

BIOL 494: Research in Plant Biology: Assignment Overview

Weekly Research Journal: 1-2 Journal Entries in your research journal, depending on the week. (12 total weeks)

Research Journal Entries are:

- Free form writing on our readings, discussion, and your ideas for research.
- Mary will read weekly and respond, you can use this as a slow dialogue as well.
- Label each page a new week (ie "Week 2: Jan XX) at the top

Personal Goals: Part of this class is to help you work on goals related to the course - in and out of your academic life. This can vary based on your needs and interests, but can include: honors projects/capstones, REU and summer job applications, networking about careers with alumni and colleagues, informational interviews, grad school planning, etc.

We will have 4 short assignments/meetings based on this:

- 1) Goal Setting Statement and Timeline
- 2) Accountability Check 1 / Proof of Progress Meeting
- 3) Accountability Check 2 / / Proof of Progress Meeting
- 4) Goal Celebration Plan / Celebration

Leading Journal Club (2 total): Each student will pair up and lead journal club 2 times over the semester, once before spring break, once after. Leading a journal club means you are in charge of setting up the discussion, answering questions (when you can) and providing discussion topics. All other students are responsible for reading the papers and being involved in discussion. Papers are pre-selected, but you can find others if you are interested.

Lab Meeting Presentation (4 total): Every other week students will present their progress and questions to the lab to get feedback. This can be on the board or with slides. This is a good time to ask for help to the group, or showcase a finding and idea for feedback.

Research Activities:

All students will practice and accomplish a number of 'research skills' through our class activities. These will include:

- Reading primary literature (Journal Club, Lit Review/Proposal)
- synthesizing science literature (Lit Review/Proposal)
- science writing with citation (Lit Review/ Proposal)
- Experimental design (Proposal, Lab meetings)
- Hypothesis building (Proposal, Lab meetings)
- Data analysis and exploration (Data Progress Reports)
- Data visualization (Data Progress Reports, Poster, Oral Pres)
- Applying and interpreting statistics (Data Progress Reports, Poster, Oral Pres)
- leading discussions/teaching (Journal Club, Lab meetings, Oral/Poster Pres, Crash Courses)
- Poster presentation of research
- Oral presentation of research
- Peer review of other's work (Lit Review/Proposal, Data Progress Reports, Lab meeting, Posters)
- Science communication to a general audience (Posters, Oral pres, broad audience article; other like "Couch to 10 trees", zine, etc)

Lit Review/Proposal

As we begin our projects, you will write concise literature reviews and proposals in the format of the NSF Graduate research fellowship proposal. This is a prestigious fellowship that many first and second year PhD students apply for. It has to be both broad and specific, include hypotheses and your planned methodology. It is only 2 pages single spaced, and includes references (can be on the 3rd page), so being concise is key!

Details on the GRFP are here: <https://nsfgrfp.org/applicants/statements/> Mary will provide feedback that can be addressed and revised. This MIT site might be helpful too: <https://mitcommlab.mit.edu/broad/commkit/nsf-research-proposal/>

Data Progress Report

The data progress reports are short (2-3 pages) communications about the state of your analysis. This can be in an Rmd or doc format and include 1-4 figures or tables, a description of your analysis approaches and plans for moving forward. Think of it as a way to update Mary and your team about your project's status and get feedback. You can ask questions in the report too, as a way to get more directed feedback on visualization or statistical approaches.

There are two due through the semester, you set up the timelines and alert Mary when you submitted it in your Drive folder. Mary will aim to give you feedback within a week.

Science Communication Project

Individually or in small groups (2-3) you will come up with a science communication project related to plant biology or ecology. This can take the form of an op-ed article, an infographic, a zine, an educational brochure, etc. Brainstorm and get approval and feedback from Mary. Due any time before end of semester so it can be shared in class.

Fixed Deadline Assignments:

- Lit Review & Proposal (GRFP) Feb 19 first full draft
- Posters (end of course)
- Oral Presentation (end of course)
- Journal Club (2x total)
- Lab Meeting (every other week)
- Research Journal (weekly)

Variable Deadline Assignments:

- **Science communication project** - due anytime during semester, can be done in pairs if you want.
- **Data Progress Reports** - 2 due through the semester. DPR will have a number of plots and statistics with descriptions and interpretations about your findings. Mary will provide feedback via Drive or in person.
- Accountability Checks on Personal Goals