The Art of Grantsmanship

By Jacob Kraicer

Writing a successful grant application is an art. Although science is primarily being evaluated, presentation and respect for the requirements of the funding agency are key aspects that can make or break an application. In this article, Jack Kraicer, former Director of Research Grants at HFSP provides guidelines on preparing grant applications from the moment of conception to the submitting the final proposal.

Feel free to copy part or all of this document, but with the following provisos:

1. INTRODUCTION

"Grantsmanship is the art of acquiring peer-reviewed research funding"

The objective of these guidelines is to assist both new and veteran investigators to optimize their chances of successfully competing in peer-reviewed grant application competition. It is a competition. With success rates falling to 50% or below, the difference between success and failure often results, not just from the quality of the science, but from the quality of the grant application. In all probability, the quality of science of the applications in the 10% below the cut off for funding by an agency is not significantly different from that in the 10% just above the cut off. "Grantsmanship" can make the difference.

The art of "grantsmanship" will not turn mediocre science into a fundable grant proposal. But poor "grantsmanship" will, and often does, turn very good science into an unfundable grant proposal. Good writing will not save bad ideas, but bad writing can kill good ones.

Why am I qualified to give advice ? First, I was successful in obtaining peer-reviewed funding and I served on a number of national and international reviewing bodies for some 30 years. But perhaps more relevant is the fact that I was responsible for the administration of a peer-reviewed research grants program for four years. During this time some 1600 research grant applications were processed.

My comments, suggestions, and recommendations are based on this experience, plus documents and discussions listed in the acknowledgements. They are relevant to most peer-reviewed research grant applications to most granting agencies. The information required, formats, and review processes are generally similar.

2. BEFORE YOU START TO WRb46(il)16TE] TJ ET BT /F2 12 Tf 1 0 0 1 4270.82335.14 Tm [(2)] T

- x What questions are to be addressed ?
- x Can you define and design specific experiments that will test directly your hypothesis?

Start the process early (see timetable suggested by Tutis Vilis (section 3.2), which I have modified slightly).

Put together and write up your recent work and submit it to appropriate peer

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- x Imagine what the possible outcomes might be.
- x Start reviewing the literature.
- x Discuss your ideas with others. Just going through the process of trying to explain things *to others is a great way to clarify things for yourself. Don't be disappointed if they do not* share your enthusiasm. But listen to their criticisms.

Complete as many of your current experiments as possible ; write up the papers and submit them for publication.

- x It can easily take 6 months to have a submitted paper accepted, longer if there are several revisions.
- x A most important element of your application is your track record.
- x What counts most in your track record is published papers in peer-reviewed journals.

9 months before the deadline:

Obtain preliminary data.

- x These will greatly strengthen your proposal.
- x A reviewer can think of a hundred reasons why something that you propose will not work. These objections vanish if you can show that you have done it.

You may need to submit a small application to your local institution to obtain funds to do the preliminary experiments.

- x Getting this support will enhance your application.

6 months before the deadline:

Write an initial draft of the main proposal section.

- x This can take a month of very intensive work.
- x This section may best be done in one continuous block of time; 3 to 6 hours per day each day of the week.
- x Block this time off in advance.
- x You will get nowhere, working a few hours a week.

5 months before the deadline:

Obtain comments from your colleagues.

- x These are people who are willing to spend hours reading and rereading your grant, not someone who returns it with the word "fantastic" on the front cover.
- x Sit down and talk to them about their comments.
- x Pay attention to what they failed to understand. Revise.
- x Get more comments. Revise, etc.

x Get some sleep.

3.3 First / Title Page

Fill it in completely and accurately and ensure that all signatures are obtained (in my experience, up to 10% of applications have something missing from this page).

The TITLE of your project is important.

- x It sets the first impression.
- x It is often used, with the Abstract, to route the application to the appropriate review committee(s) and reviewers.
- x It should be descriptive, specific and appropriate, and should reflect the importance of the proposal(s). But it should not be so specific as to require changes with each renewal (it helps to maintain the same title for renewals). One way to achieve this is to have a two part title ; the first general and the second more specific (eg "The control of secretion of growth hormone : mechanism of action of somatostatin"). The phrase after the colon may then change in subsequent renewals, while the part before the colon will remain unchanged.

