

iLab: Fall 2020 Lab Rotation Plan

This Fall, it is possible that Lab Rotations might initiate in a remote mode. In that case, the plan below ensures that such a remote start can be configured to accelerate achieving the same goals as in-lab rotation. Specifically, in close consultation with your rotation advisor, you should:

1. Develop an understanding of the lab's culture.

Rotations are used to learn about the strengths and weaknesses of the lab as they relate to your background and desires. To accomplish this goal while working remotely, you should:

- a. Take part in all lab meetings and journal clubs, and do so actively.
- b. Arrange time to meet and talk with individual lab members, and discuss their projects.
- c. Join in the more social (though still 'remote') lab events.

2. Develop background knowledge and skills.

- a. Work with your mentor to define a list of relevant background papers to read and to discuss with the mentor, as well as with other lab members (one to two papers per week).
- b. Identify lab-relevant skills that can be developed remotely (e.g., programming, data-mining). Again, work with your mentor to devise a plan that establishes specific goals, with recommendations for the amount of time you should devote developing these skills.

3. Develop a project plan.

In some cases, your experience will be similar to a usual rotation (e.g. analysis of existing data or developing theory). However, in many cases you will be developing an experimental plan to be executed in-lab at a later time. This plan, developed in consultation with your rotation mentor, should:

- a. Define the goal of your project and its scientific foundation, usually from your reading list.
- b. Define the hypothesis to test. Does the previous work suggest a specific hypothesis that you will be testing? If so, state it as succinctly as possible. Not all projects start with an hypothesis, and instead require developing new data sets, or interrogating data that already exists to generate hypotheses to test. If this is the case for your project, state the rationale underlying this need.
- c. Determine the appropriate experimental approach(es) to be used for this project. In some cases, there may be online resources, or short courses, to consult that will provide background and training in a technology or approach. List these resources, and schedule discussions of the material with peers in the lab. Ideally, you might tackle this collaboratively with one or two colleagues from lab who have been meaning to view or review the material themselves.
- d. Develop a detailed experimental plan. The specifics of this plan will depend on the nature of the research, but in general there are several points that you should consider: **i)** What, if any, reagents need to be validated, and how will that be done? **ii)** How will data be acquired? For example, will there be experimental and control groups? **iii)** How much data will be collected? Can you do a power analysis? **iv)** Will you pre-register your experiment? **v)** How will you organize your lab notebook in terms of describing the experiments? Will you use an electronic notebook (e.g., LabArchives)? **vi)** Will you have inclusion/exclusion criteria for your data, in terms of what will be used in your analyses? **vii)** How will you visualize your data? **viii)** What analyses will you use? How will record those analyses (e.g., code on GitHub)? How will you use those analyses to determine if the data do or do not support your hypothesis?