

# Choosing a Dissertation Laboratory

*This guide is meant as an aid to help you choose a rotation lab and dissertation lab. Students have differing needs and expectations from a thesis lab, as such, this guide includes questions to ask the PI, the lab members, and yourself to see if a lab is a "good fit" and to see how you react to the questions and answers. You need to know what environment you thrive in and what environment would drive you crazy or leave you feeling without direction. There are no hard and fast rules here, just questions. You are limited in the number of rotations that you can do. Thus, in the end you'll need to evaluate your experiences and choose the "best lab" for you from your rotations. At the end of the document are listed a few links to similar resources that others have put together.*

## **The Basics**

Lab demographics are an important aspect of your experience. Post-docs can offer experimental guidance and advice, while other graduate students provide camaraderie. Labs with technicians and/or lab managers can be more organized and reduce your workload by streamlining ordering, waste management, etc. as well as supplying common solutions and media. The financial situation of a lab should also be taken into consideration: not only do you want to make sure you have funding, but the financial status of the lab can impact the types of experiments you are able to do as a graduate student. It is important to note that even labs with less funding will be able to take advantage of departmental resources; in addition, there are many grants available for equipment and supplies for which you can apply as a graduate student. Finally, the tenure status of a PI can be a consideration for students. Some graduate students will prefer to work for a PI who has already been given tenure, others will join a lab as long as the tenure decision will not come up during their years in the lab (i.e., a brand new faculty member).

How many graduate students are in the lab? How many post-docs?

Is there a lab manager? Are there technicians?

Will these technicians be available to help with my project?

Will you make your own reagents and pour your own gels?

What is the funding situation in this lab?

Will there be any problems funding me in the lab?

Do post-docs/graduate students complain about an inability to do certain experiments because they cannot order reagents?

Does the PI have tenure?

If not, when will this decision be reached?

What is the atmosphere at group meeting?

How frequently do lab members give group meeting?

Do people seem interested, ask questions, or offer advice for other people's projects?

Do common stocks exist or do individuals have personal caches of reagents?

Are there assigned lab jobs?

How long is the average thesis? What is the average time to graduation?

Does the lab interact with neighboring labs?

## ***PI managing and mentoring style***

Some graduate students will find that they like to talk to their thesis advisor almost every day. Others will prefer to give infrequent reports about their progress. This is an issue of preference, but you should make sure that the PI's style fits yours. Furthermore, the way your PI manages the lab impacts the day-to-day running of the lab. Assignment of projects can make a lab congenial or competitive. Students should assess what atmosphere best fits their work style.

How often do you interact with the PI?

Is this more or less than you would like?

Do you have a set meeting time, or is it more impromptu?

Does the PI come to your bench to inquire about experiments?

When you may have a cool result?

Infrequently? Daily?

Is the PI available to talk to you when you want to discuss things?

Is the PI out of town often? Are they accessible by e-mail then?

Does the PI have a lot of ideas?

How do you filter them?

Does the PI know what's going on in the lab?

Have you been assigned a post-doc or older graduate student to work with?

When your PI is absent, do you feel comfortable asking others for help/advice?

Do post-docs/graduate students have the same projects?

Similar but complementary projects?

If they have the same projects, do they work together or independently?

Is there a spirit of competitiveness in the lab?

Does the lab work on projects that other labs work on?

Is the lab doing the same experiments as these other labs?

Does the PI set up a collaboration when this is the case?

Does the PI arrange back-to-back publications?

Are you encouraged not to talk about certain experiments outside the lab?

Do the graduate students/post-docs feel that the PI is interested in their projects?

More or less than other projects?

Do the lab members feel that they receive equal time from the PI?

How does the PI decide when it's time to write up results?

Does the grad student/post-doc write the paper, or does the PI?

Are you required to attend talks/seminars?

How many per week?

How often is lab meeting?

How long is lab meeting?

Do many people ask questions or just a few?

Do people give polished talks or show autorads fresh from the developer?

How often do people present?

Is there journal club as well?

## ***The Project***

People often say the key to success is to be interested in your project. It is hard to put in the long hours and the energy into an experiment if you don't care what the result is. Thus, the type of science and projects the lab works on should be in line with your own interests. In addition, your rotation project does not necessarily have to be your dissertation project. You should talk the PI to determine whether other projects will be available if you should join the lab.

Does the PI have an overall vision for your project?

Do you understand how your project fits in with the rest of the PI's research?

Is your project feasible and what is the time frame it may take?

Are there related or alternative approaches you can take or topics you can explore?

Does the lab do cutting edge research or use new techniques?

Does the lab develop novel techniques? Does that interest you?

Does the PI give students several projects? Are they related to one another?

Does the PI give one risky project and one "sure" project?

What happens to students whose initial project doesn't work? Do they find another, does the PI help with this?

Does the PI have too many project ideas and not a lot of guidance?

Do you enjoy the daily experiments of your project?

Are there other people who do the techniques for your project or will you be teaching yourself the techniques?

Do other people in the lab think your project is "do-able"? Or has the PI been waiting for someone to try it again?

Will you be working on the PI's "pet" project? Is the PI interested in your project?

Is there the possibility for collaboration with other labs?

Are many labs interested in this? Is there a large chance I can get scooped?

## ***The Sociability Factor***

For some, lab can be a home away from home. If you are keeping long hours doing experiments, it may be important to you that your labmates are also friends. Others prefer to interact more professionally with the other people in the lab. Labs that are highly social can be good places to work: discussion of science spreads to the Pig as well as the lunchroom, and people are happy to lend a hand when you can't make it in. However, highly social labs can also be labs of high drama. And, if you prefer a more businesslike atmosphere, the advantages of a highly social lab can be lost if you don't want to always participate in social gatherings.

