GRADUATE SCHOOL INFORMATION FOR BIOLOGY MAJORS

I. Is grad school for me?

Grad school IS for you if you love biology and research and have decided that you would like to become a professional biologist.

If you haven't yet decided what you want to do with your life, then it's too early to think about grad school. Grad school is not something to do merely to increase your chances of finding a "good job" if you don't yet know what kind of a job you want. Grad school in biology has traditionally provided very specialized training for a very specific career: principally, research/teaching in a college or university setting or any other career that involves doing original scientific research (e.g., in industry, a government agency, a private foundation). However, a Ph.D. can be an asset in a range of scientific non-research related careers as well (e.g., patent law, business consulting, primary and secondary education). For other kinds of careers, it may not be very helpful at all (see section VIII about M.S. degrees vs. Ph.D.s).

II. What kind of a time commitment is involved?

Depending on the field, it typically takes 5-7 years to earn a Ph.D.

III. Will I get a job once I get my degree? Isn't it really hard to get jobs these days?

Yes, it is hard. But that doesn't mean you shouldn't do it if it's what you love. To increase your chances of getting a job, choose your grad program wisely. Enter the very best program you can be admitted to. The better the department's (and your mentor's) reputation in the chosen field, the better training you will get, the more important contacts you will make, the more influential your advisors' letters of recommendation will be, the better your "network" will be. All these things will help you find a job. Other skills that will help you succeed are the ability to speak well in public, to write clearly and effectively, and to be computer- and math-savvy.

IV. So how do I find out where the best programs are?

By doing lots of research. Allow several months to do this. First, you have to decided what specific subfield of biology you're most interested in. (Some examples of "specific" are "vertebrate behavioral ecology" or "developmental biology" or "plant systematics" or "prokaryotic genetics".) Then start asking your professors about good programs. Go to the library and read journals in the field that interests you, and see who's doing the kind of work you would like to be doing yourself., and where they are. Browse the Web to find out more about the departments you're interested in, and/or write to schools for information about their graduate programs. Go to the Biology office and browse through the big blue book titled "Research-Doctorate Programs in the United States." This reference gives national rankings of every school in the country for their programs in seven general areas of biology.

If you aren't interested in an academic career, but instead are hoping to work in a government agency like the Forest Service or B.L.M., look at the "land grant" schools in states you're interested in (e.g., OSU or WSU in this part of the world); they train many of the people in those agencies.

What you're looking for is this combination: a school with a very good reputation, where there are at least two faculty members whose research interests you, and where you will feel comfortable and supported (more about this later).

V. What are my chances of getting into a top program? And what should I do if I can't?

At the very minimum, you need to have taken the required courses. In most fields of biology, these are: two full years of chemistry, math through calculus, an introductory biology series, and some upper-division courses in biology. Cell/molecular biology programs often require a year of physics and courses in biochemistry and physical chemistry as well.

Grad school admission is competitive, particularly in the top programs. Students with the best chances are those who: have good grades, especially in science/math (GPA > 3.5); have extensive research experience (e.g., summer programs, independent study, course projects, senior thesis); have strong, detailed letters of recommendation; and have good GRE scores in both the general test and in biology/biochemistry. If your record is strong, you should apply for an NSF or Howard Hughes Foundation graduate fellowship; winners of these stiff competitions are highly sought by the top programs. Get a faculty member whose judgment you respect to help you prepare a strong application package; this person can read and edit your essays, talk with you about who you should ask for recommendations, etc.

If your record is not super strong, but you are very committed to going to grad school, then you have two options: you can apply to a Master's program at a lesser-ranked school (the top programs rarely take Master's students), do a bang-up job, and then apply to a Ph.D. program at a better school once you've proven yourself; or, you can spend two or three years working as a research technician in a high profile lab in your area of interest, using the time to gain knowledge, experience, some good recommendations, and possibly a publication or two before applying to grad school.

VI. Is it okay to take a year off between college graduation and grad school?

This is quite common; it is neither an advantage nor a disadvantage, as long as you spend your time productively (like working in a research lab). If you take time off, don't fail to maintain contact with the professors who will be writing your letters of recommendation. Write or visit them periodically. If you plan to apply for any fellowships, make sure your professors know how to reach you when the application forms arrive.

