

## **GUIDELINES FOR PREPARATION FOR THE PRELIMINARY EXAMINATION IN THE DEPARTMENT OF BIOLOGICAL SCIENCES**

The following suggests procedures for preparation for the Preliminary Examination. It provides a list of do's and don'ts for the student and a framework for understanding expected standards of performance. Remember, this is primarily an oral examination and not a written examination. However, you should be aware that the written description you provide your examination committee in advance can seriously affect their expectations of your success.

### **A. Choice of a topic:**

Students taking the preliminary examination have two choices of format: (1) a topic within your own research area, or (2) a topic unrelated to the area of your thesis research. **Well in advance**, discuss your choice of format with your Major Professor since they may have strong opinions on which format is most appropriate for you. It should be noted that, regardless of the format, the expectations for performance will be similar. Examining committees are likely to be less forgiving about the depth of your background knowledge when the topic is in the area of your thesis research. Remember also that if you do choose a thesis-related topic, the proposal still must reflect the student's own scientific creativity. Whichever format you choose, you should design approaches that are expected to provide significant advances to the field and you should be prepared to discuss further approaches beyond the immediate scope of your proposal. Thoughtfulness and innovation are highly desirable qualities in a research proposal.

### **B. Preparation of the written proposal:**

The purpose of the written proposal is to provide the examination committee with adequate background and details to understand the current state of the chosen field of research and evaluate your proposed experiments. Too little detail will frustrate the committee in its evaluation while excessive length will be a waste of their time. You can be prepared to discuss experimental details and interpretations without listing them all in the proposal. For example, you can describe how you would characterize a protein by electrophoresis without giving the composition of every solution used in the procedure. The expected length of the written proposal can vary, but 15 double-spaced pages, excluding the title page, references, figures, and figure legends is your limit. The font size is limited to 11 pt. Arial or 12 pt. Times New Roman. Please note that the Committee will always be favorably impressed with short, concise, well written reports instead of ones that maximize the word count. Excessive length may be considered grounds for denying the proposal.

#### **1. Background and significance.**

Provide a brief background of the field. Describe the current knowledge as it relates to your proposal. Try to stick to the significant findings, but describe issues that are controversial or unclear. Be sure to point out what information is missing in the field that you will be providing through your proposed experiments. Within the framework of your current knowledge, formulate a hypothesis that you will test by experimentation. State concisely what significant issues or questions you are attempting to answer and how your studies are expected to advance the field. This section is extremely important for your committee to grasp. Do your best in conveying this message to them. It is often useful to state the issues in the form of hypotheses because this method tends to organize your thoughts about how best to test the hypotheses.

#### **2. Research design and methods.**

Provide a description of the experimental approaches you are proposing. A good preliminary proposal will provide 3 or 4 major experimental approaches to be used. Be critical when using approaches proposed by others, and give credit to your sources (references, personal communications).

State the specific aims of the proposal in outline form first. Then, for each approach describe the experiments that will be performed, how data will be collected, analyzed, and interpreted. While not every conceivable detail need be included, you should be aware of the mechanics of the experiment and any instrumentation used, as well as the strengths and limitations of the method. Be prepared for alternative approaches, should your original proposed experiment fail.

#### **3. Discussion of expected results.**

Describe the expected experimental results within the context of your hypotheses. Be prepared to discuss alternatives should you be able to reject your original hypothesis. Be prepared to suggest further avenues of research beyond the scope of your proposal.

#### **4. References.**

In the text of your proposal, you should cite references for important previous work in the field. This is essential for the committee to obtain supplemental information as well as to evaluate whether your proposal is novel or derivative.

#### **5. Calendar of expected progress.**

Include a time estimate of doing and completing various phases of the proposed research, including specific experiments, manuscript writing and submission, dissertation writing, dissertation defense and graduation date. This will, of course, be amended as progress is realized. But it does inform the committee about an expected timetable of accomplishments.

#### **C. Pre-prelim:**

You are encouraged to practice your oral defense of your proposal as a "pre-prelim". It is advised that you seek the help of more senior graduate students who can read your proposal, sit in for a practice exam, and provide you with feedback on the strengths and weaknesses of your performance. This practice will be very valuable in preparing you for the expectations of the exam. Choose practice examiners who are beyond prelims themselves and know what to expect. Hold the pre-prelim meeting early enough to give yourself time to make any needed adjustments in the proposal. Use your own judgement in reacting to the suggestions of other students. No one is perfect and omniscient.

#### **D. Seeking outside help:**

While originality in design of the experimental approach is essential, seeking outside help on details of experimentation and analysis is encouraged. For example, if you do not understand the principles behind analytical ultracentrifugation, you are permitted to seek the advice of an expert. Your Advisory Committee members may also serve in this capacity.