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Specific Aims Workshop: Your Grant in a Sound Bite

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Grant writing is an essential component of research. In an increasingly competitive funding environment, writing successful grants has become an important focus of workshops and websites with each grant proposal component requiring detailed attention. The FUN 2017 Workshop session “Specific Aims: Your Grant in a Sound Bite” was dedicated to provide information and guidance in constructing and composing a Specific Aims document. This workshop drew on the presenters’ collective combination of grant experience ranging from successful submissions to serving as grant reviewers. The focus of the

session was to provide some key points with regards to the purpose of a Specific Aims document, the typical audience who will read the Specific Aims, and how to construct Specific Aims that catch the attention of reviewers and provide a clear and concise overview of the grant with the goal of attracting funding. The following is a brief summary of this workshop and includes links to additional resources to help construct a Specific Aims document that provides clarity and outlines the impact of proposed research.

Key words: Specific Aims; National Institutes of Health (NIH); Purpose; Grant Composition

Almost all granting agencies that rely on a panel/committee grant review process require some form of an abbreviated summary and impact statement. Grant proposals to the National Institutes of Health (NIH) refer to this document specifically as the “Specific Aims” page. Other granting bodies require a similar page where the impact and contribution of your research must be provided; for instance, the National Science Foundation requires a summary page where the Intellectual Merit and Broader Impacts of the research proposal must be outlined. Thus, although different funding agencies require a similar summary statement, the workshop focused on these summary statements from the perspective of the NIH Specific Aims document.

PURPOSES OF SPECIFIC AIMS

The Specific Aims comprise the publicly available information about funded projects for a particular funding agency. As such, Specific Aims provide accountability both for the funding agency at large, as well as the particular Program Officer/Director with regards to the types of projects that have received funding following a review process. As Specific Aims are made available to the public, this document also provides information to potential future applicants to gain some sense of what sorts of projects have previously received funding from this agency and/or funding initiative.

For the Program Officer/Director, the Specific Aims provide a brief statement about the proposal that clarifies immediately if a proposal addresses requirements of a specific funding opportunity. For instance, for funding opportunities that are topic-specific, Program Officers will look to the Specific Aims to ensure proposals are on-topic. Specific Aims can also help determine if a grant proposal addresses requirements for funding opportunities that serve additional goals (research experience for undergraduates, facilitate interdisciplinary research or collaboration, build

infrastructure, etc.). As well, the brief summary of proposed research in the Specific Aims can also help identify potential grant reviewers, whether for purposes of serving on a panel or study section or as an ad hoc reviewer. Finally, Program Officers are often willing to provide valuable feedback based on the Specific Aims document if they receive it well in advance of the proposal deadline, increasing the chances of a successful proposal. Therefore, information in the Specific Aims can have considerable influence on whether a grant proposal is reviewed and who might review it.

The Specific Aims also serve a function for the grant review process. To understand this, it is helpful to consider the typical process for reviewing grants by committee. Funding agencies bring together panels of scientists (known as study sections at NIH) who perform research in fields that are related to the research proposals. The individuals who serve as grant reviewers are not necessarily the same individuals who attend your conference presentations, but they are sufficiently familiar with the research field and scientific process to be able to identify a viable, and likely impactful, research proposal. All panelists do not read every proposal cover to cover. Typically, prior to the review meeting, panelists are assigned a subset of proposals to read and evaluate. For proposals that are not part of their assigned subset, panelists will have at least a sense of a grant proposal from reading the Specific Aims of the proposal. At the grant review session, panelists present a summary and review of the strengths and weaknesses for each grant proposal they were assigned. This is then followed by a discussion about the proposal that includes all of the panelists where questions about proposal details are directed to the presenting panelists. When a grant is up for review, those who were not assigned the grant rely on the presenter, the discussion, and the Specific Aims page in making decisions regarding scoring of the proposal. Thus, the Specific Aims of a grant proposal provide an important “sound bite” summary that will inform the majority of

members on a grant review panel. In some cases, it may be the only part of the grant a reviewer reads. Therefore, the Specific Aims must be clearly written and compelling.

WRITING SPECIFIC AIMS

The Specific Aims document typically has a similar structure regardless of the funding agency it is written for. For the FUN 2017 Workshop, we relied heavily on two resources to present this structure and discuss its content. Guidelines for grant writers written by the NIH – Specifically the National Institute of Allergy and Infectious Diseases (NIAID) – provides overall guidelines and specific tips on how to draft Specific Aims (<https://www.niaid.nih.gov/grants-contracts/draft-specific-aims>). The website also provides tips on the other sections of a typical NIH grant and “sample applications” that can be explored (<https://www.niaid.nih.gov/grants-contracts/sample-applications>). Although the examples are specific to this particular agency, they are written in such a way that someone not in this particular field can still appreciate and understand the Aims page. This is one of the goals of any Specific Aims page: You want people who aren't exactly in your field to understand your work and its impact.

