

Rotation Guide

This guide is meant as an aid to help you evaluate your rotation labs and, ultimately, choose a thesis lab. Students have differing needs and expectations from a thesis lab, so 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. This will help you choose a lab that is right for you. 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. And at the end of the document you'll find a few links to similar resources that others have put together.

Some of these factors can be judged before you actually begin a rotation. It is appropriate to meet with several professors before you decide on rotations. In this way you can explore several labs in a shorter time period, and you can make an informed decision about the labs where you will rotate. This will also give you a great introduction to the neuroscience faculty. Once you have decided on labs for rotations, be sure to communicate clearly and politely with all the professors that you met with.

The Basics

You may have done rotations in different areas within Neuroscience. So the first, obvious issue is to make sure that you are excited about the subject matter, the scientific questions that are asked in the lab and the methodical approaches that are used in the lab.

Lab demographics are another 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. However, the need for technicians will depend on the type of lab. 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). If you think the PI might be coming up for tenure during your years in the lab, it's reasonable to ask them a direct (polite) question about this issue when you are considering the lab.

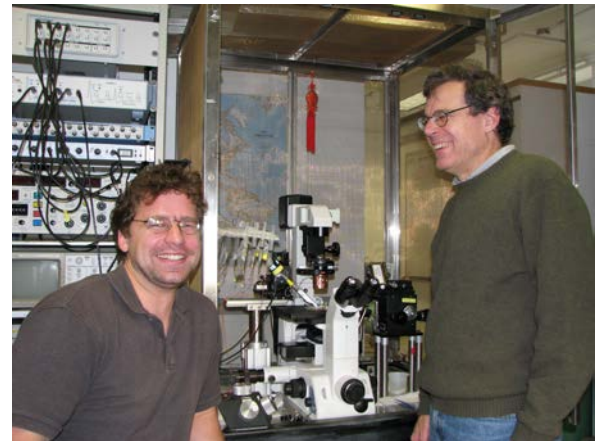
- ❖ How many graduate students are in the lab?
- ❖ How many post-docs?
- ❖ Is there a lab manager?
- ❖ Are there technicians?



- Will these technicians be available to help with my project?
 - Will you make your own reagents and pour your own gels?
 - Is there an system for sharing/organizing regular logistical tasks?
 - ❖ 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 or equipment?
 - ❖ 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 common stocks exist or do individuals have personal caches of reagents?
 - ❖ Are there assigned lab jobs?
 - ❖ What have students gone on to do after graduating? How has this been accepted?
 - ❖ How long is the average thesis?
 - ❖ What is the average time to graduation?
 - ❖ Does the lab interact with neighboring labs?

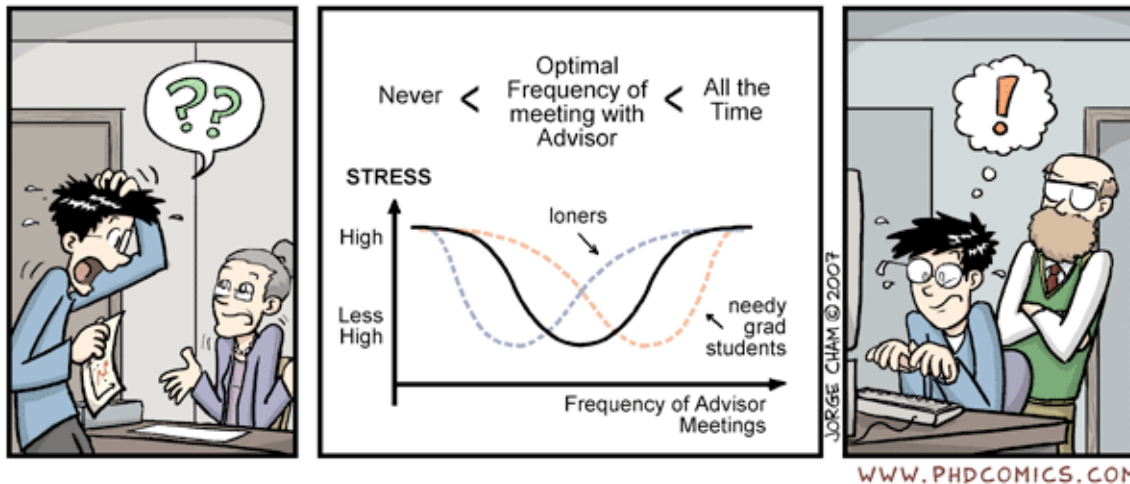
PI managing and mentoring style

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 affects 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. It can be useful to ask current lab members about the PI's style during one-on-one confidential conversations (e.g., over lunch or coffee).



