Random Thoughts . . .

SO YOU WANT TO WIN A CAREER AWARD

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The NSF Early Faculty Development (CAREER) Program Award is the most sought-after recognition a new faculty member can receive. Besides being an impressive addition to the recipient's resume, the award gives major bragging rights to his or her department and institution. As soon as most new assistant professors move into their offices and boot up their computers, they are expected to begin work on their CAREER proposals—and if they don't make it on the first attempt they are expected to keep plugging away until they either win the award or are no longer eligible.

When I recently had the pleasure of serving on an NSF review panel,* I noticed that certain common mistakes tended to land proposals in the "Sorry—good try, but not quite good enough to get funded" category. If you're a new faculty member planning to go for a CAREER award, you might consider taking several precautions to avoid these mistakes.

According to the NSF program solicitation,[1] CAREER proposals must include "creative, integrative, and effective research and education plans," and show "excellence in both education and research." The most common mistake I've seen is discounting the importance of the education part. It appeared that many of the authors of proposals I reviewed worked long and hard on their research plans, then thought briefly about their education plans and wrote one or two cursory paragraphs about sponsoring undergraduate research projects or developing a new graduate course related to the proposal topic. With very few exceptions, those proposals were not funded.

This outcome makes sense if you think about it. Most CAREER applicants have spent at least four years thinking about the research topic of their proposals and are also smart enough to get knowledgeable senior colleagues to review their research plans. Those plans are consequently excellent in most proposals that make it past the first cut, which means that the education plans often determine who gets the awards. If the education plans are hastily or unimaginatively written, the proposals are not likely to be competitive.

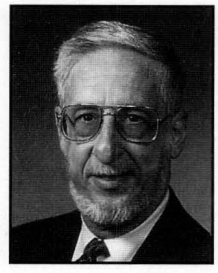
Here are several specific suggestions.

❒ **Read the program solicitation carefully and follow all instructions.**

When the solicitation says that the program wants an integrated plan of research and education, provide exactly that. When it tells you that you must obtain the written endorsement of your department head and your bio must contain no more than 10 references and your project description has a 15-page maximum and you may submit letters of support from prospective collaborators but not reference letters, believe it.

❒ **After you have outlined your plans, run your ideas by the CAREER contact person in the NSF division or program to which you plan to submit.**

This is legal; in fact, NSF program officers expect it. You will find them extremely helpful—they don't want you to waste your time, reviewers' time, and ultimately



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**I'm sincere about calling the experience a pleasure—sitting in a room full of exceptionally talented people and discussing the pros and cons of clever scholarly ideas for two days is truly enjoyable. If you are ever invited to do it, I'd advise accepting.*

their time by writing a proposal that doesn't fit their program's goals and guidelines. They might recommend modifications that would make your proposal more suitable for them, or they might suggest sending the proposal to another program for which it would be a better fit.

❑ **Do a thorough literature review and make sure you cite the most important theoretical and experimental work and most important researchers in the areas covered by the proposal.**

Search the literature in the area of the education part as well: if you're proposing a new approach to cooperative learning or distance education or K-12 outreach or the undergraduate laboratory, be sure to find the relevant published work and cite it. Ignoring important research in your proposal reflects poorly on your expertise and looks like you haven't done your homework, and omitting an important researcher will also do very little for your cause, especially if he or she turns out to be a reviewer.

Try to avoid negativity in your citations, proposing to build on previous work rather than correcting it: *"Frobish [1998] attempted something similar but got it all wrong—my work will repair his blunders"* is likely to backfire on you. You'd be surprised at how often those important people will get to review your proposals and how surly they can become if they don't see their names in the reference list or their work is trashed.

❑ **Pay attention to assessment, especially in the education plan.**

Be specific about how you will know whether your research and education plans are successful. State your hypotheses, itemize the data you plan to collect, and make explicit connections between the hypotheses and the data. If you're trying something novel in your education plan (or if your research involves teaching and learning) and your "assessment" consists only of surveying students to see how they liked it, you will not get a warm reception from the reviewers. What they want to know is how you plan to demonstrate that your intervention improved learning or skill development or retention in engineering or science.

❑ **Don't overreach.**

If you submit a proposal for a five-year $300,000 study and propose to do research that would clearly require a large team of investigators and a much higher level of funding, it will probably not be funded, especially if you're also going to be teaching three courses a semester throughout the award period. You're much better off proposing something of more limited scope that you have a reasonable chance of accomplishing.

❑ **Don't forget that you're writing a career development plan and not just a research proposal.**

In the project description and/or the biographical sketch, take a little time to spell out your long-range goals and how the proposed work will further them.

❑ **Push your credentials.**

A biography in a proposal is not a good place to be modest. Include anything that suggests your ability to carry out your plans successfully—prior job and research experience, publications (summarize the relevant findings if they're not in your project description), awards, collaborations with leaders in the field, and so on. Since you can't include reference letters in the proposal, the only one in a position to blow your horn is you—and you can be sure that your competitors will be blowing theirs.

❑ **Get internal feedback before submitting the proposal.**

Beg, bribe, do whatever it takes to get knowledgeable colleagues to act like picky NSF reviewers and bleed red ink all over your proposal draft. Ask them to focus on the things that the real reviewers will be rating: (a) the "intellectual merit of the proposed activity," (b) the "broader impacts of the proposed activity," (c) the level of integration of research and education, and (d) the degree to which the work will "broaden opportunities and enable the participation of all citizens—women and men, underrepresented minorities, and persons with disabilities."[1] Revise the proposal to take into account the criticisms and suggestions you get, and *then* send it in.

Doing all these things may not make your proposal a guaranteed winner, but it will unquestionably improve your odds. Good luck.

REFERENCE

1. <http://www.nsf.gov/pubs/2001/nsf0184/nsf0184.htm>

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