VII. Can I afford it?

Grad school in science is free. Good programs offer the students they accept financial support. You can expect to get a fellowship, a teaching assistantship (T.A.) or research assistantship (R.A.) and a tuition waiver. Look for a guarantee of at least four years of financial support before accepting an offer. If you are not guaranteed financial support, then wait for a better offer; you can't succeed in graduate school if you have to work part-time.

VIII. What will grad school be like?

A summer research program is a good model for grad school, except that you will have less faculty guidance in grad school. You won't take many classes; you'll do research and attend seminars, where you read and discuss newly-published and ongoing research, yours and other peoples'. No one will be telling you how to spend your time, but there will be the clear expectation that you will spend ALL of it working. You'll live, eat, and sleep research, including evenings and weekends. Prepare for exhilarating intellectual stimulation. You'll meet people who share your interests and dedication and will be some of the smartest people you'll ever meet. In many fields, you might spend your first year doing rotations (e.g., cell or molecular biology); in others (e.g., ecology or evolutionary biology) you'll work with a particular adviser from the start. In some fields, you'll choose your own research problem (e.g., ecology or evolutionary biology); in others (e.g., cell or molecular biology), you'll work on a problem that your adviser suggests to you, and that is a part of his/her research program.

Each program is different, so before taking an offer, you should visit the different schools you're interested in (the best programs expect you to visit for an interview and will pay for your trip). Talk to potential advisers, but also to their graduate students. They'll be the people you'll spend the most time with. Are they happy? Miserable? Will you feel comfortable with them? How do they feel about their advisor? Do they think he/she is wonderful? Hateful? Do they think they're being well-trained? Are they getting jobs when they finish?

IX. Should I get a Master's or a Ph.D.?

A Ph.D. is necessary for careers involving independent research, where you are the one determining the direction and plan of the research. A Master's is the terminal degree in many non-research fields (e.g., high school teaching, some environmental fields). Depending on your career goals, it may be all you need. If you think you want a Ph.D., but your undergrad record isn't very strong, a Master's could be a stepping-stone into a better Ph.D. program (see section V above). If you're not sure about your commitment, a Master's is a way to test the waters (but be prepared for less support and status than Ph.D. students get). If you love benchwork and do not mind being dependent upon someone else for funding and research direction, then a Master's could be for you. Well-trained Master's students are highly paid and sought after by many academic research labs and biotech companies. These jobs are plentiful, allow you to spend the rest of your days doing experiments (not sitting in front of a computer), and keep you at the cutting edge of science.

Letters of Recommendation

Letters of recommendation are an extremely important part of the application process. You will need three or four, and they take quite a bit of time to prepare. Be courteous to your recommenders and remember that they have many other deadlines to meet. Some good advice:

1. Don't <u>assume</u> that a particular faculty member is willing to write you a letter; make an appointment with them and <u>ask</u> if they will do you this favor.

2. If they agree, then give them at least a month's notice before the letter is due.
3. Supply them with information about yourself to help them prepare the letter: an academic transcript, a draft of your application essay, whatever else they may request.
4. Make sure they have the necessary forms, with your sections already filled out. They appreciate receiving stamped, pre-addressed envelopes as well.
5. You might give them a reminder a few days before the deadline.
6. Thank them! And don't forget to tell them what happens; did you get in or not? They really want to know!

Applying – A Timetable

Note: If you take a year off, shift all of these times accordingly

Summer btwn. Jr. & Sr. years:	Research which grad schools to apply to and get applications; study for the GRE
Early fall of Sr. year:	Sign up to take GRE general and subject exam in the fall
Early Nov. of Sr. year:	NSF/HHMI fellowship application deadlines
Dec.-Jan. of Sr. year:	Grad school applications deadlines
Mar.-Apr. of Sr. year:	Interviews and notification of admission

For additional questions or information, contact Kellar Autumn (x7502, autumn@), Greta Binford (x7653, binford@), or Greg Hermann (x7568, hermann@). For information about grad school in a specific area of biology, talk to the faculty member whose interests are closest to that area.