

## **MCB Second-Year Student Review Guidelines**

Revised May 10, 2023

### **I. Objective**

The purpose of the Second-Year Review is to evaluate your progress in establishing the foundational knowledge in your research area needed to develop an impactful set of research questions that will make up the thesis proposal. It is expected that you will be continuously adding to your knowledge base through coursework, lab meetings, discussions with your PI, independent readings, journal clubs, and attending scientific seminars and conferences. Engaging in these activities will serve to familiarize you with the important questions in your field and methods with which to tackle them. **Therefore, this exercise is not intended to be an exam for which you are expected to study or cram.** Rather, the majority of the knowledge needed for this review should be the cumulation of your scientific activities to date and thus represents an initial foundation to build upon as your training continues.

In preparation for this milestone, as a second-year graduate student, you should be able to demonstrate:

- Solid foundational background on the state of the field as it relates to your research focus
- A well-defined overall objective of your project
- Progress in lab work towards defining your specific aims
- Effective communication of scientific ideas and impact of your work

### **II. General Guidelines for the Second-Year Student Review**

**A. Time of evaluation.** The Second-Year Review can be completed at any point during your second year as a Ph.D. student, including the summer, but it must be completed prior to the beginning of your third year.

**B. Committee.** Three committee members (including your PI) must be present for this review, a full 5-member committee is not required for this review. Any member of the advisory committee can chair this meeting.

**C. Preparation for the evaluation.** The following documents must be prepared in advance:

1) Your Second-Year Review Document, which must be submitted to your committee at least two weeks before the meeting. See "*III. Guidelines for Preparing the Second-Year Review Document*" below.

2) A 20-minute slide presentation composed of two sections. The first will serve as an overview of the information covered in your Second-Year Review Document. This is intended to be a visual aid for discussion with your committee. The second is a few slides that *succinctly* describe your research activities over the first two years in the MCB graduate program. As you are still near the beginning of your graduate program, some examples of these endeavors might include method and/or tool development, experimental design strategies for both wet lab and computational work, training in or modification of a technique, and any data generated by these undertakings.

3) A current copy of your Plan of Study.

**D. Format of the evaluation.** The Second-Year Review consists of two main components:

1) Discussion of your Second-Year Review Document. The review will commence with you giving a brief overview of your written document, using your prepared slides as a visual aid. This should not be a comprehensive restating of the document, as the committee will have read it prior to the exam. The committee will lead a discussion related to this document, including background material and the objectives of your proposed research project.

2) Discussion of Research Progress. You will provide your committee with an overview of your research progress to date, using your prepared slide presentation as a visual aid. The committee will then pose questions regarding your understanding of the design, implementation, and interpretation of your experiments.

Note that there may be discussion of other items, including suggested revisions to your Plan of Study.

**E. Certification of the evaluation and potential next steps.**

1) Committee recommendations and evaluation. The main goal of the Second-Year Review is for your committee to evaluate your readiness for the next steps in your graduate research (most notably, the General Exam of your third year) and to help you successfully prepare for them. It is possible that the committee may require revision of the Second-Year Review Document, additional coursework, or other training as part of the outcome of the review.

2) A report will be provided by the committee summarizing your progress towards achieving the four aims outlined in the first part of this document. These include a solid foundation in your field of study, well-defined objective of your research, progress in the lab and effective communication of ideas.

3) A signed report confirming completion of the review must be given to the MCB Graduate Program Coordinator, Chelsea Bartos (BPB 108).

### **III. Guidelines for Preparing the Second-Year Review Document**

It is expected that you will seek input from your PI before submitting the document package. Although your PI can provide input regarding the general content and organization, they cannot do extensive editing, rewriting or copyediting.

**A. Document format.**

1) The document text should be 2-3 pages, 11 pt. font, single-spaced, 0.5 in margins on all sides. The front page should include a title that summarizes the topic and questions of your project.

2) Figures are optional and can be included as a separate 1-2 pages with figures and legends referenced in the text narrative. Figures are not counted in the page limit.

3) A bibliography must be included that is not counted in the page limit. See Section C below for guidelines on bibliography preparation.

**B. Document content.** Your document should be organized into the two sections described below. Make sure to address the topics listed under each section.

**(i) Background and significance**

- Briefly describe the topic or field being examined and explain why this is an important area of research.
- Describe important or outstanding major questions in your field that your research will address.

**(ii) Research questions and statement of importance**

- Describe the objective of the project and its relationship to the gap in knowledge that you have articulated. If applicable, clearly state the central hypothesis for the work and the rationale for that hypothesis. If your project is more aptly aligned with discovery science or method/tool development, describe the question being addressed with your research.
- Describe to your audience the impact the completion of this work would have on increasing knowledge or progress in your field.
- Be mindful that hypothesis-driven research is fueled by understanding the key questions pertaining to your project and field. Identifying these questions and thinking through them will guide your overall project direction, influence your experimental design, and ensure your results have the highest impact possible.
- For projects that are not fully hypothesis-driven (e.g., method development or question-driven), it is expected that the student will clearly identify the gap that they are filling and, in the case of technology or method development, the need for such technologies and tools.
- Be sure to include what types of knowledge or data must be acquired to answer these questions and how the resulting information will be collated and interpreted.

**C. Bibliography.** Use a standard citation format from a key journal in your field. It is recommended that you use a reference manager such as EndNote, Mendeley, or Zotero.

Examples:

- Article in a journal: Sondheimer, N., and Lindquist, S. (2000). Rnq1: an epigenetic modifier of protein function in yeast. *Mol. Cell* 5, 163–172.
- Article in a book: King, S.M. (2003). Dynein motors: Structure, mechanochemistry and regulation. In *Molecular Motors*, M. Schliwa, ed. (Wiley-VCH Verlag GmbH), pp. 45–78.
- An entire book: Cowan, W.M., Jessell, T.M., and Zipursky, S.L. (1997). *Molecular and Cellular Approaches to Neural Development* (Oxford University Press).