YOU ARE HERE

Welcome to the world of grantsmanship! Grantsmanship combines technical skills and know-how and involves a series of activities to obtain funding to carry out a proposed program, whether that program is for research, education, training, or other purposes. Grantsmanship is both an art and a technical skill that involves hard work, and sometimes trial and error prior to a successful outcome of funding.

A basic tenet of grantsmanship is that being well informed about the process and the funding source is critical for a successful outcome of funding. The more you know about the grant-writing process and a particular funder's mission and objectives, its funding priorities, and its review process, the greater the likelihood that you will be able to write a proposal that is competitive and which matches the intent of the funding source.

The funding environment is constantly changing and priorities for funding evolve with societal trends and needs and public health priorities. Therefore, finding the right funder for your particular idea may take time and will require knowledge of sources that can offer information about potential funding opportunities.

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Part I

Getting Started

Grant writing, however, really begins with you—your passion, your innovative ideas—your vision. As a professional activity, grant writing should fit within a career path. Although you might engage in grant writing as a “one-off” experience, for most, grantsmanship is rooted in their professional DNA.

Part I contains five chapters. We begin by explaining the language of grantsmanship, reasons for writing a grant, and how these reasons should align with a career trajectory (Chapter 1, *Why Write a Grant?*). Next, we discuss sources for and strategies by which to identify funding sources (Chapter 2, *Becoming Familiar With Funding Sources*) and how to develop a competitive grant idea (Chapter 3, *Developing Your Ideas for Funding*). We also examine the basic elements of an infrastructure that is needed to support grant writing in your environment (Chapter 4, *Infrastructure to Support Grantsmanship*) and highlight specifically the invaluable value of mentorship (Chapter 5, *Everyone Needs a Mentor*).

Our journey begins ...

Why Write a Grant?

After reading this chapter, you will be able to:

- Understand common terms of grantsmanship.
- Identify how grant writing fits along a career trajectory.
- Develop a plan of action for writing a grant based on your career stage.

1.1 INTRODUCTION

- I have a great idea but need funds to carry it out.
- I am proposing a pilot study for my dissertation that will involve original data collection and resources to support that activity.
- My postdoctoral studies involve prospective data collection that will require a research assistant.
- I have an idea for a new educational initiative that requires start-up funds, but I do not know how to get started in writing a grant.

These are common situations that students, health and human service professionals, and faculty at any career stage encounter in their daily professional lives, which require some level of funding in order to carry out the desired activity—thus, the necessity of grantsmanship. A grant is a sum of money offered by an organization (an agency) to an applicant (a grantee) for the distinct purpose of carrying out a specified set of activities, whether that concerns research, training, education programming, conference planning, fellowships, or a combination thereof or any other. Grantsmanship, in turn, is the science and art of obtaining such funds. It involves technical skill as well as expertise and know-how!

Grantsmanship reflects a unique world with its own language, rules, strategies, and requirements. In this chapter, we introduce grantsmanship through

its language and also locate grant writing within the larger context of its role in career building and as an essential professional activity. Grant writing should not be a “one-off” activity—but rather each grant should be viewed as a stepping-stone to building programs that progress along a career trajectory. Thus, grantsmanship is a thoughtful process and a professional commitment, with each award contributing to the advancement of knowledge, practice, and programmatic development. As a novice or even experienced grant writer, you will have questions and concerns about grantsmanship, such as:

- Where can I obtain information about potential sources to support my research or training ideas?
- What is the best way to convince a funding source to support my ideas?
- Is obtaining a grant outside my reach or capability?

These are the right questions to ask, and the answers can be found throughout this book. If you are a novice in grant writing, you may approach this effort with some trepidation. Though grant writing and obtaining funds is a competitive process, it is important to recognize that funding agencies in both the public and private sectors do have monies to award and are seeking the most innovative and important projects to invest in with their funds. It may come as a surprise, but in fact, the goal of federal funding agencies and private foundations is to monetarily support worthy projects. Agencies and foundations want to and have to award their funds to worthy projects!

Consider this: Agencies of the federal government are funded by Congress to address key public health problems confronting Americans. Each agency is charged with the responsibility of addressing a different issue, such as women’s health, age-related processes, maternal and child health, mental health, or cancer prevention, to name a few.

Based on its charge, each agency has a mission and sets priorities for the types of research, training, and educational programs it will fund. Each year, agencies must compete for continual funding from Congress to support their grant programs. To obtain congressional funds, an agency must demonstrate to Congress that it is making significant progress toward meeting its goals. Indices of progress include the number of grant proposals submitted to and funded by the agency, the quality of the programs that are funded, and the contributions that funded programs have made to the advancement of knowledge, and ultimately the health of the public. It is in an agency’s best interest to encourage the submission of excellent grant proposals. Your job as the grant writer is to prove to an agency and its reviewers that your idea is sound, that it is feasible and has the potential to be successful, that you and your team are the best group to carry out the proposed project, and that you are located in an institutional environment that can support your proposed efforts.

There is no doubt that grant writing is challenging. Not every great idea for a research, training, or education project will be viewed as competitive or receive funding. This is true for several reasons. Funding agencies have specific areas that they seek to fund. These targeted areas for funding may differ from the specific ideas that you may wish to pursue or those that may be identified as in need of systematic inquiry in the scientific literature. A golden rule of grantsmanship is that it is critical to identify a funding source whose goals match your areas of interest. We come back to this point in various chapters of this book. However, even when there is a match, be prepared to modify your ideas to meet specific emphases, requirements, interests, and goals expressed by the agency or particular call for

funding. If you find it difficult to identify an agency that may fund your area of interest, you will need to think somewhat differently as to how your interests and areas of expertise can be modified to be aligned with a funder; alternatively, you may need to identify a different area of investigation. In this case, place your initial idea for funding in a file for future consideration, as agencies do change priorities and interests over time. It is possible that your idea or an iteration of it will be of interest to a funder in the future. Your idea may reflect an important public health issue but may be one that agencies are not quite ready to commit funding to or that does not fit within their current strategic plan. Furthermore, even a great idea will not get funded if the grant to support it is not written competitively and persuasively. So, having a great idea is only one step in grantsmanship.

Let us start by examining a common scenario. In this real-world grant story, a faculty member has an interesting idea for a service learning evaluation project for which funding is needed.

1.2 A GRANT STORY

Ms. L is an assistant professor of social work at an urban university. The school in which she works has departments of physical therapy, occupational therapy, physician assistants, counseling, and nursing. Ms. L volunteers in a number of homeless shelters throughout the city and has organized a student volunteer program. In her volunteer work, she notices that shelter residents have significant health problems and difficulties accessing social services. She also notices that the supervisors in the shelter are not experienced at managing health problems and do not have knowledge about the social services network. She is convinced that a formal educational program to prepare social work, nursing, and other health professional students to work in these shelters could be an important way to help alleviate some of these health problems. While Ms. L is confident that she knows what the components of such a program should be, she is not sure about the best way to implement it.

