Appendix 1: Prelim Guidelines

GUIDELINES FOR THE PRELIMINARY EXAM
DEPARTMENT OF MOLECULAR AND INTEGRATIVE PHYSIOLOGY

Approved by Department of Physiology Faculty January 10, 2002
Timeline revised by the Graduate Committee September 9, 2002

These Guidelines will be distributed to all second year students, who will in turn distribute the Guidelines to his/her mentor, and to all members of the Prelim Committee.

OBJECTIVES OF THE PRELIMINARY EXAM

1. To evaluate a student’s knowledge of physiology in his/her general area of interest and to test the student’s ability to integrate this knowledge with other areas of physiology.

2. To evaluate the student’s capacity to think creatively and communicate effectively in both oral and written presentations.

3. To provide students with a unique learning experience in written and oral communication and to foster development and expression of scientific creativity.

MECHANISM (see schedule at end)

1. Prelim Committee: The Prelim Committee will consist of at least four faculty members, at least three from the Molecular and Integrative Physiology Department and at least one from outside the Department. A graduate student representative will be present at all functions as a non-voting participant. To avoid conflict of interest, the student’s mentor cannot be a member of the Prelim Committee.

The student will select a Prelim Committee Chair no later than September 15th of the second year. The Chair must be a member of the Physiology Graduate Committee to ensure that the process is done in an equitable fashion. As soon as possible after selection of the Prelim Committee Chair, the student and the student’s mentor will meet with the Chair to discuss and/or clarify the Prelim Guidelines. This meeting should be arranged by the student. The student will submit a preliminary Abstract and tentative specific aims for the Research Proposal (see below) to the Prelim Committee Chair by October 1. By October 15: the student in consultation with the Chair will select the other Members of the Committee; schedule the date and time of the Preliminary Examination (rooms for the oral exam should be reserved at this time); and distribute the preliminary Abstract and tentative specific aims to the Prelim Committee Members. Soon after October 15, the student will schedule a brief meeting with each Committee Member to discuss the Abstract and tentative plans for the Research Proposal.

2. Written Research Proposal: The student will write a research proposal according to the guidelines of an NIH pre-doctoral fellowship (see below). The student, in consultation with his/her research mentor, will choose a topic area: it should be of scope and area suitable for a Ph.D. thesis. Although the selected topic may represent the student’s planned Ph.D. thesis research, this is not required. If the Research Proposal has changed substantively
from that represented in the original Abstract submitted to the Committee (see above), the 
student must notify the Committee Members and send them a revised Abstract. The student 
should exercise originality and independence in the preparation of the Research Proposal. 
The proposed experiments and experimental design should originate with the student. 
However, the student is encouraged to seek and receive critique of the developing proposal 
by the mentor, Committee Members and other faculty. Students can have others read their 
Proposal and provide general comments regarding the clarity of the writing and feasibility of 
the proposed experiments. Students are not allowed to include specific aims and 
experiments that are part of their mentor’s grant proposals. The Research Proposal must be 
submitted no later than December 1 of the student’s second year, and the oral defense done 
before December 15, to abide by Rackham regulations. The Research Proposal must be 
delivered to the Prelim Committee Members at least two weeks prior to the Preliminary 
Exam.

Formatting and page limit guidelines can be found in the latest NIH Individual Fellowship 
Application Guide, which can be found here:


Some points that should be noted specifically (stated/paraphrased here from the Application 
Guide):

Page Limits (as of August 2012):
- Cover Page (1 Page): not present in an NIH application
- Specific Aims (1 Page)
- Research Strategy (6 Pages)
- References (no limit)

Font: Use an Arial, Helvetica, Palatino Linotype, or Georgia typeface, a black font color, and 
a font size of 11 points or larger. (A Symbol font may be used to insert Greek letters or 
special characters; the font size requirement still applies.) Type density, including 
characters and spaces, must be no more than 15 characters per inch. Type may be no 
more than six lines per inch.

Paper Size and Page Margins: Use standard paper size (8 ½” x 11). Use at least one-half 
inch margins (top, bottom, left, and right) for all pages. No information should appear 
in the margins, including the PI’s name and page numbers.

Page Formatting: Since a number of reviewers will be reviewing applications as an 
electronic document and not a paper version, applicants are strongly encouraged to 
use only a standard, single-column format for the text. Avoid using a two-column 
format since it can cause difficulties when reviewing the document electronically. 
Include page numbers in the footer area, but otherwise do not include any other 
information in the header or footer.

Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnotes: These items 
should be incorporated into the main text and count toward the six page limit. You may 
use a smaller type size but it must be in a black font color, readily legible, and follow 
the font typeface requirement. Color can be used in figures; however, all text must be 
in a black font color, clear and legible. Use figures judiciously. They are effective 
ways to communicate results and hypotheses, but they limit available space for text. 
DO NOT minimize figures to unreadable size. Committee members will ignore any 
figures that are too small to read comfortably.
**Cover Page:** Include a proposal title and student contact information.

**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, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

**Research Strategy:** Organize the Research Strategy in the specified order below. Start each section with the appropriate section heading—Significance, Innovation, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the 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) **Innovation**
   - Prelim applications need not include an Innovation section. But projects with technological components may warrant its inclusion.

(c) **Approach**
   - Discuss preliminary studies, data and/or experience pertinent to this application.
   - 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 as well as any resource sharing plans as appropriate.
   - 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.

If an application has multiple Specific Aims, then it may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively.

**References:** Provide literature citations at the end of the proposal. Each citation must include names of all authors, titles, book or journal, volume number, page numbers, and year of publication. References pages are NOT counted in the 6 page limit for Research Strategy. There is no limit on the number of Reference pages.

