

The Neuroscience Graduate Program Qualifying Examination

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 NRSA's

Qualifying Exam

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 qualifying exam must be taken no later than October of the third year in the program and it must be successfully completed (in the event of a conditional pass or failure) by the end of February.** If there are extenuating circumstances under which these deadlines cannot be met, then the student must petition the Curriculum and Tracking Committee for an extension.

The proposal:

- The student will write a research proposal that contains the following sections (single-spaced):
 - Title and Specific aims page: Title and 1 page describing the context, long term goals of the project, hypothesis and/or model to be tested and a list of specific experiments or aims that will be carried out
 - Background and Significance: 10- 15 pages of pertinent background that describes the field, what is known about the topic, and delineates how the aims of the proposal fit into the field
 - Experimental design: 5- 10 pages that describe the details of the proposed experiments, rationale, and interpretation of the possible outcomes, including potential pitfalls and problems
- Writing this 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
- No less than 10 weeks before the qualifying exam, the student will submit a title and one page summary of the planned proposal formatted as an NIH specific aims page together with a list of their advisor's extramural funding, which includes title, source and abstract, and a list of suggested committee members, representing different areas of expertise in neuroscience (3 members with 1-2 alternates) and knowledgeable in the proposed experimental approaches
 - The Tracking and Curriculum Committee will review the specific aims page(s) within 2 weeks and inform the student as to whether these aims are acceptable for their proposal; if they are not, they will provide feedback as to how the aims can be improved
 - Once the general scope of the proposal is approved, the examination committee will be selected by the Tracking and Curriculum Committee based on the recommendation of the student and his or her advisor; **the advisor will not be a member of the committee**
 - The Tracking and Curriculum Committee Chair will contact the committee members to confirm that they agree to serve on the committee and to coordinate the selection of a Chair for the qualifying exam committee, which will be done by consensus amongst the faculty members
 - The Chair of the committee is responsible for moderating the oral exam and documenting the activities of the committee with respect to the outcome of the exam
 - The student, together with their advisor will determine the date and time of the exam and communicate this choice to the NGP Assistant, who will schedule a room
 - Once members have agreed to serve, the NGP Assistant will send a memo confirming the date, time, and location of the exam. The Tracking and Curriculum Committee Chair will send guidelines for the proposal and oral exam.
- The document must be single-spaced written in 11 point Arial or 12 point Times Roman font with margins no smaller than 0.5 inches; citations must be listed as "author, date" and the bibliography must be full length citations (Authors, Date, Title, Journal Volume: inclusive pages) and be listed in alphabetical order according to the last name of the first author
- The proposal must be written solely by the student with only general input from the advisor
- The examination committee must receive the completed proposal no less than 10 days prior to the exam

The oral exam:

- The exam can be any length less than 3 hrs (it is expected that most exams will be 2- 2.5 hrs long)
- The exam will be conducted in a respectful environment

The committee will submit separate evaluations for the proposal and the oral exam (see evaluation forms).

- 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 oral exam will be a means for the faculty committee to determine the depth and breadth of the student's knowledge in areas related to their proposal and material covered in their course work
- The student will be responsible for having a detailed knowledge of the following:
 - The significance (relevance to human health; novelty of the proposed work), background (previous work in the field)
 - The underlying principles of the proposed techniques and the interpretation of the data, including appropriate controls, and limits of sensitivity
 - An understanding of reasons underlying the choice of experimental approach and its strengths and weaknesses
 - Principles, mechanisms, and facts related to the area of study
 - Knowledge of parallel systems under which similar studies have been undertaken by other scientists
 - Anatomy and physiology of the system of study and related systems

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
 - Conditional pass- passes when conditions are fulfilled (eg, re-write of a portion of the proposal)
 - Fail- a fail means that the proposal and/or performance on the oral exam was unacceptable
- 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