Exploring post-Bowdoin careers: Graduate school

Worksheet 1: General Overview

Do I want to go to graduate school?

Do you love science? Have you enjoyed doing research? Are there jobs in which you may need additional scientific training to be qualified? There are many personal and professional motivations to go to graduate school. The choice is solely yours.

Getting a Ph. D. in the sciences takes an average of 5-6 years. Sometimes, it may be helpful to talk to Bowdoin alumni or your professors about their graduate school experience before making a decision. Students are also encouraged to ask visiting seminar speakers about their graduate school experience. For students who identify themselves as members of underrepresented groups in STEM (science, technology, engineering, and mathematics), there are programs you can apply to which cover the cost of transportation, accommodation, etc. to visit graduate school before applying.

**Please be aware that for most Ph.D. programs in the sciences, they offer stipends ($25-35K/yr) for graduate students, and graduate students are not responsible for tuition. Also, most Ph. D. programs will fly applicants who are accepted to visit the campus and meet the professors and graduate students so that students can make an informed decision.**

When should I apply to graduate school?

Applications for many graduate school programs are due in the fall and winter. Some students decide to apply in the fall of their senior year, and upon acceptance, they start the following fall; some schools will allow students to defer for a year under special circumstances. Other students choose to work after graduation before applying for graduate school. It is often advantageous to apply early. The choice is always yours.

How do I apply to graduate school?

Students should have discussions with their advisors or faculty members about their scientific interests, as they may have useful suggestions on which departments may match your interests. If students are interested in applying in the fall, it would be beneficial for students to approach the professors earlier, rather than later (summer or beginning of fall semester). If you remember a seminar speaker or literature paper that particularly interested you, you can also look up where the research was conducted. If you want to initially browse the schools before discussion with faculty, one place to start is to look up your program of interest in US News Report (http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools) and go directly to the Chemistry/Biochemistry/etc. website of the listed schools. If you approach the professors with a list of schools, they may have some more information as well.

Once you have chosen your schools of interest, it is your responsibility to go to each school’s website and find their application and list of requirements. Usually, applications consist of personal/research statement, letters of recommendation, transcript, and GRE & subject GRE scores. GRE tests are usually offered year-round (www. Ets.org/gre), while subject GREs are offered in September, October, and April (https://www.ets.org/gre/subject/register). Make sure to spend time on your personal statement. You can always ask your professor or advisor for advice. If you do decide to apply, be sure to also ask professors
in advance for letters of recommendation and not the night before the application is due :) More information on the application process can be found in Worksheet 2.

While many graduate schools in the sciences will provide stipends, are there fellowships that will provide more support?

There are many fellowships that are open to students in the sciences. Fellowships provide not only financial support but sometimes also offer unique opportunities (conferences, international experience, etc.) and some freedom in choosing groups once you arrive at graduate school. Students should look through the multitude of options listed on the Bowdoin website (www.bowdoin.edu/student-fellowships; link: National Fellowships, Resources beyond Bowdoin: Direct-Apply National Fellowships & Databases for National Fellowships). Some of the most common graduate fellowships in science (NSF, DOE, DD, Hertz) have due dates in the fall, so please look through the Bowdoin websites earlier, rather than later. Again, if you are interested, many faculty members will be happy to support you through the process.

www.bowdoin.edu/student-fellowships
Link: National Fellowships
Link: Resources beyond Bowdoin: Direct-Apply National Fellowships
Link: Resources beyond Bowdoin: Databases for National Fellowships
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Worksheet 2: Applications to Graduate School

Once you have decided to apply to graduate school and have talked with your advisors and professors about which programs are best suited for your interests and well-being (Worksheet 1), you are ready to begin the process of applying to graduate school.

Organization is crucial.

1) Make a spreadsheet of the schools you are applying to, the application due dates, and the application material required (e.g. a check list for each school). Most graduate schools do online submissions, so keep a record of your user name and password for each school. While you may not have all the application material prepared, often it is useful to go ahead and open accounts at the schools of interest. It takes time to fill in the personal information content (address, current classes, etc.), so you may want to do this earlier rather than later in the application process.

