

Department of Cell & Developmental Biology Qualifying Exam Guideline for Committee Members

The overall goals of the qualifying exam in CDB are as follows: 1) to assess the student's ability to formulate a series of hypotheses and specific aims to test these hypotheses that will likely constitute the basis for a Ph.D. dissertation, 2) to immerse the student in scientific literature relevant to the Ph.D. dissertation, 3) to assess the student's general knowledge base and aptitude for a research career, 4) to provide training in the grant writing process, and 5) to form a thesis committee to foster and monitor the student's continued development.

Pre-exam meeting

The goal of the pre-exam meeting is simply to determine whether the student's anticipated research proposal (based on a one-page abstract) will be "defendable" in a qualifying exam. The committee confers in the student's absence at the start of the meeting, which lasts one hour maximum. The student gives a ~15 minute presentation (brief background and outline of proposal) interspersed with discussion of the logic, feasibility, and scientific merit of the proposal. The committee ideally gains a clear understanding of the student's plan for the proposal, and the student ideally gains a clear understanding of the committee's expectations with regard to the qualifying exam (both written and oral components). The committee confers in the student's absence after the presentation/discussion, at which time the chair polls each member as to the suitability of the proposed research plan. Possible outcomes are as follows: approval, approval with revisions, extensive revision of abstract necessitating second pre-exam meeting.

Qualifying exam meeting

The qualifying exam comprises two parts: written proposal and oral exam. The qualifying exam meeting lasts two hours, including the oral exam and closed discussions. The committee confers in the student's absence at the start of the meeting, at which time the committee discusses whether the written proposal is satisfactory. Criteria for assessing the document include (but are not limited to) the following: hypothesis-based, scientifically sound, logical, sufficient background/review of field, sufficiently independent aims, explanation of expected outcomes, consideration of alternative approaches, well-organized, clearly written, proper grammar/spelling. The chair polls each member to reach a consensus as to whether the written proposal is acceptable or needs revision.

The oral exam consists of a ~20-30 minute presentation (brief background and specific aims) given by the student interspersed with questioning, which typically follows the flow of the written proposal. Roughly two-thirds of the overall exam time should correspond to a presentation and defense of the written proposal. Questions from the committee ideally probe the student's ability to pose a scientific question, state a hypothesis, develop reasonable strategies and alternatives to test the hypothesis, anticipate possible outcomes, and interpret these possible outcomes. Roughly one-third of the overall exam time (spread throughout the exam) should be used to probe the student's knowledge of cell and developmental biology principles in general as well as knowledge of his/her field of specialization. Committee members would ideally prepare in advance for the meeting by reading the entire proposal and identifying several lines of questioning (on both the proposal itself and general background) to pursue during the oral exam. All committee members should actively participate in questioning the student. The student's

mentor is expected to remain silent during the oral exam unless specifically addressed by the committee or granted permission by the committee to speak briefly.

Although a wide variety of questions may be deemed appropriate during the oral exam, the committee's focus should be to ascertain whether the student has established a critical knowledge base essential for understanding his/her research project and achieving success as he/she progresses through graduate school. It is the chair's responsibility to keep everyone "on track" (in terms of time, lines of questioning, and overall direction) during the oral exam. Upon conclusion of the oral exam, the committee confers in the student's absence to evaluate the student's performance. The chair polls each member to reach a consensus and three forms will be completed, two for the department and one for the graduate school. It should be noted that both the department and the graduate school allow a student to repeat the examination should the student fail the first examination.

Both the student's written proposal and performance during the oral exam must be deemed satisfactory by all committee members. Disapproval of the proposal and/or inadequate performance by the student in the oral exam (either in defense of the proposal or in general knowledge) will necessitate a redrafting of the proposal (within 90 days), a second oral exam (within 90 days), and/or additional remediation. In such cases, it is the chair's responsibility to delineate (with input from the committee) what remedial steps are most appropriate for a particular student. Examples of remediation used successfully in the past include the following: provide student with a specific reading list to augment background knowledge relevant to his/her project followed by a second oral exam to test understanding of the assigned material; student meets with an assigned faculty member for "tutorials" to remedy specific gaps in knowledge (e.g. mouse genetics) or to improve breadth of understanding of fundamental cell and developmental biology topics (e.g. discuss chapters from Alberts textbook). The chair of the committee will inform the student of the results and go over in detail the committee's evaluation at the end of the meeting.

After the qualifying exam, the chair will prepare a brief report summarizing the student's performance and outcome of the exam. The chair will ask for input from all committee members and then provide the report to the Graduate Program Manager within one week of the exam who will forward to committee members and student. Both the advisor and the student should submit a student evaluation form directly to all committee members in advance of the oral exam (student-submit with proposal; advisor-at least one day prior to exam). Committee members will use this self-evaluation form to aid discussion about the student's progress, and a final version will be included in the summary report. The report will also indicate the time frame (e.g. 3, 6, 9, or 12 months) for scheduling the student's first regular committee meeting based on the committee's recommendation.