Guidelines for Qualifying Exam Committees in the Neuroscience Graduate Program

The overall goal of the qualifying exam is to determine whether the student’s depth and breadth of knowledge and ability to integrate information is such that he or she should be advanced to candidacy for the PhD. In preparing for this exam, it is also our intent to provide the student with training in the scientific skills of paper research, grant writing, hypothesis formulation, and experimental design. The examination has the following objectives:

- To provide experience researching topics through detailed examination of review articles and original research papers
- To establish breadth outside of the specific experiments of the dissertation research
- To establish a depth of knowledge about experimental procedures: the principles underlying the approaches; an ability to trouble shoot; an understanding of the appropriate controls; and an understanding of the strengths and weaknesses of the approach
- To integrate information from course work as it relates to the research area
- To train students how to write research grants and to facilitate submission of applications for predoctoral NRSAs

The qualifying exam will consist of two components: a research proposal and a 2-3 hr oral exam that will cover areas related to the proposed research. The examining committee for both proposal and oral exam will consist of 3 NGP faculty members.

The Proposal:
The writing of the proposal is an intellectual exercise meant to explore questions broader than the actual PhD dissertation work and to give students experience with the formulation of hypotheses, experiments to test them, and grant writing.

- The proposal should be in the area of the student’s planned dissertation research, but can include aims that are beyond the scope of feasibility in the advisor’s laboratory
- Students are encouraged to propose experiments using multiple experimental approaches

The proposal will be evaluated for:

- focus (stating a specific hypothesis, model, or question that will be tested by the proposed experiments)
- background (concise presentation of the context of the research and a description of previous work in the field together with stating the remaining questions in the field and the relevance of the proposed work to these questions)
- experimental design (do the proposed experiments actually answer the question or test the hypothesis; are they appropriate for the study; has the student considered the various plausible outcomes and how the results will be interpreted)
- clarity of writing and logic
- presentation: grammar, spelling, appropriate use of language

The committee should not expect this document to have the polish of a seasoned investigator. Remember that this is the student’s first experience at writing a research proposal.

The Oral Exam:
The oral exam is a means for the faculty committee to determine the **depth and breadth** of the student’s knowledge in **areas related to their proposal**

- The exam can be any length less than 3 hrs (it is expected that most exams will be 2-2.5 hrs long).
- Prior to conducting the exam, the committee must determine who will be the Chair of the committee. The Chair facilitates the exam and completes the evaluation forms.
- **The exam will be conducted in a respectful environment.** Members of the exam committee are encouraged to try different routes towards asking a question if the student seems not to understand how to answer.
- Some examples of areas in which the student should be prepared:
  - Underlying principles of the proposed techniques and the interpretation of the data, including appropriate controls, and limits of sensitivity
  - Neurobiology (molecular, cellular, systems) related to the area of study
  - Anatomy and physiology of the system of study
  - Other areas as deemed essential for being a successful neuroscientist in the chosen field of study
  - Health relevance or significance of the study
- After the oral exam is completed, the committee will ask the student to leave while they discuss their evaluation of the exam and the proposal. Once this is decided, the Committee will discuss their evaluation with the student.

**Evaluation:**

- The proposal and the oral exam will be evaluated separately
- Three possible “grades” can be assigned by majority vote of the examination committee for each component (proposal and oral exam)
  - Full pass- the student is competent and comfortable with all areas that were queried; any difficulties answering questions were minor and were overcome by the student when other questions were given; rewrites on the proposal are straightforward corrections.
  - Conditional pass- the student has a deficiency in one or two areas of the proposal or oral exam; the student must make up for these deficiencies as prescribed by the committee; the student passes when conditions are fulfilled (eg, re-write of a portion of the proposal that has a fatal flaw, faulty reasoning, or mis-information).
  - Fail- the student’s proposal and/or performance on the oral exam was severely deficient and unacceptable; the student failed to answer even the most straightforward questions; answers were incomplete or poor for more than half of the questions that were asked.
- If the student fails both portions of the exam, then he or she will be given one more chance to take the exam, and may do so with a new committee
- If the student fails either component twice, the exam committee must forward a recommendation to the Director as to whether the student should be immediately asked to withdraw or can be allowed to complete a terminal masters degree