- ❖ 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 a journal club as well?



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 Squealing 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? What about getting a teaching certificate?
- ❖ 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?
- ❖ Are there any students in the lab who are involved in the DMS Paths Program? How would the PI feel if you spend a bit of time on Paths Program activities?

Different things to think about:

- What kind of results do you like? Visual? Quantitative? Precise?
- How long does each experiment take?
- Model system: are you comfortable with the approaches used?
- How much time is preparing for an experiment (reagents, methods), and how much time is doing the experiment?

Students talk about rotations ...



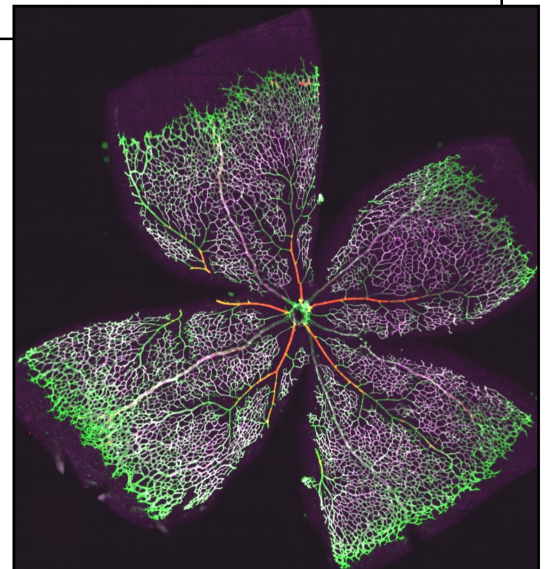
For some reason, we all start out thinking that people who choose labs at far-away campuses like McLean, MGH, or MGH East are going to be cut off from graduate student life while everyone else is out enjoying daily get-togethers. While it's true that students on the Quad see each other more often than they see students in labs off the Quad, the rest of us are not isolated by any means. First, you can always go to seminars on the Quad if you're willing to spend the time to get there. Second, each campus and each hospital has its own lab culture with its own seminars, beer hours, and other social opportunities to get to know students, staff, postdocs, and faculty in nearby labs. And finally, just as a reality check, my lab is in HIM just across the street from the Quad, yet I not

only never go to Quad seminars or happy hours because there are too many things going on in my own building. In the end, you only have time for a limited number of non-lab activities and there will always be a rich and varied community of scientists in your immediate vicinity, so location should not prevent you from trying out a particular lab.

I decided to start rotating in the fall for two main reasons. First, I had just finished a year of full-time research at another institution, so it seemed natural to keep doing lab work. Second, even though I basically knew which area I wanted to work in when I came to Harvard, I hadn't completely decided about which labs I wanted to rotate through. Therefore, I wanted to start in the fall to maximize the time available for rotations, as I was unable to start the summer before classes began.

Rotating in the fall did give me extra time, although ultimately I ended up joining a lab early in the next summer instead of doing an extra fourth rotation. There were a few drawbacks to starting in the fall, however. In retrospect, it would have been valuable to have had full days to devote to working in the lab, especially when I first started, instead of having every day broken up with classes. Also, I found the coursework more intense during the fall compared with the spring, so I had less time to work in lab compared with my later rotations. However, I still found the extra time to be valuable, so if I had to do it again, I would most likely make the same decision to rotate early.