Ms. L decides to meet with her department chair to inquire about recruiting more students to work in the shelters and to suggest that the department offer a formal educational program to prepare clinicians to work in underserved areas. At the meeting, her chair points out that, while Ms. L's idea is important, starting a new program is expensive and time-consuming. Since the school is short of both money and faculty, the chair tells her that it is not possible to invest the department's limited resources in a program such as this at this time. The only way that such a program could be supported would be for Ms. L to secure funds elsewhere to pay for its development and implementation. During her next evening of volunteer work, Ms. L becomes even more determined to do something about the health problems she sees. The next day, she makes an appointment to meet with a senior faculty member, Dr. A, who has received grant funding for a number of related projects from different sources. She explains her idea and asks for advice. Dr. A is sympathetic but tells her that because of her inexperience, it is unlikely that she will be successful in finding funding for her project by working alone. He suggests that she develop a systematic plan to develop her credentials and that she partner with a more senior investigator and a team of experienced faculty. Given that some agencies are interested in proposals reflecting interprofessional strategies and that the problems in the shelter are complex, he also suggests that she form an interprofessional team to address them. An interprofessional team would not only help her gain the experience necessary to develop and conduct a program,

but the participation of a variety of disciplines on the project would strengthen the proposal and make it more competitive and address a wide range of needs of the targeted population. Also, Dr. A recommends that members of her team include one or more student representatives, an administrator of a homeless shelter, and an individual who is or was formerly homeless who could effectively participate on a project team. Having a team with all relevant stakeholders can help assure the project elements are relevant and fit the real-world structures of universities and homeless shelters as well as address what really matters most to the individuals or end users of the proposed program.

He also suggests that she start by conducting a systematic review of the literature (see Chapter 7, Overview of Common Sections of Proposals, and Chapter 9, Background and Significance) to learn the magnitude of the health problems that exist among shelter residents locally and nationally. Furthermore, he recommends that she conduct a few low-cost focus groups with various stakeholders, including residents in shelters, to understand their major problems in accessing social services, and whether there are existing programs that have addressed these problems, and if so, their effectiveness from their perspective. Finally, Dr. A also encourages her to write up the results of this research and submit it as a manuscript or for presentation at a meeting of her professional association.

In addition to her meetings with Dr. A, Ms. L meets with her university's reference librarian. He recommends that she "cast a wide net" in her search for a funding agency because it would be difficult to obtain funding from some of the larger, well-known agencies such as the National Institutes of Health (NIH), given that this will be a training or a demonstration learning service program, she is at a novice stage in developing her career, and she has limited grant-writing and project management experience.

Ms. L is a little discouraged as she realizes that the project may take longer to launch than she thought but that for it to be successful and effective, there are a few steps that must be followed (Box 1.1). She decides to first meet with senior faculty members in occupational therapy, physical therapy, nursing, and social work who have had relevant experience in the homeless clinics. She explains her idea about developing a program to prepare students to work in the shelters and

Box 1.1 *Getting Started: Beginning the Grant Process*

- Talk to your chair or supervisor.
- Identify a key mentor and possible team members.
- Meet with a reference librarian and/or development officer of your institutional advancement office to determine search strategy to identify potential funding mechanisms.
- Identify key stakeholders and who should be part of the project team.
- Conduct a systematic review of the literature.
- Consider conducting a pilot study that may involve a needs assessment, focus groups, a Delphi study, or other methodology for identifying and substantiating the need for the project.
- Develop a timeline for initiating the grant-writing process.
- Learn the language of grantsmanship to become familiar with and understand funding opportunity announcements.

asks if they would be interested in working on the grant proposal with her. All the faculty members express great interest in working with her if she can identify a funding source. She then meets with a few administrators in homeless shelters, and they too express interest. She asks them to identify one or more individuals who were or are presently homeless who could participate as a member of the team. Now that Ms. L has an initial idea and an emerging team, it is important for her to identify funding opportunities and funding deadlines so a concrete goal can be presented at the first team meeting. Ms. L realizes she has a lot to learn and her first step is to understand the basic language of grantsmanship.

1.3 THE LANGUAGE OF GRANTSMANSHIP

As in other fields, there is a language that is specific to grantsmanship, which is important to understand in order to proceed with the application processes, communicate with agency personnel, and interpret application instructions for submitting a proposal. Listed in Box 1.2 and defined in the following text are 18 key terms related to grantsmanship that are commonly used by most foundations and federal agencies.

Research grants: Research grants provide money for an investigator or team of investigators to conduct a specific research study, either basic or applied. In basic research, an investigator(s) examines a question that will add to the theoretical body of knowledge in a discipline. In applied research, the investigator(s) applies a specific theoretical principle, program, or approach to a practical situation. A research grant may propose any type of research design and methodology that must match the stated aims/objectives of the study. Reviewers will evaluate whether the proposed design will yield results that can address the proposed aims.

Box 1.2 18 Common Terms in Grantsmanship Used by Public and Private Funding Agencies

- Research grants
- Training or educational grants
- Demonstration grants
- Agency
- Call for proposals (funding announcements, program announcements)
- Letter of intent
- Competition
- Preferences, priorities, and special considerations
- General instructions/supplemental instructions
- Grantee/grantor
- Principal investigator/coinvestigator/project director/
project manager/study coordinator
- Program officer/project officer
- Peer-review panel
- Reviewers' comments (formerly pink sheets)
- Funding cycle
- Direct and indirect cost recovery (facilities and administrative)
- Pre- and postaward
- Grants.gov

Training or educational grants: Training or educational grants are those that have, as a main purpose, the education or training of students, faculty, clinicians, or other practitioners. These grants can be used for planning and implementing new undergraduate or graduate programs, revising or updating curriculum materials, recruiting students into special programs, or helping health and human service professionals to gain new knowledge or develop new skills. Unlike a research grant that can be moved if an investigator leaves for another institution, training grants are not movable. As the training being proposed occurs within the applicant institution, this type of grant cannot be transferred if the investigator leaves.

Demonstration grants: Demonstration grants provide support to projects that evaluate a model program, set of services, or methodology. A demonstration project often tests a program that is already in place, but it can also be used to develop and then test a program if there is evidence that suggests a given model or service is an effective way to address a specific issue. These types of grants are most commonly pursued by health and human service providers who wish to expand existing services or develop innovative model programs that can be replicated. Demonstration projects can also be used to translate and adapt a previously proven intervention to a new practice-care setting or for use with a different target population. Ms. L's idea lends itself to a demonstration project grant.

Agency: Throughout this book, we use the generic term *agency* to refer to any funding source. A funding agency can also be referred to as the sponsor. The federal government is divided into a bewildering array of organizational units called centers, offices, institutes, bureaus, divisions, departments, or administrations, all of which may have programs of funding. Private foundations and companies have different organizational structures through which money is awarded and their own set of instructions for proposals and procedures for reviewing them.

Call for proposals: A call for proposals is a notice of an opportunity to submit a proposal on a specific topic. A call for proposals may also be referred to as a request for proposals (RFPs), a funding opportunity, a program announcement (PA), or a request for applications (RFAs), depending upon the funding organization. Agencies publish announcements describing a problem area and inviting interested parties to propose ways to investigate aspects of the problem. These announcements vary considerably in the level of funding provided, type of projects solicited, and scope of work involved. The federal government tends to provide very explicit and targeted calls for proposals that describe in detail the focus of the funding announcement and what needs to be included in an application. In contrast, foundations and private companies vary in the detail of their calls for proposals, with some being similar to those of the federal government and others being more open ended and general.

