

ENV H 530
Research Proposal Preparation for Biological Sciences
(Proposal Writing)
[SLN 22187](#)

Fall Quarter, 2014
Requested time: MW 2-3:20
South campus center Rm 309

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Grading: 3 Credits, graded

Course Description: The goal of this course is to introduce doctoral graduate students in the biological sciences to NIH grant proposal preparation, submission, the review process, and revision. The course will focus on hypothesis-driven, laboratory bench-work based research following the NIH pre-doctoral (NRSA) fellowship format. It should help students to prepare pre-doctoral fellowship submissions as well as their general qualifying exams.

The course will consist of some formal lectures, presentation of research articles to be used as the common basis of the proposal, proposal preparations, reviewing and critiquing each other's proposals, revision of proposals based on the comments received, and final presentation/review of the revised proposal.

Formal lectures will be given on the fundamental principles and processes of grant preparation and submission, including animal care. Guest lectures and panel discussions will be offered by 1) experienced PIs with outstanding track records at securing NIH funding and have served on regular NIH study sections; 2) UW faculty who serve on NIH study sections reviewing fellowships; 3) UW graduate students/postdoc who have successfully competed for NRSA fellowships.

In addition to lectures, research articles on 2-3 different topics will be chosen by the instructor, and presented by students in the beginning of the class. This serves several purposes: 1) The use of a common set of the articles provides common platform for all to work on to facilitate classroom discussion, making it easier and meaningful for everyone in the class to review and critique each other's proposals; 2) Learn the concept of high quality preliminary data, and how to formulate novel yet testable hypothesis based on the preliminary data. The exact article, topic, and number of articles will be decided based on the number and areas of training of the registered students.

Alternatively, students can elect to write a proposal related to their thesis project. Such students will provide one paper for the class to read to gain background information, and will give a presentation to provide sufficient background information for the class.

The presentation slides will be submitted to the instructor and posted on class website for later references for reviewers.

Each student will then write their first submission of the proposal, based on one of the chosen topics and articles discussed in the class. The proposals will be distributed to the class for review and critiquing; 2 primary reviewers will be assigned to each proposal and will provide a written critique—either as a separate document

or mark as track change of the proposal. The written critique needn't be formal, can simply list the pertinent points. Each student will then present their proposal to the class, and the class will review the proposal in "mock" study sections with comments and criticisms. The 2 primary reviewers will lead the discussion. At the end of the panel discussion, everyone will provide a score (anonymous).

The student will then revise their proposals based on the critiques, which will be presented and reviewed again by the class. The same primary reviewers will be assigned to each proposal and will lead the discussion.

The goal is to obtain intense hands-on experience in writing and revising of a proposal. In addition, presentation style—how to give a good presentation, how to prepare slides, will be emphasized, and feedback given by the instructor and the class.

Learning Objectives: At the end of this course, the student will be able to

- 1) Describe the fundamental principles of grant writing
- 2) Be familiar with the grant submission processes
- 3) Demonstrate skills in formulating a novel, highly focused, and testable hypothesis
- 4) Demonstrate skills in formulating specific aims
- 5) Demonstrate skills in designing state-of-the art, yet feasible methods to address the specific aims
- 6) Demonstrate an ability to revise a proposal based on critique.
- 7) Demonstrate critical thinking skills about the content of scientific proposals in the context of the general hypothesis of the grant
- 8) Understand the principles of original writing and how to avoid plagiarism
- 9) Demonstrate skills in the critique of peer proposals in a constructive way
- 10) Demonstrate an ability to present the critique in a mock "study section" panel made up of peer students
- 11) Develop and display teamwork skills in the grant reviewing process

Intended Student Audience: PhD degree graduate students in the health and biological sciences, whose research focus on biochemical, molecular and cellular mechanisms of biological functions. They include but are not limited to those students from the Toxicology program in the Department of Environmental and Occupational Health Sciences, the Department of Pharmacology, the Department of Physiology & Biophysics, the MCB graduate program, the Department of Biochemistry, and the Neurobiology and Behavior graduate program.

Course Requirements:

- 1) Attend class sessions every week. Students are expected to attend all sessions unless it is a medical or family emergency. Each unexcused absence will result in a 2-point reduction in your grade.
- 2) Participate in group-presentations of the chosen research articles that will be used as the basis for research proposal
- 3) Write a first submission of the proposal and present the proposal to the class.
- 4) Read and Critique fellow students' proposals—both 1st and revised submissions.
- 5) Participate in class discussions and peer review.
- 6) Revise the proposal based on the critiques.

Grading:

	<u>Points</u>
Presentation of background/hypothesis/specific aims	5
1 st submission of the research proposal	10
Grant review as primary reviewers	20 (5 each x 4)
Revised proposal	60
Participating class discussion:	5
Total	100

Proposal grading will be based on student peer scoring (40%) and Instructor's scoring (60%). For example, for the 1st draft proposal, the best score is 10 points; of which instructor can give a score of 0-6 (6 being the best) and peer will give a score of 0-4. For the final proposal, the best score is 60 points; of which instructor can give a score of 0-36 and peer will give a score of 0-24 (24 being the best).

Readings:

No required text.

Hand-outs and articles will be distributed by instructors.

Peer proposals—1st and revised submission.

Accommodations:

Students with disabilities are welcome to request academic accommodations. To request academic accommodations due to a disability, please contact Disability Resources for Students, 448 Schmitz Hall, 206-543-8924 (V/TTY). If you have a letter from Disability Resources for Students indicating that you have a disability which requires academic accommodations, please present the letter to Zhengui Xia (instructor) so we can discuss the accommodations you might need in this class.

Date	Topic	Presenter
Sept. 24	General introduction I- Basics of proposal submission etc.	Xia
Sept. 29	General introduction II--Basic principles for proposal writing	Xia
Oct. 1	A specific example of proposal	Xia
Oct. 6	How to revise--a specific example	Xia
Oct. 8	Presentation: background/significance/hypothesis/specific aims	Students Group 1
Oct. 13	Presentation: background/significance/hypothesis/specific aims	Students Group 2
Oct. 15	Presentation: background/significance/hypothesis/specific aims	Students Group 3
Oct. 20	Presentation: background/significance/hypothesis/specific aims	Students Group 4
Oct. 22	Presentation: background/significance/hypothesis/specific aims	Students Group 5
Oct. 27	Panel discussion led by guest student/postdoc panel	Alison Mehravari (N&B)/Alison Mehravari (N&B)/ Mario Rosasco (Pharm.)/Dr. Roque (Tox)
Oct. 29	Lecture and panel discussion with faculty experts	Drs. Sullivan, Costa, and Kavanaugh
Nov. 3	Review discussion of 1st proposal	Students Group 1
Nov. 5	Review discussion of 1st proposal	Students Group 2
Nov. 10	Review discussion of 1st proposal	Students Group 3
Nov. 12	Review discussion of 1st proposal	Students Group 4
Nov. 17	Review discussion of 1st proposal	Students Group 5
Nov. 19	general classroom Q & A for revising	Xia
Nov. 24	Review of final proposal	Students Group 1, part 2
Nov. 26	Review of final proposal	Students Group 2/3
Nov. 27	Thanksgiving	
Dec. 1	Review of final proposal	Students Group 3/4
Dec. 3	Review of final proposal	Students Group 4/5