— Fifth-year student at Harvard Medical School



Brian Chow — Gu Lab

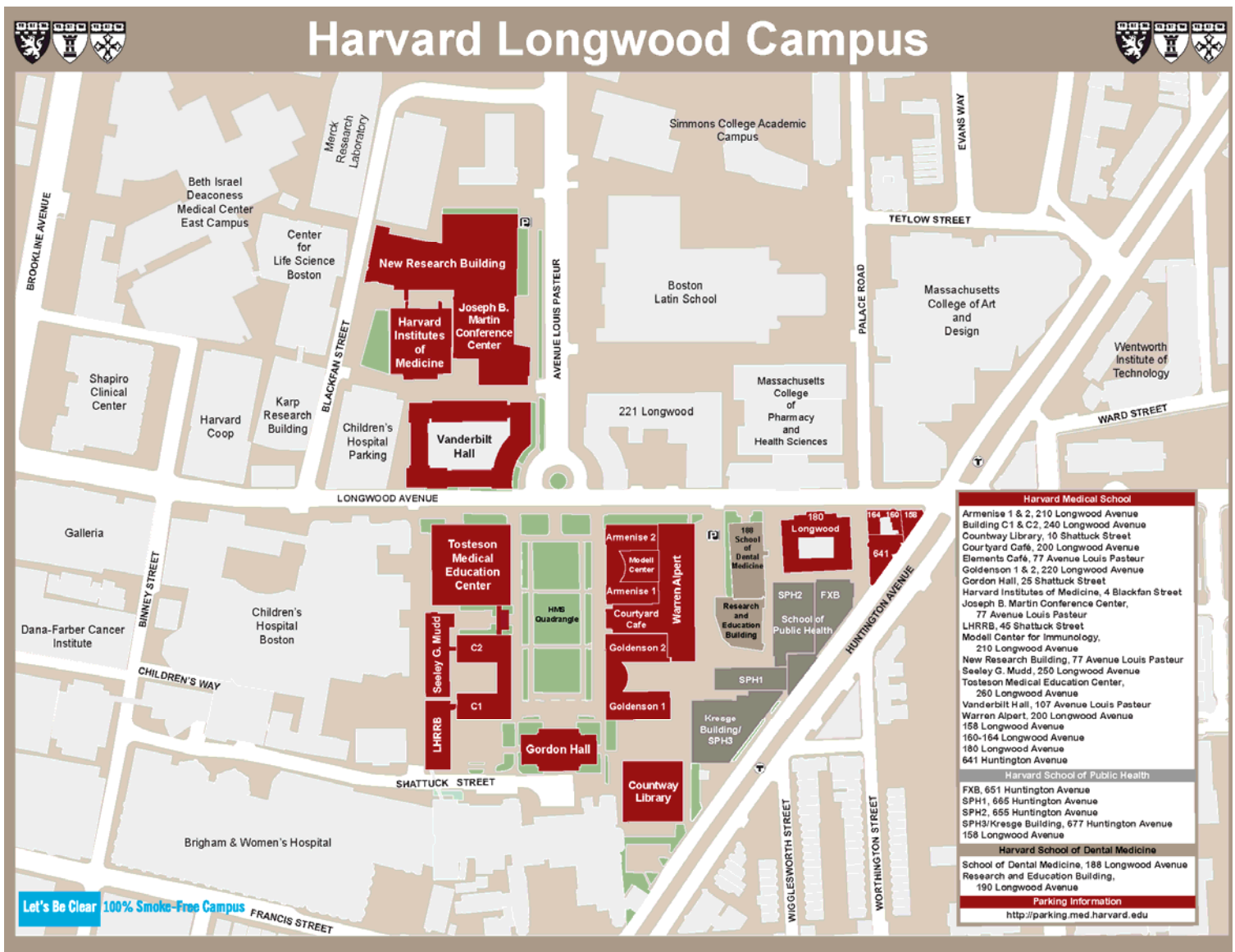
Rotations are your chance to "test drive" potential thesis labs. You are not expected to generate lots of data, write a paper, or impress the lab with your wealth of knowledge. If any of these things happen, that's great. But it's not expected and not necessary. Take advantage of your rotation to talk to everyone in the lab. Ask lots of questions about life in the lab, the PI's expectations, whether they're happy with their experience, and so on. You should definitely work hard, of course! You want to show the lab that you work hard, think hard, happy to learn new things, and able to integrate into the lab's social structure. Just don't lose sight of the fact that you are evaluating the lab as much as they are evaluating you, and that this is supposed to be a fun experience, not a painful one.

