Experimental Pathology Advising Guidelines
Yale University

Introduction

This document outlines the expectations of and between students, thesis advisors, and mentors in our department and serves as a companion to our graduate program handbook (https://medicine.yale.edu/pathology/training/graduateprogram/expath_forms/). Together these documents will serve as critical references for you and your advisor. Remember that each will be updated periodically and always refer to the most recent version.

Selecting a Thesis Advisor

Our handbook provides guidance on finding rotation advisors and conducting lab rotations in the first year of study. In the spring of the first year, each student will select one formal thesis advisor. A student may declare two faculty to serve as equal co-advisors if the research project benefits from their combined expertise. Suppose a student subsequently needs to switch to a new thesis advisor (due to faculty departure from Yale, change in student's research interests, etc.). In that case, the student should consult the Director of Graduate Studies as soon as the situation arises.

The Student and Advisor: Your Shared Responsibilities

a. *Communication*. The student and advisor share responsibility for establishing and maintaining a respectful and collaborative advising relationship. Before or shortly after (less encouraged) committing to an advisor-student pairing, you should meet to agree on expectations for how often to meet, how frequently, and via which mediums (email, in person, text, Slack, etc.) to communicate.

b. *Research*. Carrying forward the thesis project is a shared responsibility. Though each project is different, the advisor may likely take the lead in designing the research plan and suggesting experiments at first. Over time the student can take increasing responsibility for the project directions and experimental design. **Advisor,** make sure to outline new projects with the student specifying how much of the project will be the student's responsibility, if/how the project fits into other projects, and what collaboration/personnel support the student may have access to (e.g., if there is a lab technician hired for this project. For collaborators, specify who will be responsible for maintaining communications). Pre-candidacy, you and your advisor should jointly establish project/personal goals and timelines and decide how strictly you should both adhere to them while maintaining a degree of reasonable deviation expectations due to unforeseen circumstances. After candidacy, you should also discuss these joint plans with your committee members.

The Advisor: Your Responsibilities

a. *Communication.* As noted above, communication is a key aspect of an advising relationship. It is important to maintain regular communication with your students and alert them of changes in your communication dynamic or anticipated delays in responding. Be as concrete as possible about your expectations regarding frequency, after-hours availability, format, etc.

b. *Research*. You are responsible for overseeing your student's overall research plan. Ensure you specify to what extent a student is/is not expected to secure external funding and materials. Guide your student in troubleshooting technical problems and interpreting data, seeking out and participating in related collaborations, and provide regular feedback. Finally, expect to complete and sign the annual Dissertation Progress Report each May, beginning after the student's prospectus is approved.

c. *Research findings*. Make sure to detail your policies on authorship early in a student's tenure in your lab. Discuss with your student their goals for participating in peer review and contributing to writing review articles and manuscripts beyond their project. Provide guidance on manuscripts, and review drafts in a timely manner. When possible, provide opportunities for your student to present their research at a conference. Note they may need help developing a presentation style in advance of these opportunities.

d. *Career and professional development*. Yale offers many resources for students to develop their skills and prepare for careers both within and beyond academia. Understand that staying in the academy will not be an appropriate choice for every student and that your mentoring may need to be adjusted based on your student's goals. As an advisor, you profoundly influence your student's development and career trajectory. Meet with your student a minimum of once or twice a year to discuss career goals (more encouraged), assist with networking within the field, and provide opportunities for your student to develop mentoring, grant writing, and other skills off the bench. Encourage the use of the Office of Career Strategy resources if your student is interested in careers beyond the academy. Conferences and meetings may double as presentations for research findings and career/personal development opportunities. Encourage your student to produce a GANTT chart early and update it before each committee meeting.

e. *Time*. Advisors have different expectations regarding performance. Include in your discussions any flexibility/inflexibility that may occur with this. Discussion points include remote work, expected hours in the lab, and performance metrics.

Plan to accommodate your student's academic and professionalization responsibilities, including coursework, teaching, requirements for qualification and prospectus presentation, presentation preparations, program-required attendances, career development activities, etc.

Discuss early what vacation time you allow your lab members beyond the university granted two weeks per year, and clarify how your student should communicate

these dates to you. Discuss other obligations, including family responsibilities, religious observances, or medical restrictions that may limit your student's presence in the lab. Be prepared to discuss your concerns if your student is devoting too little (or too much!) time to research activities.

