

Comprehensive Exam Guidelines for the Graduate Program of Neuroscience

The Comprehensive Examination has both oral and written portions. The written portion will be in the form of a grant based proposal, while the oral portion of the examination will be split between questions aimed at general neuroscience and the grant proposal.

Core areas used to evaluate each student include:

- **Knowledge base in the field of neuroscience:** Students demonstrate an understanding and ability to apply basic principles of biological structure and function in Neuroscience.
- **Critical thinking:** Students show an ability to critically evaluate the literature and extract the relevant information on an in depth level. Students should demonstrate that they conceptualized and integrated a variety of neuroscience topics.
- **Knowledge and application of the scientific method:** Students demonstrate an ability to generate sound hypotheses that are tested by study objectives/aims. Students demonstrate their ability to construct well-designed experiments, interpret study outcomes, and brain-storm alternative strategies that are appropriately justified and feasible.

The Written Examination

The Chair of the Examination Committee collects the written grant from students **two weeks** prior to the scheduled date of the oral exam. The written exam will be in a NIH NRSA F30/31 format. Students submit a written grant to the Chair of the Examination Committee. The total length of this document (excluding references) should be 6-pages plus a one specific aims page. It should be single spaced, in 11 point Arial font, with 0.5 inch margins all around. The proposal should explain the research questions to be addressed and their importance to the scientific field, the hypotheses to be tested, and the rationale behind these hypotheses. The experimental plan should clearly explain the experimental design including animal or human usage and appropriate controls, and methodological and statistical descriptions. The plan should include expected outcomes and alternate strategies. The research scope should be appropriate for a graduate student to complete in 3-4 years of study. Students should consult the NIH website for additional guidance and tips.

Two weeks following the submission of the written grant, there will be an **oral examination, typically lasting 1.5 hours**. During the first part of the oral examination, there will be **general neuroscience questions** to test the student's knowledge basis covering fundamental neuroscience topics, in which students will be expected to discuss these topics in depth at the white board. Students should focus preparation for their oral exam on coursework included in GC550 Foundations in Biomedical Sciences, NS700 Cellular Neurophysiology, NS715 Cellular and Molecular Neuroscience, NS740 Neuroanatomy, and NS690 Neuropharmacology. During the second part of the examination, the student will be asked **questions relating to their grant proposal**. Students should be prepared with all aspects of the proposal from an in depth understanding of the background elements, the rationale for experimental design and chosen methodology, and providing appropriate evidence based expected outcomes and alternate strategies. Students should be able to show their ability to critically evaluate the literature during both portions of the oral exam. The goal of the oral exam as conducted by members of the Examination Committee is to assess each student in all three core content areas (Knowledge in Neuroscience, Critical Thinking, and Application of the Scientific Methods) in addition to their written grant proposal. **Mock oral exams with faculty (other than the PI), post-docs, upper level graduate students are highly encouraged.**

Policy on Faculty & Peer Support

The Comprehensive Examination Committee is a test of the student's individual ability to pursue advanced studies in Neuroscience. Therefore, the student must be solely responsible for the preparation of the written and oral portions of the exam. Since the **written document** is to be the work of the student only, there will be **NO editorial input** from the student's thesis advisor, post-docs, fellow students, or other faculty. Some verbal guidance on grant organization and conceptual development of the grant is expected, while the written document should be that of the student. The student is encouraged to use the thesis topic for the grant, although this is not a requirement. **If the student plans to submit a fellowship application before or soon after the CE and expects to receive feedback on the written proposal, the student must notify the GPN directors and submit a version of the proposal before receiving feedback. Students using written feedback on proposals from the course GC730 Grant Writing are required to submit the grant version showing markups/edits to the Program Directors for review by the Exam Committee.** The student is encouraged to conduct "**mock exams**" and receive feedback from faculty (except for the PI) and peers before taking the Oral Comprehensive Exam. Students may also contact the chair of the Curriculum Committee or Program Director to request clarification regarding the Comprehensive Examination process at any point.

Committee formation

The Curriculum Committee together with the Program Directors appoints one Examination Committee for all students in a given year, consisting of three GPN faculty members (***excluding the thesis advisor***) with different areas of expertise to examine all students. The Examination Committee will be composed of individuals who are both standing faculty members in Jefferson College of Biomedical Sciences (JCBS) and part of GPN. All GPN faculty may be selected to serve on the examination committee. One committee member will serve as chair of the examination committee and one of the GPN Directors will observe, but does not participate in the CE. The examination committee with the help of a GPN administrator sets the date of the examination.

Timing of CE

GPN students submit a one-page abstract of his/her intended thesis work by the end of Spring I of the second year of study to the Program Directors and Curriculum Committee. The written portion of the CE is due 2 weeks prior to the oral CE, which takes place by the end of the students' second year of enrollment in the graduate program, typically late July. Students receive their assigned time for the examination from either the GPN administrator or the CE Chair.

Policy on Failing

A student who fails the Comprehensive Exam is expected to retake it and pass no later than three months after the first attempt. Failing the comprehensive exam twice results in dismissal from the Program.

Deadline Extensions

A student who is unable to comply with the deadlines must petition the Executive Committee for an extension. Extensions will be granted only for verifiable extenuating circumstances such as illness or serious personal situations.