

Qualifying Examination in the Biochemistry & Molecular Pharmacology Program

A. Purpose and Scope

The purpose of the qualifying examination is to evaluate the student's progress in the graduate program and to determine the student's potential for successful completion of the Ph.D. requirements. The Qualifying Exam Committee conducts this evaluation based on the student's performance in the core curriculum and advanced courses, performance in laboratory rotations, preparation and defense of an original research proposal, and general scientific knowledge and reasoning ability.

B. Exam Format

Preparing for the Exam

In order to take the Qualifying Exam in the Biochemistry & Molecular Pharmacology (BMP) Program, a student should have completed two advanced topics courses and have joined a laboratory of a BMP Program faculty member. Preparation for the Qualifying Examination involves selection of a Qualifying Examination Committee and a proposal topic. The student and their thesis advisor propose a Qualifying Exam Committee, which is then approved by the Graduate Director. The committee is to be composed of 3 faculty members with at least one BMP Program faculty member. The Chair of the Qualifying Exam Committee must be a BMP Program Faculty member. The General Examiner will be assigned to your Committee by the GSBS. The advisor is not a member of the Committee and is not present during its deliberations. However, the advisor can assist the student in developing the specific aims, which can be discussed at a joint meeting of exam committee members, student, and advisor.

These arrangements are to be completed by mid-January of the student's second year.

The Proposal

Students are encouraged to write proposals that relate directly to their likely thesis research, although an unrelated topic may be chosen. The student will write the Specific Aims in consultation with the research advisor. It is highly recommended that the student writes a research proposal with only two major aims. The Specific Aims are then submitted to the chair of the committee for preliminary approval. The chair, in consultation with the other members of the committee, will determine whether the Specific Aims are appropriate or if revision is needed.

If the student chooses to have a Specific Aims Meeting, it should be less than 1 hour and the brief presentation should describe (1) the biological significance; (2) the Specific Aims; (3) the experimental approaches to be used; (4) the expected results. The presentation should only have 5 – 6 slides. Students that are concurrently submitting a fellowship application with their advisor should contact the Graduate Director to develop a Qualifying Exam proposal that has a non-overlapping Specific Aim.

The student should schedule their Qualifying Exam ~ 6 weeks after approval of their Specific Aims. Once the room (reserve it for 3hr) and date are scheduled, the student will write a research proposal with the format and page limitations shown below. The proposal is to be prepared without consultation with committee members or the thesis advisor, however the chair of the committee can provide input on general approach and formatting issues. The student may consult with other faculty members, postdocs, and students. The written proposal will be submitted to the Qualifying Exam Committee two weeks before the Qualifying Exam.

Formatting:

Font

Use a standard black typeface (such as Arial, Helvetica, Palatino Linotype, or Georgia) and a font size of 11 points or larger. Symbol font may be used to insert Greek letters or special characters.

Paper Size Page Margins and Line spacing

Use standard paper size (8 ½" x 11).

Use at least one-half inch margins (top, bottom, left, and right) for all pages.

Use single spacing with no more than 6 lines per inch.

Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnotes

Various inserts may be included in the **SPECIFIC AIMS** and **RESEARCH STRATEGY** sections, but they count towards the page limitations listed below. You may use a smaller font size for the figure legends, but it must be in a black font color and be readily legible. Color can be used in figures; however, all text must be black and clearly legible.

Headers and Footers

You may use the headers and/or footers for page numbers and to place your name on the proposal.

Proposal Page Limits:

ABSTRACT	~1/2 page (30 lines)
SPECIFIC AIMS	1 page
RESEARCH STRATEGY	12 pages
BIBLIOGRAPHY & REFERENCES CITED	no page limit

ABSTRACT – is meant to serve as a succinct and accurate description of the proposed work when separated from the proposal. State the proposal’s broad, long-term objectives and specific aims. Describe concisely the research design and methods for achieving the stated goals. This section should be informative to other persons working in the same or related fields and insofar as possible understandable to a scientifically or technically literate reader. In the **ABSTRACT**, avoid describing past accomplishments and the use of the first person.

SPECIFIC AIMS – State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved. List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, solve a specific problem, or challenge an existing scientific paradigm.

RESEARCH STRATEGY – Organize the Research Strategy in the specified order using the instructions provided below. Start each section with the appropriate section heading—Significance or Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section.

(a) Significance

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

(b) Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project – include how the data will be collected, analyzed, and interpreted.
- Discuss the expected outcomes and results
- Discuss potential problems, caveats, and alternative strategies and outcomes.

Regarding specific experimental methods – do not go into great detail describing the specifics of buffers, time courses, equipment to be used, etc. However, you are responsible for knowing how all methods work, as well as explaining their strengths and weaknesses if asked in the Oral Exam.

Preliminary Data – any recent or published data that the student has generated can be used to set up the **Significance** and **Approach** sections. However, this is not a necessary part of the proposal and the lack of Preliminary Data will **not** negatively impact the proposal or the oral exam.

BIBLIOGRAPHY & REFERENCES CITED – Provide a bibliography of any references cited, including title, full author list, journal, year, volume, and page numbers.

The Oral Exam

The oral exam will take place two weeks following submission of the proposal and no later than the end of the spring semester student's second year.

Before the oral exam begins, the Committee will meet briefly, in the absence of the student, to review materials related to the student's progress in the graduate program and the format of the oral exam. A typical exam will begin with a brief (10 to 15 min) presentation of the research proposal by the student describing the specific problem to be addressed, the experimental approach to be used, and interpretation of anticipated results. The initial presentation will generally proceed without questions from the Committee unless particular points require clarification. The Committee will then ask questions designed to evaluate the proposed research, familiarity with the scientific literature, scientific reasoning ability, and general knowledge of biochemistry. After a question period, the student is often asked to leave the examination room while the Committee discusses the progress of the exam and determines whether an additional question period is needed to complete the exam. After the exam is concluded, the student will be asked to leave the room while the Committee arrives at its decision. The Chair will inform the student of the Committee's decision, and a written report of the examination results will be submitted by the Chair to the Dean of the Graduate School.

C. Results of the Qualifying Examination – Pass, Revise, Retest or Fail

Pass – enter thesis research.

Revise – specific sections of the proposal are re-written and subject to approval by the committee with no need for an oral examination retest.

Retest – oral defense of specific areas or complete proposal must be completed within 2 weeks of original defense.

Fail – academic withdrawal from the GSBS program.

D. Qualifying Examination Schedule

Each step in the Qualifying Examination will be completed during the student's second year using the following suggested deadlines. Students are encouraged to begin the necessary arrangements well in advance of the deadlines.

Notification by the Advisor of Candidacy for the Exam	January 15
Submission of an Approved Abstract	March 15
Submission of the Research Proposal	April 30
Completion of the Oral Exam	May 31