

REQUIREMENTS FOR THE Ph.D. QUALIFYING EXAMINATION

Ph.D. Program in Biomedical Sciences

Purpose: The purpose of the Ph.D. Qualifying Examination is to determine the student's knowledge and ability to analyze information in her/his area of concentration (“track”) and/or in the biomedical sciences in general and to apply this to the solution of problems that a student would be expected to meet in her/his professional career. The examination consists of a written research grant proposal followed by an oral presentation of the proposal and questioning session with the student’s Advisory Committee. The examination may also serve to demonstrate that the student is technically competent to complete the tasks described in the proposal.

Time: The Qualifying Examination must be administered by the end of the second year after the graduate student has matriculated as a full-time student in regular standing in the Ph.D. program in Biomedical Sciences at the University of Toledo College of Medicine and Life Sciences. A student not meeting this examination deadline is subject to termination of financial support from the university. Should a student need to extend the deadline past the second year, the student and major advisor must petition, in writing, to the Associate Dean, College of Graduate Studies on the Health Science Campus at least two months prior to the end of the second year of training. All students must complete the exam by the end of the third year in their program.

Prior to scheduling of the examination, the Advisory Committee section of the GRAD form and Plan of Study form must be approved and on file in the College of Graduate Studies. These documents should be completed within two weeks after the student joins a faculty mentor’s lab.

Topic: The topic of the Qualifying Examination may be based on the student’s dissertation project or another topic determined by the student’s Advisory Committee. The student’s Advisory Committee is responsible for the approval of the proposal topic. This is typically decided at the student’s first meeting with the Advisory Committee which should be held soon after the student joins the lab and the advisory committee is formed. The proposal must be newly developed by the student and cannot be based on any specific aim(s) of a grant application of the major advisor or anyone else besides the student.

Format: The Qualifying Examination will consist of two parts evaluated by the Advisory Committee: a written research grant proposal, and an oral presentation with questioning session. The written proposal will be prepared in single-spaced 11 point Arial font. The proposal will resemble the NIH R01 style (see **Appendix** for additional instructions):

The initial grant proposal must be written solely by the student and should not have been reviewed, edited, or critiqued by other persons (including students and faculty) as part of a course or outside of a course. A secondary submission of the proposal, if required (see below under **Grading**), may include input from Advisory Committee members. The proposal may include preliminary data generated by the student or by others that support the project’s feasibility. The proposal must indicate cases where such preliminary data were not obtained by the student. Preliminary data generated by the student may also be included to demonstrate the student’s technical competency to perform the proposed experiments. The oral exam may include questions that relate directly to the proposal as well as those that probe the breadth and depth of basic knowledge and critical thinking skills of the student.

It is nearly impossible to prevent discussion of a student’s research ideas and approaches with the mentor, lab members, fellow students, at lab meetings, and other venues. However, as noted above, one major purpose of the Qualifying Exam is to determine if a student has the ability to apply knowledge to the solution of problems that s/he may encounter in her/his professional career. Towards that aim, it is important that the student’s research proposal reflect as much as possible her/his “own work” including conception, approach, writing, interpretation, etc. Thus, input from others must be minimized as much as possible to achieve a fair evaluation of the student.

The student's Major Advisor typically serves as chairperson for the oral presentation and examination. However, if the committee or track guidelines dictate, it is also permissible for another committee member, the Track Director, or the home department Chairperson to serve as chair for the oral presentation and examination. Specific guidelines for the duration of the oral presentation, format and duration of questioning, overall duration of the presentation and oral examination, and other aspects of the proceedings may also be set individually by each track. The recommended duration of the oral presentation is 30 minutes and total examination time is no longer than three hours.

A Graduate School Representative may be appointed at the student's or Advisory Committee's request to attend the oral portion of the examination. In that case, the College of Graduate Studies office on the Health Science Campus should be notified when and where the oral examination will take place and the Associate Dean of COGS will appoint a member of the Graduate Faculty to serve as the Representative. It is the duty of the student to first identify the faculty Representative and submit the faculty's name to the Associate Dean of COGS for approval. The Representative and the oral examination Chair should ensure that the student is treated fairly during the oral exam.

Grading: Successfully passing the Qualifying Exam requires committee acceptance of the written grant proposal for written clarity and adherence to the NIH format and subsequent passage of the oral presentation and examination session.

