Microbiology Program Advising Guidelines
Yale University

Introduction

This document outlines the expectations of students and thesis advisers in our graduate program and serves as a companion to our graduate program handbook. We recommend that all students and thesis advisers read our handbook. The central goal of conducting PhD studies in the Micro programs are:

- Mastery of relevant resources and methods
- Original contribution to knowledge in the field

Selecting a Thesis Adviser

Selecting a Thesis Adviser is the most important decision in the first year. There is great diversity in mentoring styles. One lab and mentor that works well for one student, may not work well for another. To increase good matching between student and mentor expectations, we advise students and mentors to have conversations about the following topics. We also highlight the importance of using rotations to determine the best scientific match for you.

1. Norms of communication: How often will a student and adviser meet? What communication method(s) (email, in person, Slack, etc) does the adviser prefer?
2. Time: What are the normal hours of operation in the lab? What is the policy on vacation and time off for religious observances and holidays? What are the expectations for research on weekends or at night?
3. Thesis project: What is the role of the adviser and student in formulating a project? How much will a project overlap with projects of other members of the lab?
4. Feedback: Is feedback provided one-on-one, in lab meetings, both?
5. Authorship: What are the lab's rules on who is an author and who is a first author?
6. Publications: Does the adviser expect a first author paper prior to graduating? (Note that some graduate programs may already have expectations on first author papers.)
7. Conferences: What is the lab's policy on attending national/international conferences?
8. Career/professional development: How much time is available to participate in career and professional development activities? What role(s) would the adviser play in career/professional development?

Following these conversations, each student will select a formal thesis adviser in the spring of the first year. For 1st-year students, framing the selection of a thesis advisor "following these conversations" may minimize the importance of the scientific topic in selecting a thesis lab. If the answers to Q1-Q8 above are all great but the project isn't exciting to the student, it is not a good match.

If a student subsequently needs to switch to a new thesis adviser, the student should consult the Director of Graduate Studies (DGS) far in advance of the change. We would like to acknowledge that there are many reasons a student may need to change labs, and would benefit from making the switch early in their

graduate career. As stated above, there are different types of mentorship and the match between a student/advisor may prove untenable. This is an acceptable reason to change labs, in consultation with all parties and the DGS. Science is difficult and setbacks are a normal part of the PhD process. Students should work with their advisor, thesis committee, and DGS to explore ways of addressing issues before switching labs and thesis projects.

The Student and Adviser: Your Shared Responsibilities

a. *Communication*. The student and adviser share responsibility for establishing and maintaining a respectful advising relationship. You should meet early in the relationship to agree on expectations for how often to meet, how frequently to communicate, and via which mechanisms (email, in person, text, Slack, etc.) to communicate.

    a. *Recurring dialogue*. Our program encourages all students and advisers to keep an open dialogue about expectations and responsibilities. To facilitate these conversations, we provide a list of possible topics to discuss. At a minimum, this is part of the form for both joining a thesis lab and as a yearly one-on-one meeting, though we encourage all students and advisers to have these conversations frequently over the course of the graduate career.

b. *Research*. You both also share responsibility for carrying forward the thesis project. Initially the adviser will take the lead in designating the research plan and designing experiments, and over time the student will take increasing responsibility for the project. You are both responsible for the design of rigorous and reproducible experiments and for ensuring that the research is conducted ethically. Our handbook has more guidance on selecting a thesis committee. You will work in partnership to select faculty for this committee (see our handbook for more information).

The Adviser: Your Responsibilities

Adviser's responsibility is to help a student to acquire mastery of relevant resources and produce an original contribution to the field.

a. *Communication.* As noted above, communication is a key aspect of an advising relationship. It is important to maintain regular communication with your student and to alert your student to anticipated delays in responding.

b. *Research*. You are responsible for overseeing the overall research plan for your student, for securing funding to conduct the research, and for providing the materials and equipment necessary to carry out experiments. Students are also encouraged to obtain external funding. Guide your student in troubleshooting technical problems and interpreting data, and provide regular feedback. Finally, expect to review and sign the annual Dissertation Progress Report each May, beginning in the student's 3rd year of study.

c. Maintain an environment that is conducive for success. Safe and inclusive work environment, mediating disputes between lab members.

