Comprehensive Exam Guidelines

Ph.D. Graduate Students

Purpose

The Graduate Program for Biochemistry and Neuroscience (B&N) is a statewide graduate program administered through the Department of Chemistry and Biochemistry with faculty and students from UAF, UAA, and UAS. The format for the PhD comprehensive exam outlines a consistent procedure across all campuses (UAF, UAA, UAS) with the intent to increase both the quality and stringency of the examination process. The format of the PhD comprehensive exam also generates a tool to assess the B&N core courses and prerequisites, which will ultimately benefit our student's education. The goal of the B&N core courses is to provide an understanding of biochemistry and neuroscience, which will benefit the student's research and future career.

Timeline

Register for the PhD Comprehensive Exam by completing the registration form in this packet and sending it to kdrew@alaska.edu. Follow up with additional e-mail or phone messages if you do not get a reply acknowledging receipt of the registration form. Students take the PhD comprehensive exam after the second year of entering the program or once the B&N core course requirements are fulfilled. The core requirements for each individual student are determined by the student's committee with the goal to provide the academic education most pertinent to the benefit of the student's thesis research field. You will be contacted after completing your second year and will be asked to provide a timeline for taking your exam.

The written examination (proposal) must be submitted by 5:00 pm August 10th or by 5:00 pm February 10. If the due date falls on a Saturday or Sunday the proposal will be due the Monday following the stated due date. The proposal should be emailed to Kelly Drew at kdrew@alaska.edu by the due date and time. The date and time for the oral examination is determined by the student in consultation with the student's graduate committee and should be held no later than four months after submitting the written proposal. The student should contact the graduate school to arrange for an outside examiner as soon as a date is set for the oral exam.

Format of Exam

Written

The written portion of the exam consists of writing a research proposal. The proposal can be your thesis proposal, but it must be your own work. For example, it would not be appropriate to copy from a funded proposal written by your PI, even if a lot of your experiments are from that proposal. Research proposals must contain the following sections

1. Specific Aims (no longer than one page)
2. Research Strategy (at least five single-spaced pages and no more than six single-spaced pages (not including references)
3. Biosketch formatted according to the instructions required for the type of proposal. NIH and NSF have specific biosketch instructions.
4. Description of Facilities where the work will be done
5. Vertebrate Animal or Human Subjects section (if appropriate). The Vertebrate Animal and Human Subsections should conform to current NIH requirements

We encourage students to use the format of an NIH R03 or R21 proposal. A rubric, included in this packet, details how the proposal will be evaluated. Students should pay attention to the rubric when writing the proposal.

If a student wishes to use another format, the format must be pre-approved by the student's graduate committee. The written proposal must be submitted to the graduate advisory committee four weeks prior to the oral defense of the proposal. The oral defense constitutes the Oral Comprehensive Exam and requires that the student request an outside examiner at least 3 weeks prior to the oral exam.

Oral

The oral portion of the comprehensive exam consists of formally presenting the proposed research to the graduate committee and defending the research plan. Students will prepare a set of slides, in one to three sentences describe the overall research goal. Additional slides should illustrate and defend the significance, innovation, approach, expected results and interpretation

Outcome

Registration for PhD comprehensive examination

Student:	Date:	Campus:

Core
Course

PhD comprehensive Examination

Payattention to the following detail when writing your proposal and preparing for your oral defense of that proposal:

… Identify the rigor (or lack thereof) of published studies and your own preliminary data

… Use proper scientific terminology

x

Weaknesses

x

5. Environment

Strengths

x

Weaknesses

x

ADDITIONAL REVIEW CRITERIA

As applicable for the project proposed, reviewers will consider the following additional items in the determination of scientific and technical merit, but will not give separate scores for these items.

- R esponses for Protections for Human Subjects, Vertebrate Animals, and Biohazards are required for all applications.
- A response for Inclusion of Women, Minorities and Children is required for applications proposing Human Subjects Research.

Protections for Human Subjects

Click Here to Select

Comments (Required Unless Not Applicable):

x

Data and Safety Monitoring Plan (Applicable for Clinical Trials Only):

Click Here to Select

Comments (Required Unless Not Applicable):

o

Inclusion of Women, Minorities and Children Applicable Only for Human Subjects research and not IRB Exemption #4.

x Sex/Gender: Click Here to Select

x Race/Ethnicity: Click Here to Select

x Inclusion/Exclusion of Children under 21: Click Here to Select

Comments (Required Unless Not Applicable):

x

Vertebrate Animals

Is the proposed research involving vertebrate animals scientifically appropriate, including the justification for animal usage and protections for research animals described in the Vertebrate

Animal section?