Letter of intent: Some calls for proposals require that the investigator(s) submit a brief letter of intent (LOI) that describes the purpose of the project and the intent to submit a full proposal. An LOI may serve various purposes. One purpose of an LOI is to inform the agency as to the number of potential applications they may receive, which can help them prepare for the review process. In this case, an LOI is merely informative. It does not bind the investigator(s) to submit an actual application, and the agency does not use the LOI to screen applications at this stage. However, later in the process, the LOI may provide an initial screening process prior to full proposal submissions. Here, the agency carefully reviews each LOI to decide whether a full application will be requested. In this case, the

agency will either invite or not invite a full application based on their interest in the LOI. A call for proposal will indicate in the instructions whether an LOI is necessary and if a full application submission is by invitation only.

Competition: The term *competition* will be used throughout this book. It simply refers to a particular grant program for which a call for proposals has been issued.

Preferences, priorities, and special considerations: Some federal agencies such as the Department of Education identify a specific focus or emphasis that they would like to be addressed in a grant proposal. For example, an agency may wish to increase involvement of a particular minority or underserved group in the project and thus offer “extra credit” or increased points to proposals that meet this additional priority or preference. There are three categories for which extra credit may be given by some agencies: funding preferences, funding priorities, and special considerations. If a funding preference is specified, special attention will be given to applications that address the stated preference. For example, if preference is given to problems in underserved communities and your proposal meets this requirement and is approved for funding, you will be funded before other approved applicants who do not meet the preference. If you qualify for a funding priority, the score assigned to your proposal will be adjusted favorably by a predetermined amount, such as 5 or 10 points. In competitions that contain a special consideration, reviewers have additional latitude in assigning points to those proposals that address the consideration. The use of these funding mechanisms varies across agencies. However, in some instances, the legislation authorizing funding may require that the agency use one or more of these funding mechanisms. When applying for grant monies from an agency that offers a preference, priority, or special consideration, it is important to address it as part of your application. Although for most competitions it is not a requirement to address the preference or priority, there is a strong competitive advantage in doing so. Some agencies will provide a special section in the proposal for you to indicate that you are applying for one or more of these special categories. If they do not, make sure you state your intent in an introductory paragraph and describe the specific reasons why. The NIH also awards additional points or changes its funding timeline (see definition given later) based on specific priorities, including for first-time investigators who have not been funded previously by the NIH or for certain domains of research, such as dementia.

General instructions/supplemental instructions: General instructions provide guidelines for submitting a grant application. These guidelines must be followed very carefully. Agencies in the federal government provide the most detailed general instructions. They usually contain the following types of information: a general overview of the requirements of the project; the date the application is due; where it should be sent; how to submit the application (e.g., for most agencies and competitions, electronic submissions are required; however, there are still a few competitions that require paper submissions); identification of preferences, priorities, or special considerations; the amount of money allocated for the funding mechanism; the average expected funding range of projects; and the date grants will be reviewed and funded.

General instructions also may include the guidelines that will be used by reviewers to evaluate proposals, and for some competitions, the optimal number of points that can be given to any one particular section of the proposal. Supplemental instructions extend or modify the general instructions. These need to be read very carefully because the agency may have made significant

changes in the requirements for a proposal after the general instructions were issued. Supplemental instructions provide critical information for writing your proposal and may provide alternative requirements than that described in the general instructions.

Grantee/grantor: The grantee is the institution or individual who submits the grant application and receives a grant award. A grantor is the agency or sponsor providing the grant funds.

Principal investigator/coinvestigator/project director/project manager/study coordinator: The term *principal investigator* (PI) is used most often in research grants and refers to the person who provides the scientific oversight and integrity of the proposed grant activity and who has overarching responsibility from budgetary to all research-related activities. Presently, the NIH allows for two or more persons to serve in the role of PI, referred to as a multiple PI or co-principal (Co-PI) arrangement. If proposing this arrangement, a leadership plan must be developed and included as part of the application. The plan must provide a strong rationale as to why two or more PIs are important for the scientific integrity of the study and explain how the PIs will divide responsibilities and resolve conflict. In this arrangement, one person and his or her institution assume responsibility for being the applicant organization and main contact with the NIH. A multiple PI option is appropriate for studies requiring team science and if the PIs are established investigators. It is not a preferred approach for a new investigator and/or if the proposed study does not require individuals with distinct professional backgrounds and a team science approach.

A *coinvestigator* (Co-I) is an individual who contributes substantially to the conceptual development of a research study and who assists the PI in implementation in terms of the science. Their effort on a grant can vary depending upon their particular role as a Co-I. A *project director* is typically the term used in training, educational, or demonstration grants and is applied to the person who is responsible for the daily operations or day-to-day activities of the project. For these types of grants, the project director is considered equivalent to the PI and relates to the person who oversees the grant activity, ensures the scientific integrity of the endeavor, and is responsible for ensuring that the grant is conducted in accordance with all regulations.

Project manager and *study coordinator* are terms applied to persons who are hired to assist the PI in implementing a research study. These persons may have a wide range of responsibilities, including hiring and supervising assessors, research assistants, or data entry personnel and implementing study procedures.

Program officer/project officer: A program officer is an employee of an agency who manages a specific program of grant funding. A project officer is someone who is assigned to supervise and provide technical assistance to a particular funded grant within a particular program of funding. These terms are sometimes used interchangeably.

Peer-review panel: A peer-review panel is a group of experts selected by an agency to evaluate the grant proposals submitted to that agency. The panel evaluates and scores each proposal according to the agency's evaluative criteria. Each agency structures the review panel differently. The structure and composition of panels within the federal government are determined by statute or other federal guidelines. The NIH, for example, selects individuals with expertise in different scientific areas, such as health services, behavioral science, or medical research, and areas of expertise, including statistics, economics, sociology, and medicine. These panels are referred to as integrated review groups (IRGs) or study sections.

Members are appointed for specified periods of time (usually three years) and generally meet three times a year to review proposals. Agencies also select special emphasis panels of experts who serve as reviewers for particular competitions. Panels may vary in size from three to 15 to 30 members. Different formats are used when convening review panels, and we discuss this further in Part VI, *Life After a Grant Submission*.

Some private foundations do not use peer-review panels. Funding decisions are typically made by a board of directors or trustees of the foundation. Their decision is often based on the evaluations and recommendations made by program officers who work for the foundation. Other private foundations may have foundation workgroups or committees of experts who are asked to convene for a specific competition, review proposals, and make specific recommendations to the board. Other foundations may use a combination of approaches.

Reviewers' comments (summary sheets): Once referred to as “pink sheets” for the color of the paper on which they were printed, reviewers' comments are written evaluations provided by a review panel of an application. A summary sheet of reviewers' comments usually provides an in-depth critique of a proposal, summarizing the major strengths and weaknesses, and a total score that rates the proposal. Scoring criteria vary widely among agencies, so it is always best to consult the application guidelines or the agency website for the most up-to-date scoring system being used. Most agencies use either web-based programs or email to distribute scores and summary sheets of the review.

