

DEPARTMENT OF GENETICS

Qualifying Exam

Students in the Genetics Graduate Program take the Qualifying Examination in the Fall Quarter of their second year of study. There are two parts to the exam, a written research proposal and an oral examination. Students must pass both parts of the exam to qualify for doctoral studies. Exam is not designed to weed students out. It is a tool see strengths and areas that need working on.

Qualifying Exam Topic

The research topic of the Qualifying Exam is flexible, depending on student's interest. It can be directly related to the student's dissertation work, or unrelated. A goal of this approach is to give students the opportunity to fully develop a research project of their interest and gain a deep understanding of the topic.

Purposes of the Qualifying Exam

The purposes of the Qualifying Exam are for students to:

1. demonstrate understanding of the fundamentals of genetics, genomics, and molecular and cellular biology.
2. learn the essential background knowledge for their expected thesis area.
3. demonstrate the capacity for independent, creative thinking within their chosen topic area.

In the Qualifying Exam, the student should:

1. identify interesting unanswered questions and pose hypotheses concerning those questions.
2. design experiments that test the hypotheses or answer the questions. This means that the student needs to understand what types of experiments are feasible, how to execute them, what their limitations are, and the types of data that result from particular types of experiments.
3. Include figures
4. anticipate possible outcomes that might be obtained from the proposed experiments and interpret the results to draw appropriate conclusions.
5. suggest alternative experimental approaches if an initial approach fails to answer a question.
6. consider subsequent questions, which may depend on the results obtained in the initial experiments.

Qualifying Exam Committee

A student's Qualifying Exam Committee is composed of four or more faculty members. We ask students to discuss with their advisor for suggestion of 1-2 faculty to serve on their committee. However, the committee members are arranged by the PhD program, and may or may not include the suggested faculty members.

The Written Proposal

The Qualifying Exam proposal should reflect the student's thinking and writing and demonstrate her/his ability to think critically and write well. The proposal must be written in an 11pt font, single space, .5 inch margins, with the following requirements:

Feedback on Written Proposal from PI and Others

Your written proposal should reflect your own independent thinking and writing. You may initially consult with your PI on general aspects of the proposal, both in terms of the specific biological question that you seek to answer, as well as the Specific Aims Page (see below). This should be a limited discussion on the overall scope of the proposal and the broader aspects of the Aims that are proposed. You should not discuss or receive further guidance from your PI in writing the remainder of the proposal. You can however share your proposal with your peers (other graduate students and lab mates) for their feedback on your ideas - they may provide you with comments on your proposal, but should not be editing it for you

Title Page: just that – proposal's title and student's name.

Project Summary/Abstract: a summary of the entire proposal, 1-2 paragraphs and no more than 30 lines of text. Put this on a separate page just after the title page. The abstract should include a statement of the specific aims.

Specific Aims: one page, describing the major goals of the proposal in clear, concise language. The aims page should address several topics: What is the overall conceptual framework for the study? What is the rationale for constructing the framework? What does the investigator plan to do or test (without going into a lot of detail)? Proposals should have **3** logically connected specific aims, the third of which *should be a higher risk, pioneering idea*. For purposes of clarity, some proposals will contain subaims for one or more aims. Each aim or subaim should be described in one or two pithy sentences. An aims page often ends with a description of how achieving the proposed aims will advance the field.

Research Strategy (6 pages total including figures, but not including references):

Start each section with the appropriate heading - Significance, Innovation, Approach.

1. Significance

- Explain the importance of the problem or critical barrier to progress that the proposed project addresses.
- Describe the scientific premise for the proposed project, including consideration of the strengths and weaknesses of published research or preliminary data crucial to the support of your application.
- 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.

2. Innovation

- Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

3. Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Describe the experimental design and methods proposed and how they will achieve robust and unbiased results. Include how the data will be collected, analyzed, and interpreted.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.

Tips and suggestions:

1. In the Approach section, it is important to structure it such that each specific aim or subaim is a distinct subsection. Re-listing the aim or subaim at the beginning of each subsection can improve clarity.
2. Including multiple figures is highly recommended.
3. The volume written is not the point, obviously; it is the content that is important. Students should strive to ask questions that can be experimentally (wet and/or dry) tested by one or two people over a three- to four-year period. For instance, a proposed set of experiments that would abruptly end if a particular result were obtained early in the process is neither a good Qualifying Exam proposal nor a good grant proposal. Likewise, proposing a set of experiments that requires the entire output of a 10-person lab for five years is way too much and would be perceived as “overly ambitious”, a common criticism of first-time grant applicants. The student is allowed to rely on reagents and knowledge from other laboratories, but most of the student’s proposal must be based on work that s/he (and, optionally, one more person) could do in a few year period.

Note: Students have sole responsibility for the content and form of their proposal. The specific topic, questions to be asked, and experimental approach must be devised by the student. S/he may seek help from peers (e.g., a practice presentation to classmates), but input from the advisor, other senior lab members and faculty are not allowed.

