

IMP QUALIFYING EXAM

General Information

The Immunology and Microbiology Program qualifying exam consists of the preparation and oral defense of a research proposal and a test of general knowledge related to that proposal. The student's examining committee will be appointed by the Immunology, Virology or Microbiology Graduate Director. Each student must successfully complete the Qualifying Exam on or before May 31st of their second year. A student who has not completed the Exam by May 31st will not be eligible for a stipend, unless an exception has been voted by the IMP Faculty.

Please refer to the GSBS Standards Document attached below for additional general information about the exam.

Timeline (for year 2 students)

1. Title due January 27, 2014
2. Qualifying Exam Committee or Research Advisory Committee appointed by Feb 3, 2014
3. Abstract of research proposal due Feb 10, 2014
4. Final abstract due on or before Mar 10, 2014
5. Proposal due four weeks after abstract acceptance date
6. Qualifying exam scheduled ≥ 10 days after proposal submission and on or before May 16, 2014

Research Proposal

A. Steps for preparing research proposal: (deadlines indicated above)

1. Each student will submit a proposal title. The qualifying exam topic may be unrelated to the student's thesis work, related to the thesis work, or, should the student have an idea of what the thesis project will be the time of the exam, on the actual thesis project. The choice should be made in consultation with the student's advisor. The proposal must demonstrate the student's ability to formulate original hypotheses, to test these hypotheses experimentally, and to interpret experimental results in the context of published literature in the field. The ideas behind the proposal should be generated by the student and not by the mentor, and should the topic be on the thesis proposal, the mentor will attest that

- the proposal represents original ideas from the student (even though the mentor may have originally steered the student onto this project).
2. The Qualifying Exam Committee (QEC) will be appointed and the student will be notified of the Committee's composition. The committee will have at least 4 members. The student's potential thesis advisor shall not be a member of the QEC. The chair and at least two other members shall be from the primary Program; at least one member shall be from another Program within the school. At least three members need to be present at the exam. The QEC will be selected to reflect the subject of the proposal along with the recommendations of the mentor and student.
 3. Each student will develop a 1 page Abstract. One page (single spaced, 1 inch margins) is the maximum length allowed, 11 pt font or larger. Proposed areas for the research proposal can be discussed with anyone during the preparation of the Abstract. Students are encouraged to discuss their choice of topic with their research advisor and to discuss their proposed experiments with committee members during preparation of the Abstract. Faculty may provide technical insight into and literature references for experimental methodologies but may not contribute to the experimental design of the proposal. Once the Abstract has been accepted, no further discussion is permitted with any faculty member. Discussion with postdoctoral fellows and other graduate students is permitted during the entire process and in fact is highly encouraged. Once the Abstract is prepared, the student should distribute it to all members of his/her Committee. The Committee will meet and develop a consensus on the student's Abstract draft, then meet with the student to discuss the Abstract. The Abstract meeting should discuss the proposed experiments in detail, with the student being asked to describe them to the faculty. Generally, the meeting with the student is at least 1 hr in length, as it is essential that the proposed experiments be clear to the Faculty in order for them to be critically assessed. Faculty that cannot attend the Abstract meeting should not participate in the exam. The Chair of the committee should take notes of the meeting and thoroughly discuss the suggestions with the student. Often, subsequent dialogue regarding a revised Abstract occurs via email. If so, the messages should be forwarded to all of the committee members as well as the student. The Abstract must be approved by the QE committee prior to development into a research proposal. It is common for students to be asked to revise their abstract based on faculty comments before its acceptance. Only one revision is permitted.
 4. Following acceptance of the Abstract, the student prepares the full-length proposal (see detailed instructions below). Students are encouraged to have postdocs and other students *critically* read their proposals. The due date for the proposal is four weeks (28 days) after the abstract acceptance.
 5. Once the proposal is prepared and submitted, the Qualifying Exam will be scheduled no sooner than 10 days after the receipt of the proposal. The Chair of

the committee will handle the details of scheduling the exam. The student's thesis advisor may not be present at the exam.

