Grantwriting Checklist for Research Proposals

Before You Begin:

☐   Do I know the field and its literature well?

☐   Do I know what other projects in my field are being funded?

☐   Is the field overpopulated with researchers?

☐   Did I check the literature to make sure the project I'm considering has not been done before, or has been done and its methods judged inadequate?

☐   Did I brainstorm ideas with colleagues and mentors?

☐   Did I discuss my proposal with the sponsor program staff?

☐   Did I check to see if my idea matches the sponsor's initiatives reflecting any high-priority areas?

☐   Do I know what resources and support UNC has, and what other support I'll need?

☐   Do I know what institutional deadlines I must meet – department, college, sponsored programs?

☐   Am I giving myself plenty of time to write the application, at least three to six months?

☐   Have I considered asking a few of my senior colleagues to be on a mock review committee so that I can get ideas along with feedback on the concept, planning, and writing stages of my application?

Documentation:

☐   Will I be doing human subjects research? Have I completed IRB requirements?

☐   Will I be using research animals? Have I completed IACUUC requirements?

☐   Will I be doing research using rDNA or hazardous or controlled substances? Have I notified the Environmental Health and Safety Office?

☐   Does the proposal require electronic application? Have I notified Sponsored Programs?

☐   Are there any special requirements in the program announcement or request for proposals?

New Investigators:

☐   Have I balanced my lack of publications with more biographical information?

☐   Have I outlined modest, attainable goals that will match my level of experience?

☐   Have I shown that I have my own resources and institutional support, that I am independent, and able to lead?

☐   Have I brought in (if possible, well-known) collaborators to fill gaps in my expertise and resources?

☐   Am I showing a solid understanding of the literature and recognition of the strengths and weaknesses of my methods?

☐   Am I attempting a modest amount of work and not too much for my first research grant?

Hypothesis:

- [ ] Is my proposal driven by a strong hypothesis?
- [ ] Have I defined specifically what I am setting out to prove?
- [ ] Is the central research question important to the field?
- [ ] Is the hypothesis testable by current methods?
- [ ] Did I state my hypothesis in the proposal abstract and the specific aims section?
- [ ] Is my idea focused enough? Is it provable during my the award period and with the resources I am requesting?
- [ ] Does my topic fit with the sponsor's mission?

Research Plan - Planning - Answer these questions when you *develop* your research plan:

- [ ] Does my project address each of the sponsor's review criterions?
- [ ] Does my research approach answer the question posed by my hypothesis?
- [ ] Does my project have a coherent direction?
- [ ] Are the aims of the project I am considering achievable?
- [ ] Does my project have a central focus?
- [ ] Have I kept myself from being too innovative? Can I justify my innovations with sound reasoning?
- [ ] Have I checked my project against common research problems that might keep me from getting funded?
- [ ] Have I familiarized myself with common review problems and solutions?

Research Plan - Process - Answer these questions when you *write* your plan:

- [ ] Have I started with an outline, and then worked on developing each section?
- [ ] Am I presenting the information logically and clearly?
- [ ] Am I maintaining a balance between technical and non-technical language in my writing?
- [ ] Am I keeping both of my audiences in mind (my primary reader and my other reviewers)?
- [ ] Am I highlighting the importance and innovation of my project?
- [ ] Am I following the exact format specified in the instructions?
- [ ] Am I explaining which gaps in science my project would fill?
- [ ] Am I referring to the literature thoroughly and thoughtfully?
- [ ] Did I state my hypothesis in the specific aims and the abstract, and provide a logical rationale for the hypothesis?
- [ ] Did I prepare an appropriate budget, following both the sponsor's and UNC's guidelines?
- [ ] Did I provide all necessary information for human subjects and animals?
- [ ] Did I include a timetable for the proposed research?
- [ ] Have I kept in mind the page length, type size and margins required by the sponsor?
- [ ] Have I followed the instructions in the application guidelines to the letter?

Research Plan -- Specific Aims

- ☐ Have I written this section in clear, non-technical terms?
- ☐ Have I begun this section by stating the general purpose or objectives of my research?
- ☐ Have I limited myself to three or four specific aims?
- ☐ Do my specific aims and objectives support and test my hypothesis?
- ☐ Are they tightly focused?
- ☐ Did I present alternatives to my hypothesis and the reasons I chose the one I did?
- ☐ Can my objectives be assessed by the proposal review committee?
- ☐ Did I list the experiments I'll do to support each aim?
- ☐ Did I mention what staff I'll need to accomplish my aims?
- ☐ Have I organized and defined my aims so I can relate them directly to my research methods?
- ☐ Have I kept in mind any page limitation for this section?

