

Equipment Funding Opportunities and Strategies for Success (Part 1)

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I think most of you probably know me. I tend to be rather vocal about things, whether it be on the Microscopy Listserv or through the years on problems of facility management, so I'm going to very briefly go over some of my experiences. I direct a core facility that has independent users, has a service component, is basically life sciences, but we do imaging for everybody. They can be from civil engineering, vet school, aeronautics, chemistry . . . who knows what will come in the door. So, some of the challenge has been to obtain major instrumentation that is versatile enough to handle a broad, broad range of users, but is initially justified based on a critical core research group. This is integral for obtaining any type of federal funding. So, we need new instrumentation for numerous reasons. Some of the more important ones are as follows:

1. We need to increase the capabilities of the faculty. If they are going to be able to compete for federal funding, they have to have current equipment to be able to do so. One of the problems is finding what they need in order to be able to go to the next step in their research.
2. You have to have current instruments for training students. Part of our mission as academic institutions is to produce graduate students who will be the next generation of researchers. If they are not exposed to current instrumentation in their research, then it makes it more difficult for them to compete for positions in both industry and in academic institutions. So this is an extremely important part of our role in the teaching, training, and developing our future researchers.
3. The third thing is to grow the user base of facilities. We all know that there are problems with funding core facilities, and if we do not come up with a way to attract users into our facilities, then we will not be financially viable. So in obtaining any new instrumentation, this has to be in the equation. It is not just what is appropriate for these few research projects that are used to justify this research proposal, but also what is correct for the future of the institution in order to attract users, retain

users, and develop a strong financial base to be able to afford to maintain this instrument in future years.

Problem: How do we fund instrumentation that can cost a million, or more, in times of extreme financial limitations? The days of our institutions going out and spending a million dollars because we think we have need, and another million for the facility across the hall or the one down the street, just don't exist anymore. It may have existed thirty or forty years ago, but it does not exist today in public and many private universities. So from where is funding going to come? Most likely it comes from granting agencies. In a few cases funding comes from private sources, but in most cases it is from our major federal granting agencies. So what are the steps that are required?

- First, we have to determine our need, and this is a problem based on the structure of the resources in your facility. If you have core facilities with directors or managers who understand what is out there as far as technical advancements and such, then they're the ones that have to take information to the researchers. Researchers usually are not current on what is the newest technology—especially if it's not in their major research area. So you must identify what your people need. Part of our job is to go out and find the investigators that have legitimate needs for particular pieces of instrumentation.
- Then we have to identify the appropriate granting program. Are these NSF-funded people? Are these NIH-funded people? Is this something that can go to one of the smaller agencies? Is it a DOD thing? Does it hit one of the military funding agencies? You have to match the granting program with the investigators and with their projects or you're not going to be successful.
- You need to identify the principal investigator (PI). I'm staff, not faculty, so I cannot be a PI. I can write a grant, I can assemble the people, I can put the pieces together, but I cannot be the PI. So what I have to do is identify who within my group of investigators has the background of strong and continuous funding and who is willing to take on this role of not only assisting with writing and submitting this grant, but the responsibility for oversight if you get the piece of equipment.
- Then you have to identify the instrumentation, and that is going to be based on your justification. Don't bother wasting your time trying to write a grant for something if you cannot justify acquiring it based on the faculty

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research needs. So you have to know what is available, see if you need demonstrations and/or preliminary data, get preliminary quotes, etc. You need to get all of this information about the instrumentation and boil it down to a particular instrument.

I once made a mistake in the first grant I wrote. There were three companies coming out with a major innovation. I could not demo any of them because they were not available, and they were coming out after the grant had to be submitted. So I listed in the grant, “These are what I need and this instrumentation is not available to demo so I cannot specify a particular instrument.” The reviews came back, “Should have specified a specific instrumentation; this is too vague.” I had to identify an instrument even though the justification was there as to what features had to be in the instrument.

