

# APPLYING TO GRADUATE SCHOOL

No matter what program or area of biology you select for graduate school, your chance of being accepted will be strongly influenced by your research experience, references, and graduate record examination (GRE). Students serious about graduate school should seek out research opportunities and make sure they cultivate relationships with faculty during their undergraduate education. The procedure below outlines the general process of selecting and applying to graduate school, but individual programs may vary. Applying to health professional schools is a very different process, although some programs such as combined M.D. / PhD programs will share similar traits. Although it can happen, students interested in science generally do not go to graduate school at the same place they did their undergraduate degree.

## **WHAT IS THIS THING CALLED GRADUATE SCHOOL?**

A typical master's degree in the life sciences takes 2-3 years, and a doctorate takes 4-6 years. Students with a bachelor's degree can go directly to a doctoral program or get a master's degree followed by a doctorate if they wish to continue. Graduate students spend most of their time conducting research, writing it up in a thesis, and publishing it in a journal(s) (unless the program is non-thesis). They also take graduate courses, though coursework is a much smaller part of graduate school compared to undergraduate education.

Graduate education differs from undergraduate education in that students generally get support to pay for their education through research assistantships (RAs), teaching assistantships (TAs), or fellowships. RA support differs depending on the program and advisor. In some cases it may mean students are simply doing their own research and being paid for it, but in others it may mean working for their advisor or another lab. Teaching assistantships are generally given to graduate students for teaching laboratory sections to undergraduates. In many cases, students obtain combined RA and TA support to pay for their tuition and all or most of their living expenses. Fellowships are grants that are given to students and they generally fund individuals' education and living expenses at the school of their choice. Before accepting any offer for graduate school, students should know what kind of financial support is being offered. This includes determining if funding is available for 9 months or 12 months because summer support is sometimes problematic.

During the graduate school process students work with their advisor to agree on a project and protocols that address scientific question(s) of interest to the student. A master's degree student will do a smaller project and may be given their project idea, while doctorate students generally develop their projects independently. Doctoral research takes significantly longer, is more comprehensive, and tends to consist of multiple related research projects. Because the process for either degree requires working closely with the graduate advisor and program, completing a degree can be a very long and unpleasant experience if students are not working with the right advisor and program for their interests. Choose wisely.

## **1. GETTING STARTED: RESEARCHING AREA(S) YOU ARE INTERESTED IN**

Try to determine your interests as best you can, while recognizing that they may change some once you are in graduate school. Go to the library to locate and read papers on the type of research that most interests you; look at the types of questions that are being worked on, and who is working on them. Talk to professors and advisors about science and scientists in your area of interest. Remember that graduate school is generally about finding interesting questions and not just picking organisms that are of interest to you. For example, being interested in the diving physiology of marine mammals is more appropriate than just being interested in marine mammals. Students should also be careful to be more focused than for example, the ecology of bears, since that encompasses many areas such as feeding ecology, population ecology, etc. In general, you should have a more specific idea of what you want to study if you are planning on doing a PhD compared to a master's degree. If this research sounds time consuming, it is, so give yourself plenty of time.

## **2. IDENTIFY POTENTIAL GRADUATE ADVISORS AND PROGRAMS**

Because graduate school is such a significant commitment, the process of selecting a graduate mentor (called an advisor) and/or program is very important, and you should plan on spending time researching your options and applying to multiple potential graduate advisors/programs. The process will differ depending on

the kind of graduate education you are seeking. Most schools accept students to work with a particular graduate advisor and lab and require you to know whom you want to work with before you apply. Students in this situation should carefully investigate potential advisors *before* they apply to any school by reading their papers, communicating with them, and arranging a visit if possible. Once you find appropriate potential advisors, investigate their schools and programs to see if they are in a program consistent with your goals and interests. Apply to schools that fit the goals you set for your graduate education and where you feel good about the advisor. The most prestigious school may not have the best program or advisor for you.

Non-thesis master's degrees generally do not require students to find a graduate advisor and students apply directly to programs that fit their interests. Likewise, some programs, particularly those in the molecular biology and biomedical fields, select students and then have them rotate through different laboratories and graduate advisors in their program to find the most appropriate fit. In these cases you would want to make sure that there are people at the program that you would be interested in working with, but you would not necessarily need to contact them initially. Talk to the programs you are interested in and/or your undergraduate advisor for guidance on these issues.