Committee approval of the written proposal requires the student first submit the grant application to all Advisory Committee members who then within two weeks review the document for clarity of writing and adherence to the NIH format, but not content. If all committee members agree the document is of sufficient clarity of writing and adherence to the NIH format, the oral presentation and examination may proceed. If committee members have issues with content of the document, these should be addressed during the oral examination.

If any committee member disapproves the document, s/he will submit criticism(s) to the Major Advisor. The Major Advisor will present the criticisms to the student and the student will address the criticisms by submitting a revised proposal. Similar to an NIH grant application, the revised proposal will include a succinct Introduction that describes how the criticisms were addressed.

The student will have no more than two weeks to submit the revised proposal. As before, the committee members will evaluate the revised proposal for clarity of writing and adherence to the NIH format. If all committee members approve the proposal, the oral examination may proceed. If any committee member disapproves the revised proposal, the student will be asked to again revise and resubmit the proposal. The student will be allowed the initial proposal submission and two revisions. If the committee does not approve the proposal after the second revision, the student may be subject to dismissal from the program.

After approval of the proposal, the student will orally present and defend the research proposal to the Advisory Committee. The student is not allowed to bring texts, papers, or other materials to the exam, but should rely on her/his inherent knowledge when presenting and answering questions. Following the presentation, the student will be questioned by the committee members. The questions may be directed towards the oral presentation, the written proposal, and/or probe the breadth and depth of basic knowledge and critical thinking skills of the student. After completion of oral questioning, the committee will vote in the absence of the student to pass or fail the student. A simple majority vote is necessary to pass or fail the student.

If a failure is achieved, the student may be re-examined one time. Re-examination may require revision of the content of the written proposal and its resubmission/approval by the committee and a second oral presentation and examination. Alternatively, re-examination may include but is not limited to written responses and oral discussion of questions related to the student's coursework, the student's track of interest, and/or the student's area of research; presentation of a research paper (similar to a journal club format); or other formats determined by the student's track and/or Advisory Committee. For the second examination, a simple majority vote is necessary to pass or fail the student.

If a student fails the exam a second time, she/he may be subject to dismissal from the Ph.D. program. However, if the majority of the committee agrees that an additional attempt is warranted, the Major Advisor will petition the Associate Dean of the College of Graduate Studies in writing to request an additional attempt. No additional attempts beyond this third one will be permitted.

The Report of the Qualifying Exam form should be completed and signed by all members of the Advisory Committee: www.utoledo.edu/graduate/hsc/pdfs/Exam_Form_Preliminary_or_Quali.pdf. The completed form should be sent to the Associate Dean, College of Graduate Studies on the Health Science Campus.

Scheduling: Students should initiate the Qualifying Exam process as soon as possible after joining a mentor's lab and forming the Graduate Committee. An initial committee should be held as soon as possible to introduce the student to the committee and the student's research area. At this meeting, the topic of the research proposal for the Qualifying Exam should be decided upon. This meeting could occur within the Summer term of the student's first year, but certainly no later than early Fall semester of the second year.

APPENDIX: GUIDELINES FOR PREPARING THE QUALIFYING EXAMINATION GRANT PROPOSAL

The proposal will resemble the NIH R01 style. The proposal should be prepared in single-spaced 11 point Arial font.

Instructional assistance for preparing R01 grant applications can be found at:

http://grants.nih.gov/grants/funding/424/SF424_RR_Guide_General_Adobe_VerB.pdf

Examples of R01 grant applications can be found at:

<http://www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx>

The proposal should be divided into four major sections:

1. Title Page

2. Specific Aims (1 page limit)

In one or two paragraphs, state concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.

List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

3. Research Strategy (12 page limit)

Organize the Research Strategy under the following three section headings:

Significance

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

Innovation

- Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.

If an application has multiple Specific Aims, the applicant may address Significance, Innovation, and Approach under each Specific Aim. Alternatively, the applicant may address Significance, Innovation, and Approach for all of the Specific Aims collectively.

If applicable, preliminary data should be included in the Research Strategy. The data may be presented as a single section under Approach or distributed within individual sections of the Research Plan.

All published experimental details should be cited in the Research Strategy section and full references should be provided in the Bibliography section.

4. Bibliography (no page limit)

List all citations numerically in the order they appeared in the text. Each citation should include names of all authors (et. al. is not an acceptable name), title of manuscript, book chapter, book or journal name, volume, page numbers, and year of publication.