Research Plan – Background and Significance

- ☐ Have I written this section in clear, non-technical terms that all reviewers will understand?
- ☐ Did I show how my research is innovative?
- ☐ Did I explain why my project is worth funding?
- ☐ Have I conveyed the significance of my research and how it will increase knowledge in the field?
- ☐ Did I include background information about the field?
- ☐ Does the literature section show reviewers my understanding of the field?
- ☐ Have I shown that I know the gaps, discrepancies, or roadblocks in the field?
- ☐ Did I identify the next logical research beyond this application?
- ☐ Have I kept in mind any page limitation for this section?

Research Plan – Preliminary Data

- ☐ Do the preliminary data support the hypothesis to be tested?
- ☐ Do they show the feasibility of the project?
- ☐ Did I focus on my own preliminary data, or when using results from other labs, draw a clear distinction between theirs and mine?
- ☐ Did I explain how the results from my preliminary studies are valid and how they will be expanded?
- ☐ Did I interpret my results critically and provide alternative meanings for them?
- ☐ Have I explained how my early work prepares me for the new project?
- ☐ Have I kept in mind any page limitation for this section?

Design and Methods – General

- [ ] Does each experiment correspond to one of the specific aims, and are they stated in the same order?
- [ ] Do the experiments follow a logical sequence?
- [ ] Did I offer a timetable showing how and when I will accomplish my aims, including any overlap of experiments and alternative paths?
- [ ] Did I use flow charts and decision trees to show paths of experiments and how they will progress?
- [ ] Did I estimate what I expect to accomplish each year and state foreseeable delays?
- [ ] Did I describe any hazardous procedures, situations, or materials, as well as appropriate precautions?
- [ ] Did I include supporting data?
- [ ] Have I included sufficient detail to show I understand and can handle the research?
- [ ] Have I only included information that is needed to state my case, i.e., have I avoided including anything I don't plan to do?
- [ ] Does my appendix include publications showing my use of the methods I've described?
- [ ] Have I cited references wherever possible?

Design and Methods – Approach

- [ ] Did I state the expected outcome of my research?
- [ ] Did I list each set of experiments in the same order as my specific aims, linking my experiments to the aims so reviewers can see how I will achieve them?
- [ ] Are the methods I chose appropriate to achieve the specific aims?
- [ ] Did I show why each experiment is important or how it is relevant to the hypothesis?
- [ ] Are the experiments in a logical sequence, flowing from one to another with clear end points?
- [ ] Did I offer a timeline for experiments?
- [ ] Will reviewers think I am knowledgeable about my methods?
- [ ] Did I justify my choice of methods in detail?
- [ ] Did I outline my methods in detail?
- [ ] Did I support my methods with data?
- [ ] Did I provide solutions for potential problems?
- [ ] Is my proposed model system appropriate?
- [ ] Did I address difficulties I may encounter with the proposed approaches, show I can handle them, and propose solutions and alternatives?
- [ ] Did I consider how the limitations of the approaches may affect my results and data?
- [ ] Did I address possible problems and limitations of the procedures, and propose solutions?

- ☐ Did I estimate how much I expect to accomplish each year of the grant and state any potential delays?
- ☐ Did I use enough detail?
- ☐ Did I include all relevant controls?
- ☐ Did I anticipate reviewers' questions about the feasibility of what I propose, e.g., how I will gain access to reagents, equipment, or study populations?

Design and Methods – Results

- ☐ Did I show I am aware of the limits to and value of the kinds of results I expect?
- ☐ Have I convinced reviewers I will be able to interpret my results?
- ☐ Have I enlisted help from a statistician, if needed, and discussed statistical methods to be used?
- ☐ Did I define the criteria for evaluating the success or failure of a specific test?
- ☐ Did I state the conditions under which my experimental data would support or contradict my hypothesis?
- ☐ Did I state the limits I will observe in interpreting results?

