

Goals

Work on a small, independent project that demonstrates mastery of the microscopy skills learned throughout the class. The project scope should be small enough to accomplish within the allotted time using the resources available in the class lab.

Important Dates

Feb 5	Proposal due.
Feb 10	Meet for feedback on proposals.
Feb 10-Mar 11	Work on final project.
Mar 9-11	Oral Presentations.
Mar 16	Written report due.

Assignment

No late assignments will be accepted.

Choose an independent project to design and execute. You are welcome to work in small groups if you wish though each person will write their own report. Choose something that is of interest to you. Something relevant to your research is also appropriate. This project can be related to a specific assignment done during the class.

Requirements:

1. Choose a sample to image. Besides the slides and the live organisms used during the class, you may also choose an organism or cell line related to your own research. However, you must provide the necessary samples and related reagents or supplies. The course will be happy to buy reagents for your project but make sure to leave enough time for delivery. If you have any questions, ask the instructor or TA.
2. You must incorporate confocal or light sheet microscopy in your project.
3. Write a proposal for your final project.
4. You must present on the last week of class (March 9 and 11).
5. Each student must submit a written proposal on Feb 5th and a written report no later than Mar 116.

Project Proposal

Include enough information so that the instructors and TA can understand what you want to do and determine the feasibility within the constraints of the class. The goal of the proposal is so that we can help you design an experiment that can be accomplished in the allotted time. We will give you feedback and recommendations for modifications to your experiment to fit within the time and resources of the class, but we will not design the experiment for you. If you propose something that may not work, we will allow you to fail, but we will make sure that you can fail within the time allotted and give a presentation and report on what happened. Be sure to address the following points in the proposal (worth 16 pts):

1. Explain your sample/organism and describe how you will image. (3pts)
2. Explain the problem you hope to solve or explore. (4pts)
3. Include an expected timeline. (Do samples need a week just for preparation? Do you need to image a time lapse over 1 hour or 2 days?). (3pts)
4. Include an itemized list of all necessary supplies you want the class to provide. Preferably, these items should be available at the campus stockrooms. If they are not available in the stockrooms, you must either provide these items yourself or give us enough time to order them for you. (3pts)
5. Include at least 1 outside reference, such as a journal paper, showing feasibility. A full copy of the reference must be included. (3pts)

Project Written Report

The written report (5 to 10 pages) must cover each of the points addressed below (34 pts).

1. Introduction to the topic/problem. (3pts)
2. What role does confocal microscopy play in addressing the problem? (3pts)
3. What was your specific approach and results? (4pts)
4. What techniques did you use that were or were not taught in the class? (3pts)
5. Describe the methods required to recreate the experiment.
 - a. Sample preparation. (3pts)
 - b. Imaging. (3pts)
6. What problems did you encounter and how did you or would you solve them? (3pts)
7. What would be the next set of experiments? (3pts)
8. Relevant references cited? Be sure to include at least 1 outside reference showing interest and relevance to the current scientific community. Include the references from the proposal. (3pts)
9. Image quality. (3pts)
10. Figure captions & annotations. (3pts)

Hand in a paper copy and electronic copy. Include all original, unaltered images used in the report burned on a CD or sent in a zipped file. If you take a time lapse, include the relevant movies. Each person should hand in a separate CD or zipped file. Clearly label the CD or file with the words "Bi227 2020 Final Project" and your name.

Project Presentation

This should be an abbreviated version of your written report in which you focus on your approach, results and problems. Please practice ahead of time and make sure that your movies play. Aim for a 10-minute presentation. The presentation will be graded the same way as the weekly assignments.