

By the time most faculty start their first academic job, they will have written several technical papers. It is less likely that they will have written a grant. Because a grant is very different from a paper, the rules for writing a good paper do not necessarily map to writing a good grant. Here I enumerate some important features of a good grant.

1. **Organization.** Reviewers do not typically read a proposal from beginning to end. It is far more likely that they will read the summary and then skip through various sections. Therefore, it is critical to have a well organized proposal that allows reviewers to find the relevant information. Your summary should have an itemized list of proposed work with sections that correspond to each entry. Each section should have a short opening paragraph that gives an overview of that section's proposed work. Each section should end with an itemized list of specific goals to be achieved by the proposed work. At any given point in the proposal, do not assume that the reviewer has read the proposal in its entirety up to that point. As such, each section should be as self contained as possible, while still being well integrated with the entire proposal.
2. **Less is More.** Reviewers typically have many proposals to review at any given time. A dense proposal therefore is less likely to be carefully read as compared to a thoughtful, but manageable proposal. In particular, use a large enough font and large enough margins for easy reading, and be generous with the use of figures. While you must give a full description of your proposed work, remember that a grant is not a paper, and some highly technical or lengthy descriptions can be removed and incorporated more efficiently with a few references.
3. **The 1/3 Rule.** Most funding agencies are fairly conservative and are averse to funding highly speculative research. At the same time, review panels are critical of proposals that are seen as being too incremental. A good compromise is to configure your proposal into three parts: (1) the first 1/3 of your proposed work builds on earlier work -- this will be somewhat incremental, but describes work that has a high probability of success; (2) the second 1/3 of your proposed work has some preliminary results, but much work remains to be done; and (3) the last 1/3 of your proposed work is far reaching and somewhat speculative -- this part shows that you are thinking about big and far-reaching ideas. These three parts strike a balance between a safe and incremental, and risky and far-reaching proposal.
4. **Write your own review.** A grant reviewer will have to write a fairly detailed review of your proposal and in some cases, describe your proposal to the review panel. It is in your interest to make this process as easy as possible for the reviewer. At the end of each proposed work section (and in the final summary), you should have an itemized list that concisely describes what you propose to do, and why it is important. A reviewer should be able to use this easy to find and compact description for their review.
5. **Summary.** The opening one- to two-page proposal summary is perhaps the most critical part of your grant (in some cases, this is all that will be read by some reviewers). This summary should clearly describe: (1) the problem you propose to work on; (2) the importance of the problem; (3) the impact of solving the problem; and (4) a clear overview of the specific proposed technical approach.
6. **Review panels.** If at all possible, you should sit on a review panel so as to understand the review process and dynamics. This experience will help you to understand the features of good and bad proposals. Keep in mind, however, that every review panel is slightly different, so it is important not to configure your proposal too narrowly based on just one experience.

7. **Proofread.** Typical funding rates at the major U.S. agencies are less than 10%. This means that review panels are looking for reasons not to fund proposals. Sloppiness in your proposal reflects badly on you and your work. It suggests that you did not take the grant writing seriously, so a reviewer is less likely to give your proposal favorable consideration. Carefully (very carefully) proofread your proposal, and make sure that it conforms to the submission guidelines.

8. **Time.** The likelihood of your grant being funded is proportional to how much time you spend on it. Do not start working on a grant a few weeks before the deadline -- your chance of getting it funded is very slim. In my experience, you need at least two months to write a good grant. To begin, spend a week writing the overall outline and the one- to two-page summary. Put your outline/summary aside for a week and return to it with fresh eyes. Get feedback from a colleague at this early stage so that there are no serious structural problems with your proposal. Start writing the main body of the proposal, working steady each day, but also taking breaks. Try to finish a first draft in two weeks. Put your proposal aside again for a few days. Spend the next week polishing the draft. You now have 2-3 weeks to put the final touches and get feedback from colleagues. Note also that your proposal will have to be routed through your University, so make sure to leave time for this process.