Cited Literature

- ☐ Have I listed all publications supporting my hypothesis and methods?
- ☐ Have I formatted the citations correctly, i.e., the names of all authors (not *et al.*), name of the book or journal, volume number, page numbers (not first page only), and year of publication?

Abstract

- ☐ Did I stay within the word limit?
- ☐ Did I state my hypothesis?
- ☐ Does my abstract describe my objectives and specific aims?
- ☐ Does it state the importance of the research and how it is innovative?
- ☐ Does it outline the methods I will use to accomplish my goals?
- ☐ Have I excluded all confidential or proprietary information from my abstract?
- ☐ Did I keep the language of my abstract simple and easy to understand for a broad audience?

Performance Site

- ☐ Have I listed all the sites where my work will take place?
- ☐ Does it match the information on the Resources Format Page?
- ☐ Have I included a Key Personnel header, listing all people involved and their roles? Does each have a biosketch?

Consultants

☐ Have I referred to consultants for any experience I lack?

☐ Have I tried to use consultants who are experts in their fields?

☐ Have I included in my application a letter describing the willingness of an investigator to participate as a consultant?

☐ Did I list my consultants as key personnel and provide biosketches in my application?

Biosketches

☐ Have I included biosketches in the proper order: principal investigator, then all others in alphabetical order by last name?

☐ Does each biosketch include all required details: name, title, education, and employment history?

☐ Does the employment history section contain dates, places, nature of position, professional experience, and honors in chronological order? Do these combined pieces of information adhere to any page limit?

☐ Does my employment history contain a chronological list of current, _relevant_ publications with titles and complete references (including all authors)?

☐ Are my roles in other relevant research included?

☐ Did I describe the aims of current and recent support?

☐ Have I kept in mind any page limitation for this section?

Other Support

☐ Have I shown that no other organization is supporting the research I've outlined in my research plan?

☐ Have I let the sponsor know of any other grant support I or any of my key personnel have?

☐ If applying for more than one grant, did I point out in my application and my cover letter that there's no overlap between them, and made sure the aims differ?

☐ Does my other support section have subheads -- active, pending, and overlap -- showing dates, granting organization name, funds, a one-sentence description of the project, and the percentage of my time spent on each award?

☐ Have I made sure that I'm not committing more than 100 percent effort to all my support?

Budget

☐ Is my budget realistic and appropriate for the project's aims and methods?

☐ Have I requested enough, but only enough, money to do the work?

☐ Have I made sure none of my requests appear to be extravagant or include resources already available to me?

☐ Is the PI's salary less or equal to the current government cap?

☐ Have I followed the budget instructions in the sponsor guidelines?

☐ Have I planned for the cost of the entire project, including costs not requested of the sponsor?

☐ Have I figured all of my costs into my budget?

☐ Did I specify costs for consortium arrangements through subcontracts?

☐ Have I avoided asking for expensive equipment unless I really need it to conduct this research?

Resources

☐ Does my description of resources show adequate equipment, space, and support staff to conduct the research?

Cover Letter

☐ Have I included a cover letter with my application?

☐ Does it include my application's title?

☐ Does it include a list of people who should not review my application and why?

☐ Does it state the different disciplines involved, if multidisciplinary?

☐ If applicable, does it state that the application is in response to a RFA or PA?

☐ If applicable, does it state that the application was previously submitted in response to an RFA or PA?

☐ If applicable, does it state that I've enclosed the required institutional approval documentation?

Writing Checklists:

Presentation of Information

☐ Does the application have a pleasing presentation, e.g., well-organized and sufficient white space to prevent crowding of information?

☐ Have I labeled all materials clearly so that reviewers can easily find information?

☐ Is the type clean and legible?

☐ Do I begin with basic ideas and move towards more complex ideas?

☐ Have I included bullets and lists to draw attention to key facts and create visual breaks?

☐ Have I included graphics that can help reviewers grasp information quickly and easily?

☐ Have I only included information that will photocopy well?

☐ Have I made sure that any colored or glossy materials are in the appendix?

☐ Have I put all other graphs and charts (not on glossy paper) in the research plan and *not* the appendix?

☐ Have I included the necessary number of copies of the proposal and sets of all appendix material packaged as required by the sponsor?

☐ Does a cover letter accompany my application?

☐ Have I included a table of contents?

Writing -- Mechanics

☐ Do my paragraphs contain only one major point each?