B. The proposal: (15 pages maximum, including figures, double-spaced, 1 inch margins)

Once the abstract is approved, the student is expected to prepare a full-length proposal developing the ideas outlined in the abstract. The page limits apply to the figures also, but not to the bibliography. The proposal will be an in-depth examination of the proposed topic with a comprehensive literature review.

The proposal should include the following sections and address the following issues:

1. **Introduction:** (no more than 7 pages). This section serves to introduce the problem you wish to address experimentally, and includes a brief description of previous relevant research, and an explanation of why your project is important and interesting. In the Introduction you should address the following questions, but the order of the questions will be determined by the nature of your project. What is the hypothesis that you plan to test? Why is this an interesting problem? Why is this an important problem (i.e., what is the significance)? What published work is relevant to your proposal? How do published results support or conflict with your hypothesis? Include both where appropriate. What are the experimental systems that you will use to test your hypothesis and (if it is not obvious) how do they work?
2. **Experimental Design, Results, and Interpretation:** (~8 pages). What are the experiments that you will do to test your model? Why is this the best approach? Do not list methods as a separate section and do not repeat details of published procedures (i.e., enzyme concentration, buffers, etc.) in the proposal, but you will be expected to be intimately familiar with the methodology for the oral exam. What are the anticipated results, and why do you expect them? What are possible alternative results and how would you explain them? What would you do if your experiments did not work as expected? Have you really tested your hypothesis? (If the answer to the last question is "no", start over again.) You should include those figures and tables that will help your committee understand and evaluate your proposal. Do not present your expected results as figures or tables in the written proposal, but do have them clearly thought out and do discuss them clearly.
3. **Bibliography:** Your bibliography should be sufficiently comprehensive to include all of the pertinent references. If you cite a paper, it will be assumed that you have read it and that you are familiar with its details. Cite complete references, with titles, and use the style found in either the Journal of Immunology, Cell or Journal of Virology.

C. Possible outcomes of the exam are outlined in the Standards document below.

GSBS QUALIFYING EXAMINATION PERFORMANCE ASSESSMENT			
<i>Student</i>		<i>Date</i>	
Background Knowledge			Score
Define area of study			
Recognize and explain broader significance of project			
Identify knowledge from other sources relevant to area of study			
Apply knowledge from relevant areas to proposed research			
Appraise strength of conclusions of relevant papers			
<i>Overall Knowledge Score</i>			
Hypothesis and Aims			Score
Identify the hypothesis to be tested			
Summarize evidence that supports proposed hypothesis			
Explain the significance of the hypothesis			
Evaluate alternative hypotheses with evidence-based argumentation			
Outline focused aims and relate them to the hypothesis			
<i>Overall Hypothesis and Aims Score</i>			
Experimental Approach			Score
Explain experimental design clearly and completely			
Identify assumptions in experimental plan			
Describe experiments that are feasible			
Appraise the quality of self-generated data (if applicable)			
Draw clear conclusions from experimental data			
Defend experimental rationale			
Relate all experiments directly to aims and hypothesis			
Predict an appropriate range of possible results			
Interpret potential outcomes of proposed experiments			
Propose alternative strategies			
<i>Overall Experimental Approach Score</i>			
Document Preparation and oral communication			Score
Communicate in clear, written English with proper grammar and word usage			
Compose document with minimal typographical and formatting errors			
Organize document in proposal format			
Present in clear spoken English			
Prepare high quality visual aids that clarify aims and approach			
Compose document with minimal typographical and formatting errors			
<i>Overall Presentation Score</i>			
FINAL OUTCOME (Pass; Provisional Pass; Revise; Retest; Fail)			
Scoring Rubric			
1 — Not performing. Student was unable to meet this objective			
2 — Developing. Student met this objective, but only with prompting			
3 — Achieving. Student met this objective without prompting			
4 — Excelling. Student showed unusual ability in meeting this objective			

