

## How to Win a Graduate Fellowship

By MICHAEL KIPARSKY

### CATALYST

Career advice for scientists

Trying to win a graduate fellowship can sometimes feel like playing the lottery -- long odds for a big payoff. I remember well the stress of the application process, and my surprise when I actually landed a National Science Foundation fellowship while some of my academically superior peers did not. I credit equal parts good luck and good strategy.

In the sciences, the best fellowships pay tuition and a stipend of up to \$30,000 a year, for multiple years. Some also provide money for research expenses.

Many students learn the ropes of fellowship writing through long, hard experience -- if they learn them at all. What I learned from the application process is that you *can* tweak the odds in your favor. I would like to offer some tips here to help you get a leg up on your competition.

### Make Time

Writing fellowships is not easy. But like any large task, it can be broken down into smaller, more manageable elements. For successful applicants, applying for a fellowship is not a one-weekend, or even a one-month, endeavor. As with any writing project that demands a substantial, polished, well-thought-out product, cramming at the last minute will not produce your best work.

Plan well ahead of your deadline, and build extra time into your schedule. Many people budget considerable time over their summer and fall for a November due date. One winner I know worked on his proposal for over a year.

If you're a first-year graduate student, you should consider taking on fewer commitments from the enticing new menu before you in order to have time to work on

fellowship proposals. Count your proposal writing as equivalent to a hefty seminar.

### **Do Your Homework**

Most universities have a fellowship office that can get you started answering your first question: What opportunities for financial support are out there? Set aside a couple of afternoons to browse through binders of information. Don't forget to talk to the staff members in that office; they often have a wealth of experience and knowledge, and can point you to workshops on grant writing.

On the Web, a good place to start looking for fellowships is at [GrantsNet](#). Among the biggest names in the business:

- the [National Science Foundation Graduate Research Fellowship Program](#),
- the [NASA Harriett G. Jenkins Predoctoral Fellowship Program](#),
- the [National Defense Science and Engineering Graduate Fellowship](#),
- the Environmental Protection Agency's [Science to Achieve Results \(STAR\) Fellowships for Graduate Environmental Study](#),
- the [Hertz Foundation](#), and
- the U.S. Education Department's [Jacob K. Javits Fellowships Program](#).

Spending some time searching around the Web or at your fellowship office may reward you with a more obscure, less competitive source of money in your discipline.

Once you've decided which fellowships to apply for, it's time to gather information. Find out which topics are most often supported, and which rarely get the nod. Don't forget to read all of the material supplied by the grant agency.

Tailoring your proposal to the interests of the agency or foundation is critical. Parse the call for proposals thoroughly, and make sure your proposal deals with all the criteria.

Read as many successful proposals as you can find. University fellowship offices may have archived proposals, organized by agency. Hit up previous winners in your department for their proposals, and ask for their advice. They may represent potential editors for your drafts.

### **Narrow Your Focus**

A few students enter graduate school knowing exactly what they want to study. If you are one of them, so much the better -- build on what you have already done.

Many students don't have such focus, although most have some idea of the areas that interest them. Being faced with a blank piece of paper on which to describe your earth-shaking future research can seem daunting.

The first step, then, is to find out what people have already done in your areas of

interest. Make use of your university librarian, and be as systematic as possible. Note that no matter how clear you are about what you want to pursue, you will need to demonstrate your understanding of the existing literature. So keep track of what you read -- you will be evaluated partly on the citations in your final proposal.

## **The Idea**

The crux of the application is the research question you will investigate. It can be of your own design; indeed, developing your own good idea is very satisfying. But there are other paths to identifying your research question, as well.

Finding a question that follows logically from an existing line of inquiry is a great way to go. That is where your reading will pay off. Proposing to fill an existing void in the research -- even an obvious one -- has formed the basis for many successful proposals. Often you can find next steps and research gaps directly laid out in the conclusions of research papers.

An equally valid approach is to look to your adviser or another professor for a topic, or merely for guidance on a topic you've identified. You will develop the idea into a solid proposal, and own it by the time you finish.

Make sure you have a hypothesis -- or more than one. Failure on that seemingly obvious point has sunk many an applicant. You need to be able to boil down your research goal to a specific question you propose to ask, rather than discussing a general examination of a topic. Explicitly laying out your approach as a test of null and alternate hypotheses will force you to clarify your thinking about the research you plan to pursue, and it will help you explain it unambiguously.

Try using your course work to help you on your fellowship proposal. Doing your research as part of a class can be helpful. Taking a seminar on your topic of interest can provide structure and focus for your literature review, and a captive audience to evaluate your ideas as they develop. It is also a chance to enlist the support of an interested professor.

## **Know Your Audience**

Your proposal will be read by busy scientists who probably are not expert in your exact area of interest. They read hundreds of proposals in a sitting, with the goal of quickly eliminating those that don't stand out as excellent. Make it easy for them to choose yours. How?