— Fifth-year student at Brigham and Women's Hospital

Longwood Medical Area

The majority of labs in which PIN students rotate or work are located in the Longwood Medical Area of Boston. This includes labs of Harvard Medical School and Harvard Institutes of Medicine, as well as labs located in adjacent teaching hospitals: Children's Hospital, Dana Farber Cancer Institute, Beth Israel Deaconess Medical Center, Brigham and Women's Hospital, and Joslin Diabetes Center.

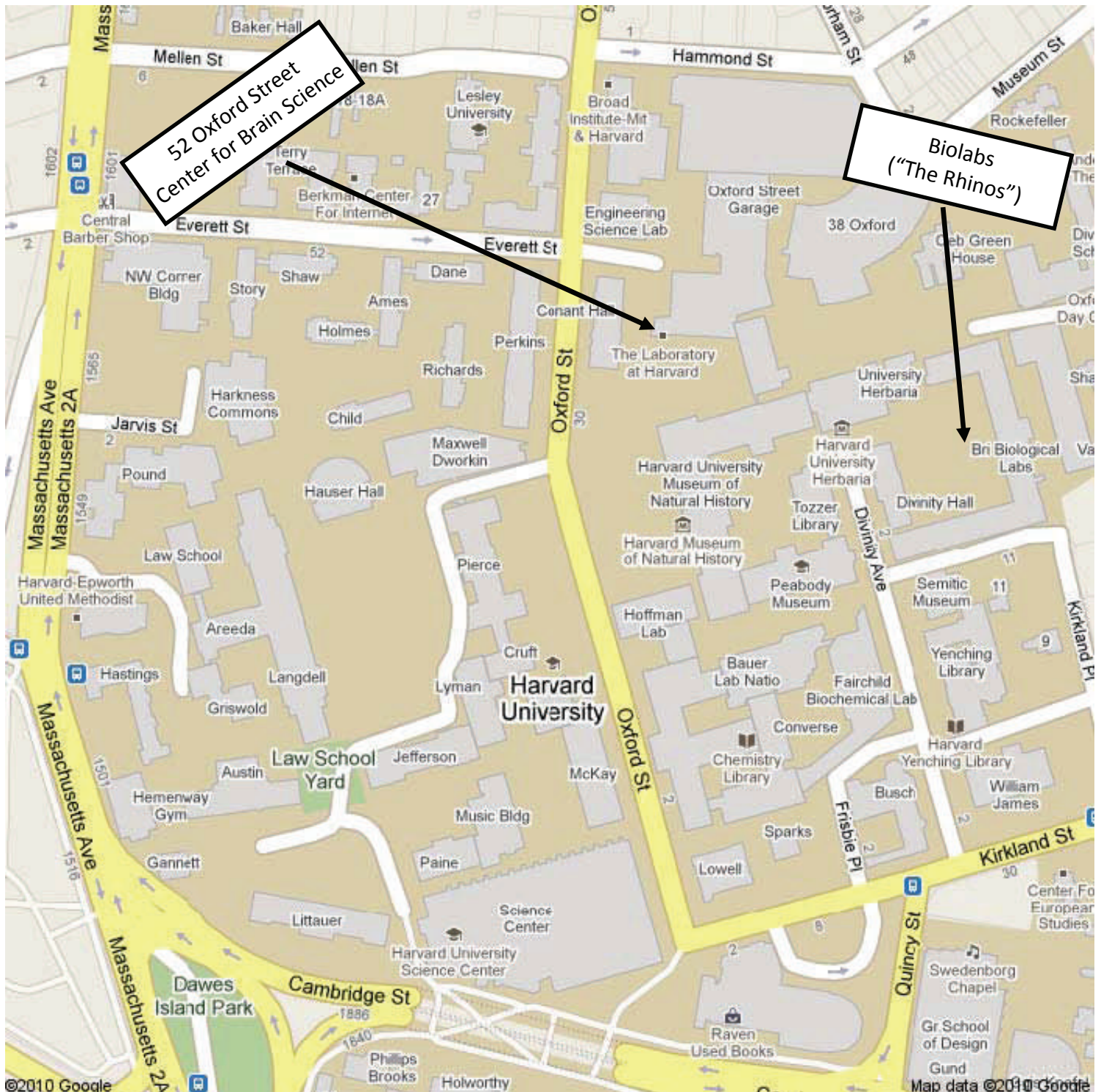
These labs are within walking distance of many parts of Brookline and Boston, and are within a 20- to 30-minute ride from Cambridge on the free shuttle provided to Harvard students.



