Funding Sources in Faculty Development: Strategies for Success in Submitting Proposals

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Abstract

Keywords

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Although the capacity for integrated research and potential for translating research findings to the clinical setting have never been stronger, we are paradoxically entering a period of highly constrained funding. It is more important than ever for clinician scientists and young researchers to be strategic in the approach to funding. The purpose of this article is to discuss strategies for a successful approach to appropriate grant funding agencies.

Objectives: Upon completion of this article, the reader will have an understanding of the funding sources available to support academic faculty development.

In the current age of information, the capacity to integrate medical research programs and the potential to genuinely advance health and health care have never been stronger. Clinician scientists are rightly excited by the opportunities inherent in major accomplishments such as the human genome project, novel immunotherapies, and large linked databases. Based on the growing number of clinician scientists that submit career development award proposals annually, many of the best and brightest medical school graduates continue to aspire to the notion of the “triple threat”—excellent clinicians, dedicated teachers, and creative and insightful researchers.

Simultaneously, however, the United States has entered a research funding crisis period. It has become obvious that, by design, grant funds rarely cover the complete effort required.¹ Many of the traditional funding organization budgets have lagged inflation in recent years as well. For example, during decades of budget growth, the grant success rate of the National Cancer Institute (NCI) was approximately 20 to 30%. After nearly 10 flat budget years, the NCI's published grant success rate in fiscal year 2012 is 13.6% based on the

number of grants awarded over the number reviewed (1085/7972).² Because 50% of submitted grants are triaged and therefore do not receive a review, a more accurate representation of the success rate would be approximately 7% (i.e., payline of 7). Similarly, large private foundations are scaling back. In 2012, the grant success rate of the American Cancer Society (ACS), the largest nongovernmental funder of cancer research, was approximately 17% (280/1654) (American Cancer Society, Research and Training Report 2012, in publication). The ACS has gone so far as to suspend the Spring 2013 grant cycle to explore ways to more cost-effectively conduct peer review and minimize their administrative costs.³

Given the current unheralded opportunities for discovery and the paradoxically constrained funding environment, young investigators must become more sophisticated to optimize funding. The purpose of this article is to discuss strategies for a successful approach to appropriate grant funding agencies.

Advance Preparation

There are several overarching strategies for success in funding and all are based on advance preparation. Grant proposals are funded on the basis of person, project, and place. First, it is imperative to develop an academic career plan. The plan

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should focus on personal academic development and on an idea that the applicant loves and can sell. This topic of interest will serve as a foundation for the pilot data, hypothesis, aims, and the research plan. The applicant must help the reviewers to understand his comparative advantage over other applicants, based on his background, academic development plan, and topic.

Second, the project should be feasible in and enhanced by the applicant's current setting. A persuasive proposal will detail and maximize the efficient use of existing resources. Appropriate collaborators and access to resources, including protected time for a career development award, should be described explicitly.

Third, the applicant must identify appropriate funding agencies and study them. There is no substitute for knowing the funding agency. Most funding organizations post a mission statement on the internet and many will list review committee members and previous grantees as well. All are important sources of information to shape an argument for the proposal. The proposal to be submitted must align clearly with the funding organization's stated mission. The review committee members may not be contacted directly, but understanding their work and backgrounds can and should influence grantsmanship. Successful grantsmanship is also facilitated by access to previously funded proposals. Previous grantees will often share their proposals upon request or alternatively any federally funded grant can be obtained from the Freedom of Information Act Office of the National Institutes of Health.⁴

Primary Sources of Medical Research Funding

In the largest study of biomedical research funding to date,⁵ investigators noted that over the past two decades just under 5% of U.S. health care expenditures go to research. Biomedical research receives approximately 4.5%. With the recent allocations under the Patient Protection and Affordable Care Act, health services research receives approximately 0.3%. Private industry was the largest source of funding overall (estimated at 58%), but most of that was internal research and development. The federal government was the second largest funder at approximately 33% overall. The remaining sources of funding were composed of not-for-profit foundations, disease-specific advocacy organizations, societies and associations, and private donors.