Funding cycle: Most federal and foundation competitions follow a schedule for receiving, reviewing, and awarding funds, referred to as a funding cycle. Most federal agencies have funding cycles that occur at the same time each year. For example, in the NIH, there are three primary deadlines for submitting individual investigator, new research grant applications (commonly referred to as an RO-1): October 5, February 5, and June 5. For resubmissions of a previously reviewed grant or for other funding opportunities, other due dates will apply. Submission dates for federal and private foundations and corporations can be found on the website of the agency and in the call for proposals. Always check the websites prior to embarking on grant writing to obtain the most up-to-date submission deadlines. Of importance is that due dates for grant applications are nonnegotiable. Late applications are rarely if ever accepted. Exceptions are only made in the case of a national disaster. In this case, a federal agency will typically allow late applications by individuals submitting from the region of the country most affected.

Direct and indirect costs (facilities and administrative [F&A] costs): Most grants provide two broad categories of funding. Direct funds refer to budgetary support for costs associated with the implementation of the proposed project. This may include salary support for the investigator and his or her team; materials needed to carry out the research, such as laboratory specimens, chemicals, supplies, or mailings; equipment, clinical tests, and/or software specific to the proposed project; data analyses; and travel to professional meetings. The grant may also provide stipends for graduate or undergraduate students. However, it is important to refer to the application requirements to understand the specific allowable and unallowable budgetary categories and items (we discuss this further in Part III, *Preparing a Budget*).

For most grants (research, demonstration, education and/or training, and fellowships), federal agencies, such as the NIH, also provide a certain amount of funds to the applicant's university over and above the requested budget for direct costs

associated with implementing the project in order to help defray basic operational expenses. These monies are referred to as F&A costs (formerly referred to as indirect cost recovery) and are based on a rate negotiated between the university and funding agency based on a specific formula involving square footage, volume of grant activity, and other considerations. Approved federal rates for research grants can vary widely and may be as much as 50% to 65% of the direct operating costs required for the conduct of the study.

Indirect cost recovery rates for foundations are typically much lower and are set by the foundation or industry itself. Similarly, training grants provide direct funds for salary, supplies, travel, consultants, and possibly stipends for graduate students and, in some instances, equipment. However, these grants offer F&A costs at a rate that is lower than federal research grants. Typically, the rate is between 8% and 10% of the direct operating costs of the grant.

Pre- and postaward: These terms refer to time frames for budget management of a grant application. Preaward refers to the activities associated with institutional oversight of budget development for a grant application. Activities include, for example, meeting with a grants administrator at your institution to establish a budget (direct and indirect costs) for a grant application; completing all budget-related forms, including budget justifications for each line item of a budget; and obtaining approvals for the proposed budget and, if any, in-kind or institutional contributions to the budget. Postaward refers to budget-related oversight activities that occur following the award and receipt of a grant. This typically involves ongoing meetings with a grants administrator to manage the awarded budget and assure that there is not underspending or overspending of funds. Also, postaward activities involve preparing yearly budget reports summarizing expenditures for funding agencies, assuring the budget is being spent appropriately and that charges to the grant budget are accurate and within guidelines for expensing. Even small grant awards (e.g., <\$5,000) require pre-and postaward budget management.

Grants.gov: For information about federal grant opportunities funded by the Department of Health and Human Services, grants.gov (www.grants.gov/web/grants/home.html) is a useful website for searching for funding opportunities and learning about grantsmanship and regulations. From its grants learning center, helpful blogs, and searchable engine of funding opportunities, it acts as an important source of information.

In addition to the terms defined earlier, there is another vocabulary specific to the NIH environment listed in Box 1.3.

Box 1.3 *Nine Common Terms Specific to the NIH Environment*

- *The NIH Guide for Grants and Contracts*
- SF-424
- Funding opportunity announcement (FOA)
- electronic Research Administration (eRA) Commons
- Research performance progress report (RPPR)
- Integrated review group (IRG)
- Scientific review officer (SRO)
- Payline
- ASSIST (Application Submission System and Interface for Submission Tracking)

The NIH Guide for Grants and Contracts: This is the official publication for NIH grant policies, guidelines, and funding opportunities that is published daily. Also, the NIH publishes a table of contents weekly. It is an excellent source for identifying and staying on top of funding initiatives from the NIH. You can register to receive weekly emails that contain the table of contents for the week.

SF-424: This refers to the electronic application forms that are now in use by the NIH for all applications. Guidance as to what these forms are and how they need to be completed can be found at grants.nih.gov/grants/how-to-apply-application-guide/forms-e/research-forms-e.pdf.

Funding opportunity announcement (FOA): This is an umbrella term for different types of grant-funding opportunities of the NIH. There are different types of FOAs, including PAs, program announcement requests (PARs), program announcements with set asides (PAS), RFAs, or notice of funding availability. These terms refer to publicly available announcements for applications issued by federal agencies or specific institutes in the NIH that addresses a particular area of research.

More specifically, a PA details priority areas for funding and particular funding mechanisms. A PAR is a PA with special considerations either in terms of due dates or review considerations. A PAS is a PA with specific set-aside funds as described in the announcement. RFA is specific to a particular area of inquiry for which one or more institutes of the NIH have set aside funds for a certain number of awards. RFAs typically have one deadline in contrast to PARs in which standard due dates apply. Similarly, RFPs seek contract proposals and have a specified due date. Each announcement follows a specific numbering convention that includes the year it is issued in and a serial number. For example, PAR-19-135 (Research Enhancement Award Program [REAP] for Health Professional Schools and Graduate Schools) indicates this is issued in 2019 and has an associated serial number (135) specific to NIH.

When applying to the NIH using electronic submission and the SF-424 forms, you must identify a particular FOA that is relevant to your proposal. If none exist, you may use the generic FOA that the NIH has created for this purpose. FOAs can be found at grants.nih.gov/funding/searchguide/index.html or www.grants.gov/web/grants/search-grants.html.

electronic Research Administration (eRA) Commons: This refers to the electronic infrastructure that allows the NIH to electronically receive, review, and administer grant awards. The eRA is the most important tool for monitoring your NIH grants and their status and from which to download reviewers' comments. Be sure to register for an account as part of your start-up activities for preparing a grant application to the NIH.

Research performance progress report (RPPR): This refers to the online submission process for progress reports to the NIH for awarded grants. For all awarded grants, both an annual progress report and a final RPPR are required as part of the close-out of the grant. For each, the investigator must provide a narrative describing scientific progress, a summary of expenditures for the year of the report, and scholarly activities. For the final RPPR, a description of results or outcomes is also included. For both annual progress and end of grant reports, it is essential to work with a grant administrator in your institution to complete the budget and submission process. There is also a third type of RPPR, which is referred to as an interim report. An interim report is used when an applicant is submitting what is referred to as a Type 2 grant (previously called a competing continuation) in which new funds are requested to continue, extend, or augment a line of research being supported through a grant. A renewal grant is reviewed competitively and if it is not funded, then the interim RPPR will serve as the final report.

Integrated review group (IRG): This refers to the study sections of the NIH that conduct peer review of all grant proposals submitted to the NIH. Study sections are organized around scientific areas. Each section is composed of scientists who conduct the initial peer review of submitted grant applications. Related terms include peer review, study section, and scientific review group.