3. **Oral Defense:** The Chair of the Prelim Committee will coordinate the examination process and remind all present of the confidential nature of the exam and discussions. The student will leave temporarily. The Chair of the Prelim Committee will present brief
introductory comments and oversee the discussion. At this time, the Chair will ask the mentor to comment on the student’s research performance and/or exam preparation. The mentor will then be dismissed. The Chair will then review the objectives of the preliminary exam and discuss the plan for questioning the student. The student will then be invited to return to the room for the presentation and oral defense. The presentation will take the form of a research seminar based on the written proposal. Since each subject area is unique, there is no standard format for the presentation. Rather, each student should be creative in delivering an appropriate, interesting presentation of the research topic. Although the seminar may include data generated by the student to document the merit and feasibility of the research proposal, it is stressed that such data are *not required*. It is reasonable for the presentation to last 40-45 minutes, but the student should expect questioning from the committee throughout the presentation. During the oral defense, the questioning should include areas directly related to the research proposal, including the background knowledge of the student as well as experimental design and interpretation of hypothetical results. Questioning should also test the student’s general knowledge of physiology, including molecular and integrative aspects, using the research proposal as a point of departure. After this questioning session, the student will be temporarily excused and the student’s performance will be discussed. The role of the student representative is as advocate for the student being examined, and not to vote or directly question the examinee. If the student representative has concerns about the fairness or appropriateness of some portion of the examination, they should voice their concern to the committee during the discussion of the student’s performance.

5. **Determination of Outcome:** The outcome should be based on the areas identified above under “Objectives”. In determining the outcome, the Committee should consider the student’s written and oral communication skills, the level of understanding in the area of the student’s interest as well as in general physiology, the student’s ability to think critically and creatively, and to understand, explain, and defend the ideas presented. Each committee member will vote separately (pass, fail, or conditional pass) on each of the three components of the prelim: written research proposal, seminar, and oral defense. Conditional pass indicates that a substantive deficiency exists and will require that remedial action be taken as recommended by the Committee to make up deficiencies (e.g., directed readings in a particular area, revision of research proposal, additional course work, etc.). If no consensus is reached, the outcome will be determined by majority vote. If a student fails any one of the three components of the Prelim (i.e., Proposal, Seminar, or Oral Defense), the overall outcome will be fail. A failing grade implies that the student will no longer be able to continue with the program. A student that receives a failing grade may petition the Graduate Committee for permission to retake the exam.

6. **Notification and Recording of Results:** The Chair of the Prelim Committee will notify the student and mentor immediately after determination of the outcome. The Chair will also prepare a written report signed by all Committee members. The Chair will also meet with the student to verbally summarize the evaluation of the student’s performance and to convey specific strengths and weaknesses as well as any concerns of the committee. To provide critical feedback to the student, the report will evaluate the overall performance and include a summary critique of the written proposal and seminar. This report will be distributed to the student, the mentor and the Graduate Committee, and it will be placed in the student’s file.
PRELIM EXAM TIMETABLE (2\textsuperscript{ND} YEAR)

**Time Line** (anytime but not later than specified date)

September 15 Select committee chair

Soon after Student and mentor meet with committee chair to discuss these guidelines.

October 1 Student submits preliminary abstract and tentative specific aims for research proposal to committee chair.

October 15 Student selects other members of prelim committee and distributes abstract to all committee members and sets date for prelim exam.

December 1 Student submits research proposal to committee.

December 15 Research seminar and oral prelim.
Appendix 2. Mentors input to students preparing for prelims

Guidelines to Mentors Regarding Input to Students Preparing for Prelims

The Graduate Committee has become aware of questions and confusion regarding the extent to which students may receive input from faculty (mentors or other faculty) in developing the Prelim research proposal. To reduce confusion, the Graduate Committee emphasizes two points contained within the Guidelines for the Prelim Exam with some added clarifications.

• One objective of the prelim in MIP is to foster development of scientific creativity and expression and to provide a unique learning experience in written and oral communication.

Other objectives are to evaluate the students' knowledge in their area of interest, to assess their ability to integrate this knowledge to other areas of physiology, and judge their capacity to think creatively and communicate effectively. These latter objectives, as well as the student’s comprehension of the proposal itself, can and should be rigorously assessed by each student’s Prelim Examination Committee through the oral presentation of the proposal and the question and answer sessions with the student.

• The student should exercise originality and independence in preparing the research proposal. Although proposed experiments and designs should originate with the student, each student is encouraged to seek critical input from his/her mentor, committee members, other faculty and students. It is acceptable for others to comment on the rationale and justification of the hypothesis, the clarity of the writing, as well as the feasibility of the proposed experimental design, techniques and interpretation of the results. It is not appropriate for a student to copy or include specific aims and experiments that are part of a grant proposal developed previously by the mentor.

Traditionally, the “culture” of the MIP graduate program is for faculty to be available and helpful to our students. Mentors are a critically important learning resource. Students developing a proposal in consultation with their mentors, and mentors providing guidance in areas of hypothesis formation and testing, suitability of potential approaches and specific techniques, and identification of strengths and weaknesses are all entirely appropriate. This helps to provide a unique learning experience and fosters scientific creativity and expression, which are important objectives of the Prelim. Specific interpretation of these guidelines is left to the discretion of individual faculty mentors.

Finally, our hope is that each student will develop a research proposal that is suitable to submit for extramural funding. Therefore, we hope with the help of these guidelines, mentors will actively engage their students during the proposal development and use it to as an important teaching tool for their academic and career development.