Careers

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Small College, Big Research

Tips for scientists at teaching-oriented institutions on how to pursue outside grants

By KAREN M. MARKIN

Catalyst

When scientists at small colleges and universities seek research grants, they often run into challenges not faced by their colleagues at major institutions. It is, nonetheless, possible to maintain a research program at a small institution—if you have a great deal of passion and a little ingenuity.

Here are some issues to consider at various points in your career as you navigate the grant landscape:

Campus culture. If you are still looking for a tenure-track position, especially at teaching-oriented colleges, pay attention to the campus culture. Faculty members at small institutions say a supportive culture is crucial to their success as researchers. It's important that the administration "get it," said one department head.

Among the clues that an institution will not just encourage but will also support faculty efforts to win outside grants: Grant writing counts as scholarly activity for promotion and tenure; the college has a seed-money fund for work that could lead to a large grant proposal; some indirect costs, or "overhead" dollars, are funneled back to the investigator or the department; and workshops on writing or managing grants are offered.

Workload. Whether the teaching load at a small institution is an impediment to grant-financed research depends on the circumstances. You will need to assess your own work style and situation. Some faculty members say that, with a teaching load of four courses a semester, release from some classroom responsibilities is essential to meeting their grant obligations—the summer just isn't enough.

Other professors say the teaching load sometimes looks worse than it is. The small size of their classes, they say, makes up for the large number of courses they have to teach. Still others say they can succeed in their research if they are able to hire students to work in their laboratories in the summer.

Faculty members all seem to agree, though, that you must be passionate about your research program and that you must anticipate that it will require some long days in the lab.

The nature of the work. If you are at a small institution with modest lab facilities, consider research topics that you can tackle in that setting. Don't overreach.

For example, if you do not have a Biosafety Level 3 facility on the campus, your life will be easier if you avoid the study of yellow fever or West Nile virus. One researcher I know at a small institution has successfully focused on yeast genetics, which is relatively inexpensive to study. So pick a topic that is doable, given the facilities available to you.

Administrative support. Faculty members at all types of institutions complain about proce-

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dures for submitting grants and spending grant money. They want to do their research, not get bogged down in federal regulations. But the federal government wants to see its rules followed when you are spending its money.

Large research universities have staff members who know the complex rules and can guide scientists through them. Smaller institutions that do little research can't justify the expense of a large staff of grant professionals. That can be frustrating to faculty members, but you can work around the dilemma.

At a small institution, someone from the fund-raising office can probably help you write grant proposals to private foundations. If you want to move beyond that, consider collaborating with a scientist at a larger institution. For example, if you want to work with animals or human subjects but your university does not have the necessary federal assurances, you may be able to get the appropriate reviews performed at a nearby research institution.

Collaboration need not relegate you to second-string status. If you control half of the grant budget, you have half the power.

Nor is there any need for you to feel like a supplicant when looking for a collaborator. First, most scientific research these days is multidisciplinary. Someone will need your expertise. Second, federal agencies are serious about fostering a culture for research at predominantly undergraduate institutions, since they are a source of tomorrow's scientists. Finding someone with whom you can collaborate is about finding the right fit.

Facilities. Besides lacking grant-writing offices, many small institutions have lab facilities that are less extensive than you would find at a major research university. Scientific equipment is expensive to acquire and maintain. The solution may be for you to find another lab to use. One assistant professor arranged to spend the summer in a lab where she had worked as a postdoc.

In addition, both the National Institutes of Health and the National Science Foundation have major programs designed to aid states that lag in scientific research and education. The NIH program is called the Institutional Development Award, or IDeA. Twenty-three states and Puerto Rico are now eligible to participate (see the full list at www.ncrr.nih.gov/research_infrastructure/institutional_development_award). The NSF has the Experimental Program to Stimulate Competitiveness in Research, more commonly known as EPSCoR (pronounced as a word rather than a string of letters). Twenty-five states, the U.S. Virgin Islands, and Puerto Rico are included (see the full list at www.nsf.gov/od/oia/programs/epscor/statewebsites.jsp).

Both programs provide large multi-institution grants aimed at improving a state's scientific research infrastructure. They're not something you apply for on your own; how the money is used is determined at the local level. Projects vary from state to state, but they often include seed-money grants to hire new faculty members, purchase equipment, and involve undergraduates in research. If you are in a state participating in one of those programs, it is worth tracking down the local leaders to see how you and your institution might benefit.