d. *Research findings*. Make sure to communicate roles, responsibility, scientific merit, and requirements of authorship of a scientific manuscript early in a student's tenure in your lab. Provide guidance on writing manuscripts, and review drafts in a timely manner. Additionally, provide opportunities for your student to present research at national or international meetings and to practice these presentations before you and your lab.

e. *Career and professional development*. Yale offers many resources for students to develop their skills and prepare for careers both within and beyond academia. At the same time, the thesis adviser can profoundly influence a student's development and career trajectory. Meet with your student regularly to discuss career goals, assist with networking within the field, and provide opportunities for your student to develop mentoring, grant writing, and other skills off the bench. There are many exciting and interesting careers available to trainees. As an advisor, you should encourage your trainees to make use of the Office of Career Strategy.

f. *Time*. Share the norms for typical hours of operation in your lab, explain that some experiments may require deviating from these norms, and note whether you encourage in-person attendance vs. remote research activities. Plan to accommodate your student's academic responsibilities such as coursework, teaching, qualifying exam preparation, required seminar attendance, etc. Likewise, anticipate that your student will devote time to career and professional development activities outside the lab. Similarly, we encourage trainees to have a healthy work-life balance, therefore you should anticipate students to take time off outside these other activities as well. Also discuss your concerns if your student is devoting too little (or too much) time to research activities.

g. *Letters*. Discuss with your student your willingness to write letters of support for fellowship applications and job applications. Note how far in advance letters should be requested.

h. *Health and well-being*. Although students are responsible for maintaining a healthy balance in graduate school, you should promote your student's health and well-being by creating a welcoming and positive lab culture, placing limits on time in the lab, accommodating our graduate program's 2-week vacation policy, and advocating for your student's overall well-being, through direct discussions with the student as well as engaging outside resources. Of note, advisors are not health professionals. Students should seek professional medical and mental health support whenever needed.
    a. *Vacation policy*. As per the BBS guidelines, students are guaranteed 2 weeks of vacation in addition to the university wide winter break. Additional time off should be discussed between the advisor and the student.

i. *Seeking help*. Please turn to the DGS, thesis committee, and/or GSAS Dean's office if you have concerns that you are unable to resolve directly with your student.

The Student: Your Responsibilities

Student's responsibilities include pursuing original and high impact scientific research, developing critical thinking and scientific interrogation skills, maintaining research rigor and integrity, sharpening scientific communication skills, as a collegial and responsible team member.

a. *Communication.* As noted above, communication is a key aspect of an advising relationship. You should maintain regular communication as well as alert your adviser when either personal or academic obligations may cause delays in communication or result in an unanticipated absence. Be receptive to scientific comments and address scientific questions professionally.

b. *Research*. You are responsible for driving forward your thesis project, managing your research obligations amidst other academic responsibilities, completing your annual Dissertation Progress Report on time, and scheduling annual thesis committee meetings. Dead ends, changing direction, and technical obstacles may be part of the process and experiencing these situations are often part of the PhD. Work with your advisor to advance your project in these situations. You should submit an update to your Thesis Committee members at least one week in advance of the meeting. Be open to critical feedback from your adviser and thesis committee members. Ask questions if you do not understand the feedback they give you; follow up with a plan to address the issues they raise.

c. *Research findings*. Disseminating research findings is a critical aspect of becoming a scientist. You should work with your adviser to prepare drafts of manuscripts, and seek opportunities to share research findings in departmental seminars and at national or international meetings.
    a. Take advantage of workshops and resources provided by the Poorvu Center and the Graduate Writing Lab to develop your writing and presentation skills.
    b. Graduate students are responsible for a once-yearly departmental Research in Progress talk, beginning their third year.
    c. Ask your advisor early on what their philosophy regarding manuscript preparation is. Suggested questions to spark conversation are listed in the *"Mentorship Questionnaire"* guide.
    d. We advocate going to at least one conference during your graduate tenure. Presenting a poster is a great way to practice your science communication, and network with other scientists. Discuss with your advisor to ask if there are resources to help fund your travel!

d. *Lab citizenship.* You should respect your lab members regardless of their academic rank or background. You should actively support the scientific progress of the lab as a team member, be responsible for lab chores and maintenance, maintain professional and collegial communications with other lab members, respect other people's time and space, participate in group lab activities, and maintain research rigor and integrity of the lab.