Scientific review officer (SRO): This individual is the federal scientist who is responsible for overseeing a scientific review group. He or she is responsible for coordinating and reporting the results of each peer review of each application assigned to an integrated review group. The SRO acts as an intermediary between the applicant and reviewers, answers questions from applicants about the review, and prepares a summary review statement for each application.

Payline: Each fiscal year, the NIH establishes what is referred to as its “paylines” or funding cutoff points. A payline is established for every major funding mechanism and will vary by institute, type of grant, area of inquiry, and/or if an investigator is new to NIH funding. Paylines reflect the amount of funds an institute may have and the estimated number of applications that is expected to be recommended for funding by study sections. Paylines are in the form of a percentile, which indicates the percentile scores of grants it intends to fund up to. For example, if an institute’s payline for a particular grant mechanism is 17%, then grants scored up to that percentage will most likely be funded, although there are no guarantees. We discuss paylines and how grants are scored in Part VI, Life After a Grant Submission.

Application Submission System and Interface for Submission Tracking (ASSIST): This system is used to prepare and submit grant applications electronically to the NIH. It requires logging in to eRA Commons. For a step-by-step guide on using ASSIST, go to grants.nih.gov/grants/how-to-apply-application-guide/prepare-to-apply-and-register/submission-options/assist.htm.

For additional information about all aspects of the NIH grants process, visit the NIH website at www.nih.gov/grants-funding. Also, for a full glossary of terms specific to the NIH, visit the NIH grants glossary website at www.grants.nih.gov/grants/glossary.htm.

1.4 DEVELOPING A CAREER TRAJECTORY INVOLVING GRANTSMANSHIP

Grantsmanship is a systematic process and an essential component of one’s career development as a health and human professional, pre- or postdoctoral fellow, or faculty member. Each grant proposal that is written (and ultimately funded) becomes a stepping-stone for the next grant submission, thereby building a coherent fundable program of research, education, and demonstration projects that have impact. A grant proposal should be viewed as one component of a larger plan for developing a long-term program of scholarship. Each grant submission should build on the previous, and there should be a unified theme across one’s career. A series of disjointed projects will only produce a limited funding stream over time and will not result in systematically building a coherent program of science/scholarship that builds from one project to the next.

Nevertheless, we are not suggesting that only one research or training idea or topic be singularly pursued over one’s career. Rather, we encourage you to consider how one grant-writing activity can lead to the next and be logically linked to your next idea. For example, let us say you are interested in developing and testing a service for families involved in the care of older adults with dementia. After receiving funding and completing the project, you may determine that the

next logical step of scientific importance and interest is to evaluate whether your caregiver program is effective for other types of caregivers such as those caring for older adults with a stroke or cancer, or of individuals of any age with serious illnesses; alternately, it may be of interest to evaluate whether the caregiver program has benefits for the older adult receiving care. Other avenues to pursue may also emerge, such as developing a measure that reflects an outcome of interest or testing delivery of the program using different modalities, including technologies or an online application. Alternately, a next step might be to build an online training program for family caregivers or for providers to learn how to work with families effectively. In all of these examples, knowledge gained from the initial funded effort is logically expanded and represents a logical stepwise building of a research and/or educational program. It also affords opportunities to seek funding from different sources, such as multiple institutes of the NIH or the leading national associations for stroke or cancer.

Grantsmanship is integral to one's professional responsibilities. Research, teaching, and service are all fundamental components of a career as a health and human service professional, particularly for faculty members in a university setting. External funding has the potential to provide opportunities to advance practice or develop new and innovative services. For many faculty members, writing a grant proposal must be integrated within and complement other job responsibilities. Each of your responsibilities can serve to enhance and advance the other, although this can be challenging, particularly for faculty with heavy teaching loads. However, the courses that one teaches can provide a basis from which to delve into a body of literature that may suggest an important topic for a research study. Interactions with clinicians might suggest important gaps in service provision. Discussions with colleagues at your institution or professional meetings can stimulate ideas for fundable projects. Ideas can come from a variety of sources, so it is important to keep an open mind to the many possibilities. (See Part III, Preparing a Budget, which examines different sources for generating competitive grant ideas.)

Developing a funded research career is usually accomplished in a series of interrelated steps, each building on the one before. See reflective questions in Box 1.4 to help kick-start your thinking about building a career involving grantsmanship.

Box 1.4 *Reflective Questions: Building a Career With Grantsmanship*

- Where do I want to be in 2, 3, or 5 years in terms of my career?
- What kind of impact would I like to have?
- What skills do I need to reach my goals?
- What funding opportunities can I immediately apply for?
- Do my ideas address local, national, or global societal trends?
- Do my ideas make a contribution to my profession?

Developing proficiency at obtaining funding for your ideas will take time and patience. It will need to involve a planned, focused effort with well-defined professional and research goals that evolve over time. It is always helpful to consult with senior faculty members and identify and work closely with a mentor or mentorship team (see Chapter 5, Everyone Needs a Mentor, on mentorship) or an established professional who can help you identify short- and long-range professional goals and a pathway toward achieving them.

Remember that developing skills in grantsmanship and writing a grant proposal represent a significant investment of time and energy. Grant applications are evaluated in part based on whether the applicant demonstrates expertise in the proposed work. Also, an applicant must demonstrate having a record of presentations, publications, and previous experience in managing a project. Thus, building one's credentials in a focused area is an important part of developing a career and assuring success in grantsmanship. Box 1.5 lists five components of a strategy for incremental professional growth to enhance one's competitiveness in grant writing.

Box 1.5 *Five Components of a Professional Growth Strategy for Funding*

- Develop a plan for short- and long-range professional development and evaluate and update your plan.
- Seek mentorship and build relationships with potential collaborators.
- Build credentials through presentations and publications and include collaborators.
- Monitor funding trends, and build a track record of funding, starting with pilot funds.
- Work on teams with more experienced researchers.

Let us take a close look at each of these components of a growth strategy.

Develop a plan for short- and long-range professional development: To develop a plan for professional growth, begin by outlining your career or professional goals. Ask yourself "What do I want to be doing 2 to 5 years from now?" "Am I more interested in research, teaching, clinical work, or a combination?" and "What type of impact do I want to have?" Starting from these interrelated self-reflective questions, the area you select will influence the type of grant programs for which you will seek funding. After identifying immediate and long-range career goals, talk to your supervisor or your department head. Learn what their expectations are for you, the department, and the institution as a whole and how your goals may fit with the strategic planning of the institution. This will provide a better idea of how compatible your goals are with those of your department or institution. If your goals are not in keeping with the department or institution, you may not have access to or be able to obtain the necessary resources and intellectual and financial support to reach your goals. For example, if you are interested in curriculum development and your department values and supports educational innovation, then you will probably receive the institutional support necessary to pursue a training grant. If, on the other hand, your department has a greater interest in research, you may need to rethink your goals and perhaps develop your research skills or examine your interest in curriculum from a research perspective.

Seek mentorship: Mentorship is invaluable at any stage of one's career, but it is particularly important at the pre- and postdoctoral level and during the early stages of your career as a faculty member. A mentor with funding experience can provide you with important guidance to help you navigate through the grantsmanship maze. If a mentor is not available, it is important to identify an experienced investigator in your institution who would be willing to read and respond to drafts of your work. This kind of intensive critiquing is essential for developing a competitive grant application.

