

Guidelines for Qualifying Exam

Molecular and Cellular Basis of Disease Graduate Program

Dissertation Committee

In consultation with your mentor and subject to approval by the MCBBD Program director, you will assemble a dissertation committee of five faculty members in accordance with Molecular and Cellular Basis of Disease (MCBD) guidelines (defined in the MCBBD Curriculum Document). For the exam and subsequent meetings, one member is chosen to serve as chairperson at your proposal defense, and to be the primary liaison between you and your committee. The chairperson must be a full member of the MCBBD training faculty and a faculty member in the department of Pathology. Your mentor, while present, will not provide assistance during the qualifying exam defense. A list of MCBBD faculty members can be obtained from the program director, who can also provide guidance with assembling your committee to meet the criteria set forth by the MCBBD program.

Timetable

The proposal is prepared and successfully defended before **June 30th** at the end of your second year in order to remain in good standing as a PhD candidate. Bear in mind when scheduling your exam that the committee may require revisions to the written proposal and/or a second oral defense.

Examination process

The Qualifying Exam includes a written portion consisting of an NIH-style grant application based on your chosen thesis project and an oral presentation/defense of the research proposal. Specific details are provided below.

Components of the Qualifying exam:

Written Proposal:

The research proposal is prepared in the style of an NIH grant application. Detailed guidelines for preparing the written document are included on the next page. *The written proposal must be provided to the committee members at least two weeks prior to the exam.* Be aware that individual committee members may prefer a paper or an electronic version of the proposal. The written document *must reflect the independent work of the student.* While it is certainly expected that the mentor will have substantial input in devising the project/aims/hypothesis to be tested, as well as experimental approaches etc. utilized, the mentor should not edit or otherwise contribute to the actual written document. You are encouraged to seek input from your colleagues (students, postdoctoral fellows etc.), but the written document should be prepared *without faculty input.*

Oral presentation:

You will also prepare an oral presentation of the research proposal. As above, you are encouraged to practice your talk for your colleagues, but should not receive input from faculty. During your oral presentation the committee will assess whether you can defend the approaches and conclusions of the proposed work. The committee will also critique the logic and feasibility of the proposed studies and may make specific suggestions. In addition, the committee will ascertain that you have a working knowledge of the fundamental and advanced topics relevant to the proposed research. You should ensure that a current transcript is available for the committee at the defense [Please see your BIMS Administrator for this].

Potential outcomes:

There are three potential outcomes for the Qualifying Exam.

Unconditional pass: Advance to candidacy (contingent upon having fulfilled all other University requirements).

Conditional pass: The student may be required to make alterations to the written research proposal, be asked to re-define a part of the proposal and/or be required to take additional coursework as recommended by the committee.

Fail, in which the student is dismissed from the MCBBD program. May qualify for a Master's degree if GSAS and BIMS requirements for that degree have been fulfilled.

Following successful advancement to candidacy, you will be expected to complete requirements for the PhD within five years of the Qualifying Exam or may be liable for re-examination and possible dismissal.

Written Proposal Instructions

The research proposal follows the format of an NIH application, with an Abstract, Specific Aims, Background/Significance/Innovation, Preliminary Studies, Experimental Design and Methods, and Literature Cited. The total length of the application (excluding the Specific Aims page, Abstract and References but including Figures and Tables) should not exceed 12 pages, single-spaced, (11-point font minimum in main text, 10-point in figure legends, 0.5 inch margins, using NIH-approved fonts (Arial, Garamond, Georgia, Helvetica, Palatino Linotype, Times New Roman, Verdana). For more information on formatting requirement, please see: <https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/format-attachments.htm#font>). As with any grant application, the emphasis is on an explanation and justification of hypotheses to be tested, the approach by which the hypotheses will be tested, the interpretation of experimental outcomes and how they reflect upon the hypotheses. The proposal is for two to three years of work, so it should not be overambitious and it should reflect the experimental capabilities that either your lab or a collaborator's lab possesses.

I. ABSTRACT (Suggested length – 1/2 page) – Not included in 12-page limit.

In lay terms, provide an overview of the goals of the project and its potential significance.

II. SPECIFIC AIMS (1 page)

This section contains the formal statement of the hypothesis/hypotheses to be tested with a succinct description of the basis for the statement and an overall objective of what the research is expected to accomplish. Following the statement, the aims are listed and supported with major experimental goals that will be completed to achieve that overall objective during the course of your study. Most proposals consist of two or three Specific Aims.

III. BACKGROUND/SIGNIFICANCE/INNOVATION (suggested length ~ 3-4 pages)

Provide an overall introduction to the field of research, with increasing focus on the information from which the hypotheses were developed. Illustrate why the proposed research is important in the context of the results that others have previously acquired, and how the knowledge gained from the proposed research might influence thinking in the field. Finally, discuss how the proposed research is innovative, either in its concepts or its approaches.

IV. PRELIMINARY STUDIES (suggested length ~ 1-2 pages)

The preliminary studies section details those experiments already conducted that are pertinent to the proposal. Included in the discussion of these experiments are insights as to how the results contributed to the development of the hypotheses. The preliminary studies section may include experiments previously conducted by others in the lab if they have not been published. Please note that, given the nature and timing of the proposal, there is no expectation for extensive preliminary studies and the review of the proposal is not influenced by the extensiveness of this section. In the absence of preliminary data, the Background Section may be expanded to provide further rationale for the proposal.

V. EXPERIMENTAL DESIGN AND METHODS (suggested length ~ 6-7 pages)

For each section, introduce the question to be tested, how the question fits into the overall proposal scheme, and detail briefly how the question will be tested. The section is subdivided by Specific Aim, and may be further subdivided by experimental goal (subaims). *Extensive descriptions of methodologies is discouraged*. In particular, standard techniques do not need to be elaborated on, but significant modifications of such techniques must be explained. The *goals* of the experimental approach must be discussed, along with *expected outcomes and interpretations* of both expected and unexpected outcomes, *anticipated problems* and *alternative approaches*. Particular attention is paid to how each experimental result reflects upon the hypothesis, and potential follow-up experiments that might confirm or clarify results and/or interpretation should be introduced. *It is stressed that the interpretation of each outcome is of greater importance than the description of the experiment*. This section is often most clearly structured using a *rationale, approach, interpretation, potential problems and alternatives* format (with appropriate headings). Provide a timeline for the completion of the proposed experiments.

V. LITERATURE CITED – not included in 12 page limit

Use complete literature citations, including all authors and titles. The bibliography need not be exhaustive, but must be relevant and current.