Click Here to Select

Comments (Required Unless Not Applicable):

x

Biohazards

Click Here to Select

Comments (Required Unless Not Applicable):

x

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Comments (if applicable):

x

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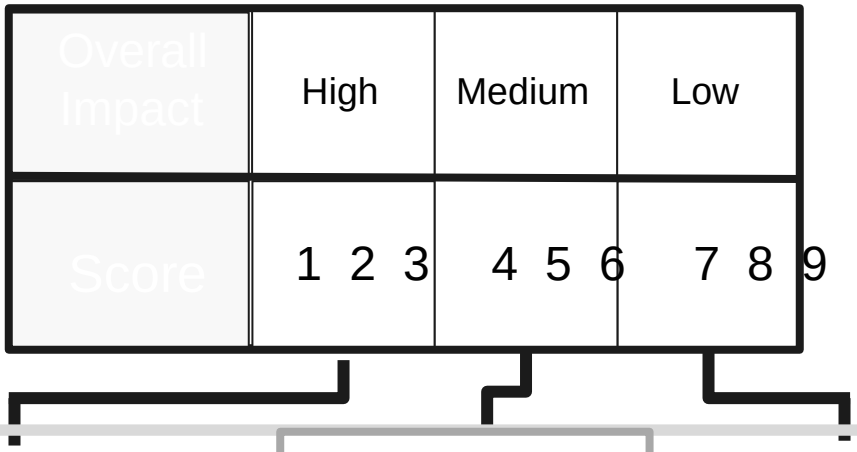

Evaluating Overall Impact :

Consider the 5 criteria: significance, investigator, innovation, approach, environment (weighted based on reviewer's judgment) and other score influences (e.g. human subjects)

e.g. Applications may be addressing a problem of high importance in the field, but weaknesses in the criteria bring down the overall impact to medium.

e.g. Applications may be addressing a problem of moderate

5 is a good medium-impact application, and the entire scale (1-9) should always be considered.

Chemistry and Biochemistry Graduate Program Assessment Q uestionnaire

The purpose of this form is for our department to improve its graduate programs. This form is filled out at every student's annual committee meeting and any other event (e.g. defenses, comprehensive examinations, etc.). At the end of the academic year, we compile the results to see how well our program is educating all students. If we find that many students fall short of an assessment standard, we will work to improve the curriculum's teaching of that standard. This form is anonymous and is not used to grade individual students . However, if we find that a student's performance is beyond expectation or lacking in some areas (compared to expectations for their program / year in program), these areas will be mentioned on the "A

Frequently asked questions

1. Will the proposal be on our current research or research related to our current research or we are expected to write a completely different proposal?
The proposal can be your thesis proposal, but it must be your own work. For example, it would not be appropriate to copy from a funded proposal written by your PI, even if a lot of your experiments are from that proposal.

3. The outside examiner means someone apart from our committee right?
Yes, the outside examiner is for the oral defense of the proposal. You need to coordinate this through the graduate school. The purpose of the outside examiner is to assess fairness and rigor of the oral exam.

4. Does the score on the evaluation forms for the written proposal count as a grade for the proposal?
No! The score is a quantitative assessment of the scientific merit of your proposal based on NIH review criteria. Feedback on the scientific merit is expected to be an important learning opportunity, but is not a grade for the exam.

A decision of pass or fail will be based on the following criteria

- Is the student able to identify the rigor (or lack thereof) of published studies and his or her own preliminary data?
- Does the student use proper scientific terminology?
- Is the student prepared to explain basic principles?
- Is the student able to apply principals of biochemistry and neuroscience when discussing the rationale, for the approach proposed, expected results and alternative interpretations to the proposed research design?
- Is the student able to synthesize answers and defend answers based on his or her own understanding
- Does the student make a clear statement of hypothesis in the context of a working model and propose and defend a means to test the hypothesis? If the research is not hypothesis driven does the student provide a compelling argument that a hypothesis driven approach is not appropriate?
- Does the student demonstrate ability to critically analyze scientific literature by explaining the bias or lack of rigor in prior work to justify why additional study is required?
- Is the student able to explain why the proposed approach is the best approach to test the hypothesis? Does the student have a practical and theoretical understanding of techniques and is the student able to provide and discuss detailed methods?
- Do all graphs include axes labels with units? Are graphs large enough to read in the written proposal and on slides used for the oral defense? Are sample sizes noted on graphs or in figure legends? If the sample size is greater than two, are data expressed as mean or median with indications of variation about the mean or median? Are graphs annotated to indicate statistical significanc

- Is the student able to explain