies, the Department Chair, and/or the Graduate Education Committee any concerns about the student's progress.
4. Be able to mediate any disputes that might arise between the student and the Committee with regard to the completion, revisions, and/or defense of the dissertation.
5. Be an advocate for the student and his/her research.

Duties of the Dissertation Committee

1. Be available to the student for consultation about experimental designs, problems, and the development of a realistic set of aims for the dissertation.
2. Evaluate and provide feedback on the dissertation proposal. Verify that the dissertation proposal and the anticipated timeline for completing the research are feasible. Help the student focus or expand research aims as necessary.
3. Participate in dissertation committee meetings. The first committee meeting is typically the Doctoral Oral Examination, held only after the student passes the Doctoral Written Exam. Thesis committee meeting should be re-scheduled at least year or more frequently depending upon the student's need for guidance. Committee members may suggest or require meetings at shorter intervals. Committee members should review summaries of committee meetings prepared by the student for accuracy and completeness.
4. Evaluate and provide feedback on the dissertation and participate in the dissertation defense.

Overview of Graduate Program Committees

There are three committees that oversee the Graduate Program in Molecular and Cellular Pathology, and they report directly to the Chair of the Department of Pathology and Laboratory Medicine. Faculty members who are most interested in the graduate program, who actively work and teach in the graduate program, and who have a long-term interest in working with graduate students primarily compose the standing committees of the Molecular and Cellular Pathology graduate program. The administration of the Graduate Program falls mainly upon the shoulders of the Director of Graduate Studies and the Associate Director of Graduate Studies. The Director of Graduate Studies and the Associate Director of Graduate Studies are assisted by the Student Services Manager. The standing committees of the Molecular and Cellular Pathology graduate program include the Graduate Education Committee, the Written Examination Committee, and the Executive Committee. The composition and function of these committees are described below.

The **Graduate Education Committee** advises the Director of Graduate Studies in matters pertaining to different aspects of the education/training of graduate students. These may include (but are not restricted to) decisions on core curriculum, scheduling of graduate courses, creation or deletion of graduate courses from the catalog, input upon request on the nomination of graduate faculty to serve on dissertation committees, and other matters pertaining to academics. This committee is composed of the Director of Graduate Studies, the Associate Director of Graduate Studies (Chairman), the Chair of the Written Examination Committee, other representatives of the teaching faculty, and at least two student representatives.

The **Written Examination Committee** prepares the comprehensive written examination taken by our second year graduate students. This committee has responsibilities that include gathering examination questions from the faculty, preparing, administering and grading the exam, and reporting final grades to the Director of Graduate Studies. This committee is composed of a Chair, representative members of the basic science faculty, and representative members of the clinical faculty. The Director of Graduate Studies and the Associate Director of Graduate Studies serve on this committee in an *ex officio* capacity.

The **Graduate Executive Committee** is responsible for issues and events that transcend the individual committees, and it is poised to make recommendations to the Chair of the Department of Pathology and Laboratory Medicine in overseeing the successful operations of the Graduate Program. The Executive Committee is composed of the Director of Graduate Studies (Chairman), the Associate Director of Graduate Studies, The Past Director of the Graduate Studies, and the Chair of the Written Examination Committee.