Harvard University—Biolabs

A number of labs are located on the undergraduate campus in Cambridge.

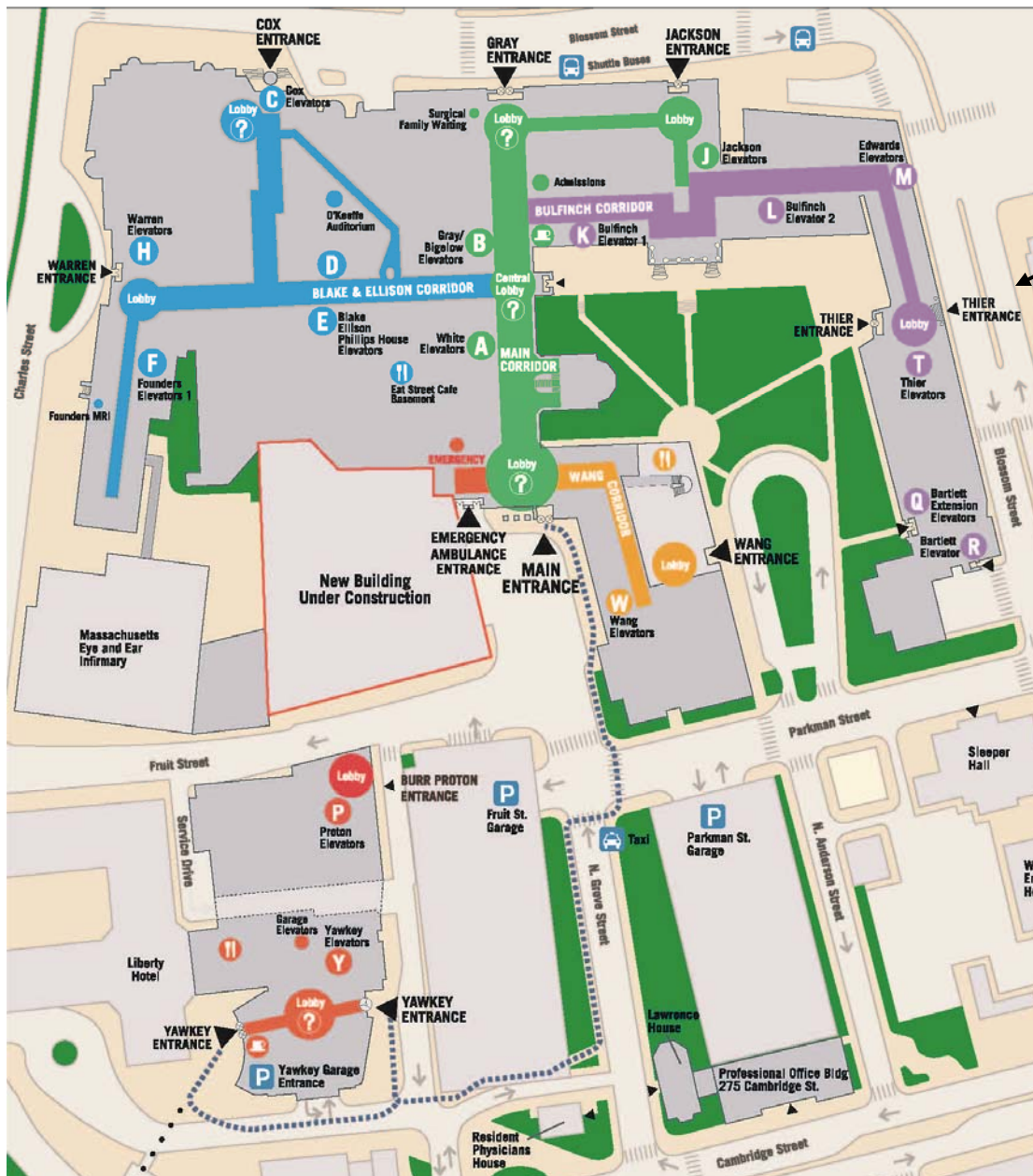
Most of the neuroscience labs affiliated with PIN are members of the Center for Brain Science. The Center for Brain Science includes junior and senior faculty doing research on topics such as songbird learning, retinal physiology, human motor control, large scale reconstruction of neural circuitry, fly olfaction, inhibitory circuitry development, rodent decision-making, zebrafish vision, and fMRI studies of human memory. CBS is also developing an imaging facility that will continue to rely on state-of-the-art optical techniques.