For research performed within academic medical centers specifically, the funding picture can be discouraging. The federal government continues to be the single largest source of grant funding and a substantial portion of funding overall. Among all 126 accredited U.S. medical schools, 28.5% of funding overall derives from grants and contracts and 66% of that funding is from federal sources.⁶ Federal dollars continue to lag inflation for an adjusted decrease of 18% from 2004 to 2012.⁷ Within academic institutions, private industry provides funds only approximately 5% of research.⁵ Foundation dollars are generally based on income earned from foundation investments, and therefore, are also threat-

ened in times of financial crisis. On a positive note, although foundation funding allotments tend to be smaller with disproportionately low indirect dollars, foundations are not as risk averse as federal funding agencies and not as likely to prioritize a commercial return on investment as private industry.

Finally, there is some evidence that professional societies are responding to the call to use endowment funds for bridging the current crisis.⁸ Along with several other professional societies, the American Society of Colon and Rectal Surgeons (ASCRS) has already begun to invest. Starting in fiscal year 2013, ASCRS will fund one supplemental career development grant per year with a contribution of up to \$75,000 supplemental annually for salary support and direct costs for NIH K series awardees.⁹

Specific Funding Organizations

After identifying a topic area, applicants must determine what sort of award best fits their needs. Most funding organizations provide grants focused on some combination of exploratory project funding (small, short-term idea grants), career development awards (analogous to K series), and senior investigator awards (analogous to R series). Identifying an appropriate funding organization will depend on the applicant's career stage and the research and/or clinical topic.

Databases

Several databases and Web sites regularly cull funding organizations for topical areas of interest, grants available, requests for applications, and requests for proposals. The Community of Science (COS: <http://pivot.cos.com/>) is a collection of online databases that provide a variety of research information to subscribers. COS was originally hosted online by the national genome database project and now is owned by ProQuest. Many academic institutions are members and provide access but individual access requires payment of a fee. Among other opportunities, users can set up a notification system for grant request for applications and request for proposals on topics of interest.

Scan grants (<http://www.scangrants.com/>) is a public service listing of grants and other funding to support health research, service, and scholarship. This excellent service is provided by the Samaritan Health Services Center for Health Research and Quality, Samaritan Health Services, a not-for-profit consortium of five hospitals in Oregon and is updated nearly daily.

Grants.gov (http://www.grants.gov/applicants/find_grant_opportunities.jsp) is a federal Web site maintained by Department of Health and Human Services. All discretionary grants offered by the 26 federal grant-making agencies can be found on Grants.gov. It is not necessary to register with Grants.gov to *find* grant opportunities. However, to *apply* for a grant, it is necessary to register which can take from 3 days to 4 weeks.

Organization Types

Although it is not meant to be comprehensive, ► **Table 1** outlines several different types of specific funding