2) Most applications will require 3 recommendation letters. As you are applying to graduate school in the sciences, the letters should be written by those that can write about your abilities and potential to conduct scientific research. If you have done independent study, honors project, or summer research with a faculty member, you should ask that faculty member for a letter. If you have done well in a science course and the professor can describe your abilities to learn and apply new scientific material, consider asking the professor for a recommendation letter. Always ask the professors if they are open to writing recommendation letters on your behalf before you submit their names as references on applications. Please be aware that professors will be writing multiple letters for multiple students, and they will need your help to be organized. Some professors may ask for a spreadsheet with the school names, department programs (e.g. Chemistry versus Environmental Science), and the due dates. Others may have a google document online. Every professor appreciates organization and plenty of notice in writing your letter.

3) Most schools require both the general and subject GRE (www.Ets.org/gre and https://www.ets.org/gre/subject/register). If you have not taken the tests, schedule the dates. Please note that there are fewer test dates available for the subject exam (September, October, and April), while the GRE tests are offered year-round.

How do I write a personal statement?

Many schools will require you to submit a personal statement. Why do you want to go to graduate school in the sciences? What excites you? Everyone has had a different pathway to deciding on applying to graduate school. That’s why the statements are personal. Try your best to share your experiences with the reader.

As the personal statement is part of your application to a graduate school program in science, the reader is most likely interested in learning more about your development and potential as a scientist. Have you ever conducted scientific research or worked in a lab/industry? What did you do for your research/work? What skills did you develop? Have you ever presented or published your scientific research?
The reader may also be interested in which areas of science you would like to continue your independent research study. What topics interest you and why? Did you have a class, read a journal article, or hear a seminar that changed your perspective? Did your research or work experience influence your view? Please do not be afraid to express interest in learning something new. If you already were an expert in the field, you would not being going to graduate school to learn more about the research topic. If your interests are part of a larger plan (i.e. to work in industry, government lab, university), include that as well.

Finally, the reader may be trying to determine whether your research interests can be accommodated by the resources and faculty available at the school. If there are professors you are interested in working with, go ahead and list them. If there are particular factors about the department that appeal to you, include them as well (e.g. large number of faculty working on your problem of interest, geographic proximity for environmental studies, international aspect, ongoing collaborations, etc.). Students may ask how individualized the personal statements have to be for each graduate school application. If you are applying to different departmental programs, the personal statements can vary a bit, yet among similar programs, they will be the same, except for this paragraph. This is your opportunity to express why you think you could succeed as a graduate student and scientist at their specific program.

Students are highly encouraged to share drafts of their personal statements with professors, so they can get feedback on their writing, and they can help professors better understand their decisions to apply to graduate school.

**If you would like to read sample personal statements from former Bowdoin graduates, Emily Murphy, the chemistry coordinator, has a binder of previous statements that you may look over. Drop by Druckenmiller 157 to see the binder**

Is there an interview as part of the application process, and if so, how should I prepare?

Many chemistry programs do not include an interview process as part of the application process; many biochemistry programs, however, do. If you are invited for an interview, you should receive a schedule listing the professors or research groups that you will be meeting. Look over the groups and become familiar with their research. If you have difficulty navigating their research website/papers, ask a faculty member to help you. At your interview, be prepared to talk about your research experience and your interests in ongoing projects at the graduate school of interest. The interview helps both you and your future advisor decide whether your research interests can be supported by the graduate program.

Is the fellowship application process similar to the graduate school application process?

The deadlines for graduate school fellowships are often earlier in the fall (October) than graduate school applications. Again, organization is crucial, and if you are interested in submitting fellowship applications, it is strongly recommended that you develop a separate spreadsheet for fellowships. While each fellowship may have different requirements, you will find that you can use your personal/research statements from your graduate school applications as a starting point for many of the required fellowship statements. The biggest difference may be that many fellowships will ask you about your outreach experience. You may have already done some outreach activities with organizations on campus, such as the Kamerling Society in the Chemistry Department. You may have helped teach a course that has inspired you to help students in the future. Finally, you may have had experiences that have inspired you to start doing outreach events when you enter graduate school. These experiences may come from leaderships
activities in non-science groups. They may come from your experience from having a strong scientific mentor. Remember the outreach component can include both past and future activities.

Students are highly encouraged to talk to their professors about the fellowship application process. Professors can provide valuable feedback on the statements.
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Worksheet 3: Choosing a graduate school once you have been accepted

Many graduate school programs will organize visit weekends for students accepted into their Ph. D. programs. They will pay or subsidize your travel expenses and accommodations. Students are highly encouraged to attend these visit weekends or schedule alternate visit days, as visiting the graduate school and talking to both students and faculty members can play an important factor in deciding which graduate program is best suited for the student.