This is kind of strange because when we write grants now, we put in a particular instrument, we get the funding, and then we go out to demo instruments from multiple vendors and decide what we’re going to buy. Very often it is not the instrument that was in the grant because something new has come out with additional features that make it a better fit for what we want to do.

- Obtain university support. This is absolutely critical. Sometimes there are internal competitions that are necessary. Sometimes the proposals that go forward are the ones that have gone through a higher review. Sometimes matching funds are needed to even qualify your grant for a program. This used to be more so in the past than in the present, but it is still a commitment. “Yes, we support you in acquiring this tool and we are willing to put in money for these accessories to make a complete system.” This also becomes important when you are hitting the top of the range for funding from that granting agency and you need more money. You better have an institutional commitment to say, “Okay, we want \$700,000 from you, but the institution is going to give us another \$200,000 to buy these other parts so we can end up with a complete instrument.”
- Then you need to write the proposal. You need to read the information from the particular granting agency, from that particular submission, and make sure you follow it in detail. Leaving out a section or not following directions can be very difficult to overcome in the review process. Then we submit, and what comes next? What then? Wait for the preliminary scores and reviews. This can take anywhere from 4 or 5 months to almost a year from the time of submission when you’re in limbo and you don’t know what the outcome will be.

Funded! Celebrate—this is great! How many out there have been funded the first time around? Three in the room have been funded the first time around. A few more the second time around. If you’re funded the first time around, that’s fantastic, but don’t count on it.

Not funded? Determine why. Then decide how to proceed. You can resubmit, and you can use reviewer’s comments to help improve the proposal. This is a really good avenue and has a fairly good success rate on second and possibly third submissions. If the reviewer’s comments are constructive, you can address them.

You have the option of contacting your program administrator for advice if you don’t understand comments. If you don’t think they are appropriate comments, how should you deal with them? This happened to us one time, and it was obvious that the senior reviewer had not done a very good job with reviewing. When it was brought to the program administrator, they agreed, but they didn’t have the money at the time to fund the proposal.

We did resubmit, and the next time around they knew we had lodged a concern about that first round, and a little bit more care was given to who was reviewing. The second time we got funded with very high scores. So, success rate: first time, two submissions, funded on the second submission. Next time, not funded, but managed to get it with internal funds. Sometimes that happens with something that’s a little less expensive. Third time, third instrument, three submissions, two different agencies, funded on the third submission. Fourth time, two submissions, not funded . . . we’re still working on that one.

So reviewers’ comments can be very constructive, or out in left field. Some quick examples . . . these were responses to the section on justification of need from a proposal for a medium voltage transmission electron microscope that would provide higher acceleration for tomography and materials samples and yet be affordable for internal users. It was an in-between instrument that would fill the gap between our aging 100 kV instruments and field emission instruments on campus. We justified the need for tomography and general access. These are some of the comments:

- Strengths: “Most suitable for electron microscopy, most scopes on campus are at the end of their lifetime, and if they had one, more would use it.” “Versatile instrument, evident need for new instrument, etc.” Sounds great, right?
- Weaknesses: “Configuration of requested instrument is undesirable for the type of cell biology being done.” After we were told we chose a great instrument, one reviewer decided it wasn’t so great. So we had a contradiction among reviewers. Who do we believe?
- “I think that any microscope that will be performing electron tomography of heavy stained metal items will not be suitable for x-ray microanalysis due to contamination by heavy metals.” Those of you who do EDX realize that is not a very legitimate comment.
- “According to product sheet, we need certain tilt holders and quotation does not include this.” But the proposal did say double-tilt holders to be purchased with campus funds for routine imaging and tomography. We had thought of this! The reviewer hadn’t read the budget!

Another example is in the area of institutional commitment where the institution provides two professional-level salaried positions. Weaknesses: “Pays only two facility staff salaries and provides free space.” Minimal commitment! How many of you give two facility salaries that you don’t have to recoup on a recharge center? This is a major thing.

Final comment: Learn from past experiences. This is not failure if you don’t get a grant on the first submission. Use the comments, don’t be afraid to contact your program administrator if you have questions, go back in again with a revised proposal, and don’t give up!


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