☐ Do I use short, basic sentences that average 20 words or less?

☐ Do I include transitions to show the relationship between my ideas, using words such as: furthermore, additionally, in other words, in another area, in contrast, following the same path, and moving to the next stage (but not in excess)?

☐ Do I keep related ideas and information together, e.g., put clauses and phrases as close as possible to (preferably right after) the words they modify?

☐ Do I use strong, active verbs? Do I avoid passive verbs? (i.e. "We will develop a cell line," not "A cell line will be developed.")

☐ Do I use verbs instead of abstract nouns ending in "ion" and "ment"? (i.e. say "creating the assay leads to..." rather than "the creation of the assay leads to...")

Writing – Editing and Proofreading

☐ Have I edited and proofread the application thoroughly several times after giving myself a few days away from it to gain perspective?

☐ Have I eliminated redundant words and phrases?

☐ Have I checked all my information and data for consistency?

☐ Have I reviewed my conclusions to see if my supporting facts might lead a reader to different conclusions?

☐ Did I have several colleagues critique the application on the writing and presentation?

☐ Have I gotten editorial help from a nonscientist with a strong writing background?

☐ Have I supported all facts with citations?

☐ Have I avoided using URLs for source material in my application?

☐ Have I checked my table of contents to make sure that all the items and page numbers correspond to those in the body of my application?

☐ Do I have a clear, concise, but interesting title that describes my project and will get the attention of the readers?

Revising and Resubmitting

☐ Did I read the summary statement and identify the problems?

☐ Did I address reviewers' comments point by point, identifying changes clearly?

☐ Did I summarize substantial additions, deletions, and changes in three pages?

☐ Did I clearly distinguish sections that are the same in the previous application and those that are different, showing precisely where I added new information with a method that will show up on a photocopy (not changing the color of the text)?

☐ If I disagreed with the reviewers, did I explain why and provide additional information?

☐ Did I follow the sponsor's instructions?

☐ Did I keep the title the same as it was the first time I submitted my application?

☐ If applicable, did I include an introduction to the research plan as part of the application?

☐ Does the introduction respond to the reviewers' comments by describing how I have substantially changed the application and addressed the criticisms outlined in the summary statement?

☐ Does it include any new findings I have had since I sent in the initial application?

Common Research Problems

Below we list the most common reasons cited by reviewers of research proposals for an application's failure to gain an award. Review this list and make sure none of these items apply to your idea.

- Problem not important enough.
- Study not likely to produce useful information.
- Studies based on a shaky hypothesis or data.
- Alternative hypotheses not considered.
- Methods unsuited to the objective.
- Problem more complex than investigator appears to realize.
- Not significant to health-related research.
- Too little detail in the research plan to convince reviewers the investigator knows what he or she is doing, i.e., no recognition of potential problems and pitfalls.
- Issue is scientifically premature.
- Over-ambitious research plan with an unrealistically large amount of work.
- Direction or sense of priority not clearly defined, i.e., experiments do not follow from one another and lack a clear starting or finishing point.
- Lack of focus in hypotheses, aims, and or research plan.
- Lack of original or new ideas.
- Investigator too inexperienced with the proposed techniques.
- Proposed project a fishing expedition lacking solid scientific basis, i.e., no basic scientific question being addressed.
- Proposal driven by technology, i.e., a method in search of a problem.
- Rationale for experiments not provided, i.e., why they are important or how they are relevant to the hypothesis.
- Experiments too dependent on success of an initial proposed experiment. Lack of alternative methods in case the primary approach does not work out.
- Proposed model system not appropriate to address the proposed questions.
- Relevant controls not included.
- Proposal lacking enough preliminary data or preliminary data do not support project's feasibility.
- Insufficient consideration of statistical needs.
- Not clear which data were obtained by the investigator and which reported by others.
- Avoid the main traps applicants fall into. Reviewers are knowledgeable, experienced scientists, but they can't know everything.

Common Reviewer Problems

Problem: They may not get the significance of your proposed research.
Solution: Write a compelling argument.

Problem: They may not be familiar with all your methods.
Solution: Write to the non-expert in the field.

Problem: They may not be familiar with your facilities.
Solution: Show them you can do the job.

Problem: They may get worn out by having to read 10 to 15 applications in detail.
Solution: Make sure your application is clear and concise, neat, well organized, and visually appealing.