3.4 Abstract / Summary of Proposal

THE ABSTRACT SHOULD SERVE AS A SUCCINCT AND ACCURATE DESCRIPTION OF THE PROPOSAL EVEN WHEN IT IS SEPARATED FROM THE APPLICATION. IT MUST STAND ON ITS OWN.

- x This is probably the most important section in your application. Take it seriously . Write it last. Work on it extensively after the bulk of the proposal has been refined. It is the first part that is read, and this sets the first impression.
- x It is often used to route the application to the appropriate external reviewers, grants committee, and to the primary reviewer(s) in the grants committee.
- x It must be understood by both experts in your field and by "generalists".
- x The primary reviewer(s) read the entire application for which they are responsib le, but others on the review committee may only read the abstract (see also Appendix the process in the review committee). The abstract may be the only part of the application that is read by all the members of the grants committee who are not primary reviewers, even though ALL members may have to give their independent scores (given equal weight to the scores of the primary reviewer(s)).
- x Review committee members often study the application (and prepare written reports, if required) weeks or months before the meetings. They then quickly review all the abstracts just before the meetings in order to recall the essentials.
- x The contents: to include hypotheses, objectives, approaches, research plan, and significance.
    - o State the hypotheses to be tested. Give long-term objectives.
    - o State the specific aims.

- Remind the reviewers of the start and end dates of the previous award. You must establish your credibility of excellence in research, and that the proposal will continue the high quality of your research.
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the overall Objectives. It is useful to break this section down, beginning with each stated Specific Aim (plus a one-sentence rationale for each aim). Then outline the design and

- o   Make sure they are allowed.
- o   Specify the unique and essential role that each will play, and state how their qualifications are matched with the role.
- o   Avoid "to be named" if possible.
- x   For travel, specify who will travel and whether they will be presenting a paper. Also justify a request for more than one meeting per year for any one person.

3.8 Other Grants Received and/or Pending

- x   Be honest and complete. The agency can verify this information from independent sources.
- x   Be careful if stating "no overlap". It may be more accurate to state "There are certain similarities   10.081g20(g)m [T-26(i)yP TJ ET 3 [<0078>6p.o(o)-19( )-t 9(a)-15(n)20(d)20( )

- x There are no results of pilot studies or other preliminary data.
- x The time listed to be spent on research should be at least 50%, and preferably over 75%. Anything less than 50% may be unacceptable (a smaller percent effort is usually acceptable for established investigators).
- x The budget is unrealistic.

4.2 By Established Investigators

- x The application is fragmented and disjointed. Different parts were obviously written by different junior colleagues and then hastily assembled by the applicant.
- x "I don't have to go into detail. Trust me and examine my track record. Rely on my reputation". This no longer works.
- x The proposals tend to be too cautious and do not venture into new and unexplored areas. They tend to be "more of the same".

5. APPENDIX

Outline of the Review Process

Granting agencies differ in the processing of applications. The following general scheme applies to most.

The cycle begins with the deadline for receipt of applications. Most agencies will reject applications that arrive after the deadline.

The secretariat then examines each application, looking for various irregularities including:

- x Missing critical information or signatures
- x Inappropriate format (type size, spacing, margins, etc..)
- x Number of pages exceeding that allowed
- x Application does not "fit" with the mission / objectives of the agency
- x Missing sections
- x Applicant does not qualify
- x Extra (not required) information is included.

Depending on the seriousness of the irregularity, the application may be rejected, or further information will be solicited.

The applications are then assigned to external reviewers. These are chosen from names recommended a) by the applicants, b) by members of the review committees and c) from the database in the agency. The external reviewers are asked to submit extensive written reviews, which are made available to the members of the appropriate review committee. Both the external reviewers and review committee members (see below) are asked to follow a format such as this in their reports:

grant application writers, some of which has been incorporated. Although aimed primarily with the National Institute of Health and the National Science Foundation in mind, much of the advice can be applied universally.