The Graduate School Process

By James Batteas

For many students, the prospect of going to graduate school can be daunting. Here I discuss some simple guidelines to help you through the process of making decisions about graduate school.

Deciding to go or not to go?

The first step, of course, is deciding if graduate school will further your career goals. This will depend on what you see as your long-term career plans. If you think that academia is in your future, then a Ph.D. is a must. If your career plans are focused on entering the chemical industry, you might take a job right after completing your B.A. or B.S., but an advanced degree may become important for potential advancement. In many industrial settings, only those with advanced degrees will be considered for management tracks and other leadership roles.

Let's assume that, whatever your reasons may be, you do want to go to graduate school. Now what? You probably have many questions, and a limited amount of time to plan your way forward. If so, here are a few answers and pointers to help you through the process.

How to choose which schools to apply to

Once you have decided that graduate school is part of the career path for you, the next step is to pick the schools to which you want to apply. But how should you choose? At present there are approximately 170 schools that offer advanced degrees in chemistry. Depending on your situation, many factors may influence where you consider attending school, including family obligations or work constraints that place geographical restrictions on you (e.g., your company is paying for you to attend a graduate program, etc.).

However, the single most important factor in deciding those schools to which you should apply is the research focus (or foci) of the faculty. For each school you consider, you need to ask: "Are the faculty engaged in the type of research that I am interested in doing?" If you are not sure what area of research you want to pursue, then probably a bigger school is better for you, since it will tend to offer a broader range of opportunities.

How do you find out what faculty at the schools are investigating? Go to graduate school fairs, carefully look through departmental websites, and call or e-mail the department to request information on their graduate programs and faculty. It is good to do your homework at this stage, because once you decide to go to graduate school, you (and the school) are making an approximately five-year commitment. You want to make sure you are going to the place that is best for you. By the way, it also wouldn't hurt to e-mail the specific faculty members with whom you are interested in working. Most faculty love to talk about their work with prospective students, so drop them a note! Sending form e-mails to faculty, however, should be avoided.

What should go into your applications?

Luckily, most applications for graduate schools are about the same, so you will be able to recycle some of what you prepare for every school. Pay attention to the deadlines … and APPLY EARLY! Why? Many programs have additional fellowship funds to award, depending on the program, and when you apply early you have a better chance of being considered for these fellowships. At the very least, apply on time. Graduate recruiters and admissions committees may regard late applications as a lack of commitment or organization on your part, and these intangibles may make your application less competitive.

Fees

Be prepared to pay, as you will encounter fees along the way. Each time you take the Graduate Record Examination (GRE) costs around $140, for example. On top of these costs, there may also be application fees for the graduate programs you are considering, meaning that applying to six or seven schools could cost you as much as $600! If you can't pay the fee, ask the program if the fee can be waived or reduced. It never hurts to ask.

Grades

Almost all graduate school applications will require transcripts from ALL schools you have attended. That includes that the local community college where you may have taken classes while home for the summer. Make sure that you request all of the transcripts in time to arrive by the application deadline (or earlier), as applications may be considered incomplete without them, and thus not get reviewed. In terms of grades, most graduate programs require a B average or better (3.0/4.0) to gain admission. Your application will be especially strengthened by good grades in your upper division courses. In fact, many places consider these grades more heavily than those in your first two years.

Entry exams

You will also need to submit scores from the GRE. Check to see which exams are required by the schools to which you are applying, and learn their typical score requirements for admission. Not all schools require the subject test, but some do. Plan accordingly to have these exams completed in enough time for the scores to be reported before the application deadline.

If you are applying for admission in the fall, you should really target taking these exams by September of your senior year. If you are applying for spring admission (i.e. January or February), then you will need to have your GREs done by May of the year you graduate to receive your scores in time. Check with the schools to which you are applying to see whether they will consider applications for spring admission (some may not). If you are an international student, you may also be required to submit scores for the Test of English as a Foreign Language (TOEFL). Again, you want to make sure that these scores are reported in time for the application deadline.

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Personal statement

Every school will require you to submit a personal statement, in which you should succinctly describe what you have done to prepare for graduate school. You should take this part of the application very seriously. Here are a few tips for success:

Articulate your personal goals. Explain to the admissions committee why they should make you an offer to come to their school. Describe your career goals and what area(s) of research you wish to pursue. Take the time to outline the relevant coursework you have taken to prepare for advanced studies.

Describe your undergraduate research. Many places will not strongly consider applications from students with no research experience, so if you have not been involved in research yet, *do so.* This research can come in many forms, ranging from participating in research at your home institution, to going away for the summer to participate in a Research Experiences for Undergraduate (REU) program. The National Science Foundation maintains a list of schools with active REU programs on its website. Also, many schools, companies, and national labs offer summer programs that are internally supported, so check with them. No matter how you get it, *research experience is a must* for getting into a good graduate school. In your personal statement, you should relate your overall experience to the committee.

Explain your extracurricular activities. In addition to research, if you have been involved in clubs or other activities that have allowed you to develop leadership skills (e.g., serving as secretary of your local ACS Student Affiliates chapter, etc.), this is also useful to describe to the committee.