Outcome of Exam
Pass - Student may enter into doctoral thesis research
Provisional Pass - Student may enter into doctoral thesis research but is required to take and pass the following course(s) with a grade of 'A', 'B', or 'P' the next time offered by GSBS. Required Course(s):
Not Passed – Revise - Student is required to revise the QE Proposal and may not enter into doctoral thesis research until the revisions have been approved by the committee
Not Passed - Retest - Student must retest and may not enter into doctoral thesis research until passing the retest. At the direction of the committee, this may require that the proposal be re-written.
Fail - Dismissed from GSBS

The final outcome should be selected from the range of outcomes currently used (see above), and should be a reflection of performance in each area, weighted as deemed appropriate by the committee (much like NIH study sections assign an overall impact score). A student who receives scores of 1 and 2 for all of the areas of assessment would Fail, whereas a student who receives scores of 3 or better for most the areas of assessment would Pass. A score of 2 in any individual assessment area, while acceptable, informs the student, mentor, and future TRAC of the need for improvement, and that developmental progress in those areas should be assessed by the TRAC. The worksheet is not intended to eliminate subjectivity; rather, it is offered as an aid to the QE committee for identifying student strengths and weakness and for focusing discussion of student performance on uniform criteria. The completed worksheet serves as a record of the exam and is submitted to the GSBS office for inclusion in the student's permanent record and also to the student's thesis advisor.

One member of every QE committee will be chosen from a pool of experienced, senior faculty. Previously, GSBS standards required that at least one member of the QE committee be an "outside member". Most programs are now interdepartmental, and many faculty are affiliated with multiple programs thereby blurring the definition of outside member. The original purpose for this requirement was to provide quality control and uniformity in QE standards across programs. GSBS Assembly has approved reinstatement of the outside member requirement but in a form consistent with present operation of the GSBS. The GSBS Dean will recruit and appoint several senior faculty members to fulfill this role each year. These faculty will be designated "General Examiners" (GE). The most important qualification for GE would be experience in graduate student training. The number of GE's will be determined by the number QE's to be administered that year, with the intention that each GE sit on 2-3 QE's per year. Ideally GE's would serve for more than one year with only 1/2 to 1/3 of GE's being replaced each year.

The GE has equal standing to other members of the QE, but cannot be the Chair and will not assume the roles and functions assigned to the Chair. The Chair will continue to be responsible for informing the student of exam procedure, communicating relevant details of the student's academic record to the committee as a whole, insuring fair treatment of the student during the exam, leading the committee's deliberation to determine exam outcome, and communicating the outcome to the student and the GSBS Office. The role of the GE would be to lend his/her experience to the committee as a whole, with special emphasis on "big picture" aspects. *In particular, the primary responsibilities of the GE would be to ensure that student assessment be based on the defined*

learning objectives and that final determination of pass/fail be consistent with other QE's. Accordingly, the GE need not be an expert on the subject of the qualify exam proposal.

The roster of GEs will be determined by the Dean in consultation with the Program Directors, and will be assigned to each QEC by the Dean in consultation with the Program Directors. Selection and assignments are made during the Fall semester to facilitate committee selection and scheduling. An annual orientation will outline GE responsibilities and standards for the QE. Subsequent annual orientation sessions will include an evaluation by returning GEs of the strengths and weakness of the mechanism for ensuring that student assessment is based on defined standards that extend across all graduate programs.

The role of General Examiner will be added to institutional Educational Effort calculations to ensure that the role and time commitment of the GEs are appropriately recognized. GSBS Assembly understands that most QE's are uniformly administered and that outcomes are consistent with the expectations of the majority of GSBS faculty. For that reason, it is anticipated that GE participation in the QE will be little different from that of the other members. In exceptional cases, however, the GE may have to act as a student advocate, or conversely, have to remind the committee of GSBS expectations for student performance. In either case, it is imperative the GE feel free to state his/her position; therefore, the Standards Committee recommends all GEs are tenured. The GE's vote is equal to that of the other members.