WHAT EVERYONE NEEDS TO KNOW TO DEVELOP A SUCCESSFUL GRANT PROPOSAL

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Eight Basic Questions Reviewers Ask

- *How high are the intellectual quality and merit of the study?*
- *What is its potential impact?*
- *How novel is the proposal? If not novel, to what extent does potential impact overcome this lack? Is the research likely to produce new data and concepts or confirm existing hypotheses?*
- *Is the hypothesis valid and have you presented evidence supporting it?*
- *Are the aims logical?*
- *Are the procedures appropriate, adequate, and feasible for the research?*
- *Are the investigators qualified? Have they shown competence, credentials, and experience?*
- *Are the facilities adequate and the environment conducive to the research?*

Developing the Hypothesis

- *Most reviewers feel that a good grant application is driven by a strong hypothesis. The hypothesis is the foundation of your application. It must be important to the field, and you must have a means of testing it.*

- *Provide a rationale for the hypothesis. Make sure it's based on current scientific literature. Consider alternative hypotheses. Your research plan will explain why you chose the one you selected.*

- *A good hypothesis should increase understanding of field of study.*

- *Your proposal should be driven by one or more hypotheses, not by advances in technology (i.e., it should not be a method in search of a problem). Also, avoid proposing a "fishing expedition" that lacks solid scientific basis.*

- *State your hypothesis in both the specific aims section of the research plan and the abstract.*

Developing Your Research Plan

- A top-quality research plan is the most important factor determining your application's success in peer review. As with a scientific publication, developing your ideas is key.
    - Your application should be based on a strong hypothesis.
    - Be sure your project has a coherent direction.
    - Keep the sections of the plan well coordinated and clearly related to the central focus.
    - Emphasize mechanism: A good grant application asks questions about mechanisms.
    - Don't be overly ambitious - your plan should be based on a feasible timetable.
    - Specific aims and experiments should relate directly to the hypothesis to be tested.

Specific Aims

- Your specific aims are the objectives of your research project, what you want to accomplish. The project aims should be driven by the hypothesis you set out to test. Make sure they are highly focused.

- Begin this section by stating the general purpose or major objectives of your research. Be sure all objectives relate directly to the hypothesis you are setting out to test. If you have more than one hypothesis, state specific aims for each one. Keep in mind your research methods will relate directly to the aims you have described.

- State alternatives to your hypothesis and explain why you chose the one (or more) you selected.

- Choose objectives that can be easily assessed by the review committee. Do not confuse specific aims with long-term goals.

Background and Significance

- Keep the statement of significance brief. State how your research is innovative, how your proposal looks at a topic from a fresh point of view or develops or improves technology.

- Show how the hypothesis and research will increase knowledge in the field. Relate them to the longer-term, big picture objectives and to the betterment of your field.

- Justify your proposal with background information about the research field that led to the research you are proposing. The literature section is very important because it shows reviewers you understand the field and have a balanced and adequate knowledge of it.

- Use this opportunity to reveal that you are aware of gaps or discrepancies in the field. Show familiarity with unpublished work, gained through personal contacts, as well.

- Identify the next logical stage of research beyond your current application.

Preliminary Studies

- Preliminary data should support the hypothesis to be tested and the feasibility of the project.
- Explain how the preliminary results are valid and how early studies will be expanded in scope or size.
- Make sure you interpret results critically. Showing alternative meanings indicates that you've thought the problem through and will be able to meet future challenges.
- Preliminary data may consist of your own publications, publications of others, unpublished data from your own laboratory or from others, or some combination of these.
- Include manuscripts submitted for publication. Make sure it's clear which data are yours and which others reported.

Research Design and Methods

- Describe the experimental design and procedures in detail and give a rationale for their use.

- Convince reviewers that the methods you chose are appropriate to your specific aims, that you are familiar with them, and that, unless innovative, they are well established.

- State why you chose your approach as opposed to others.