Build credentials through presentations and publications: Building your credentials requires time and patience, but it is critical to becoming funded. When submitting a grant proposal, the peer-review panel will closely examine the credentials of the applicant as part of the evaluation process. Also, reviewers will consider whether you have worked with coinvestigators or named collaborators on the grant application. Box 1.6 contains a typical comment by a review panel regarding the credentials of an investigator who did not demonstrate sufficient expertise in the topic of his proposal: congestive heart failure and a nursing home care intervention.

Box 1.6 Example of a Peer-Review Evaluation of Applicant Credentials

The principle investigator, Dr. T, has a PhD in sociology and is an assistant professor. His past experience has included extensive research in gerontology and healthcare interventions for stroke patients. However, he has no previous research experience or publications on nursing, home care, or congestive heart failure. There is no doctorally prepared nurse on the project, which is also a problem given the focus on quality of life of residents with congestive heart failure and their healthcare needs. In particular, the team lacks clinical research expertise with congestive heart failure patients. The project would be enhanced by collaboration with nurses who have both clinical and research expertise in this area.

Building your credentials in a particular area can be accomplished in a number of ways. These include presenting papers at professional meetings; developing these presentations for publication; writing a book review or column for your professional newsletter; serving as a reviewer for a professional journal; reviewing abstracts for a professional meeting; and serving as a reviewer for a grant competition. Reviewers will be evaluating the credentials not only of the PI but also of the team as well as whether the team has worked and published together previously.

Build a track record of funding, starting with pilot funds: One component of building one's credentials involves developing a track record of funding. Funding agencies require that an applicant demonstrate expertise in the proposed area. Therefore, reviewers will carefully evaluate biographical material by the number of professional presentations and publications in the proposed area and by previous funding or project management experience. Obtaining even small funds from intramural sources such as one's department, college, institution, or professional association to carry out small research projects will help you get started in developing a track record. Part of building a track record also involves demonstrating how members of the grant-writing team have previously presented, published, or worked together. Reviewers will evaluate the extent to which the assembled team for the grant has partnered in previous efforts.

Work on teams with more experienced researchers: There are two key strategies to follow to gain funding experience if you are early in your grant-writing and professional career. The first is through obtaining small grant funds. Most universities have intramural competitive grant programs that provide seed money for novice investigators to conduct research and obtain pilot data. Many professional associations also have small grant programs. A second strategy is to work with others who have more experience and existing funded programs of research.

Working on the grant of an experienced investigator is a very helpful approach from which to learn project management as well as obtain opportunities to participate in presentations and publications related to the project. Becoming a member of an investigative team provides hands-on experience with funded activity. This experience will also allow you to obtain critical insight into how proposals are written and funded projects implemented.

Keeping these in mind, being successful at grantsmanship over an extended period of time also involves a step-by-step progression by which you systematically build your portfolio or expertise. Figure 1.1 outlines a systematic approach to developing a career trajectory for grant writing. This particular career trajectory is most appropriate for those in faculty positions. However, many of the activities we list are also relevant to health and human service professionals in practice settings who need to seek funding to support innovative programming. As shown by this trajectory, building a career in research or funded grant programs is a planned series of highly interrelated and iterative steps that move an individual from novice, to intermediate, to advanced, to expert levels of research and grant-writing skill. Each level is composed of three fundamental activities: making presentations at professional meetings, publishing in professional journals, and conducting research. The number and type of activities undertaken, and the depth in which each is pursued, will change depending upon one's level of expertise and position along the trajectory. It is helpful to start as a member of an established team or a team composed of senior members.

The time frame for moving from novice to intermediate to expert will vary, depending on a number of factors. These include the match of your research idea with the interests of a funding agency, your success at gaining funding at various stages, the amount of time you have available, your other commitments and responsibilities including work-life balance, and a certain amount of luck. This research trajectory is a heuristic guide for thinking about and planning a grant-writing career in a systematic way. It is also a helpful tool for mentoring others and/or in department planning.

Novice

Think about the grant story of Ms. L. Where would you place her along this career trajectory? If you said she is a "novice," you are correct. Ms. L has a great idea with funding potential, but she has not had direct experience writing a grant, securing external funding for a program, or overseeing a grant program.

At the novice level, the primary goal is to identify a research area of interest that is broad enough that it allows a meaningful set of questions to be developed and from which to build a strong program of research. This requires that you initially identify a broad area of inquiry within which to examine specific research questions.

Let us say you are interested in issues related to the functional capacity of individuals with dementia. Your first step is to develop focused research questions that address this broad area of investigation. For example, as a health professional, you may find that it is difficult to evaluate physical function in persons with dementia. The accuracy of reports of daily functioning provided by either a caregiver or the person with dementia may not be accurate. The research literature suggests that caregivers tend to over- or underestimate functional capacity depending on their own level of stress. Thus, one researchable question might be "What caregiver characteristics, other than stress, have an impact on the accuracy of proxy reports of functional capacity?" Another question might be "What is

Figure 1.1 Research Career Trajectory

AHRQ, Agency for Healthcare Research and Quality; AREA, Academic Research Enhancement Award; NIDRR, National Institute on Disability and Rehabilitation Research; NIH, National Institutes of Health; RSA, Rehabilitation Services Administration; RWJ, Robert Wood Johnson.

the relationship between performance-based measures and self-report measures of physical function for this clinical population?" A similar process occurs when developing an educational or training program. A broad educational idea may be identified, such as training health professionals in early intervention programs for children. A grant application would then focus on one aspect, such as testing the effectiveness of web-based strategies or interprofessional approaches to such training.

At the novice level, other activities such as making presentations at professional meetings, publishing in journals, and seeking money for pilot studies are very important.

Let us examine each of these activities in more depth.

Presentations and Publications

As a novice, it is critical to start with a comprehensive literature review on your topic. This literature review will help you become familiar with the current state of knowledge in the field. You will learn what research has been conducted in your area and the gaps that exist in the knowledge base. It will show you the kinds of research questions that are being asked in the field as well as the research designs and measurement instruments that are most common. A literature review is an ongoing process that you must continually engage in at each step of the research trajectory, particularly since the field is constantly changing as the research evidence around a specific topic grows. An initial review will enable you to determine the primary issues and the significant research questions suggested by the gaps in the knowledge base. This is one way to identify a broad area of inquiry and, within that, narrow your focus to a researchable question.

The knowledge gained from a systematic review may put you in a position to develop an abstract suitable for presentation at a professional meeting. One approach may be to identify a gap in knowledge and make recommendations as to how to address it. Another might be to apply a particular theoretical framework to a practical situation to explain why a specific technique works in practice. Yet another approach may be to present an innovative teaching technique that you have developed and found to be effective. At this point in your career, you should target your local professional association and submit abstracts for presentation at their next meeting.

The next step would be to use this presentation as a base, expand on it, and turn it into a short article that you can submit for publication. Again, at this stage in your career, the most appropriate places to submit your manuscript would be local or state journals or online, open-access journals or even professional newsletters.

Another way to build credentials is to contact journals or publishers in your field and offer to review books. Publishers are sometimes open to receive reviews of new books by those in the field. Some journals also have special sections that introduce readers to the latest works in a particular area of inquiry. Publishers, and some journals, provide you with a copy of the book to review.