Research the faculty. Take the time to tell the admissions committee under which faculty members you are most interested in studying. This shows the committee that you have done your homework and that you have thought about what you want to do. As a rule of thumb, you should be sure there are at least three faculty members whose research interests you, since admission to a doctoral program does not guarantee you admission into a particular faculty member's group.

Letters of recommendation

Most programs will request at least three letters of recommendation in support of your application. These letters should come from faculty or employers who can speak to your experience in chemistry. You should include letters from faculty who have taught you in class or with whom you have done research. Make sure that you ask for these letters at least a month in advance.

Take the time to sit down with any letter writers who don't know you well to discuss your career aspirations. Prior to your meeting, give them a copy of your current résumé. If you don't have a résumé, learn how to create one now. As you begin to enter the professional workforce, an up-to-date résumé is a must, and many schools have services to help you prepare one (see the sidebar about resources, below). This will help your letter writers provide a more meaningful assessment of your background and goals to the admissions committee. Also, don't hesitate to bug your letter writers and remind them of upcoming deadlines.

Which school is right for you?

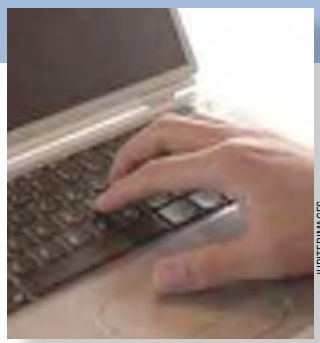
If you are lucky enough to be admitted to more than one program, then you face the tough task of narrowing down your options to one program. How do you decide?

Check out these resources from ACS

Graduate Education in Chemistry — Information about resources, planning for graduate work in chemistry, and more! **http:acs.org/education** and click on Graduate Education.

DGRweb — The ACS Directory of Graduate Research, an online resource on faculty and their research programs in institutions throughout the U.S. and Canada. **www.acs.org/DGRweb**

Experiential Programs in Chemistry — A one-stop source for information on summer research, internship, and co-op opportunities. **www.acs.org/epic**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Visit the school

Many programs will offer you the opportunity to visit their school (and will pay for it) either during a visitation weekend or set of weekends. If you can't make one of the scheduled dates, ask about individual visits. You should take advantage of this, as it gives you the chance to see the school and meet with faculty and students to determine if you can see yourself in that program for the next five years.

This is not the time to geographically restrict yourself. Graduate school can be an opportunity to live somewhere different for a few years; and even if you don't like a particular area that much, you will only need to be there for a finite time. Ultimately, of course, just as with your decision about where to apply, you need to ensure that there are faculty members at the school with whom you would like to work. By visiting, you will have the chance to meet with these faculty and their students to get the 'real scoop' on what it is like to go to graduate school there.

Evaluate your careeer support

When you visit, take a close look at the facilities that the program offers. You want to make sure that you will have access to the equipment you need to conduct your research in a timely fashion. For example, if you are going to be doing a fair amount of synthesis, find out whether you will need to send your samples out for NMR or X-ray diffraction or mass spectrometry analysis, or will be able to have such procedures done on site.

In terms of your long-term career goals, try to evaluate how the program assists students in obtaining jobs once they graduate. See if they offer career assistance such as helping students prepare résumés, and whether companies actively seek students from the program for employment. Does the school have on-site interviews? Find out where the graduates from the school have gone after graduation, especially the students of the faculty with whom you are interested in working.

Understand the program requirements

How many and what types of courses will you need to take? Since doctoral programs are research-intensive, it is unlikely that you will take many classes, but requirements vary from school to school. Are there cumulative exams or oral exams that you will need to pass? Many programs require students to teach a minimum number of courses. What is that requirement for the programs in which you are interested? While requirements vary, you will find that much of the overall workload is generally comparable, with probably the largest variations coming in coursework. Talk with several students at the school when you visit, and see how they feel about their course/workload. Individual impressions of the school can vary, so get a balanced opinion. If you hear the same things from several people, then the information is probably more reliable.

Carefully evaluate your offer

Most places will make you an offer that includes a teaching and/or a research assistantship. To fairly compare offers between schools, you must determine what your take-home pay will be, as well as what tuition and fees you will need to pay. At many places these costs may be waived; at others, tuition and fees are paid by the students, while the schools pay the students a higher salary. Don't be fooled by hidden costs! What types of health benefits are available to you as a student? What is the local cost of housing?

All this being said, don't let the stipend be your sole guide in choosing between schools. You are not going to graduate school to make money immediately; rather, you are going there to enhance your future career and overall earning potential. Everyone in graduate school 'lives on peanuts' — so ultimately, you need to be working with faculty whose research interests match your own.

Once you have decided, sign your offer on the dotted line and prepare to work hard. The next step is choosing a research advisor, a process that is addressed in this issue's editorial by Marjorie Caserio. Earning an M.S. or Ph.D. is not easy, but it will be one of the most rewarding experiences of your early career. Revel in the challenge! inC

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