

# Guide to Choosing a Neuroscience Research Lab

## Part 1: What factors to consider when joining a lab.

There are hundreds of Harvard affiliated labs, and all of them are different. Below, we have distilled those differences into several important categories to consider as you make your choice. The overarching goal is to help you choose a lab that will foster your development as a scientist.

A note about changing labs: If you joined a lab in your first or second year but you're not feeling great about your project or experience, you can (and probably should) change labs! This is common. Don't be afraid to try a new topic or lab environment. There is great benefit in gathering multiple experiences as a beginning researcher. Even if you plan to write a thesis, you don't need to finalize your lab until the start of Junior spring semester.

**Research Topic.** Students often feel that the research topic is the decisive factor. For example, you may have a topic that you are already passionate about (*e.g.*, Alzheimer's Disease, Traumatic Brain Injury, or Free Will). While this pre-existing interest can be a great motivator, consider the following: over three semesters and one summer, you will spend > 750 hours in the lab! For that much time, we think the priority should be finding a great lab environment with supportive mentors.

- *Myth 1:* If you don't find the topic immediately interesting, you won't enjoy working on it.
  - False! A topic isn't usually exciting until you learn more about it. We find that once students realize what questions are being asked, what the debates are in this area, and what real-world implications the topic has, what methods are being used/developed, they quickly become passionate about their work.
- *Myth 2:* Medical schools are impressed by students doing medically relevant research projects (translational/clinical research) rather than fundamental science (science to understand how the brain works).
  - False! Medical and graduate schools are evaluating your lab experiences in two major ways: First, they want evidence of your scientific development in the lab, including your independence in designing experiments/analyzing data and your understanding of your research topic. Second, they want to see an authentic, personalized, positive letter from your faculty mentor detailing your drive, independence, attention to detail, collegiality, *etc.*

**Size of the lab.** The size of the lab is not always, but very often, a predictor of student success. Higher visibility labs tend to be big (>20 people). Although they are publishing great papers, the environment may not be ideal for undergrads. Why? In bigger labs, it is harder to get face time with the faculty mentor. Moreover, each daily supervisor (post doc or grad student) may have several undergraduates working with them or be consumed with their own work. Students can feel lost when they do not get enough mentoring and attention. Another peril of working for 'rockstar' faculty is that projects may be aiming for publication in Nature, Science, or Cell, which can take more than 5 years of full-time teamwork ... when things go right. As such, students are often a small part of a bigger, longer project (a

'cog in the machine'). Their role is often more of a technical one with less control, thought, or creativity in the experimental design and therefore less scientific development and growth.

In spite of the drawbacks, some students prefer to work on high visibility projects in big labs. That is fine but be aware that these projects can lead to lower thesis evaluation grades because faculty evaluators look for evidence that the student has put independent thought and individual work into the thesis.

**Independence and Project Type.** It is daunting to be responsible for your own research project's success or failure, especially when you are just starting out in science. Yet, this really is the best way to learn how to do science. Having to make decisions about what experiment to do or how to analyze your work requires a deep understanding of your research area. Large, team projects can be fun, but students often grow and learn more from small projects where they can make decisions.

Typically, projects that are small in scope (short term) work best, so you can learn from your mistakes and get feedback on your results within weeks to reconfigure if need be. Working more independently on a project also gives you more control of your data, rather than being handed data from someone else and not having any influence on how or why the experiments were done.

**Mentoring.** Arguably the most important aspect of your lab experience is your direct mentor. Try to meet your direct mentor before signing up with a lab. You want to make sure that they are invested in your success: meaning, 1) they has time to meet with your regularly, they have reasonable demands on your time (15 hours or less per week during the term), and they can communicate clearly with you.

Whatever lab you're in, be sure to schedule face time with the faculty mentor (alone or with your daily supervisor) at least once per month. This will help you forge a connection to the lab head and be part of conversations that can influence your study design and color the interpretation of your results. You should also make an effort to attend lab meeting to learn about other projects and develop your critical thinking/questioning skills.

**Commute/ Location.** It might seem harrowing, but commuting to a lab is very possible. The free M2 shuttle can get you to the Longwood/hospital area in about 30 minutes (outside of rush hour times and extreme weather). The MBTA can get you to MGH, MIT, Broad Institute just as quickly. As long as you can arrange your schedule to have big blocks of consecutive lab time (3 hours), the commute will only be a fraction of your dedicated lab time.

The good news, if you don't want to commute, is that labs closer to Cambridge typically have more experience working with undergrads. This often translates into a better mentoring culture for students. All things being equal, we recommend you start looking for a lab on campus (Biolabs, NW Building, William James). If you don't find a good fit there, consider labs at the Medical School that are affiliated with the [Program for Neuroscience](#). If you still aren't satisfied, you can extend your search to other Harvard-affiliated hospitals or centers (MGH, Children's Hospital, Beth Israel, Brigham and Women's, McLean, etc.)

**Part 2: Questions to ask before joining a lab.** Here is a list of potential questions to ask the lab director when you meet to talk about joining a lab:

- **How often would I be able to meet with you (the PI)?**
  - Typically, students meet with the faculty mentor two or three times per semester. Its great if it is more frequently, but it should not be less.
- **Who would be my direct supervisor? Could I meet them in advance of joining the lab?**
  - Typically, students work with a grad student or a post-doc. They often meet every time the student comes to lab (at least at the beginning) and communicate informally by email. Since they play a big role in mentoring you, it is always a good idea to meet them before joining.
- **Would I have the ability to influence the design of the experiments and work on data collection, processing, and analysis?**
  - Student projects are most rewarding when students are involved in experimental design and all aspects of data analysis. It gives the student more ownership and control of the project, which very often creates a better environment to learn to do science.
- **What is the time frame for data collection within the experiment I would work on (days, weeks, months, years)?**
  - Longer term experiments (more than a year) are usually team-projects where students don't have much influence or control of the project.
- **Are there any other students working in the lab that you can talk to about their experience?**
  - While every student is different, other undergrads in the lab can usually tell you what kind of experience to expect. (Laura and Ryan can give you feedback on labs students have worked in as well in case you want an additional opinion.)
- **Would it be possible to attend a lab meeting before joining the lab?**
  - Lab meetings can be a great way to assess the group dynamics and lab culture to make sure it feels like a comfortable and stimulating environment for you.
- **Would level of commitment is expected (# hours per week, summer required, needs to be more than one semester, etc).**
  - Typically, students should expect to spend 5-10 hrs/week if they are volunteering in the lab during the semester, or 10-15 hrs/week if they are enrolled in research for credit (Neuro 91). Most labs expect students spend one summer working full-time in the lab (often before senior year) if they are serious about a thesis or a career in research after graduation.
- **Can I choose my own project, or will I be assigned one?**
  - This varies by lab: sometimes students will choose among several options. Sometimes there might only be one project that needs additional help (or has an available mentor). Occasionally, faculty mentors want students to develop their own project idea! You just don't know until you ask.