Some journals also publish summaries/abstracts of recent, relevant published articles to enable their membership to become aware of the latest thinking

in the field. Conducting these reviews can provide you with up-to-date information and, at the same time, give you a publication related to your research area of interest.

Research Funding

As a novice, you will need to develop skills in conducting research. As we have previously suggested, one way to gain experience is to identify a funded researcher in your department or college and volunteer to work on his or her grant. Some investigators welcome the involvement of novice faculty in their research. You may be asked to conduct a literature review or engage in other related research activities such as interviewing subjects. This involvement will provide you with information about the day-to-day activities of a funded project as well as experience working on a research team.

Another way to develop hands-on research experience is to seek funding for a small research project. Based on your background reading, you should be able to formulate a question that can be studied on a small scale. Many universities have small pots of money earmarked for faculty development. This money might be available from your department chair or from your college. Usually, these are small amounts of money ranging from \$500 to a few thousand dollars. You can use these in-house monies to conduct a small pilot study that can provide preliminary data from which to develop a larger study. Be sure to plan to present the results of this study at your professional association meeting and then publish it in a journal.

Each of the preceding strategies and suggested activities helps you to develop the necessary skillset and knowledge base from which to pursue a competitive research grant application. The strategies will also build qualifications in a research area that will help you become more competitive for funding as you move to the next phase of your career.

Specific Considerations at the Predoctoral Student and Postdoctoral Fellow Level

Matching interests to the intellectual resources available in your department or school is particularly important at the pre- and postdoctoral level. When selecting a dissertation topic or postdoctoral-related research project, the expertise needed to advance the idea must be reflected among the faculty at your disposal who can then be approached to serve on your dissertation committee or mentorship team. When submitting a grant application at this level of your career, the faculty mentorship team will be critically evaluated for its adequacy and relevance to your proposed topic and project, and whether you have access to the expertise necessary to ensure that you can be successful.

It is always important to discuss your goals with more experienced grant writers, researchers, or senior faculty. These individuals will have moved through the career steps necessary to be successfully funded and can provide important insight and lessons learned from their vantage point. They will know the challenges you may confront and will be able to suggest effective strategies for developing an effective career and grant-writing plan.

Intermediate

Now that you have established a research or project direction, at this stage it is time to think about refining it. Your next steps should be designed to further refine your research question and engage in studies of a larger scope.

Presentations and Publications

As you advance in your career, you need to continue to give presentations at professional meetings and develop these presentations into publishable manuscripts. At this point, you should target national meetings for your presentations and peer-reviewed journals for your publications.

Another valuable experience at this stage of your research career is to serve as a peer reviewer for your professional journal. Most journal editors need to identify individuals with expertise in specific areas to review manuscripts. Serving as a peer reviewer will give you exposure to the latest thinking in your field and a better understanding of the components of publishable manuscripts. In addition, critically reviewing manuscripts helps to hone your writing skills and avoid common mistakes in scientific writing.

Research Funding

If you have received seed money to conduct a pilot study, the results of this study can be used to identify a larger research study in the same area, justify it empirically, and pursue a larger grant award. Most grant applications include a section in which the applicants must outline their previous efforts in the proposed area and empirical evidence to support the need for conducting research on this topic.

Numerous sources for small pockets of money exist, including your own institution, professional organization, and local foundations and agencies within the federal government. Many professional organizations offer small grant awards for projects related to the profession and for which you might qualify. Descriptions and requirements for these competitions are usually advertised in the professional journal or found on the association's website.

At the federal level, many of the institutes in the NIH have small award programs that are designed to help new investigators gain research experience. One of these is called the K01 mentored research scientists award. There are many different types of development awards under the K series. Be sure to check the "K kiosk" online, which explains in detail eligibility criteria and application information (researchtraining.nih.gov/programs/career-development). Some K award mechanisms provide funds to support an experienced scientist in your area of research to act as your mentor or will support a mentoring team.

There are other opportunities as well. These include R03 and R21 awards for small research studies, first investigators, or to initiate a new program of research. The budget and number of years supported in these mechanisms vary widely by the institutes in the NIH. These are detailed in the specific PAs. It is always important to check online to become knowledgeable about the specific requirements.

The pilot data collected in your earlier in-house study will be important for these small grant or mentorship awards. Pilot data will make your proposal more competitive because reviewers like to see that you have already begun to

investigate an area. These small grants are designed to prepare you for developing an R01 grant application, which is the main mechanism for funding investigator-initiated research studies at the NIH. R01 grants are awarded to experienced investigators who have a well-developed research program and preliminary evidence to support a larger study. These are the grants that you will be competing for in the next stage of your research career.

The NIH is not the only source of funding. At this stage, you should also consider other funding sources. The U.S. Department of Education has numerous research, training, and educational funding opportunities. For example, the National Institute on Disability and Rehabilitation Research in the Department of Education has a field-initiated program. This competition invites applications on topics identified by investigators as long as they are related to the overall goals of the agency. The Bureau of Health Professions in the Health Resources and Services Administration of the Department of Health and Human Services has many training and educational grant programs appropriate for health and human service professionals.

At this point in your career trajectory, you may want to target two to three agencies whose funding interests are similar to your area(s) of expertise, learn about their funding priorities and proposal requirements, and contact the project officers and other investigators whom they are funding. There are at least three ways to develop a better understanding of an agency's goals. The first is to contact a project officer in an agency. We discuss ways to do this in more detail in Chapter 2, *Becoming Familiar With Funding Sources*.

A second strategy is to attend a technical assistance workshop sponsored by an agency. Many agencies at the federal level conduct these workshops a few months prior to a due date for the grant proposal. These workshops are typically free, via a webinar format or face-to-face. You can obtain information about these workshops either from the agency's web page or by asking a project officer. If the agency is conducting an invitational workshop, you may have to submit a letter indicating your research goals and specific research questions. This letter serves as an application. If there is a match between your level of experience, research goals, and the agency's areas of interest, you will be invited to attend. At the workshop, members of the agency staff will discuss the upcoming competition, provide information on the kinds of studies or projects that they are interested in, and talk about the major components of proposals. There is often time set aside for you to ask specific questions or meet with project officers to discuss your ideas. Most professional organizations, such as the National Council of University Research Administrators, also hold technical assistance workshops. Similar workshops are also provided by professional associations at their annual meetings. Although some have a registration fee, these workshops provide opportunities for you to listen to presentations given by representatives from a number of federal agencies, who discuss the kinds of projects they are interested in funding, elements of a competitive application, and upcoming grant initiatives.

Another excellent way to learn about submitting proposals for funding is to serve on the peer-review panel of an agency. Although the NIH has standing panels in which experts who are funded by the agency serve for a 3-year term, other agencies appoint panels for a single competition. Many of these agencies are required by legislation to construct review panels with geographic and ethnic representation, so they are often seeking peer reviewers. Contact an agency that interests you and inquire about the possibility of serving on one of these panels. They will send you an application form that will ask you to identify your areas of expertise or to write a brief letter outlining your experiences. Your application

will be kept on file and when a competition is held in your area of expertise, you may be asked to serve. The experience you obtain from serving as a reviewer is invaluable. You will be able to see the range of proposal ideas that are submitted and common pitfalls to avoid. You will also have opportunities to meet other experts in your area, who may be able to help advance or improve your ideas.

