GRADUATE PROGRAM

DEPARTMENT OF PATHOLOGY,
Division of Microbiology and Immunology

Requirements for the Ph.D. Degree

The requirements of the Department of Pathology, Division of Microbiology and Immunology for the granting of the Ph.D. degree are described in this document.

A. Requirements for the Ph.D. Degree

(1) The five core courses and one elective required by the interdepartmental program in Molecular Biology (MB) or Biological Chemistry (BC). See the requirements listed on the MB/BC Program website (http://www.bioscience.utah.edu). If a grade of less than a B- is earned in a core course, the student is required to retake the course and receive a B- or better before the end of the 2nd year.

(2) Laboratory rotations and 1st year Journal Clubs. See the MB/BC Program website for explanations and listings of these requirements (http://www.bioscience.utah.edu). These are to be completed in the 1st year.

(3) At least one additional graduate-level didactic course (numbered 6000 or above) other than a special topics course. The specific course(s) must be approved by the student's Thesis Advisor and/or Thesis Advisory Committee. Students must receive a passing grade of B- or better. Courses numbered 5000-5999 may be taken for graduate credit with prior approval by the student's Thesis Advisor and/or Thesis Advisory Committee.

(4) At least one additional graduate-level special topics course (numbered 6000 or above). The specific course(s) must be approved by the student’s Thesis Advisor and/or Thesis Advisory Committee. Students must receive a passing grade of B- or better. Courses numbered 5000-5999 may be taken for graduate credit with prior approval by the student's Thesis Advisor and/or Thesis Advisory Committee.

(5) The following activities are an essential part of graduate training and are required of all students:

   Pathology Department Journal Club
   Pathology Department Research in Progress
   Departmental Seminars and Thesis Defenses

(6) Accumulation of at least 20 credit hours of Pathology 7970 (Ph.D. Thesis Research).

(7) Teaching Assistant duty is required for one semester or two half-semester courses, regardless of the source of individual stipends, for all students who have entered the Pathology graduate program through either of the combined Molecular Biology or Biological Chemistry programs. TA assignments are made
through the MB/BC Program Office (or their designee) for various courses offered by the departments who participate in the combined MB/BC programs.

(a) International students are required to successfully pass a SPEAK test and attend the International TA Program Workshop prior to fulfilling their TA responsibilities.

(8) Registration

(a) Prior to passing the preliminary/qualifying examination: Students should register for 9 credit hours each semester.

(b) After passing the preliminary/qualifying examination:

(i) Students whose tuition is paid by the Graduate School’s Tuition Benefit Program must be registered for 9 credit hours each semester.

   • Students are required by the Graduate School’s Tuition Benefit Program to apply for residency in the State of Utah as soon as they have completed 45 credit hours of coursework.

(ii) Students whose tuition is paid by a training grant must register for 3 or 9 credit hours as instructed by that training grant’s administrator.

(iii) Students, whose tuition is paid by a grant obtained directly by the student, must register for 3 or 9 credit hours according to the instructions of the individual award.

(iv) Students whose tuition is paid by their Thesis Advisor (due to expiration of or disqualification from their other funding sources) should register for 3 credit hours of only Pathology 7970 (Thesis Research) each semester; this will maintain the student's full-time status.

(9) Preliminary Examination (see detailed guidelines below) - Students should have completed their Preliminary Examinations (written and oral) before the start of the third year of full-time graduate study.

(10) Compensation

(a) It is anticipated that each student making satisfactory progress will receive a stipend, plus full coverage of tuition expenses. Students also receive medical and dental insurance coverage.

(b) The student is expected to devote full effort toward graduate studies while enrolled in the program. It is not permissible for a student to work at another job, nor to be enrolled in another educational program. Student loans are available in cases of financial hardship.
B. **Activities of the Second Year**

During the second year of graduate training the student should complete as many of the course and teaching requirements as possible, develop his/her own research project, and prepare for and pass the preliminary examination. Students will also be required to give Journal Club and Research in Progress presentations beginning in the second year.

C. **Guidelines for the Preliminary Examination**

The primary purpose of the preliminary examination is to help train students to function as successful scientists and to help in the evaluation of their academic progress. During the examination, the student will have an opportunity to put together ideas and hypotheses in a selected field, to express these ideas in writing, and to defend them orally. The student should expect and appreciate sharp criticism of his/her research proposal and should accept the challenge and confrontation of the exam as valuable aspects of his/her learning experience and preparation as a research scientist and academician.