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Other federal programs. Several other NSF programs seek to encourage research in teaching-oriented academic departments. For example, the Research in Undergraduate Institutions (RUI) program supports individual and collaborative projects as well as the purchase of shared instrumentation. NSF's definition of a predominantly undergraduate institution is broad enough to include two-year and four-year colleges, as well as institutions that have small graduate programs. All disciplines at NSF participate in the program.

The RUI program also provides grants for a specific type of cross-institutional collaboration. Research Opportunity Award (ROA) supplements are available to faculty members at predominantly undergraduate institutions, including community colleges, to allow them to conduct research as a visiting scientist with NSF-funded investigators at other colleges and universities. Those awards, usually for about $25,000, can provide summer support or partial support for a sabbatical.

Also available to those at community colleges and four-year institutions are Research Initiation Grants and Career Advancement Awards to Broaden Participation in Biology (RIG CAA BP). Projects submitted to that program must increase the participation of scientists from underrepresented groups as well as the number of people who can serve as role models for the scientific work force. The projects are slightly smaller in scope than standard NSF grants and are limited to a total of $150,000 for a two-year period, with the possibility of an additional $25,000 for equipment.

Other federal agencies also support professors who are not at large research institutions. The U.S. Department of Energy's Faculty and Student Teams (FaST) Program places professors and undergraduates at six of its national laboratories. The agency encourages faculty members from institutions with limited research facilities to apply. The faculty member works with two or three undergraduates and a laboratory scientist on a project of mutual interest. The program's Web site lists the laboratories and the projects available for possible collaboration. One of the best known is Lawrence Livermore National Laboratory in California. Six other facilities in various parts of the country also participate.

Although the energy department's labs began with the development of atomic weapons, today their programs are not limited to nuclear physics. Current projects involve environmental biology, computer science, materials engineering, and the human brain. Those programs are posted at www.scied.science.doe.gov/scied/fast/about.html.

I have included the program acronyms here for a reason. Before you dismiss them as confusing jargon, keep in mind that they are helpful to know when you are searching for information online. It is highly unlikely, for example, that you will get much irrelevant material if you search for "EPSCoR." Use the unique acronyms to your advantage.

No matter what programs you apply for, the most effective way to ensure support for your research at an undergraduate institution is to involve your students. Those institutions pride themselves on teaching and nurturing students; when you seek a big research grant, you may face concerns that the research will be done at the expense of personal attention to students.

Demonstrate that your students' education is enriched by assisting in your lab. Frame it as an experiential learning opportunity. Administrators will be thrilled if your budding young scientists can participate in scientific poster sessions and similar activities. It will pay off for you as well: A well-trained cadre of students can be helpful as well as self-sustaining if you have the experienced students teach the newer ones about lab procedures.

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The Importance of External Advisory Boards

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by periodically calling them or meeting them individually for lunch to ask their advice on an issue. You've brought them into the circle, so use them.

• Finally, determine whether to require board members to pay dues. Business schools typically levy a substantial annual dues payment. The amount may be as little as $2,000, or as much as $50,000 or more. Of course, in the business milieu, the dues probably would be paid by the member's business or corporation, not by the member personally. You will have to make that decision based on your own context.

Of course, external boards can present challenges as well as opportunities. Many administrators establish an advisory panel because they genuinely wish to solicit advice. But board members need to understand from the outset that their "advice" is just that—recommendations that the college may or may not act upon. Stories abound of boards or individual members who have engaged in heavy-handed attempts to dictate direction or priorities.

That was precisely the scenario when the alumni advisory board for a small liberal-arts college locked horns with its president over the general-education curriculum. "My board chair insisted that we adopt a great-books approach to gen-ed," the president told me. "I tried to explain that our faculty governance system has an elaborate procedure for making such changes and that the faculty had twice rejected a great-books orientation." The pressure eventually reached such a level that the president disbanded the board.

To avoid such conflicts, the bylaws should clearly specify that the external board has no policy-making authority and that it exists only to serve as a sounding board for the dean or president. Members need to be advised of that from the beginning of their appointment, and it is wise to exercise control over which items are placed on the agenda.

Another safeguard is to make sure that the bylaws contain term limits for members so that someone can be eased off the board if necessary.

Still, the potential benefits of advisory boards outweigh the occasional conflicts. A well-managed board can be an effective advancement tool, in the largest sense of the term: It can help you publicize your unit's accomplishments, cultivate potential donors, nurture existing ones, and extend your program's influence and support.

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