

## **Guidelines for the Qualifying Examination For students in the Biomedical Sciences PhD Program**

The qualifying exam should determine if a student "qualifies" for candidacy in the Ph.D. program. This should demonstrate that a student has obtained a breadth of knowledge in biomedical science, utilizing the information they have obtained in the core curriculum. The student should also demonstrate competence in researching the literature and organizing and presenting information on a topic of current importance. The qualifying exam should also be a learning experience in which specific skills are developed including: writing ability, grant writing expertise, techniques for effective literature searching and oral presentation skills.

It is important that standards of competence are established and met by all students in the degree program. Therefore, the qualifying examination will be similar in format for all students in the degree program. The examination will be administered by the advisory committee after the first year and before the end of the third year of continuous enrollment. The format of the written examination will be a research proposal similar in style to a research grant application. The topic will be selected by the student and approved in advance by the committee. The topic should be original and not identical to the intended research. An oral examination, in which the student defends the written research, follows successful completion of the written requirement.

The format for the written portion of the qualifying examination will be a research proposal similar in style to an NIH grant application. The topic should be selected by the student and approved in advance by the committee. The topic should be original and not identical to the intended research. It is important that the committee place constraints on the length and time allowed for writing the proposal. An oral examination should follow soon after successful completion of the written requirement and should involve a defense of the written proposal. The oral examination can be a format for assessing the general knowledge of the student.

### **Recommended PhD Qualifying Examination Format:**

The specific format of the written qualifying examination is determined by the advisory committee within the program guidelines described above. The following are recommended:

#### **1. Submission and approval of research proposal topic**

Each Ph.D. student will submit to their committee a topic for a research proposal. This need only be a statement or short paragraph to define the subject area. The only restrictions on the proposal topic are: 1) It should not be the same as their intended research topic, and 2) It must be clearly focused so that it will provide significant new information on a problem of limited scope. Although the student is expected to develop the topic for their proposal, they are encouraged to seek out advice on the suitability of possible topics as well as information on the subject. It is expected that the faculty research and/or academic advisor will give preliminary approval to the topic and make suggestions for modifying the proposal if necessary. The student's advisor should poll the committee to determine if the topic is acceptable.

## 2. Format and submission of written research proposal

The student should submit the written proposal to their advisory committee chairman within four weeks after the topic is approved. The chairman will submit copies of the proposal to the committee along with the evaluation form and information on the proposal in these guidelines. The proposal should be typed and should not exceed twenty pages (including references). The proposal should be organized into the following sections, which are derived from the application for NIH grants:

1. **Specific Aims:** Briefly state the objectives of the research. List the specific goals and any hypotheses that are to be tested. This section should be no more than one page.
2. **Background and Significance:** Briefly sketch the background of the proposal and evaluate the existing knowledge. Identify gaps in our present knowledge that the research is intended to fill. State the importance of the research as it relates to our present knowledge. Two to three pages are recommended.
3. **Experimental Plan.** Clearly define the research plan including all experimental procedures and techniques to be used. The possible or expected results of the experiments should be described. Discuss potential problems and indicate alternative approaches. The experimental plan should clearly demonstrate how the specific aims are to be achieved. Five to seven pages are recommended.
4. **Literature Cited.** List the references cited in the text using a single scientific journal format. All references should include full titles.

## 3. Grading of written proposal

Each member of the committee will evaluate the proposal within one week and return the evaluation form to the chairman of the committee with a grade of pass, remediate or fail. A critique of the proposal should be attached to the evaluation, regardless of the grade. A grade of "pass" should be given when a student has demonstrated their ability to develop a creative research proposal. The grade of "remediate" is recommended when there is a significant deficiency in the proposal that needs to be addressed, such as an insufficient survey of the literature or a major flaw in the experimental design. The grade of "fail" should be given only when the written proposal is clearly inadequate and indicates that the student needs further training to develop competence in scientific writing. Grades of "remediate" or "fail" should include specific recommendations for rewriting or reexamination. If two or more grades of "remediate" are received (or one remediate plus one fail) the student should schedule a date for resubmission of the proposal. If a student receives two or more grades of "fail" the committee should recommend a time for reexamination. If a grade of "pass" is given (four pass grades) the committee and the student should decide on a time for the oral examination. The student's advisor should ensure that a copy of the written proposal is filed in the graduate office, along with copies of the evaluation forms.

### 4. Oral examination

The examination is intended to establish the student's ability to orally present and defend a research proposal. Students are expected to be able to apply the information learned in their graduate education to specific scientific problems. Therefore, students should expect questions that probe their general scientific knowledge as it relates to the subject matter of the research proposal. The committee will convene immediately after the oral examination to determine if the student has successfully passed the examination. If the committee decides against a grade of pass, a time for reexamination should be scheduled.