1. **General Procedural Guidelines**

   (a) A student will be expected to pass, before the start of the third year of full-time graduate study, an exam based on a research proposal in a scientific area distinct from the research focus of the student’s laboratory. The student will choose a date for the exam from a list provided by the Division. Seven weeks prior to proposal submission, two acceptable abstracts (maximum of 5 double-spaced pages each) must be submitted to the Prelim Exam Committee. The committee will select one of the written abstracts for expansion into a complete proposal (maximum of 20 double-spaced pages, excluding references). One week before the exam date, the written proposal must be submitted to the Preliminary Examination Committee.

   (b) The Prelim Exam Committee for the research proposal will consist of five members. One faculty member will serve as Chairperson of the committee (usually the Prelim Exam Advisor) and will be responsible for grading of the examination. One member should be from outside the Division of Microbiology and Immunology. The student's Thesis Advisor will not be on the Prelim Exam Committee, but may attend the examination as a “silent observer”.

   (c) The Prelim Exam Committee will evaluate the abstracts and the final proposal. Satisfactory versions of 2 abstracts and the final proposal must be submitted as a condition for passing the examination.

2. **Specific Guidelines**

   (a) The student must prepare 2 abstracts (not over 5 double-spaced pages each) together with appropriate references (which can be single-spaced, and are not included within the 5-page limit). The student is encouraged to discuss the abstracts with faculty members during their preparation. Abstracts will be submitted to the Pathology Graduate Secretary. The student's best possible effort must be represented, as it will be seen by the Prelim Exam Committee and placed on record without modification.
(b) The Prelim Exam Committee will determine whether the submitted abstracts meet the requirements as described in section (3) below. Based on this assessment, the Chairperson may instruct the student to revise the abstracts based on comments from the faculty or may require the student to choose another set of topics.

(c) If both abstracts are approved, the Prelim Exam Committee will select one abstract for expansion into a research proposal of no longer than 20 double-spaced pages in length (references are not counted within this 20-page limit). Selection of an abstract by the committee will occur within 7 days of submission.

(3) Preparation of the Written & Oral Portions of the Preliminary Exam

A research proposal will be rejected, preferably in the abstract stage, if the criteria listed below are not met or cannot be met with moderate revision. Inadequacy in any one area will be sufficient grounds for rejection of a proposal. Actual passing or failing of the examination will be determined after the oral and will be based on the written proposal and the student's defense of the proposal during the oral examination.

(a) Each Abstract should:

(i) Be a logical, understandable, clear, and concise statement of the problem, hypotheses, and experiments (i.e., be in acceptable scientific prose).
(ii) State a significant and original problem.
(iii) State a testable hypothesis.
(iv) Include relevant experiments that test the hypothesis as stated.
(v) Be no longer than 5 pages of double-spaced text including tables and figures, using 12 pt Times New Roman or 11 pt Arial font and 0.5 inch margins. The bibliography, which is not counted against the page limit, should include complete references with **all authors** and **full titles**.
(vi) Be an adequate basis for examination.
(vii) Meet recommendations from prior examinations (if any).

(b) The Research Proposal should:

(i) Conform to criteria outlined for the abstract.
(ii) Expand concepts presented in the abstract and present experiments in detail (with references).
(iii) Elaborate possible outcomes of experiments and conclusions with respect to hypotheses.
(iv) Indicate significance of possible outcomes with respect to new problems and hypotheses.
(v) Be **no longer than 20 pages** of double-spaced text conforming to the formatting requirements as stated above for abstracts.
(c) **The Oral Presentation.** The student should:

(i) Present a clear and concise 15-20 minute summary, clarification or development of his/her proposal (the precise nature of this introduction will be left up to the student).

(ii) Defend the proposal with concise answers to questions.

(iii) Demonstrate adequate knowledge in peripheral areas of relevance and basic importance.

(iv) Demonstrate the ability to handle the pressures of confrontation and oral examination.

(d) **Protocol of the examination:** (These are considered to be only guidelines for each Prelim Exam Committee Chairperson)

(i) The Prelim Exam Committee will ask the student to leave the room. During this time, the committee will discuss the adequacy of the written research proposal. The committee will determine whether the proposal meets the requirements as outlined under section (3) above. The preliminary exam may be halted without an oral portion if the committee determines that the written proposal does not meet the requirements for a preliminary exam.

(ii) The hypothesis and specific aims of the proposal will be presented by the student.

(ii) The Prelim Exam Committee will engage the student in a discussion of the details of the proposal. Questions may relate directly to the topic or proposal itself, to the background and approaches central to the proposal, and/or to the general knowledge base expected of a student having successfully completed the first year of instruction in the Molecular Biology Graduate Program.

