

## GUIDELINES

### Biochemistry Program Ph.D. Preliminary Examination

The Ph.D. examination will address the research capabilities of the student and the ability of students to have a good working knowledge of their field of study. The examination will have four components: a written grant proposal, a written exam tailored to each student by his/her committee, a public oral presentation of data collected by the student and a private oral examination. Below are the rules governing the Ph.D. examination.

1) A thesis committee must be assembled during the student's third semester that is composed of the thesis advisor and three additional faculty members. The thesis advisor, in consultation with the student, will determine the composition of the thesis committee. The thesis committee must meet with the student to assess their progress on a yearly basis starting in the student's third semester. **The thesis advisor will be head of the thesis committee except during the fifth semester when the student is being examined for candidacy for a Ph. D. During the fifth semester, a Ph. D. examination committee will be formed composed of the same members as the thesis committee with the exception that the thesis advisor will *not* be a member of the examination committee. The Biochemistry Program Graduate Advisor in consultation with the thesis advisor will make appointment of a Chair of the Ph. D. examination committee.**

2) Early in the student's fifth semester (**no later than three weeks before the scheduled exam date**), the student must submit a 12-page single-spaced page or a 24 double-spaced page, NSF- or NIH-style grant proposal to their Ph.D. examination committee. A copy of the proposal must also be submitted to the Graduate Office. The grant proposal must contain Specific Aims, Preliminary Data, and Proposed Work sections that are based on past and future thesis research aims of the student. ***Students must complete the exam in the 5<sup>th</sup> semester unless they have prior, written consent of the Director of Graduate Studies to postpone the examination.*** The DGS may impose reasonable deadlines for critical events such as submission of the grant proposal and scheduling the oral defense.

The proposal must be the work of the student (not that of the PI or other group members). However, the PI or other group members may read the document and provide advice. It is expected that the student will learn a great deal from the PI about scientific writing during this process. **The PI must approve the proposal before it is submitted to the student's committee.** Students must allow sufficient time for the PI to review the document. Failure to submit an acceptable document in a timely manner may lead to a postponement of the exam date at the discretion of the student's committee.

3) The committee chair will provide the student with a written examination no fewer than 10 days before the scheduled oral exam. The purpose of this exam is to probe the breadth and depth of the student's knowledge more effectively and humanely than can be accomplished in a short oral examination. Exam questions may be open- or closed book, as the committee deems appropriate, and may focus on the student's research, course work, or important recent developments in biochemistry. In general, the closed-book part of the exam, if given, will focus on fundamental biochemistry and specialized

information at the heart of the student's research project. The open-book portion of the exam provides a more flexible means to address possible flaws in the student's research proposal and to probe students' understanding of techniques, areas less closely related to the research project, and the current literature.

The student must return the completed written exam within 72 hours of receiving it.

4) Three weeks after submission of the grant proposal, the student will present his/her research data in a public seminar. *It is the student's responsibility to schedule an exam date on which all committee members can be present and to remind the committee of the time and place of the exam.*

5) Immediately after the seminar (or as soon as is feasible), the Ph.D. examination committee will meet privately with the thesis advisor to confidentially discuss aspects of the written grant proposal, data that was presented in the seminar, and the laboratory performance of the student.

6) After meeting with the thesis advisor, the Ph. D. examination committee will privately meet with the graduate student who will orally defend both the written (grant, written exam) and presented (seminar) aspects of his or her completed and proposed work.

7) After the oral defense, the committee will privately meet to discuss the performance of the student. After deliberation, the examination committee will submit a report to the Prelims Executive Committee and to the student. The student will receive feedback on each portion of the Preliminary Exam (proposal, written exam, presentation and oral exam). Moreover, the student will be evaluated in four areas. *The student must pass each of the four areas to be admitted to Candidacy.*

- a. **Research Progress.** Has the student been sufficiently productive in the lab that it is likely s/he will earn a Ph.D. in the next 30-36 months? Is the quality of the work sufficient for publication?
- b. **Understanding of the research project.** Has the student taken intellectual ownership of his/her research project? Does the student understand project goals in detail? Does s/he understand the background literature in the field? Does s/he understand not just the conclusions that other researchers have drawn, but also the experiments leading to those conclusions? Can the student plan and execute experiments independently? Are the breadth and depth of the student's understanding adequate?
- c. **Plan for the completion of the Ph.D. degree.** Is the proposed work significant? Has feasibility been demonstrated? If not, in what time frame do you expect key preliminary experiments to be completed? Is the proposed work appropriately focused? If not, which directions are most important to pursue? Is the proposed work likely to result in a high-quality Ph.D. thesis in 30-36 months?
- d. **Biochemical Literacy.** Does the student have a sufficiently deep understanding of basic biochemistry and related fields? Does the student read broadly in high-

impact journals? Does the student attend seminars and think about the ideas and results presented?

8) The Prelims Executive Committee will meet weekly during the Fall semester to decide whether the student has successfully met the criteria for admission to Candidacy for the Ph.D. degree *in each of the four areas described above (7)*. This committee will consist of the Director of Graduate Studies, the Associate Chair of the MCB Department, and one additional faculty member, to be appointed each year. The primary basis for this decision will be the report of Ph.D. Examination Committee and the input of the Ph.D. Thesis Advisor. However, other factors, such as coursework, attendance at BMB seminars, and any academic violations will also be considered. There are three potential outcomes of the examination.

- (i) **Pass.** The student passed all aspects of the examination with the members of the Ph. D examination committee willing to sign the Graduate School's "Nomination to Candidacy Form."
- (ii) **Failure in one or more area.** The student has performed at an acceptable level in several areas, but has deficiencies that must be addressed before admission to candidacy. The PEC will require that the student re-take portions of the examination or will impose additional requirements as appropriate.
- (iii) **Failure without the Option to Retake the Exam.** The student has failed multiple areas of the examination and will NOT be allowed to progress further. In this case, the thesis advisor or student has the right to appeal the decision to the Chair of Molecular and Cellular Biochemistry.

9) The Director of Graduate Studies will meet with each student and his or her Ph.D. mentor shortly after the student's case is discussed by the Prelims Executive Committee to discuss the outcome of the examination.

10) The student is responsible for obtaining the necessary documents that describe the outcome of the oral examination and making them available to complete and sign. Failure to complete the Preliminary Exam by the end of the 5<sup>th</sup> semester without the prior consent of the Director of Graduate Research may result in a loss of good standing in the program and the possibility of a reduction in the student's level of support.

**Please note that Research Advisors who are not satisfied with a student's research progress should discuss this issue with the student before the Preliminary Examination.** A student may then decide to go forward with the examination, apply to transfer to the M.Sc. program, or decide to leave the program altogether. The student should discuss these options with the Director of Graduate Studies.

### **Summary of the Preliminary Examination Timeline:**

- 1) Student submits the mentor-approved research proposal three weeks before the scheduled oral exam.
- 2) The committee chair provides a written examination to the student no less than 10 days before the scheduled oral exam.
- 3) The student has 72 hours to complete the written exam.
- 4) The committee then has a week to read and evaluate the written work.
- 5) The student presents a public seminar describing his or her research to date and *briefly* outlining plans for future work.
- 6) The Prelims Committee meets briefly with the Research Advisor to discuss the student's progress.
- 7) The Research Advisor leaves the room and the student returns for the oral examination.
- 8) The Committee writes a report of the four-part examination.
- 9) The Executive Prelims Committee meets to decide the outcome of the exam within one week, excluding holidays.
- 10) Shortly thereafter, generally within 24 hours, the Director of Graduate Studies meets with the student and his or her Research Advisor to discuss the outcome of the exam.