Table 1 Features of specific funding organizations

Type	Organization	Focus	Examples of funded clinical topics
Government	Department of defense http://cdmrp.army.mil/	The Office of Congressionally Directed Medical Research Programs administers biomedical research programs that support basic, translational, and clinical research projects; research training; and research infrastructure for specific diseases identified by Congress.	Ulcerative colitis
	Veterans administration http://www.research.va.gov	The Office of Research and Development consists of four research services: <ul style="list-style-type: none"> • Biomedical Laboratory Research & Development Service • Clinical Science Research & Development Service—Cooperative Studies Program • Health Services Research & Development Service • Rehabilitation Research & Development Service 	Colorectal cancer screening
	NIH Loan Repayment Program http://grants.nih.gov/grants/	The Loan Repayment Program pays a proportion of educational loans annually and therefore is an especially attractive funding mechanism for early posttraining investigators.	The Loan Repayment Program can be focused on a variety of clinical topics.
Industry related	Whittaker Institute of International Education http://www.whitaker.org/grants/	The Whitaker International Program is designed to bring international experience and insight to the field of biomedical engineering (BME) with a focus on strengthening international collaborative links between young leaders in BME worldwide.	Clinical topics pertaining to biomedical engineering
Disease-specific foundations	Crohns and Colitis Foundation of America http://www.ccfa.org/science-and-professionals/research/	Basic and clinical research in inflammatory bowel diseases, providing pilot funds for established researchers, career development awards, and research fellowship awards.	Inflammatory bowel disease
	Damon Runyan Foundation http://www.damonrunyon.org/	Basic and translational cancer research by early investigators. Four programs designed to address a need or fill a gap in cancer research funding.	Colorectal cancer
	American Association for Cancer Research http://www.aacr.org/home/	The only nonsuspended mechanism currently is the Stand Up To Cancer grant. Research projects must be designed to accelerate the application of new preventive, diagnostic, or therapeutic agents to the clinic. Provides 4 years of funding for a translational cancer research project by a multidisciplinary, multiinstitutional team of expert investigators.	
General health research foundations	The Burroughs Wellcome Fund http://www.bwfund.org/pages/52/Grant-Programs/	Support of early career biomedical scientists in areas of science that are poised for significant advancement but currently undervalued and underfunded. Primarily focused on basic and translational scientists as well as linking translational science to population health.	

Table 1 (Continued)

Type	Organization	Focus	Examples of funded clinical topics
	The Commonwealth Fund http://www.commonwealth-fund.org/	To promote a high-performing health care system that achieves better access, improved quality, and greater efficiency, particularly for society's most vulnerable. Supports independent research to improve health care practice and policy.	
Clinical societies	American Society of Colon and Rectal Surgeons http://www.fascrs.org/research_foundation/	Mission is to raise and award funds to support research and educational programs related to colon and rectal diseases.	Benign and malignant diseases of the colon, rectum, and anus.

BME, biomedical engineering.

organizations. For a more complete listing, the databases above are recommended.

The Approach to Potential Funders

Preferably, the applicant will cast a wide net and identify several potential funding sources. It is permissible—even encouraged—to solicit funds from several organizations simultaneously but if the title and specific aims are identical for each proposal submitted, an either/or statement must be added to the budget.

After one or more suitable funding organizations have been identified, the applicant should generate a feasible timeline for grant writing and submission based on the specific funding cycle. The timeline should include funding organization deadlines, internal institutional deadlines, and self-identified deadlines with some built-in flexibility. The applicant must allocate time for informal reviews by colleagues and multiple substantial revisions. The importance of attention to internal institutional detail and external funding detail cannot be overstated. Many organizations will require an early letter of interest with a short proposal summary, which can help them to prepare for the labor-intensive process of reviewing proposals.

Striking the right tone in a proposal is largely based on the advance preparation described above. Before submission of a proposal, communicating with the program officer should be approached with caution. Senior investigators may advise this but they tend to have a different social contract with the organization than a new investigator does. However, young investigators with legitimate questions should not be discouraged from making contact. On most large funding organization Web sites, multiple ways to contact the program officer are provided.

Conclusion

In summary, several important strategies can help to compensate for the federal research funding crisis. Alignment of the applicant, project, and setting to the mission of the funding organization is key. Advance preparation, writing

to the audience, attention to deadlines, and submission to multiple organizations will substantially enhance the prospects for success. Clinical societies and foundations deserve special mention for stepping up to bridge the current gap with newer supplemental grants.

Finally, after awarding a grant, any funding organization will want to see a return on investment. In private industry, this process is often explicit and does not necessarily require additional efforts on the investigator's part. In government-funded projects, successful applicants should plan for the future by communicating research findings and implications to the program officer. In keeping with the fundamental altruism of foundation and society-funded projects, grant awardees are obligated to express well-deserved appreciation and to maintain excellent communication that can be transmitted to donors and administration.

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