Massachusetts General Hospital and Massachusetts General Hospital—East

Massachusetts General Hospital is the oldest and largest hospital in New England. MGH conducts the largest hospital-based research program in the country, with an annual research budget of approximately \$500 million. It is the oldest and largest teaching hospital of Harvard Medical School, where nearly all MGH staff physicians serve on the faculty.

MGH runs a free shuttle service between Longwood, the MGH Main Campus, and MGH-East (located in the Charlestown Navy Yards in east Boston). There is an MBTA redline stop immediately adjacent to the MGH main campus, just three stops away from Harvard Square.

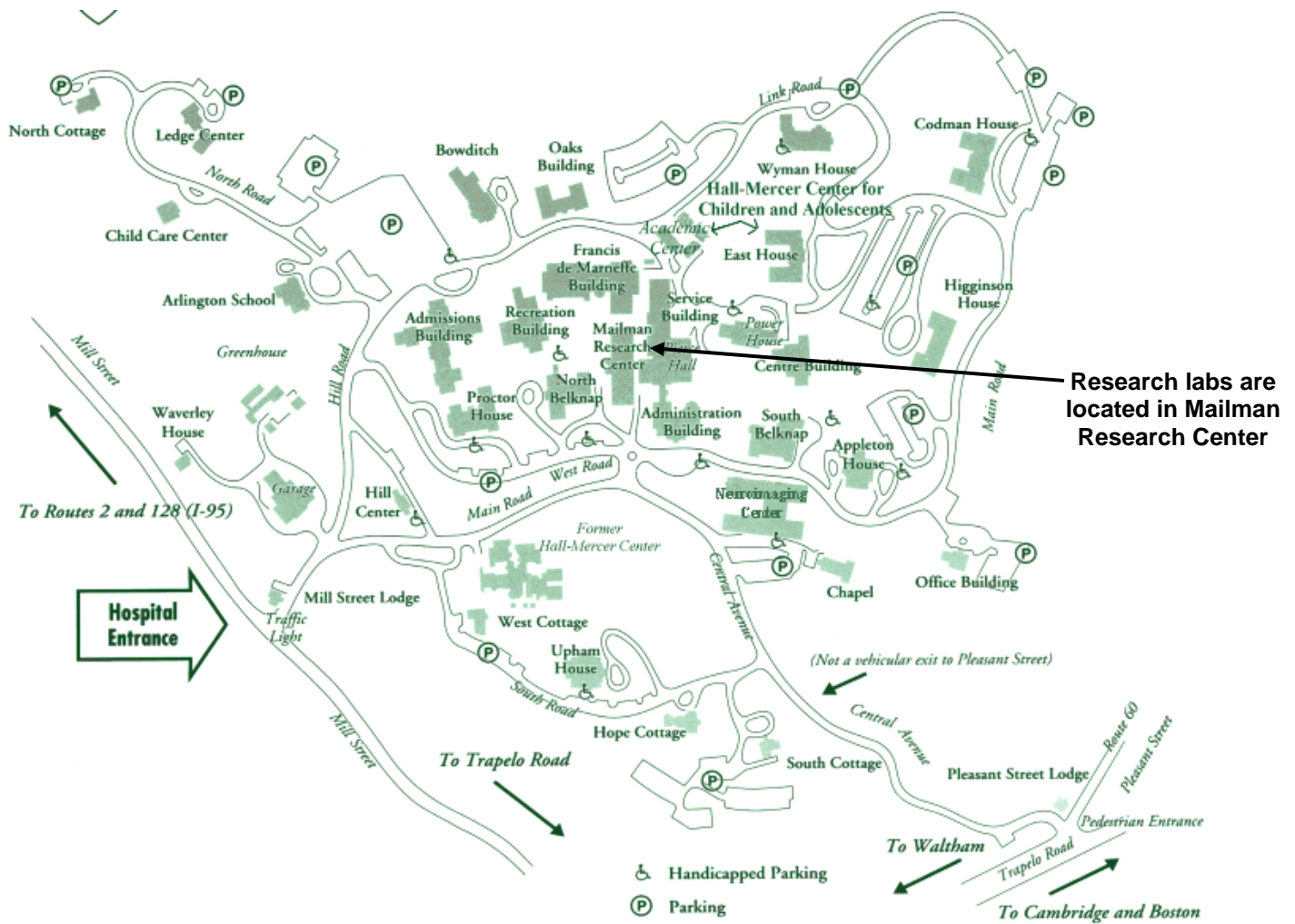


Many labs are located in Thier Research Building

McLean Hospital

McLean Hospital is the largest psychiatric affiliate of Harvard Medical School. Founded in 1811, it moved to its current Belmont site on grounds designed by Frederick Law Olmstead in 1895. McLean houses the Harvard Brain Tissue Resource Center, the world's largest "brain bank." In 2001 the Neuroimaging Center opened; as the third building on campus exclusively devoted to research, it houses a 4.0 Tesla magnet, one of less than 20 magnetic resonance scanners in the world with this field strength.

McLean Hospital is easily reached from Cambridge by car. For students relying on public transportation, McLean runs a free shuttle from the hospital to Waverly Square in Belmont. Waverly Square can be reached either by commuter train, or by the MBTA Red Line to Harvard Square and the #73 bus from Harvard Square to the end of the line in Belmont.



Students talk about working in labs outside the Longwood Medical Area ...



McLean Hospital—Administration Building

McLean is the main psychiatric institute of Harvard Medical School and is located in Belmont, MA (~25 min drive from the Longwood Medical Area). McLean has a vibrant research community that is dedicated to understanding the neurobiologic basis of behavior and is especially focused on understanding drug addiction, depression, schizophrenia, anxiety disorders and neurodegenerative disease. Dissertation projects often combine molecular