### **3. THE APPLICATION PROCEDURE**

- **Take the Graduate Record Examination.** Take the exam seriously because your scores will be important to your prospects of getting into graduate school. Very high GRE scores can offset modest grades. However, a poor performance on the GRE may jeopardize your chances if your file is not strong otherwise. Many schools will require you to take the biology subject GRE in addition to the general GRE. Be sure to have the scores sent to all schools to which you intend to apply, and make sure you take the exam early enough to get your scores in on time.
- **Contact potential advisors.** If you are applying to a thesis program or a program that does not have rotations, you should definitely contact potential advisors. Write them and let them know you are interested in their research (make sure you have read their research). Ask them if they have space available for a new student since it is not worth applying if they are not taking students. Give them a short history of your education and interests, and tell them you would like to visit.
- **Complete your application on time.** Late applications almost always place a student at a disadvantage because available slots are usually taken and funds are already allocated.
- **Take the personal essay seriously.** Many applications will include a personal essay, in which you describe “where you’re coming from” – your interests, why you want to obtain a graduate degree, career goals, and so on. To personalize your application, you may wish to state your motivations for wanting to do graduate work and describe any particularly formative experiences (for example, an undergraduate research project) that led you to decide to enter graduate school. The essay should be of reasonable length, commonly one or two pages; do not write an autobiography that continues for many pages. People screening these essays may have hundreds to read, and long essays are not generally well-received. Also, check your spelling and grammar carefully. An essay that is full of grammatical and spelling errors can automatically doom your application because such an essay denotes carelessness and a lack of commitment to doing things well. Identify faculty members with whom you would consider working in your essay. This will help route your application to appropriate faculty members who will be reading through applicant files. Be sure to contact the individuals to whom you refer in your essay.
- **Letters of reference.** It is critically important to select your references carefully. If possible, have at least one letter from someone who has interacted with you in a laboratory setting, for example, where you did your undergraduate research. More research references will make your application stronger. Solicit a letter from a professor from whom you took a small, upper division class and achieved a high grade. A letter that states “Ms (Mr.) X was one of 535 students in my introductory class and she (he) ranked in the upper third of the students in the class, etc.” is not helpful. It is best to use faculty members for all of your letters, although there are exceptions to this rule (for example, if you worked for a government research lab in the summer). “Character reference” letters—“Ms (Mr.) X was one of the fastest working staff members our McDonald’s ever hired...” will not help you. Perhaps the most obvious point is this: *get to know at least two or three professors well during your undergraduate tenure.*

#### **4. APPLY FOR FELLOWSHIPS!!!**

A surprisingly small percentage of students who apply to graduate school also apply for fellowships (for example, graduate fellowships awarded by the National Science Foundation, the Office of Naval Research, the Howard Hughes Medical Institutes, and so on). If you are awarded a fellowship, acceptance to a school of your choice is almost automatic, for at least two reasons: (1) one who receives a fellowship is obviously a good student; and (2) university funds for supporting graduate students are often limited; hence, a fellowship may allow your acceptance into a program that otherwise could not offer you support.

Investigate all relevant fellowships. Look carefully at “obscure” fellowships that may describe you in terms of interests, gender, choice of university, and so. Remember that if you do not get a fellowship, you still should be awarded support through research and/or teaching assistantships.

#### **5. VISITING SCHOOLS OF INTEREST/MEETING POTENTIAL GRADUATE ADVISORS.**

It has become routine for schools to interview prospective graduate students. You should plan to visit as many of your top-rated schools as possible. In some cases, the school will pay some fraction of the travel costs and you should check this out before you arrange your travel. Contact someone at the schools, for example, the potential advisor(s), or the chair of graduate admissions on the campus, to arrange the visit. The best time to visit is during the period after your application has arrived, but before the final decisions on admissions are made. Typically, this period falls between late January and mid-March. Do not delay your visit into April because admission decisions generally have been made by April 15.

During your visit, talk with several faculty who share your research interests. Do some homework before you visit so you are familiar with their recent work and can discuss it with them. Determine if their recent publications accurately reflect the direction of their current and future research. People may change fields and past publications are not always a reliable guide to what is, or will soon be, going on in a lab. Be prepared to talk about your scientific interests and what kind of research you would envision doing as a graduate project. Avoid being too vague (“I’m interested in marine biology”) or too specific (“I’m interested in the symbiosis between the purple-spotted jellyfish and juvenile fishes”).

*This is very important:* talk with the graduate students at each school to learn about general aspects of the graduate program, specific pros and cons of the advisor(s) with whom you might work, and the working conditions in the advisor’s laboratory. Are students allowed a high degree of independence in selecting projects? Is the advisor helpful in obtaining research support? Is the advisor generally on campus and available to the student? What is the advisor’s track record in terms of helping students find good postdoctoral opportunities and jobs? Get a feel for the size of the advisor’s laboratory. Some laboratories are huge and the existing “chain of command” may leave graduate students with only minimal contact with the advisor. This does not mean that you will not receive good training, but it may be under the guidance of a postdoctoral worker or a technician. Learn about the community at large. Does the campus have all the facilities you need? How good is the library? What are the living conditions (rents, commuting distances, etc.)? Find out about requirements and opportunities for teaching or research assistantships.

#### **6. MAKING A DECISION.**

Assume that several of the schools to which you applied have said “yes.” What criteria are most important in deciding among the possibilities? Roughly in order of importance, the following factors should be considered. **First**, based on observations and information from visits, which of the advisors/laboratories seems most attractive to you? Remember, when it comes to this stage of making your decision, the rating of the school is less important than the suitability of the laboratory in which you will work. **Second**, if several mentors on different campuses seem equally satisfactory, which overall program (supports, coursework, resources, and so on) seems best? Remember that unlike undergraduate education, most students receive financial support for their graduate education. **Third**, consider important personal factors. Did you feel comfortable on the campus and in the surrounding community? Ultimately, you must base your decision on how well the school/program/advisor can meet your personal needs in terms of allowing you to study your area of interest and providing you with the opportunity to do independent work, the hallmark of graduate education.