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

g. *Health and well-being*. Discuss how to maintain a healthy balance between academic responsibilities and personal life. Advise your student if you observe them developing an unhealthy relationship with their graduate work (i.e., anxiety, depression, apathy, and other signs of distress). The DGS, BBS Leadership, YSM Student Mental Health & Wellness Program, and GSAS Deans are available for support in these situations. Graduate students come to the program at all stages and from all walks of life. It is not unlikely that a student will have personal incidents (e.g., death or illness in the family), choose to get married, and/or have or adopt a child during graduate school. Similarly, if it seems like a set of experiments presents physical and/or medical limitations (such as animal work, work with infections agents, or radioactive work), please confirm that your student is comfortable and capable of performing these experiments. Working in concert with University services, including Yale Health, EHS, and Student Accessibility Services, to develop appropriate accommodations will contribute to smooth transitions and a healthy, safe work environment in the lab. Open communication about changing expectations and responsibilities can facilitate the adjustment to any of these circumstances.

h. *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

a. *Communication.* As noted above, communication is a key aspect of an advising relationship. You should maintain regular communication as well as alert your advisor when either personal or academic obligations may cause delays in communication or result in unanticipated absences. Communicate with your advisor well in advance of any fellowships, programs, or jobs you are going to apply for if the advisor needs to sign off on it and if any documents are required from the advisor, department, or others.

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 yearly thesis committee meetings.

Time management is often one of the most complicated aspects of a degree to learn. While different strategies work for different people, know your work style and should you need help optimizing your time management, discuss this with your advisor early and often. One aspect of research many early career students struggle with is

appropriate time management to complete their expected research tasks. A strategy that has proved useful for past students in the program is detailed in Appendix A (a model used by Prof. Nguyen and his students) and may prove useful to you and your advisor in working to develop improved time management skills.

You are required to provide your Thesis Committee with an updated document on your project/activities at least 7 days in advance of each meeting. Be open to critical feedback from your advisor and thesis committee members and ask questions if you do not understand the feedback they give you; follow up with a plan to address the issues they raise. Provide copies of larger documents (e.g., a dissertation draft) on a timeline agreed on between you, your advisor, and your committee.

Discuss diverse training opportunities that can complement your training inside and outside the university, such as workshops and courses (e.g., bioinformatics/coding courses) with your advisor. For projects both large and small, learn to develop and utilize GANTT charts early to discuss deliverables and expected timelines with both your committee and your advisor.

c. *Research findings*. Disseminating research findings is a critical aspect of becoming a scientist. You should work with your advisor to prepare drafts of manuscripts and seek opportunities to share research findings in departmental seminars and at national or international meetings. Because scientific writing and public speaking are challenging for both novices and experienced scientists alike, take advantage of workshops and resources provided by the Poorvu Center and the Graduate Writing Lab to develop your writing and presentation skills. Discuss with your advisor which meetings and conferences are appropriate for your field and which milestones should be met before attending them. Conferences typically require abstract submissions in advance, so plan accordingly. Similarly, discuss with your advisor and committee relevant journals for your field that you may want to ultimately submit to.

d. *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. Completion of an IDP will begin to be an annual requirement after progressing to candidacy. You should provide annual updates to your advisor and thesis committee about potential career plans and determine which professional skills you should develop in anticipation of your desired career path. Look for career and professional development opportunities through the Poorvu Center, Office of Career Strategy, and other Yale offices. Conferences and meetings may provide additional opportunities, and some are specifically geared towards this. There may be additional unlisted training opportunities that require connecting with your advisor and collaborators (e.g., YCCI pilot awards for training).

e. *Time*. You should plan to conduct research according to reasonably expected hours of operation of the lab, meet the academic deadlines of our graduate program, and notify your advisor in advance of academic time commitments and deadlines. If you are

uncertain about what the lab expectations are, ask your advisor to clarify them. Many students find that it is helpful to discuss the prioritization of tasks with their advisor to help them best utilize their time in the lab each week.

f. *Letters*. Discuss with your advisor in advance your need for letters of support for fellowship applications and/or job applications.

g. *Health and well-being*. It is important to develop a healthy lifestyle. Taking time to eat a healthy diet, exercise, disconnect from graduate work, and get adequate rest does not detract from but rather improves academic performance and research productivity. Your project is a time-intensive, years-long endeavor; expect fluctuations in your perceived productivity. Finding and making reasonable time for external outlets (e.g. hobbies, volunteer work, university fellowships) helps build resilience for periods where the science is not working.

There are a variety of health and wellness resources available at Yale, including Yale Health, the Payne Whitney Gym, and the Wellness Center. It is important to take breaks, and the graduate program guidelines support vacation time. Consult with your advisor prior to scheduling time off, but remember that per the graduate program, you are ensured 10 working days off each year (2 weeks). Check with your advisor about flexibility in scheduling. In regards to safety and health while performing experiments, let your advisor know if you have or plan on having any conditions that may limit the types of experiments you can perform in a laboratory. If you feel uncomfortable performing certain experiments, you should discuss this with your advisor beforehand. It is also important to let your advisor know if you have any major events that may disrupt or impose changes on your laboratory routine. EHS, Yale Health, and Student Accessibility Services are available to support you in designing and implementing necessary accommodations.

h. *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 advisor or for which you need additional assistance. Turn to these individuals as well for mentoring to supplement the guidance offered by your advisor. Though it is not within their job descriptions, older students and departmental alumni can also be useful resources.