e. *Career and professional development*. Begin mapping out your career plans early in graduate school through an individual development plan, such as via https://myidp.sciencecareers.org.
    a. You should provide annual updates to your adviser and thesis committee about potential career plans and determine which professional skills you should develop in anticipation of your desired career path.
    b. Look for career and professional development opportunities through the Poorvu Center, Office of Career Strategy, and other Yale offices.

f. *Time*. You should plan to conduct research according to the expected hours of operation of the lab, meet the academic deadlines of our graduate program, and notify your adviser in advance of academic time commitments and deadlines. A thesis project is a time-intensive, years-long endeavor, and you can anticipate working hard on your project. Time management skills will be essential, and you should work with your advisor to evaluate time management decisions? At the same time, as noted below, time away from the lab is critical for overall health. If you are uncertain about what the lab expectations are, please ask your adviser to clarify them.

g. *Letters*. Discuss with your adviser in advance your need for letters of support for fellowship applications and/or job applications. Follow your adviser's guidance on when to request these letters.

h. *Health and well-being*. It is important for you to develop a healthful lifestyle. Taking time to eat a healthful diet, exercise, and get adequate rest does not detract from but rather improves academic performance and research productivity.
    a. Explore the health and wellness resources available at Yale, such as through Yale Health, Mental Health, the Payne Whitney Gym, and the Wellness Center.
    b. Leave policies. Graduate students are encouraged to take medical leave and bereavement leave, if necessary. The time needed for these will depend on your situation, and often is not predictable. You should feel comfortable to take the time you need. Make sure to communicate your needs with your advisor and the DGS during these processes. Access the universities policies for leaves of absence here (https://gsas.yale.edu/academic-requirements/registration-courses/student-registration-status).
    c. Medical, bereavement, and personal leave are available to graduate students. There are many different paths to take leave, we encourage students to communicate your needs with your advisor and the DGS during these processes.
    d. The Dean's office has funds that can be accessed for students with unexpected needs, some of which may be used to cover issues of medical, bereavement, or personal leave. Find more information here (https://gsas.yale.edu/resources-students/finances-fellowships/funding-phd-students/deans-emergency-fund).

i. *Seeking help*. Your DGS, thesis committee members, and/or GSAS Dean's office are available if you encounter issues that you are unable to resolve with your adviser or for which you need additional assistance. Turn to these individuals as well for mentoring to supplement the guidance offered by your adviser.
    a. Office of Diversity, Equity, & Inclusion
    b. GSAS Dean's Office
    c. Office for Graduate Student Development & Diversity
    d. Yale SAS – Student Accessibility Services
    e. Yale Microbiology Program Student Siblings

Thesis Committee

A full description of the composition and roles of the committee are described in our handbook. Important responsibilities noted here include the following:

a. At the student's request, committee members should make themselves available to meet one-on-one to offer research guidance, career advice, and/or assistance in navigating conflicts with the adviser.
b. Committee members should review the progress report documents provided by the student in advance of each committee meeting.
c. At the committee meeting, members should provide constructive feedback as well as complete a formal evaluation form.
d. The committee will determine when all experiments necessary for writing the dissertation have been completed so that the student may commence the writing process.
e. Committee members should thoroughly review the written dissertation and provide written comments.
f. Committee members may sometimes serve as readers of the final version of the dissertation.
g. Committee members are expected to attend the thesis seminar.

Director of Graduate Studies

The DGS oversees the overall academic program, and more information about the DGS' role is noted in our handbook. Responsibilities related to advising include the following:

a. The DGS approves the student's course schedules, thesis adviser selection, annual thesis committee forms, qualifying exam form, and departmental recommendation form for degree conferral.
b. The DGS also tracks overall academic progress and meets with the student to discuss meeting academic milestones.
c. At the student's request, the DGS will meet with the student to help resolve problems with the thesis adviser and/or with thesis committee members and may also provide academic and career guidance.
d. As appropriate, the DGS will direct the student to other resources such as GSAS deans, Title IX office, Office of Institutional Equity and Access, Student Accessibility Services, and Yale Heath.