You will want to feel out the hours that you are expected to be in the lab. Some students may want to work through the weekends on a regular basis, while others (especially those with families) will want to find a lab where it's okay if they come in only sporadically on weekends or not at all. It's also good to know if you can set the hours you spend in lab or if you are expected to be in at the same times as the PI. Some PIs

will not care if you come in at noon and stay until midnight, others will prefer that you overlap with their time in the lab at least somewhat. You may also find that if the majority of the lab keeps different hours than you it may be difficult to find reagents or get help with experiments.

What hours do lab members keep?

What hours does the PI keep?

Does he/she expect you to be in the lab at the same time?

Do you keep the same hours as other lab members?

Do people come in early, or stay late at night?

Are they willing to set up a culture/turn down a gel/etc. for you on weekends?

Do lab members eat lunch together?

Do they discuss science over lunch?

Do others in the lab let you know if the group is having lunch?

Do lab members arrange social events/outings together?

Does it seem like there is any disparity between lab members who socialize together and those who do not?

Are there cliques within the lab? If so, do people mix between them?

What is the lab meeting dynamic?

Do younger students ask questions?

Do post-docs participate?

What is the tenor of the questions?

Is there music playing in the lab?

Do people have individual radios?

Are people listening to headphones?

Are they unapproachable?

Do all lab members have a say in the music?

Is the music only on when the PI is gone?

Can you surf the internet while you wait for things to run?

How many computers does the lab have?

Does everyone have a computer at their desk?

Will you get a computer if you join the lab?

Is it difficult to gain access to common lab computers?

Does the lab celebrate birthdays, weddings, babies?

Does the lab celebrate thesis defenses/jobs?

In the lab? At a separate party?

Do you feel obliged to go to these parties, if they occur?

### ***Your future plans***

Some people come to graduate school with the ultimate goal of becoming a professor and some are interested in receiving a training that they can apply in other fields. It's difficult to know what you'll do when you first enter graduate school and many who thought they would choose one path will choose another by the end. Regardless, choosing a thesis lab will influence the path that you take and both present opportunities and constraints.

Does the PI encourage collaborations with other labs? Within the lab?  
Are classes seen as a waste of time by the PI?  
Would you be encouraged or discouraged from taking a class at Wood's Hole or CSHL?  
What does the PI think about students taking time to teach undergraduates?  
Does the PI communicate areas that she thinks you should work on or does she wait until the letter of recommendation?  
If you aren't interested in continuing in academia, is that okay?  
    With the PI? With the members of the lab?  
Does the PI see him/herself as a trainer and educator of young scientists?  
If it made sense for your project to take a biostatistics class at HSPH, or computer programming class in Cambridge, would your PI support you in this?

### ***Questions to ask of yourself***

Knowing yourself is the best tool you have to choose a lab wisely. Knowing yourself takes a large amount of honesty, which takes a certain level of maturity and confidence. Try to ascertain what you actually need, as opposed to what you want, can be difficult. Everyone wants to think of themselves as fully capable, independent, and not open to the trappings of failed experiments or easy temptations like the internet or email. But to look at yourself and how you handle workload, failure, criticism, and pressure will ultimately help you to choose the lab is the "best fit" for you. Try to be honest with yourself about your capabilities. The following questions will hopefully help you to open a dialogue with yourself and/or those who know you well to help you consider what aspects of your prospective labs would help or hinder you during your dissertation work. Use your experiences from undergrad classes or previous lab environments to help gauge your strengths and weaknesses.

How much direction do I need?

    Do I work better with direction? How much?

    Do I work better with structure?

    Do I work better at my own pace?

How much pressure/contact do I need?

    Do weekly/bi-monthly meetings with the advisor motivate me? Or do I find them interruptive?

    Do I tend to let things slide if no one is looking (e.g. notebook)?

    Do I work well and consistently without pressure?

How much emotional support do I need?

    Do I take failed experiments hard? Or personal?

    Do I rebound easily from difficulties?

What do I expect to get from graduate school?

    How many papers, what kinds of journals?

    What kinds of techniques do I wish to learn?

    Do I plan to continue bench science with my degree?

    Are my expectations realistic? Especially for the labs I am considering?

How many hours can I work a week and still be productive/coherent?

Do I need time outside of lab to de-stress? How much?

Am I easily distracted from the tasks at hand?

Does competition drive me to work harder?

Do I tend to pay too much attention to detail and lose the bigger picture?

Do I tend to hate details, and like thinking about bigger ideas?

Do I want to work on a very independent project or work on part of a larger project in the lab?

Do I get along with the people in the prospective labs?

Are there things about the lab/people that irritate me? Can I deal with them?

Do I tend to socialize at work a lot? Too much? Too little?

Other resources: Google "choosing a lab"!

[http://sciencecareers.sciencemag.org/career\\_development/previous\\_issues/articles/2590/choosing\\_a\\_thesis\\_lab](http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2590/choosing_a_thesis_lab)

<http://www.biochem.emory.edu/bcdbforms/applicants/advice.html>

<http://www.artsci.wustl.edu/~sac/document/ChoosingaRotationLab.htm>

<http://naturalscientist.blogspot.com/search/label/Choosing%20a%20Lab>

<http://ponderingofafool.blogspot.com/2007/03/choosing-lab.html>

<http://www.mstp.washington.edu/StudentsAlumni/StudentGuide/chooselab.html>