Below is additional information for the student and advisor about the roles of the thesis committee and Director of Graduate Studies.

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 advisor selection, annual thesis committee form, qualifying exam form, and departmental recommendation form for degree conferral.

b. The DGS and/or Registrar also tracks overall academic progress and meets with the student if academic milestones are not met.

c. At the student's request, the DGS will meet with the student to help resolve problems with the thesis advisor 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, including GSAS deans, Title IX office, Office of Institutional Equity and Access, Student Accessibility Services, and Yale Heath.

Thesis Committee

The Dissertation Committee's role is to guide the student toward the Ph.D. degree and to approve the thesis. The responsibilities related to these goals include the following:

a. Committee members make themselves available to meet for at least one annual committee meeting (two or more are highly encouraged) and, at the student's request, should make themselves available to meet one-on-one to offer research guidance, career advice, and/or assistance navigating conflicts with the advisor.

b. Committee members provide a system of external accountability for advisors and students alike. They are responsible for addressing issues with the advisor, the student, and/or the DGS.

c. Committee members should review the progress report documents provided by the student in advance of each committee meeting.

d. Committee members track, evaluate, and provide feedback on student progress in both their research and professional development. This includes submitting a formal evaluation form after a committee meeting.

e. The committee will determine when the student has completed sufficient work to proceed to write the dissertation.

f. In the student's final year, all committee members are expected to attend the dissertation defense and give comments on the dissertation.

Appendix A: Developing Your Time Management Skills

*This section is intended to be reviewed by both student and advisor

One of the most difficult skills to grasp as a new graduate student is how to not only manage but optimize your time. While any research experience will come with abnormally long days in the lab, oftentimes at the beginning of your degree, this comes from the way in which you plan your day and experiments, not the way in which you execute the m. Changing this pattern is a skill, but like all skills, must be developed through practice. One tool students have successfully used to improve this skill is described below. Students, if it appears useful, consider trying this approach and reviewing your first few weekly calendars with your advisor to get their input. Advisors, if you believe your student is struggling with managing their time, suggest they try this approach and tell them the two of you can review a plan together at your next meeting.

Developing Your Plan: A 3-Step Approach

The key to time management as a researcher is to come to the lab each day with a plan. For me, what has proved successful, is assembling a three-step plan. I have detailed it for you in the hopes you might find it useful too!

Each Sunday night, I sit down and go through three sequential exercises:

1. I make a to-do list for the week divided into three separate columns. These columns are:
    a. Experiments/Tasks I need to do
    b. Experiments/Tasks I would like to do
    c. Experiments/Tasks my advisor would like me to do
2. From this to-do list, I assign some or all of these tasks to a day of the week. I like to prioritize what I am committing to getting done this week in the following way:
    a. Highest: Items that appear on both lists A and C.
    b. Medium: Items that appear only on list A followed by items that appear only on list C.
    c. Low: Items that appear only on list B.

    That said, I always attempt to make time for at least one experiment on list B, as these are almost always exploratory experiments that I am most excited about.
3. Based on the day-to-day assignment of tasks, I map out an hour-by-hour plan for the week. This can feel overwhelming but remember you are not committing to executing it as if it is set in stone. I use it as a guide, to help me remember when to pull things out to thaw, when I need to be in meetings/classes, and if I can squeeze something in while an experiment incubates. An example of a typical week is shown below.

	A	B	C	D	E	F	G	H
1		Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	7:00							
3	7:30							
4	8:00							
5	8:30							
6	**9:00**		1-1 w/ Advisor	Analyze qPCR data, dissect res	Midiprep Addgene plasmid,	Prep qPCR plate	Reading/computational	
7	**9:30**				Glycerol stock part			
8	**10:00**		Meet w/ Mentee		package the rest to mail			
9	**10:30**							
10	**11:00**		Review Received	Think, digest, read	Collect CF	Put qPCR in	Clean up lab space	
11	**11:30**		Sequencing Results			Check on the state of lentiviral	infection next week	
12	**12:00**	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	
13	**12:30**					Analyze qPCR data	Meet with Mentee	
14	**1:00**		Prep qPCR plate			See if you have any MOI 1 cells		
15	**1:30**				Collect 4D DNA Damage Assay	Schedule FLOW sort time	TC time	
16	**2:00**			Transform plasmid				
17	**2:30**					Follow up lab meeting		
18	**3:00**		TC Time - feed organoids,					
19	**3:30**		seed to collect RNA/		Meet w/ Mentee			
20	**4:00**		Put qPCR in					
21	**4:30**		change media on CF		TC time		take care of loose ends	
22	**5:00**		Thaw 293T cells					
23	5:30		Streak Addgene plasmid on plate (pour plates if you don't have)					
24	6:00							
25	6:30							
26	7:00							
27	7:30							
28	8:00							
29	8:30							
30	9:00							