

Overview of the Grant Writing Workshop From the GRAPPA 2020 Annual Meeting

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ABSTRACT. Grant writing is an important component of research funding, but it is an art that must be developed and practiced. During this workshop, experiences and 14 tips from experts on grant writing, as well as suggestions for writing a career development award, were shared.

Key Indexing Terms: career development, grant writing, GRAPPA

Prior to the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) Annual Meeting in July 2020, a grant writing workshop was held to cover key principles in grant writing for GRAPPA members. In this review of the workshop, we will present key principles discussed.

General Principles

1. *Read the directions.* When writing a grant, follow the directions! Know the page limits, the important sections to include, the size and type of font, the margins, and the additional documents needed. Further, there is often a specific curriculum vitae (CV; e.g., the National Institutes of Health [NIH] biosketch in the US) and each may have their own specifications. Review all the biosketches/CVs you are submitting on behalf of your team and make sure they followed the instructions.
2. *Create a timeline and stick to it.* It will often take 6 months to get all the pieces of the grant together (including the budget, contracts, and university signatures). Create a checklist, set up a timeline, and stick to it. Additionally, find examples of grant applications so that you know what success looks like.
3. *Write, rewrite, find a reviewer, rewrite, repeat.* Get someone else to read your grant. Do not underestimate how important it is that others get your point. We often think we are writing

clearly until someone else reads it and tells us they do not get the point, often because there is too much jargon, or too much detail without sufficient background. Leave time for this process.

4. *Know the review criteria and make it easy for the reviewer to find the information.* For almost any grant, there are clear review criteria. Use that information to help organize your grant. If the reviewer has to search to find the information, that will likely diminish their rating of your grant. Make it obvious by naming the sections of the grant or demarcating (boxing, italicizing, underlining, or bolding) key passages. However, do not overuse these text highlighting methods or the grant will look too busy.

The Science

5. *The science must be strong and clear.* You must capture the audience from the first page. Spend a lot of time on writing the Aims section and making sure it is coherent and compelling. Aims should be easy to read and clear. Include a hypothesis for each aim that is succinct and precise, and use the same wording throughout the grant.
6. *Spend time thinking about how to frame the arguments you are making.* Address the Why (why this is important), the What (the old way vs the proposed new way), the Who (why the investigators are the right group), and the How (how you will get from the old way to the new way). Consider mind mapping or moving around sticky notes to get a sense of how to best organize the information.
7. *Delineate the deliverables.* What specifically will you have accomplished at the end of the grant period? Make this clear. This will generally be in the paragraph that follows the Aims themselves but also in the body of the grant.
8. *The work must have impact.* Ideally, the outcomes will change the clinical care paradigm or solve the critical problem you have outlined (even if this just gets us clearly closer to the solution). Describe why the work is important and innovative, why you are the one (or the team) to do the work, and what the results will mean.
9. *The aims and the approach should be feasible and doable.* Aims should not be dependent on each other. In other words, Aim 1 should not have to work in order for Aim 2 to work. Next, the amount of work should be just right. The general tendency

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is to include too much. Support the fact that this is doable with preliminary and feasibility data (i.e., number of patients seen in clinic that could be approached for enrollment).

10. *Make sure your approach answers the questions and is not just a list of experiments.* Include the rationale for each experiment, the expected result, and what happens or what it means if you do not get the expected result (i.e., pitfalls, alternative approaches).

11. *Do not forget to carefully consider potential outcomes and alternative approaches.* Too often, these sections are not addressed in a logical and impactful manner. Consider all the potential outcomes of an experiment, where things can go wrong, and how you plan to address it. In a well-written grant this section should stand out.

12. *Address how you will incorporate rigor and reproducibility.* The NIH website has useful information to help you think about how to incorporate these critical components into your research and grant proposals.

Beyond the Science

13. *Do not treat the other pieces of the grant with any less importance.* The abstract or lay overview may be all that someone reads prior to giving a score based on what the primary reviewer(s) describes. Additionally, the general look of a grant matters: make it look clean and organized.

14. *Use pieces of the grant to reinforce the other components of the grant.* For example, in the budget justification, describe each team member and then use bullet points to denote the specific tasks of each team member. Use a facilities and resources document to give more information about each of the key components in the research environment that will support the proposed research. Include a flow diagram in the human subjects document to show how patients move through the study. Note that it is also important that all key information is in the body of the grant because reviewers may pay variable attention to these pages.

Career Development Awards

During the workshop, we also discussed career development awards (CDAs). A CDA is a different type of grant that aims to

assist a candidate in becoming a successful, independent investigator. These awards differ in that approximately one-third of the score will be from the science section, but another one-third each will be related to the candidate themselves and to the mentorship/environment. The anatomy of these awards is different as well (so read the directions carefully) and they require letters of recommendation and/or support. In these awards, you will discuss your career goals and objectives (both short-term and long-term) and how the proposed work in this grant will help you achieve those goals. As such, the proposed work should include skills that you will develop throughout the award, which should be clearly delineated, as well as the reason you need to develop these skills. In other words, if you have a master's degree in epidemiology and you propose to take more epidemiology courses, it needs to be clear why these specific courses will be distinct from your prior training and necessary to accomplish your goals. Next, as you develop new skills, how will those skills and your path toward independence be evaluated? Provide benchmarks and/or milestones toward successful transition to independence and describe who will evaluate whether you have attained these milestones (i.e., an advisory committee). In describing the mentors and/or mentorship committee, you will need to discuss why each mentor was selected, their prior research, training, funding, and mentorship of other investigators (ideally other investigators that have transitioned to independent scientific careers), and how they will help you transition to independence. A letter of institutional support (i.e., from the department chair) will be needed to confirm that (1) you are qualified, (2) you will have a job, ideally independent of the funding of this grant, and (3) you will have the protected time to complete the work. Finally, describe the institutional environment and how it will support you in developing your career.

Summary

In this tight current funding environment, writing a clear, compelling grant is of critical importance to attaining funding. Sometimes this takes more than one try, so do not fret if it does not go well the first time. Get more input and try again. Happy grant writing!