

# Program in Cell and Molecular Biology

## Guidelines for the Comprehensive Preliminary Examination

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Students are required to pass a comprehensive preliminary examination for admission to candidacy for the PhD. This examination consists of preparation of a written research proposal and an oral exam which covers the candidate's entire program of study. This document provides guidelines to be used by the student and the student's graduate committee during preparation for, and administration of, the examination.

### Timing

The comprehensive preliminary exam is to be administered by the end of the 5<sup>th</sup> semester in the graduate program (Fall semester of 3<sup>rd</sup> year) by which time the student should have completed all of the required classes. Failure to comply with this requirement will result in the CMB Graduate Education Office placing a hold on registration. Exceptions may be made in extraordinary circumstances but must be approved by the CMB Academic Committee and the CMB Program Director. The student is responsible for notifying the CMB Program Office of intent to hold the examination. In addition, the student will provide the CMB Program Office with documentation (copies of the GS16 form, the proposal and the examiners' evaluation) upon completion of the exam, regardless of the outcome.

A summary of the examination process is provided below:

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Early Fall Semester of 2 <sup>nd</sup> year	All 2 <sup>nd</sup> year students should attend a Preliminary Exam Information Meeting during which the format and timing of the CMB Preliminary Exam will be discussed.
Fall or Spring Semester of 2 <sup>nd</sup> year	The student should prepare a research proposal on their own project, either as part of a grant writing class and/or in close collaboration with the primary advisor. This proposal should be shared with the examination committee at least one week ahead of a Pre-Exam Committee Meeting along with a copy of the "Guidelines for the Comprehensive Preliminary Exam" (this document).
Spring/Summer of 2 <sup>nd</sup> year or Early Fall of 3 <sup>rd</sup> year	A Pre-Exam Committee Meeting should be held at which the first research proposal will be approved / discussed. In addition, the role of the advisor, chair of the committee and format and date of the exam will be finalized. This committee meeting may also double as the student's annual committee meeting.
7 weeks prior to the exam (and <u>before</u> the last week in October)	The student should provide the examination committee with a one page document describing the Specific Aims of their independent proposal.
6 weeks prior to the exam	The committee should provide comments on the specific aims to the student (by email).
4 weeks prior to the exam	Any revisions to the Specific Aims should be approved by the examination committee (by email). The CMB Office should be notified of intent to take the examination and the date. The student should allow 2-3 weeks of full time effort to complete the proposal.
1 week prior to the exam	The final independent proposal should be handed to each committee member for evaluation, along with a copy of the preliminary examination evaluation form. The student will also provide the committee with a completed Assistance Form detailing the contributions of others to the proposal.
Day of the Exam (must be completed by end of Fall semester in the 3 <sup>rd</sup> year)	Student and committee meet for the oral examination. Committee members provide their written evaluation forms to the chair after the exam.
Within 2 days after the exam	The original, signed GS16 form must be submitted to the Graduate School. Copies of GS16 and the proposal will be provided to the CMB Office. Copies may be electronic.
Within 1 week after the exam	The chair of the committee will provide the student, other committee members and the CMB office with a summary statement describing the student's performance in the examination.

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### Preliminary Exam Information Meeting

During the fall semester, all second year CMB students should attend an information meeting during which the format and timing of the CMB preliminary exam will be discussed.

### Preparation

In order to pass the preliminary exam the student must be able to independently formulate a hypothesis and design experiments to test this hypothesis. In addition, the student needs to be able to concisely and coherently convey their ideas to the examiners both orally and on paper. To develop these skills prior to the examination the student should prepare a research proposal (Thesis Proposal) on their own project in collaboration with the primary advisor and/or as part of a grant writing class. This proposal should be shared with the examination committee prior to the Pre-Exam

Meeting to allow them to evaluate whether the student is adequately prepared for the examination and familiarize themselves with the student's research area.