The second resource we used was from the BioScience writers website which has a wonderful guide called “NIH Grant Applications: The Anatomy of a Specific Aims Page” (<http://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx>.) This website contains a paragraph by paragraph guide on how to construct this important part of your grant. In addition to providing a guide on how to write each paragraph of the Specific Aims document, this website then provides color-coded paragraphs that include the particular subcomponents discussed in the guide. It's an excellent resource. What follows is a summary of this guide. The Specific Aims page is broken down into four paragraphs: 1) Introductory Paragraph; 2) What, Why, How Paragraph; 3) Specific Aims List; and 4) Pay-Off Paragraph.

Introductory Paragraph: In this paragraph you need to grab your readers' attention so that they want to know more. It needs to be an impactful paragraph that demonstrates that your research addresses the agency's goals (remember that a Program Officer may be skimming through a big pile to determine if the grant is appropriate for their funding agency). The Introductory Paragraph needs to provide a statement summarizing the current state of research in your area, delineating what is known, then identify a gap in the research and how filling this gap in knowledge is critical to the field. Once you have the reader hooked and convinced that this research area is important to address you can then proceed to the next paragraph which explains how your work will help to fill the critical gap in knowledge in the field.

Paragraph 2: What, Why, How Paragraph: In the first paragraph you've convinced the reviewer that this research area is a critical one; now in the second paragraph you need to convince the reviewer that your proposal will answer the critical need. The “What and How” requires you to state a goal for the project overall and refers to explaining how the individual studies in the proposal will address the research need and how they will fit into a longer-term goal of your

work. The “How” also requires you to convince the reviewer that you/your lab/collaboration are the best people to answer this question because you have the best approach, experience, resources, etc. The “Why” refers to including a rationale for the proposal that includes a clear and concise hypothesis statement or equivalent. That's a lot to include in a single paragraph, so writing clearly and concisely here is vital.

Specific Aims: Here is where you will explain each of the aims you will use to test your hypothesis. Typically, you should have between 2-4 aims. Each Aim however needs to include some vital information in only 2-4 sentences. The Aim needs a title. Then the Aim should tell the reader the objective of the Aim as it relates to the hypothesis. Then summarize the experimental approach (including highlighting if something is unique or unusual or especially cool). You then include the anticipated outcome of the Aim. This should be the pattern of each Aim. These should be bulleted or highlighted in some way so that they stand out from the rest of the paragraphs.

Pay-Off Paragraph: This is the final summary. Here you should highlight the outcomes of the Specific Aims and link them back to the hypothesis (if you haven't done so in the Specific Aims List). Most importantly this is where you convince the reviewer of the contribution of your proposed research. Why, if you get the funding, it will greatly benefit the research field. Specifically, this is where you need to provide a statement of how your research will impact your field. Be persuasive and don't be afraid to toot your own horn.

CONCLUSIONS AND FINAL TIPS

Specific Aims are an important component of any research grant and writing good ones takes practice and lots of feedback. The remainder of our workshop session was spent critiquing participant-provided and speaker-provided sets of Specific Aims using a rubric with a format suggested by the BioScience Writers guide (See Supplemental Materials). Feedback received from participants indicated that this was an especially appreciated component of the workshop. To do this on your own, we suggest that you share your Specific Aims drafts with multiple colleagues (perhaps with the rubric provided). It is important for us as researchers to get feedback on our work and our writing; it is easy to write something when you know what you're trying to say, but the hard part is making sure your message is clear to others. Therefore, once you're comfortable with your set of Specific Aims, we encourage you to ask a colleague in your specific field to read them and provide feedback as well as a colleague that may be in Neuroscience but perhaps in a different subfield to read them as well. Getting this feedback will help you know if your message is getting across. Good Luck!

RESOURCES

<http://www.biosciencewriters.com/NIH-Grant-Applications-The-Anatomy-of-a-Specific-Aims-Page.aspx>

<http://www.biosciencewriters.com/Resources-for-Scientific-Grant-Writing.aspx>

<https://www.niaid.nih.gov/grants-contracts/draft-specific-aims>

<https://www.niaid.nih.gov/grants-contracts/sample-applications>

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