Advanced

The advanced level is characterized by a well-developed and ongoing funded research program. This will have resulted from the systematic flow of ideas from one grant project to the next as well as an extensive publication history that is built from previous research/grant activity.

Presentations and Publications

Presentations at national meetings, publishing in journals, and networking with colleagues who have similar interests all remain critical activities. However, at this stage, these activities are more focused, and the advanced researcher is often more selective, presenting primarily as an invited or keynote speaker and also targeting international forums from which to develop or expand collaborations with colleagues in other countries.

It is at this point that as an advanced researcher, you will receive invitations to present at national and international conferences. In addition, you may be invited to present suggestions to other new investigators at the technical assistance seminars conducted by various agencies or professional associations. Finally, many agencies periodically conduct long-range planning meetings to set future funding goals. These agencies will often invite many of their funded investigators to participate in these meetings. Involvement in these planning sessions will not only provide you with more knowledge about the agency and its priorities but also allow you to influence their future funding decisions.

Research Funding

If you have not already done so, you should be competing for the larger grants, such as the R01s and program grants in the NIH, or the similar grant programs in other agencies that we discussed in a previous section.

If you have already received one or more R01 grants from an institute in the NIH, or major grants from other agencies, you may be invited to serve on one of their standing peer-review sections or ad hoc review panels. The standing peer-review sections are typically a 3-year commitment, during which you will be required to review grant proposals in your field three times a year. These are prestigious appointments that provide important networking opportunities, insight into review committee decision making, and exposure to a wide range of grant applications that can enhance one's own grant writing. Serving as a reviewer also solidifies one's reputation as an established investigator within the agency.

Large foundations, such as Robert Wood Johnson or Kellogg, may also have research funding opportunities in your area. These foundations usually fund

experienced over novice investigators so you may want to consider their initiatives at this point.

Expert

The expert level is characterized by having an active research program underway with one or more active grants at any one time. Collaborations with other experts, nationally or internationally, participation in expert panels, keynote addresses, program projects, and/or multisite studies are core activities at this stage. Box 1.7 lists key strategies to consider across a career trajectory.

Box 1.7 Strategies for Managing Funding Across a Career Trajectory

- Cast a wide net to identify funding opportunities.
- Match level of research/grant expertise with grant competition.
- Build a logical stepwise program of funding starting.
- Pilot studies are essential for building a research program.

Presentations and Publications

Your presentation and publication efforts should continue, since the results of your research should be very influential in your field and pave the way for even larger grant projects. You will also be invited to present your research as keynote speeches at various national or international meetings.

Research Funding

Now, you might also consider applying for P30 or P50 grants, which are large, multimillion dollar specialized center grants. In these programs, you would have a number of grants under your supervision as well as a team of other researchers.

1.5 PERSONAL ATTRIBUTES OF SUCCESSFUL RESEARCHERS

Now that you are familiar with the language of grantsmanship and have familiarity with how to plan a research career, begin to think about acquiring the specific skills necessary to successfully move along the trajectory. Box 1.8 presents a list of skills that can be helpful for developing a research career.

Box 1.8 Skills of Funded Expert Researchers

- Knowledge of the research process, methodology, and design
- Domain expertise
- Knowledge of funding sources and steps to obtain funds

(continued)

Box 1.8 Skills of Funded Expert Researchers (continued)

- Knowledge of descriptive and/or inferential statistics
- Expertise with various software packages and other analytic technologies
- Organizational skills
- Ability to think creatively, flexibly, and critically
- Strong writing ability
- Ability to network with other professionals
- Group leadership in helping others collaborate and helping novices seek funding

Let us briefly consider each of these skills.

Knowledge of the research process, methodology, and design: These are basic to the grantsmanship process. As a novice, you do not have to be an expert in all of these areas, but as you proceed along a research trajectory, you should become more knowledgeable about each.

Domain expertise: By domain expertise we mean a familiarity with the research and writing in the area that you plan to investigate in your grant proposal. This comes from a thorough understanding of the literature and staying on top of the current thinking in your area.

Knowledge of funding sources and methods to obtain funds: This is why you are reading this book! Also, seek opportunities to attend grant-writing workshops sponsored by the NIH, professional organizations, or your institution.

Knowledge of descriptive and/or inferential statistics: An understanding of the basic principles of statistics will be helpful for those involved in conducting both funded research, evaluation, and education projects. Statistical knowledge is obtainable in most graduate education programs and by working with more experienced investigators and having a statistician as part of your project team. Knowledge of basic statistical principles is helpful for developing your idea and knowing when you need to bring in more sophisticated statistical help.

Expertise with various software packages and other analytic technologies: It is helpful to be familiar with current and emerging technologies that can help you be more efficient in grant writing, implementing and monitoring your project, or referencing citations for publications and grant applications. Because most agencies are now requiring electronic submissions, you will need to become familiar with how to use packages for uploading grant materials to allow you to meet that requirement.

Organizational skills: Grantsmanship is a systematic process. It requires an organized approach to finding funding sources and putting together a competitive proposal.

Ability to think creatively, flexibly, and critically: In addition to being organized, you will need to think creatively and flexibly to match your ideas with the goals of a funding agency. Critical thinking skills are also important to any health professional. This allows you to develop appropriate research questions and the approaches to their analyses.

Strong writing ability: This skill is something that you should develop as you progress along the trajectory. We discuss this in more detail in Chapter 5, Everyone Needs a Mentor.

Ability to network with other professionals: Again, this is something you should learn. Networking with other professionals is an important process because this is one of the ways in which you can identify potential funding ideas and, possibly,

find colleagues with whom you can collaborate. We discuss the importance of this approach in Chapter 2, *Becoming Familiar With Funding Sources*.

Group leadership in helping others get on the same page: This is an important skill associated with developing collaborative teams. We discuss this in greater detail in Part IV, *Models for Proposal Development*.

Summary

In this chapter, we have discussed core terminology of grantsmanship and the importance of developing a professional growth plan that integrates grant writing with other aspects of your professional life. Key take-home points include

1. The essence of grantsmanship is to seek available money from a funding agency by writing a grant proposal that convinces an agency of the importance of your project idea and your ability to carry it out.
2. There is a specific language used by funders, and it is important to learn this language to communicate effectively with individuals in funding agencies and with colleagues.
3. To be successful in obtaining a grant, it is essential to understand the priorities of an agency.
4. Grantsmanship is a systematic process. There are well-defined and discrete steps, each building on the one before, in pursuing external funding. Each grant proposal that is written should be a stepping-stone for the next grant application. A grant application should fit a funding priority of an agency and also fit your skill level and placement along the career trajectory (e.g., it is not possible to be an independent investigator at the NIH without previously having pilot funding and experience overseeing a project).
5. Grantsmanship is an integral part of the professional career of health and human service professionals, whether in academic or practice settings. Gaining financial support from outside agencies can advance the body of knowledge in a particular field, improve health and human service practice, or evaluate innovative services.
6. Developing a research career takes time and patience and can be accomplished systematically.
7. There are certain skills that need to be acquired to be successful in competing for grant funds. These can be learned by reading this book, by attending grant-writing workshops, by joining a team led by an experienced grant writer, and through direct experience.