### **Pre-Examination Committee Meeting**

Once the student has completed the Thesis Proposal on their own research and it has been approved by the primary advisor and/or received a passing grade in a grant writing class, they should arrange the Pre-Examination Committee Meeting. This committee meeting may also serve as the student's annual committee meeting and all committee members should be present. In addition, the CMB Program Director (or Chair of the CMB Academic Committee) should attend this meeting in order to describe the CMB Preliminary Exam and the purpose of the meeting to the Committee. The purpose of the Pre-Exam Meeting is:

- (i) To Approve the Thesis Proposal. The committee should determine whether the Thesis Proposal meets expectations and demonstrates that the student is ready for the Preliminary Examination. The student may present the proposal orally as part of CM793 or during the committee meeting, if desired. If the proposal does not meet expectations, the committee should provide detailed guidance as to what is needed to bring it up to standard.
- (ii) To Select a Chair of the Examination Committee. The chair will communicate directly with the student during preparation of the independent proposal and provide a comprehensive written evaluation after the examination. The Chair of the Examination Committee may be the primary adviser if the rest of the committee agrees.
- (iii) To Define the Role of the Primary Advisor(s). The Committee as a whole will determine whether the student's major adviser(s) may be present for the oral examination, whether they may actively participate in the examination, and whether they may vote as to whether the student passes or fails the exam. If the committee decides to exclude the primary advisor(s) from the exam process then an alternate examiner should be identified from among the CMB Faculty. In this case, it may be necessary to file a GS9A form with the Graduate School in order to include the temporary member of the committee.
- (iv) To Establish Acceptable Practices during the Writing Process. Although the primary advisor may NOT collaborate with the student on the independent proposal, the committee may specify whether the proposal can be discussed with peers, whether the student may obtain assistance with English language editing (this should generally only be considered for those students with English as a second language), and may also provide a list of acceptable topics.
- (v) To Determine a Date and Time for the Examination.

The decisions made at this meeting should be documented on the form provided (Pre-Examination Form, Page 4 of these guidelines) and the student should provide the CMB Office with a copy.

### **Format of the Proposals**

Both the Thesis Proposal and the Independent Proposal should be in the format of an NIH R03/R21 application and use the template provided on the CMB Program Website. The entire document should not exceed 7 single-spaced pages including 1 single-spaced page allocated to the Specific Aims. Margins should be no less than 0.5" and the font should be no smaller than 11pt Arial. The main proposal should be divided into Significance, Innovation and Approach sections. Figures should be embedded in the text and have a font size of no smaller than 8 pt. Use of color figures is acceptable and encouraged. References are not included in the 7 page limit. If a grant writing course specifies a different format for the Thesis Research Proposal then that format is acceptable for that document, but the Independent Proposal should still follow the guidelines outlined above.

### **Preparation of the Independent Proposal**

The independent proposal should be prepared by the student, without discussion of the approach or hypothesis with the adviser(s). The student should rely on the literature and their own background knowledge to develop a strong, original hypothesis and design an experimental approach to test it. Potential pitfalls and alternative approaches should be considered and the techniques proposed should be appropriate and state-of-the-art. The experimental approach should rely mainly on techniques other than those the student routinely uses in their own research. For example, if the student's research project extensively utilizes ELISA assays and flow cytometry, these types of assay may not form the bulk of the experiments in the proposal, although they need not be completely avoided. Additional guidelines are provided on the CMB Program Website.

The proposal should be written in English. Students who feel they are deficient in their written language skills are encouraged to consult the CSU Writing Center for assistance. Students are also cautioned that the proposal should be an original, independently prepared document. Plagiarism of ideas or inappropriate use of passages from published documents will result in immediate dismissal from the PhD program.

At the time the proposal is submitted to the committee, the student should also submit the Assistance Form (Page 5) describing the contributions of other individuals (if any) during the preparation of the proposal.

### **Evaluation of the Specific Aims**

The committee or adviser may provide the student with a list of four or five acceptable areas of study if they wish but experimental approaches and specific problems to be addressed should not be discussed. The committee is asked to evaluate the Specific Aims before the student prepares the main proposal. Comments and suggestions should be communicated to the student by email ~6 weeks prior to the oral examination. In particular the committee should:

- (i) Evaluate whether the student is proposing research in a relevant area that is neither too close, nor too far from their own area of expertise. For example, a student working on replication of HIV-1 could propose to investigate replication of an alphavirus, or perhaps examine immunity to HIV-1, but it would be inappropriate to focus on the replication of a related retrovirus such as FIV. Equally, it would be unsuitable for this student to propose experiments on plant pollination as this topic has no obvious connection to the student's chosen field of study. The committee is encouraged to use their discretion to determine whether aims are appropriate. Finally, the proposal should not overlap significantly with other projects in the laboratory supervised by their major adviser. In general, the subject matter of the proposal should be close enough to the student's own area that the knowledge garnered will enhance the student's understanding of their own research.
- (ii) Give the student guidance regarding the scope of the specific aims and make suggestions that could help focus the proposal. For example, if the student proposes too broad a study the committee members could suggest which Aims should be discarded and which expanded.

