

Thesis Proposal Guidelines
Due: Wednesday, July 12 2017 at 3pm
(Firm deadline – no extensions!)

Prepare a succinct proposal (typically 6-8 double-spaced pages, 1" margins, 12 pt font) concisely describing your proposed project, why it is important, and what you hope to learn from it. Avoid unnecessary details that do not directly pertain to your hypothesis, as that may mislead a reader.

A reader – either a member of the Harvard faculty (HDRB, MCB, CPB) or Board of Tutors in Biochemical Sciences (MCB and CPB only) – will use your proposal to determine whether your proposed project is acceptable as a senior thesis project. The reader will evaluate the proposal according to its scope, feasibility, and clarity.

A primary goal of your thesis proposal is to convince the reader that you can accomplish your thesis project in the given time frame. You can provide evidence for feasibility in different ways, including: presenting your own preliminary data; describing your lab's preliminary data; and citing the literature in your field. Preliminary data are *not necessary*; you may include key data you have obtained if it supports your thesis project.

IMPORTANT: Your research sponsors (HDRB, MCB, CPB) and Tutor in Biochemical Sciences (MCB and CPB only) are invaluable resources for feedback and suggestions on your thesis proposal, and can help you define your project and ensure that you communicate your experimental plan effectively. Make every effort to discuss your proposal with them and provide drafts of your proposal well in advance of the due date so that you have time to incorporate their comments and suggestions.

Organization:

i) Title page (1 page)

- A tentative thesis title
- Your name and your lab sponsor's name and departmental affiliation
- A short summary that frames your topic, what is currently known about it, and what you hope to learn through your thesis research. Make sure to include a statement of your hypothesis.
- A list of your specific aims; each aim should be stated in a single sentence.
 - Example: "Aim 1: Determine whether protein X binds to protein Y."
 - When crafting your aims, use specific terms such as "identify," "define," "determine," or "ascertain" rather than more passive terms such as "observe," "study," "examine," "describe," "measure," or "investigate".
 - Specific aims are a key component of every NIH and NSF grant and fellowship application, so you may want to consult grant previous applications from your lab for further guidance.

The title page thus provides an overview of your proposal. In planning your project, keep in mind:

- Thesis proposals ordinarily consist of 2-3 specific aims. Each aim should stand alone. The aims can be related or sequential, but should not depend on the success of a previous aim.
- Develop a hypothesis, develop aims that would test your hypothesis, and design experiments that will achieve your aims. Never assume that your hypotheses are correct.
- Your short summary should address why you want to investigate these aims, and why the outcome of your research is important.

ii) Background (1-2 pages)

- Introduce your project by briefly summarizing the current state of knowledge of the field.
- State your research questions and hypothesis/hypotheses.
- Describe the experimental objectives.

Optional: Preliminary data (1-2 pages)

- If you already generated relevant data that supports your hypothesis and/or the feasibility of your proposal, you may include key elements of it in a separate section between the “Background” and the “Experimental Approach.”
- Alternatively, you could include the preliminary data pertinent to each experimental aim at the beginning of the discussion of the aim in “Experimental approach section”.
- Preliminary data should only be included if directly related to your project. For example, if you had previously worked on a different project, it is not helpful to include your previous work.
- No preliminary data are necessary. Your proposal should be focused on *future* experiments!

iii) Experimental approach (2-3 pages)

- The approach section should be divided according to your specific aims, using each aim as a subtitle. The section can also contain a short introductory and/or concluding section.
- Be specific about the work you will do in a page or less for each aim; do not describe the overall research plan of your host laboratory.
- Justify the experimental approach you propose (i.e., why are these techniques appropriate to answer the question you are posing?)

iv) Works Cited

- Provide key references regarding the background and experimental design of your project.
- Use in-text citations (author, date) and include a “Works Cited” section at the end of your proposal with complete reference information (authors, year, title, journal, volume, page #s).
- You must use reference management software program. Students report success several programs including Endnote, Mendeley, ReadCube, and Zotero. The choice is yours!

Optional: Figures

A thesis proposal does not necessarily need to have a figure included. Figures or diagrams can be used e.g. to help illustrate a complicated biological process, pathway, or experimental setup since images often help convey information to the reader. For data figures, only key preliminary results, if available, should be included. The figures should each be referenced in the text and accompanied by a brief legend. They can be embedded in the text or placed at the end of the document.

Submission process:

Send to Office: Save your thesis proposal as a PDF and upload it here:

<https://lifesci.wufoo.com/forms/thesis-proposalinformation-upload-summer-2017/>

When you upload your proposal, you'll need to provide your name, email, HUID, and the title of your proposal, as well as the names and emails of your PI and direct supervisor (the person who mentors you on a day-to-day basis in the lab).

Send to Lab: Deliver your thesis proposal directly to your PI and direct supervisor in the format they most wish to see it in, whether that is PDF, a Word file, or as hard copy. **You** are responsible for getting your proposal to your lab sponsors!

Your thesis proposal will be evaluated over the summer, and we will let you know by e-mail whether your proposal has been approved or requires revision.