(e) **Levels of Passing and Failing (options):**

The following levels of passing and failing will be recognized and recommended by the examining committee -

(i) Unconditional pass with permission to start/continue thesis research and to form a thesis committee. The committee may advise the student to study topics related to the student's apparent deficiencies, or make recommendations for meeting deficiencies by additional means such as courses, tutorials, etc.

(ii) Revise and/or retest. The committee may find deficiencies in either the oral or written portions of the exam that preclude an unconditional pass, but that the committee feels can be corrected with proper guidance. The committee will require additional work which may involve rewriting all or parts of the proposal and may or may not include a second oral examination.

(iii) Unconditional failure of the examination. Subsequent action will be determined in discussion with the student and the faculty, but candidacy for the Ph.D. degree will not be recommended.

(4) **Preliminary Examination Schedule**
(a) A list of possible examination dates will be prepared by the Graduate Secretary and sent to the graduate students. Choice of examination dates will be on a first-come first-served basis. For each examination date, there is a corresponding date for submission of abstracts.

(b) Seven weeks prior to the examination date, the student will submit 2 abstracts of potential exam topics. All abstracts should be of suitable quality for expansion into acceptable full proposals.

(c) Within approximately one week of submission, one of the two abstracts will be chosen by the faculty for expansion into a full-length proposal.

(d) Whenever possible the Prelim Exam Advisor will serve on all exams for that year to provide continuity. Three of the other Committee members will be assigned from amongst Department of Pathology faculty by the Committee Chairperson. The fifth Committee member will be assigned by the Chairperson from faculty outside of the Department of Pathology, and will be chosen based on area of expertise.

(g) Within 5 weeks from the date that the abstract is selected, the student will submit the completed proposal to the committee. The proposal should contain an introductory statement of the problem and hypothesis, an experimental approach, a critical evaluation of the possible results, and a selected bibliography.

(h) The oral examination will be held one week after submission of the proposal.

D. Successful completion of the Preliminary Exam qualifies the student to proceed with the Ph.D. degree and is regarded as:

(1) Assurance to the faculty of the Division of Microbiology and Immunology that the student is ready, or at least sufficiently developing in the ability to -

(a) Envisage and formulate a specific scientific problem (hypothesis and experiments, not an approach nor a long-term research project)

(b) Express a research problem concisely in writing and

(c) Effectively present and defend these ideas orally before a selected examining group.

(2) Assurance of sufficiency of basic background information. Demonstrated areas of deficiency in the background of the student may be filled in by any of several means (courses, examinations, tutorials, etc.).

(3) After the Preliminary Examination, a five person Thesis Advisory Committee will be appointed to take over the student's full-time educational activities. The members of this committee will be chosen by the student with consent of his/her Thesis Advisor and must be approved by the Head of the Graduate Committee.
(a) Students are required to form a Thesis Advisory Committee within 3
months of passing their Preliminary Examination.
(b) Students are required to organize and convene their first Thesis Advisory
Committee meeting within 6 months of passing their Preliminary
Examination.
(c) The Thesis Advisory Committee is required to meet with the student at
least every 12 months until graduation. In order to monitor a timely
progression towards completion of the PhD degree, all fifth year students
are required have two formal meetings per year and beyond the fifth year
all students will have a minimum of three meetings. During each meeting
the student is expected to articulate their past and ongoing thesis research
progress, and outline plans for completing their thesis work that must be
approved the committee.
(d) The Chair of the Thesis Advisory Committee will prepare a meeting
summary, including progress to date and specific recommendations for
future studies. This document will be circulated to all Thesis Advisory
Committee members for comments and clarification, with the final version
given to the student and a copy placed in the student’s file. This document
can be reviewed at the next committee meeting.

E. Scientific Expectations

Benchmarks for matriculation:

(1) Demonstration of independence and critical thinking skills
(2) Creativity and competence in research
(3) Understanding of the scientific literature

Evidence for attainment of these benchmarks includes at least one first author research
paper accepted or published. Deviations require the consent of the full thesis committee.

F. Thesis writing and defense

(1) The student may begin writing his/her thesis upon approval by the student’s
Thesis Advisory Committee. The thesis must conform to the guidelines of the
University Thesis Editor.
(2) The thesis should be presented to each member of the Thesis Advisory
Committee at least 1 week prior to the date of the thesis defense and final exam.
(3) After the thesis is written, the student will give a one-hour seminar on the thesis
research, after which the Thesis Advisory Committee and student will meet for
the Final Examination.
(4) The university requires that "the candidate must be regularly enrolled for three or
more credit hours during the semester in which the final oral examination is
taken."

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