

For Graduate Students taking the Qualifying Examination in the Department of Microbiology, Immunology, and Cancer Biology

Dissertation Committee

You should assemble your dissertation committee as soon as possible in consultation with your mentor. Committees are comprised of five BIMS affiliated faculty. The qualifying examination committee will serve as your Thesis Advisory Committee.

One of the faculty with a primary microbiology appointment (not your mentor) should serve as the chairperson or first-reader of the committee. The student's mentor will be an essentially silent member of the committee during the oral defense of the qualifying exam. Three of these faculty members must have a primary appointment in the Department of Microbiology, Immunology, and Cancer Biology (MIC).

At least one of the primary MIC faculty members, not including your mentor, must have tenure at the University of Virginia. In addition, one of your committee members must be from "outside" the Department of Microbiology, Immunology, and Cancer Biology and is considered to be the Dean's representative. This "outside" committee member must have an appointment (primary or secondary) in a PhD degree-granting program at the University of Virginia. This "outside" person may have a secondary (but not primary) appointment in the Department of Microbiology, Immunology, and Cancer Biology. The composition of your committee must be approved by the Director of Graduate Studies (DGS) prior to your qualifying examination.

Timetable

You will be required to successfully prepare and defend this proposal before July 1st of the second year in order to remain in good standing as a Ph.D. candidate, and to continue receiving financial support from the Department. It is not uncommon for a proposal to require revision, and perhaps a second committee meeting, before it is deemed to have passed. This period of revision allows you to incorporate your committee's suggestions and to focus your goals and experimental strategy.

Exceptions: An extension to the completion date of the Qualifying Exam may under extenuating circumstances be granted upon written request of the MIC Academic Advisory Committee. Extensions must be requested no later than May 31st.

Instructions

The purpose of the Qualifying Examination is to ensure that you have mastered the fundamentals of microbiology, immunology and cancer biology relevant to your proposed research and are adequately prepared to begin working full-time on your thesis research. The Exam comprises the preparation of a written research proposal and an oral defense of the proposal to a faculty committee. The structure of the written document is similar to an

NIH grant application and is described in detail below. You are expected to present the written proposal to your committee members at least one week before the oral defense.

Proposal Instructions

Your proposal should describe the research plan for one person (you) for a three year period. It should follow the format of an NIH application with five sections, and an optional Appendix. Remember that in evaluating your proposal, reviewers will be looking for more than just the protocols for your experiments; they will also be looking to ensure that you can explain the rationales behind your experiments, the justifications for their importance, and the possible interpretations of various outcomes. In short, the scientific ideas that are part of a research project are as important, if not more important, than the technical methods. Your proposal should contain the following sections. The page lengths indicated are rough suggestions. However, the total length of sections I-IV must not exceed 12 pages.

I. SPECIFIC AIMS (<1page)

First, state your overall objective, concisely and realistically. This objective should describe what the research is expected to accomplish and what hypothesis is to be tested. Then list the major experimental goals (i.e. specific aims) that will be completed to achieve that overall objective during the course of your study.

II. BACKGROUND AND SIGNIFICANCE (suggested length 2-3 pages)

Briefly sketch in the background to the present proposal, critically evaluate existing knowledge, and specifically identify the gaps that the project is intended to fill. State concisely the importance of the research described in this proposal by relating the specific aims to longer term objectives beyond the scope of the present 3-year study.

III. PRELIMINARY STUDIES (suggested length - 2-3 pages)

Use the preliminary studies section to provide an account of any experiments you have already carried out that might be pertinent to the research plan. You may also briefly review the history of the project and relevant work accomplished by others in your lab. If you have not yet started experiments relevant to the proposed project, this section will include more the latter than the former. If the project is new to your lab, this section can be very short. Appropriate figures, graphs or tables may be included.

Do not delay preparing your Qualifying Proposal past the end of the spring semester in order to accumulate more preliminary results. Your experimental skill at the bench are certainly one of the things your examination committee will consider. However, this is only one facet of the exam. The most important consideration is your ability to think logically and present your proposed experiments in a way that is clear and insightful. While the Preliminary Studies in an actual NIH application, by an independent investigator, would be required to make a compelling case for the proposed experiments, your Qualifying Proposal is not an actual application, nor are you an independent investigator yet. It is most unwise to delay preparing your proposal to get more preliminary results. If your mentor encourages you to delay beyond the end of the spring semester, then you're getting very bad advice; consider speaking with the graduate advisor for a second opinion.

IV. EXPERIMENTAL DESIGN AND METHODS (suggested length - 6 pages)

Discuss in detail the experimental design and the procedure to be used to accomplish the specific aims of the project. For standard experimental approaches (such as DNA sequencing or ELISA), cite an appropriate reference for the method, but do not go into detail regarding the experimental technique. Describe the protocols to be used and provide a tentative sequence of timetable for the investigation. Include the means by which the data will be analyzed and interpreted. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. The required last page of the proposal is an outline of the proposed research in flow chart form, clearly indicating possible alternative outcomes at each step and subsequent plan of attack.

V. LITERATURE CITED

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

VI. APPENDIX

Use the appendix, if desired, for supplementary figures, etc. However, remember that the appendix is considered supplemental. Nothing of primary significance to your proposal should appear only in the appendix. It should not be used as a way around the page limitations.

FORMATTING INFO

The suggested lengths for each section **refer to single-spaced text in easily readable type sizes such as Arial 11pt, with at least 0.5inch margins**, as required for NIH format. This is a minimum, all reviewers appreciate adequate spacing in the document, in any case do not exceed a total of 12 pages, excluding Literature Cited and Appendix.

You will probably find it useful to make liberal use of subheadings, which will help you in organizing the material and will help your readers in digesting the material.

For example, if you have three specific aims, you will probably have three major subdivisions if Part IV, and additional subheadings within these.

Since this format is essentially that of an NIH grant, it may be useful for you to study examples of these. They may be obtained from your mentor or your committee members. However, it will not be appropriate

for you to use your mentor's proposal as an example if there is a significant overlap in the research plan. Our intentions in using this format for the exam are not only to help prepare you for the "real world," but also to test your ability to critically review the current status of your research area and to design an experimental strategy to answer the important questions in that area.

Notes:

Good technical writing is an extremely important part of scientific research. Whether you become involved in teaching, academic or industrial research, or government policy, your job will include writing technical documents, proposals, and reports. The success of your career will depend not only on the creativity of your research, but also on your ability to communicate your ideas and results. The Qualifying Exam provides you the opportunity to work on your scientific writing, and garner the help and suggestions of an experienced faculty committee. We look at the Qualifying Exam as a chance to help you grow and mature in your chosen field, and as an important step in ensuring your success as an investigator.