and behavioral approaches in rodents in order to understand the genetic and neural circuit basis of complex behaviors such as fear, attention, and reward. In addition, McLean's imaging facility recently added a 9.4 Tesla magnet devoted solely to animal research. Graduate students also have the opportunity to attend a weekly neuroscience seminar series, a student and postdoc journal club and clinical grand rounds. Perhaps the most unique aspect of doing graduate work at McLean is the opportunity to study psychiatric disorders preclinically within an institution where we are surrounded by physicians, psychologists and even patients that are committed to an improved understanding of the neurobiologic basis of these disorders.

— Sixth-year student at McLean Hospital

Working at the Navy Yard: It's far away from the noise, chaos and congestion of Longwood and it's clean here. If you like walking, it's a 35-40 minute walk from downtown Boston. Or you can take the free MGH shuttle to North Station or the Red line. This is a good place to be if you don't work well with too many options or distractions.

Downside: There's no Starbucks or Boloco! (no wonder I'm losing weight!!!)

—Third-year student at MGH-East

Doing neuroscience research in Cambridge is ideal particularly for students who are interested in circuit level questions of the brain. The Center for Brain Science holds weekly seminars that invite systems/computational neuroscientists to speak about their current research. Many of the lab heads in Cambridge have backgrounds outside of biology, (physics/engineering backgrounds) making the labs here conducive to developing new technologies and fosters creative ways of thinking about the brain. Also, the neuroscience labs here are very collaborative, making it a good place to learn many different approaches to studying neuroscience. Overall, it is nice to work in a campus where you bump into people of all fields, from philosophy to math to chemistry, fostering a diverse environment. The cons of being in Cambridge is the commute, although that is not a problem if you do not live in Boston. Besides, the LMA shuttle is very convenient and extremely reliable.