The committee should not overtly suggest better experimental approaches or better hypotheses; although it is acceptable to ask that the student formulate another hypothesis and develop new specific aims if those submitted are considered unacceptable.

### **The Examination**

At the start of the oral examination the student will give a ~20min presentation covering the material in the independent proposal. The committee will then question the student to determine how well they understand the literature in their chosen field of study as well as the background information relevant to the written proposal. The committee will also test the student's ability to think creatively and communicate their ideas orally. In addition to the material presented in the proposal, the student can expect to be questioned on material taught in BC563 and/or BC565 or other graduate classes they have completed, as well as on material they presented in the Thesis Proposal. The CMB Program Director should be invited to attend the Preliminary Exam as an impartial observer and in an advisory capacity.

### **Overall Evaluation**

An evaluation form is provided on the CMB Graduate Program Website. The independent proposal should not be evaluated as if it were being considered for funding. One goal of the preliminary exam is to ascertain whether the student understands their chosen field of study sufficiently that they can formulate an interesting and original hypothesis and develop a means to test it. The exam also tests the student's ability to communicate their ideas effectively orally and on paper. The written proposal, the oral presentation and the student's performance in the questioning period will all be evaluated.

### **Failing the Examination**

The student must pass both the written and oral parts of the examination in order to pass the preliminary exam. If performance in either portion is inadequate, the student fails the examination. In this case, if the committee agrees, the exam may be administered a second time no sooner than two months and no later than four months from the date of the original examination. The requirements to pass the second exam should be clearly defined by the committee and may include rewriting the proposal, taking additional classes and/or repeating the oral defense. If the student fails the second examination they will be immediately dismissed from the Ph.D. program.

## CMB Pre-Examination Form

This form should be utilized to record the format and timing of a CMB Student Preliminary Examination as approved by the examining committee.

Student's Name: [Click here to enter text.](#)

CSU ID Number: [Click here to enter text.](#)

Date of Pre-Exam Committee Meeting: [Click here to enter a date.](#)

Primary Adviser: [Click here to enter text.](#)

Co-Adviser: [Click here to enter text.](#)

Committee Members:

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Committee Evaluation of the Thesis Research Proposal:  Exceeds Expectations

Meets Expectations

Below Expectations

If the Thesis Research Proposal was below expectations please describe briefly how this will be addressed.

[Click here to enter text.](#)

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### **Agreed Examination Format**

Chair of the Examination Committee: [Click here to enter text.](#)

Date and Time of the Preliminary Exam: [Click here to enter a date.](#) [Click here to enter time.](#)

#### **Role of the Primary Adviser(s):**

The Primary Adviser(s) will be present during the examination Yes or No

The Primary Adviser(s) will actively participate in the examination Yes or No

The Primary Adviser(s) will vote as to whether the student passes or fails the examination Yes or No

An Alternate Examiner will replace the Primary Adviser: Yes or No [Click here to enter Name of Alternate.](#)

#### **Acceptable Practices during the Writing Process:**

The student may discuss the proposal with their peers (students and post-docs) Yes or No

The student may obtain editorial assistance to improve the English in the proposal. Yes or No

The student has been provided with a list of acceptable topics Yes or No

If yes, then briefly list the topics:

[Click here to enter text.](#)

#### **Additional Comments/Clarifications on the Exam Format**

[Click here to enter text.](#)

## CMB Preliminary Exam Assistance Form

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The student should use this form to document any assistance received during the preparation of the independent proposal. Note that such assistance is generally only permitted with the prior agreement of the Examination Committee. This form should be given to the committee at the same time as the proposal.

### Scientific Assistance:

Briefly describe any interactions with peers/faculty/experts in the area of study, if any, during the preparation of the proposal.

### Editorial Assistance:

Briefly describe any editorial assistance you received, if any. Indicate whether any editor has relevant scientific expertise.