- Show you are aware of the limits to - and value of - the kinds of results you can expect based on current knowledge of the subject. State the conditions under which the data would support or contradict the hypothesis and the limits you will observe in interpreting the results.

Literature Cited

- Refer to the literature thoroughly and thoughtfully but not to excess. The publications you cite need not be exhaustive but should include those most relevant to your proposed research.

- Research proposals typically do not fare well when applicants fail to reference relevant published research, particularly if it indicates that the proposed approach has already been attempted or the methods found to be inappropriate for answering the questions posed.

Consortium/Contractual Arrangements

- This section should briefly describe any consortium and contractual arrangements you have made with regard to the proposed research plan.

- The roles of individuals or organizations with whom you have made such arrangements should be noted and reference made to any letters from them that are included in the application.

- Letters should describe the individual's or organization's understanding of the consortium or contractual arrangements.

Consultants

- Careful selection and addition of consultants can add credibility to your application and greatly improve its quality.

- A letter describing the willingness of an investigator to participate as a consultant to your project should be included in your application.

Writing and Formatting

- Edit thoroughly. Make sure your work is letter perfect. If you cannot meet the application deadline comfortably, consider delaying to the next receipt date.

- Follow the format in the instructions. Reviewers expect the research plan to be organized exactly as described in the instructions - you do not want to upset these expectations!

- *Conduct your own peer review - get outside opinions. Find colleagues in your field who are experienced and successful grant writers and preferably reviewers. The more critical they are, the better. It's better to know the problems before you send in your application than learn about them after the review when your grant gets an unfundable score.*

Writing Tips

- Prefer the active rather to the passive voice. For example, write "We will develop a cell line," not "A cell line will be developed.

- "Keep related ideas and information together, e.g., put clauses and phrases as close as possible to - preferably right after the words they modify.

- Simplify and breakup long, involved sentences and paragraphs. In general, use short simple sentences; they are much easier on the reader. Your goal is communication, not literature

- Edit out redundant words and phrases. Edit and proofread thoroughly. Look carefully for typographical and grammatical mistakes, omitted information, and errors in figures and tables. ***Sloppy work will definitely suffer in review. Reviewers feel that if the application is sloppy or disorganized, the applicant's research may be as well.***

Problems and Concerns Commonly Cited by Reviewers

- Lack of significance to the issue being addressed.
- Lack of original or new ideas.
- Proposal of an unrealistically large amount of work (i.e., an over ambitious research plan).
- Scientific rationale not valid.
- Project too diffuse or superficial or lacks focus.
- Proposed project a fishing expedition lacking solid scientific basis
- Studies based on a shaky hypothesis or on shaky data, or alternative hypotheses not considered.
- Proposed experiments simply descriptive and do not test a specific hypothesis.
- The proposed experiments do not include all relevant controls.

Problems and Concerns Commonly Cited by Reviewers

- The proposal is technology driven rather than hypothesis driven (i.e., a method in search of a problem).
- Rationale for experiments not provided (why important, or how relevant to the hypothesis).
- Direction or sense of priority not clearly defined, i.e., the experiments do not follow from one another, and lack a clear starting or finishing point.
- Lack of alternative methodological approaches in case the primary approach does not work out.
- Insufficient methodological detail to convince reviewers the investigator knows what he or she is doing
- Most experiments depend on success of an initial proposed.
- The proposed model system is not appropriate to address the proposed questions

Problems and Concerns Commonly Cited by Reviewers

- Proposal innovative but lacking enough preliminary data.
- Preliminary data does not support the feasibility of the project or the hypothesis.
- Investigator does not have experience (i.e., publications or appropriate preliminary data) with the proposed techniques or has not recruited a collaborator who does.
- The proposal lacks critical literature references causing reviewers to think that the applicant either does not know the literature or has purposely neglected critical published material.
- Not clear which data were obtained by the investigator and which others have reported.

Next Workshop on Grant Writing

The Grant Writing Process III – Resources that will Assist You Before, During, and After the Grant Acquisition Process. Friday March 2nd 10:00am – 11:00am, Malpass Library, Room 180