— Second-year student in Cambridge

I had my doubts about leaving Longwood when I joined the Macklis lab at MGH main campus back in 2005, since almost everyone seems to stay over by the Med School. I haven't regretted my decision at all, though. There is an easy 25-minute shuttle ride in either direction every 15 minutes all day long, which is a good time to read a paper or catch a short nap. Tuesday seminars are easy to get to, but they are also online- we get the projector out and watch some of them as a lab. There are more than enough research seminars, lunches, floor meetings, poster sessions, journal clubs, etc. over here (especially related to stem cell research, developmental biology, nervous system repair) between the MGH-HMS Center for Nervous System Repair, the Center for Regenerative Medicine, Mass Eye and Ear, Schepens Research Institute, and all the resources in the MGH Navy Yard campus a 15 minute shuttle ride away.

Other advantages of being over here include the great location (all the T lines meet very close to here, making everything accessible and letting me avoid riding the bus (I live in Central Square)), lots of great food and bars, and the park and the North End are both a short walk away. If you find the right lab, I highly recommended working downtown.

—Fifth-year student at MGH



Biolabs at Harvard University (Cambridge)

How to Survive Graduate School in 10 Easy Steps

You can't do all these things every day. You can, however, make sure that you do all of them regularly. They really, truly make a difference in your state of mind while you're in grad school!

1. **Get sleep.** Get enough sleep. Really. This is serious. Don't pull all-nighters unless absolutely necessary. Don't live on caffeine. And if you notice that you can't sleep, or that you're sleeping way too much, talk to someone about it — sleep disturbances may be a sign of a growing depression or a medical problem that's easily treated. Remember that physical exhaustion can feel the same as depression, and don't get so tired you're completely burned out!
2. **Get exercise.** You don't have to train for the Boston marathon; you just have to move, and it's better if moving is fun. At the very least, leave the lab for breaks and walk up and down the stairs, or down Longwood for a cup of coffee with a friend. Take a Zumba class! Try extreme Frisbee! Take a trapeze class at the Circus Arts Center in Somerville!
3. **Get outside.** Boston isn't known for a lot of sunshine and daylight in the winter; make sure you get as much as you can. Seasonal Affect Disorder is a real issue. And for the rest of the year ... it's beautiful around here! Get outside every day and enjoy it. Observe animals and plants, even if it's just the spider on your windowsill or the fish skeleton on the beach. Remind yourself what made you curious about biology in the first place.
4. **Get involved.** Helping others is a terrific way of keeping things in perspective and reminding you that you're not the only person with stress and problems. Volunteer formally with a group like HPREP or Science in the News. Or come up with a way to "volunteer" informally — go out of your way to ask people how they're doing, so that they don't feel isolated or alone.
5. **Get a hobby.** Sure, you don't have any free time ... but it pays to have a hobby or activity that has nothing to do with science. Even if you only get to do it every three months, it'll remind you that there's more to life than lab experiments. Try knitting. Try making your own beer. Find a group of people to play board games with. Have fun!
6. **Get curious.** Challenge yourself to learn new things, even if they don't seem immediately related to your project — even if they aren't related to science at all. Learning new things reminds you that your brain is powerful and the world is full of wonder.
7. **Get informed.** Read papers and attend seminars unrelated to your project. It keeps things in perspective, and it might help you make a leap of intuition that other people (in your lab or in your field) might not be making.
8. **Get support.** Keep in touch with old friends, even if they're not scientists; keep in touch with new friends from PiN as they defend and move away. Scientists are gypsies, and it's easy to lose touch with people as they move to a different city. If you hold on to good friends, you can be a life-long support system for each other. And if you're struggling during your grad school experience, reach out and talk to people; there's no reason to suffer in silence. Let the people around you help you find solutions!
9. **Get away from screens.** Constantly staring into smartphones, tablets and computer screens can wreak havoc with your mental health and suck up all of your free time before you know it. Look up — look at the real world. Don't take a photo of the moment — enjoy it instead, at least for a little while. Don't text if you can talk face-to-face.
10. **Get a sense of perspective.** Remember that doing science is a privilege, even when it's a pain in the neck. Scientists are paid to learn things and investigate whatever makes them curious. People are paying you for you to earn a Ph.D. from Harvard; revel in it! You're earning a degree that will keep you employable for the rest of your life (whether or not you believe it right now). Make the most of this incredible opportunity.