- Write clearly. The most brilliant idea can easily be swallowed by stilted prose. Re-read *The Elements of Style*.
- Minimize your use of jargon. Remember, you are not writing for someone who knows your topic fluently. State things simply in common terms, and define your terms clearly if you must use nonstandard language.

- Format appropriately, but don't overdo it. Underline your hypothesis, italicize key points, put big ideas in boldface type, use bullets. Those tricks will help readers who are skimming your proposal, and will make the main concepts stick in their heads for that extra moment.
- Use figures and graphics where appropriate. If you have preliminary data, relevant information from another source, a map of your study area, or a simple graphic to represent your ideas, by all means include it. It will probably count toward your page limit, but a strong visual element can be well worth the words you trade for it.

### **It's All About You**

Don't forget that most graduate-student fellowships are intended to support a person, not an actual product.

Your main task is to demonstrate that you can conceptualize and present a strong potential research path. Many students I know who received an NSF grant are conducting research different from the project they proposed, and the NSF is generally fine with the switch.

Remember that your entire application counts, not just your research plan. Don't neglect the other essays you are required to include. For example, the section on your background should justify why you are qualified to carry out the research you propose, and the section on career goals should show how you plan to use the skills you will develop during your schooling.

Successful proposals seem to have a few elements in common. Some of those characteristics are:

- A focus on a "hot" area of the discipline. The scientists evaluating your proposal will have a broad familiarity with the field, and may know what the spicy topics of the season are. You will impress them if you are on the ball enough to address an active debate and controversy.
- A "doable" scope. That means the project should be doable by you, on a dissertation time scale, with the resources you expect to have available. The scope of most proposals is too large at first, and needs to be narrowed.
- Clear knowledge of the subject. Demonstrate your familiarity with the system, field site, organization, organism, star cluster, or whatever you intend to study.
- Relevance to the grant agency's goals. Private foundations might have programmatic areas of interest you can contribute to. Even the NSF, which promotes basic research, seeks applicability in the work it finances. In some cases, such as the EPA's STAR fellowships, relevance is essential. Be shameless about emphasizing how your project will further social goals or have policy implications.

## **Drafts, Drafts, and More Drafts**

Don't be afraid to start writing the proposal before you feel ready. Rewriting again and again will tighten your prose, clarify your ideas, and polish your proposal. It will also help you ferret out typos. I found four in my final proposal when I reread it the other day. I got lucky in spite of that. You might not.

Ideally, professors in your field will carefully read and improve your drafts. Others who are not as expert, including friends, family, and peers, can evaluate your writing and logic. If what you are trying to say is unclear to a fellow student, chances are it will be unclear to the evaluation committee.

## **Prep Your Recommenders**

Fellowships can require four or more glowing statements about what a wonderful and brilliant person you are. To get this far, you probably have developed and maintained relationships with people, hopefully professors, who can attest to your best qualities.

It's important to offer evidence that your work has the support of your department or university. Grant agencies want to know that faculty members are invested in your success. Even if you are a first-year graduate student, your advisers should understand their function in this regard, and if they don't, it is completely legitimate to politely let them know.

It doesn't hurt if your recommenders are prominent in your field of interest. However, it is more important to have someone in your corner who writes well and wants to be your champion than to choose a big name who is not invested enough in your success to put the effort into writing a glowing appraisal.

Some applicants actively cultivate, and even coach, their recommenders. One student in our department actually lays out a list of important points, respectfully asking each letter-writer to attest to an aspect of her qualifications (quantitative skills, creativity, language skills, etc.) that supports her application.

Give your recommenders copies of your draft proposal well before they write their letters. Better yet, give them a copy of it well before it is due, and solicit their feedback. The more they invest in you, particularly if you might work in their research group, the better off you are.

## **Apply, Already!**

The odds may seem against you, but this *is* a worthwhile exercise. A month before submitting my NSF proposal, I was deeply distressed. Everyone else applying seemed so much more in control, confident, and focused. I came pretty close to chucking the whole thing. I'm glad I didn't.

The reason I stuck with it was that I shifted my attitude from an all-or-nothing, win-or-lose mentality. I relaxed, accepted that my chances were slim (everybody's are!), and approached the process as an opportunity to explore an idea that I actually wanted to pursue, without attachment to the notion of a big payoff.

However your fellowship application turns out, you will gain valuable experience and a much deeper understanding of a field of interest to you. You might also get a dissertation topic out of it, or, equally valuable, the knowledge that you don't want to explore that topic. You will also gain a template for future proposals.

Some fellowships will even send you copies of reviewer's comments, which will help you recraft your proposal for resubmission to that agency or elsewhere. And maybe, just maybe, you will be rewarded by a life-changing letter.

*Michael Kiparsky is a National Science Foundation Graduate Research Fellow in the Energy and Resources Group (ERG) at the University of California at Berkeley.*

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