Important Qualifying Exam DEADLINES

AUGUST 15 - each student should send Maria Barna (Program Director) a few sentences description of what their proposal will be on. They may suggest no more than three committee members. Maria and Wendy will arrange the committee members for each student, without a guarantee of having members suggested by the student.

If a student has not yet selected a lab, their Qualifying Exam topic should be in any area of student’s interest.

Exams will usually be taken on 2-3 selected dates in the Fall quarter of the second year.
2023 – November 15, 16 & 17

SEPTEMBER 15 -The Project Summary/Abstract

Summary/Abstract of the Qualifying Exam Proposal must be given to the Graduate Program Director and thesis advisor. This deadline serves to ensure that students start working seriously on their proposal (with no help from their advisor) in time to complete the Qualifying Exam within the specified period. Students must provide a copy of their Qualifying Exam Proposal to all faculty members on their Qualifying Exam Committee by October 15, and earlier if requested by the Committee.

OCTOBER 15 – Completed Exam Proposal

Students completed proposal should be sent to the Graduate Program Director, advisor and qual committee members for initial review. Feedback by the qual committee members will be given to student within 2 weeks. The student should make any relevant changes and resubmit an updated proposal by **NOVEMBER 8th**.

Oral Examination Format

The Qualifying Exam usually lasts about 1.5-2 hours. The student will begin with a 5-10 minute introduction summarizing their proposal (~3 slides) in as succinct a way as possible. Next, for the presentation of each aim, we suggest 3-5 slides/aim. The student should state the problem, any specific hypotheses, and the general experimental approach that will be used. The student does not need to go into specific experimental detail in this introduction, as this will be probed later with questions from the faculty. The student may also use this time to bring up any changes they decided to make in their proposal after they submitted it to the faculty. The written proposal will serve as a starting point for a broader discussion of biological principles and knowledge. *Students should practice their oral presentation with their peers/lab mates; however, their PI should NOT be present for those practice presentations.*

- After the presentation the student should summarize the suggestions from the committee and circulate the 'Outcome of the Exam' to the committee for additional feedback.

- First committee meeting should be within 6 months and the major feedback from the Qual committee should be shared with the Thesis committee at the beginning of the committee meeting (for example, have a few slides on the three or four major points and what you have done to address them over the past 6 months) Prior to the exam, each student is responsible for providing her/his committee with an "Outcome of Qualifying Exam" form, provided by the Graduate Program Administrator. Immediately after the exam, the faculty will give the student feedback on this "Outcome of Qualifying Exam" form regarding how the student did and their evaluations about their strengths and areas that need work. There are three potential outcomes of the Qualifying Examination:

1. Unconditional pass - no additional work is required.

2. Conditional pass - specific work is required to receive a passing grade, as a mechanism for the committee to provide constructive feedback and for the student to enrich their training. This would usually be additional written work or separate meetings with individual faculty to demonstrate that the student has mastered an area that needs improvement. The conditional pass is meant to help

the student and should not be perceived as a negative outcome. Typical examples of where a conditional pass may be warranted include: (1) not knowing the specific details of a commonly used technology that is being employed in your proposal (2) not knowing in depth the field that you will work on as outlined in your proposal (3) needing further guidance on oral presentation.

3. Incomplete - exam must be taken over to receive a passing grade.

Regardless of the grade, the "[Outcome of Qualifying Exam](#)" form, with signatures from the committee, and a copy of the Qualifying Examination must be filed with the Genetics Graduate Program Administrator, so it can be added to the student's Ph.D. Progress file.

If the Qualifying Exam Is Not Passed

Student Responsibilities

If the student receives an incomplete grade on their Qualifying Exam, they must retake the exam and earn a passing score by the end of Winter Quarter of that same year in order to be admitted to candidacy for a doctorate from the Department of Genetics (see below). Students should consult with faculty members and their committee for advice on how to prepare for the second exam.

Committee Responsibilities

Faculty members on a Qualifying Exam Committee should plan to offer the student advice on how to prepare for the second exam. Faculty should also be aware and remind the student that the second qualifying exam must be completed and passed by the end of Winter Quarter of that same academic year.

Admission to Candidacy

When a student has successfully completed her/his Qualifying Examination, s/he should submit an Outcome of Qualifying Exam form to the Genetics Graduate Program Administrator indicating that they have passed their exam. Once a student has passed their qualifying exam, successfully completed all required courses (exclusive of electives), and had his/her first Dissertation Committee meeting (by June 30th), s/he can be "Admitted to Candidacy" by the Department of Genetics, a process done by the Graduate Program Administrator.

Admission to candidacy for the Ph.D. program is an acknowledgment of the Student's potential to complete successfully the requirements for the Ph.D. The University requires that students in the Ph.D. program be admitted to candidacy by the end of their second year of study.

Once the student has been admitted to candidacy, the status is valid for five years subject to termination by the Department of Genetics if progress is unsatisfactory. In special circumstances, it may be renewed by the submission and approval of a new application or extended upon the Graduate Program Director's recommendation. Any interruption of graduate work longer than one month must be by official leave of absence.