Obtaining your Ph. D. may take 5-6 years, so it is important to consider (and be honest with yourself) about what is needed for you to be successful in your graduate studies and what is needed for your personal, physical, and mental health. With respect to graduate studies, most of your time in graduate school will be spent on research. Thus, you should choose a research group that does science that interests you. Be open to new ideas and research topics. It may surprise you how many groups’ research projects interest you. The rule of thumb is that you should go to a graduate school in which there are at least three separate groups that you are interested in. This is to ensure that you have choices when unplanned events occur: the faculty may leave the institute; the research group may not have funding for new students or may only have funding to accept a limited number of students; you may have personality clashes with the advisor or lab members. (For those interested, a separate guideline has been provided below on how to choose your research advisor. They may help you brainstorm questions that you would like to ask during your graduate school visits). Talk to your professors at Bowdoin. They are here to support you. They may know more information about the work environment of the school and research group of interest.

With respect to personal, physical, and mental health, students have to be honest with themselves on what they need to feel supported. One of the greatest difficulties about going to graduate school is having to move and create a new support system. Your decisions may include specific factors about the school: Can you imagine being friends with the graduate students who are currently in the program? Will your advisor be supportive in cases of emergencies or mental health outside the research environment? Other factors may not include the nature of the school itself. Priorities can include being near family or partners. They can include being in a rural versus urban environment, being near geographic landmarks that allow for specific hobbies, or being near other communities of interest. There are no wrong or right answers. They are only choices that support your well-being.

**To help other students in the future, please consider giving a copy of your personal statement and/or contact information to Emily Murphy (emurphy@bowdoin.edu) in Druckenmiller 157, so that we may add it to the graduate binder.**

Choosing a Research Advisor (**The following is from a handout designed for graduate students already in the graduate school program; the information and issues that the paragraphs cover may be of interest to prospective graduate students as well).**

Your relationship with your advisor will develop and change over time as you progress through different stages of life, both personal and professional. What you need from your advisor as a first-year in graduate school may differ greatly from what you need as an older graduate student. It is also important to remember that what you need from your advisor may differ from what a friend or classmate needs, as we all have different social and work personalities.
There is no such thing as the "perfect" advisor. Every advisor has multiple dimensions: leadership/people skills (approachable/supportive); scientific prowess (smart, good to engage / discuss ideas with); business skills (adequate funding). Advisors are people too, and it may just be that you feel more comfortable around certain advisors as compared to others. Your choice should depend on which aspects of an advisor are most critical to your happiness and productivity at your school of interest (and which aspects you may be willing to compromise).

While there are many issues to consider, here are some questions and ideas to think about when choosing an advisor:

- How big is the research group? How often does the group socialize outside of lab?
- How hands-on is this advisor? Is that good or bad for your productivity?
- How defined vs. broad are graduate research projects in this advisor’s lab? Is this advisor open to projects that are proposed/designed by graduate students?
- How available is this advisor to meet with students?
- Does this advisor have required hours, a vacation policy, or other time-related expectations?
- How well does this advisor prepare students for preliminary and qualifying exams?
- What is it like to publish with the advisor?
- Is there support, both financially and in terms of preparation, for students to attend conferences?
- How much job-search support does the advisor offer?
- Do alumni from the lab keep in touch / have positive relationships with the advisor? (Ask senior grad students who know people who have graduated.)
- How supportive is this advisor of different career goals (academia, industry, law, etc.)?
- For students who identify themselves as members of groups underrepresented in science or for students who identify themselves as members of the LGBTQ community, have there been students of similar identity in the research group? Did they graduate on good terms? Did the advisor treat and communicate with all students in an equal manner? Is the group culture welcoming?

You may want to be mindful of this list when “interviewing” current graduate students or faculty when choosing an advisor. Remember to talk to people from different years/stages in the lab, and not just the junior graduate students. Talk to students from other labs about the group you are interested in joining, since they may provide a broader perspective. Choosing an advisor can be difficult. Become informed of both departmental and campus resources to help you through the process. Also, relationships can change, so if you find that you need help later in your graduate career, you can often turn to those same resources.