An Introduction to Grant Writing: De-Mystifying the Process

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This workshop, an expansion of a session presented at the North American Research Conference in Bethesda, Maryland in 2009,[1] was designed to provide an overview of important components of writing a clear, concise and tailored grant application. Topics discussed included: review criteria of significance, approach, innovation, investigators and environment, as well as grant application components of abstract, specific aims, research questions and/or hypothesis statements including PICO components, background and discussion of theoretical model guiding the research, preliminary studies, biographical sketch, timeline and budget. Activities highlighted some aspects in the grant writing process. Our goals were to enhance participants' understanding of the grant writing process, cultivate a persuasive approach for addressing the essential components of a well-written grant and provide insight into how to embark upon a successful, comprehensive grant development process.

Develop a Track Record: The author of a successful grant application and principal investigator of a grant project must first establish a track record. Experience related to the project and to management of a budget are reasonable expectations for any agency or organization granting funding. The path that we followed is similar and may serve as an example for others.

Develop an area of specialty by focusing on a study topic and acquiring knowledge and experience related to becoming an authority in your area of study. Assure your other work contributes to this goal, for example:

- Volunteer to collaborate with established researchers conducting related studies
- Conduct small scale/pilot studies in the area of interest, and publish or present results at research meetings
- Apply for small grants from your institution, associations, foundations or organizations with similar goals; identify new investigator opportunities
- Seek opportunities to gain experience with research protocols, personnel management, budgeting and accounting procedures
- Choose community involvement and design community-based projects related to your study area and build collaborations or coalitions, versus volunteering for others' priorities. Later, you may want to involve community providers in your grant-funded program
- Present related oral presentations, scientific papers and continuing education programs at professional meetings
- Assure work is directed toward benefitting society rather than solely focusing on advancing the dental hygiene profession

Writing the Successful Grant Application: The most important lesson we learned on the path to successful grant writing was that writing a clear, concise and focused grant application with good science is not enough. The successful application must tell an interesting story, plus:

- Be tailored specifically to the funding agency's mission. Present ideas that are easy for reviewers to understand, including why the study is significant and feasible
- Convince reviewers you have the expertise to conduct the planned study and you have the appropriate environment, equipment, collaborators and budget[2]
- Prepare a reviewer-friendly application that is well organized and clear to minimize the reviewers' work. Make it easy for them to understand your ideas, locate information within the application and be your advocate. Be specific about what you want reviewers to know and what they need to know
- Follow application instructions exactly
- Take advantage of institutional resources for assistance in preparing your application and budget and submitting it as required
- Contact the funding agency's program officer as needed for information related to the agency's goals and procedures

All successful projects require planning, development, implementation and evaluation. Start early, seek collaborators and support, and note internal as well as external deadlines. Allow at least 3 months for writing the application. Consider carefully evaluation criteria to be used by reviewers to score your application.

Most funding entities have similar criteria for evaluating grant applications. The following discussion is based on the review criteria of the National Institute of Health of the U.S. Department of Health and Human Services. These criteria include: significance, approach, innovation, investigator and environment.[3]

Significance: Your study's significance must be made clear and concise and answer questions such as:

- Does the study address an important problem from the funding agency's perspective?
- If the aims are achieved, how will scientific knowledge be advanced?
- What will be the effect of your study on the concepts or methods that drive the field?

Approach: Your study's approach must answer such questions as:

- Are the conceptual/theoretical frameworks, design, methods and analyses adequately developed, well-integrated and appropriate to the aims of the study?
- Are potential problem areas acknowledged and alternative strategies considered?

Innovation: In addressing your study's innovation:

- Specifically state why you believe the proposed research is original and innovative, and offer examples
- Explain how your project challenges existing paradigms or requires developing new methods, techniques or technologies

Investigator: In addressing this criterion, answer the following questions:

- Are you appropriately trained and well suited to carry out this work?
- Is the work proposed appropriate to your experience level (and that of your collaborators)? Explain how the proposed study is similar to those you have already completed
- Does the investigative team bring complimentary expertise to the project?
- Are the contributions of each collaborator delineated?
- Have you included letters of commitment and consultation on appropriate letterhead?

In addressing the environment criterion, answer such questions as:

- How does your scientific environment contribute to the probability of success?
- Is there evidence of institutional support (e.g., a letter stating what your institution will provide)?

Grant Application Components

Abstract: The abstract, your research summary, may be the only part of your application reviewers read. The best approach is to write it first and revise it last when you know your final application content. The abstract states broad, long-term objectives related to the agency's mission, lists specific aims, concisely describes the research design and methods to achieve aims and highlights relevance to public health.

Specific Aims: The Specific Aims, the most important section of the grant application, should be well focused, not overly ambitious and hypothesis driven. It is critical to write them early, circulate them to your team of experts and incorporate their feedback before writing the rest of the proposal. Usually 2 to 4 aims are the norm.

This section typically includes 3 general sections:

1. The "set-up" paragraph, which explains the relationship between a pressing problem and your research theme. This paragraph should strongly persuade reviewers that the topic is important and worthy of their attention
2. The "specific aims" paragraph starts with a sentence like, "The specific aims of the study are to…" and then lists the aims. Each aim should allude to the techniques used to achieve each one. In listing the specific aims use active verbs, rather than passive ones
3. The "hypothesis" paragraph points to a specific problem or area and culminates in the statement of the hypothesis. Quantitative hypotheses contain PICO components: problem/population, intervention, comparison and outcome

Participants were provided with an example of specific aims to critique and edit in small groups by applying information discussed.

Background and Significance: This section must establish 3 things: the project is important, the science is interesting, and there is a high probability of success. This is not a literature review. Educate the reviewers to your way of thinking. Show how the proposed project builds on previous work and identify gaps in previous knowledge.

Preliminary Studies: This section should convince reviewers that you know what you are doing. Show that the work is feasible and that you have completed suitable groundwork.

Biographical Sketch: A formatted Biographical Sketch is used to convey information about the qualifications, productivity and the role of the key personnel involved in the proposed project. It is important to convince reviewers that you are highly qualified to carry out the project. A good biosketch includes a personal statement about the goal of the

proposed research and your related experience, employment positions, other experiences and professional memberships, honors, peer-reviewed publications and previous research support.

Workshop participants listed qualifications they would include in a biographical sketch and worked partners to brainstorm about enhancing their sketch.

Timeline: The timeline needs to clearly demonstrate that you can complete the project in the time allocated, be feasible, and realistic. A visual format is easier for reviewers.

Detailed Budget and Justification: Itemize and justify direct costs. Denote in-kind support and institutional requirements for indirect costs.

Conclusion: In conclusion, always remember that your application is a work of persuasion. It is not merely a description of the work you want to do. Rather you are making an argument that it is work that needs to be done, and that you are the right person to do it.[4]

References

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