

## General Tips for Preparing Your R

- When reviewing a grant reviewers ask themselves three important questions. Your proposal needs to clearly address these.
  - 1) Should this research be done?
  - 2) Can the question be answered using the research strategies proposed?
  - 3) Does the investigative team have the experience and expertise to carry out the proposed study?
- Don't assume the reviewer will have any subject matter expertise.
- Drive home the big picture. Your assigned reviewers may read your application piecemeal, so in every section, remind them of your goals and research questions.
- Include graphics and timetables. Many reviewers pay more attention to the charts, timetables, and graphics than to the written narrative.
- (C) For most R01s pilot data is optional but can typically be key to success. Don't be afraid to put the time and effort into a pilot as it almost always pays off. Not only you will demonstrate feasibility or initial efficacy of your idea, but you gain important insights that will only strengthen your grant.
- (B/T) Preliminary data is not required for R01s from new investigators, but feasibility needs to be addressed. Established investigators should provide enough preliminary data to support the hypotheses and establish feasibility for successful completion of the proposed project.
- If you get a not discussed score, do not give up, especially if your significance received moderate to high scores. Many grants go from not discussed to a fundable score in one resubmission.

## Characteristics that Impress Reviewers

1. Significance
  - a. The significance is the most important part of the grant. Make sure your significance clearly conveys that the research should be done, that it will have a major public health impact and/or move the field forward, and that it has not previously been done. If reviewers do not believe the research is important it won't matter that your approach is feasible or that your innovation is high.
  - b. Provide details about previous studies, including sample size, and outcomes.
  - c. Do not gloss over related work by others, address competing approaches head-on and explain why yours is different or better.
  - d. Provide a summary statement at the end of to summarize the problem, remind reviewers of what you will do in your proposal, and address why and how your proposal will overcome the gaps in the literature. Many reviewers may pull from this when writing their own summary statements so make it easy on them.
2. Investigators
  - a. Clearly state with examples (publications and grant) that the team has a history of collaboration.
  - b. If you collaborate with investigators from other institutions, make clear how you will meet and how often, how data will be shared, and any IRB/IACUC issues that may arise. If you have worked with them before, state this and demonstrate how you have been successful in working with others from another site in the past.
3. Innovation
  - a. Generally, show how the work is new and unique and how it will add significantly to the field.
  - b. Highlight new techniques or models that are being proposed.
  - c. Stick to explaining how your project will refine, improve, or propose a new application of an existing concept, method or instrumentation, or clinical intervention, or how it could shift a current paradigm.
  - d. It's okay if not everything about your project is innovative highlight the things that are and state what is not.
4. Approach
  - a. Make your aims as specific as possible. Include time periods, specific outcome measures, and a sound hypothesis.
  - b. Include a well-developed graphic of working model, with a clear indication of what aspects will be tested
    - i. For Behavioral interventions, ground your intervention in a specific behavioral theory. Include in text the conceptual model, the rationale for the model, and include a figure that depicts how constructs are linked to outcomes and to each other.

- c. Note any potential problems in the research strategy while convincing the reviewers why that limitation won't impact your overall study goals or what you made the choice to include a certain outcome or intervention component.
  - d. Do not forget to mention sex as a biological variable in your analysis plan. This is required in studies involving both human subjects and animals.
  - e. Clearly justify your sample size, include power analyses.
  - f. Make sure your analysis plan addresses each of your aims. Add biostatistical support if necessary.
5. Environment
- a. Demonstrate that equipment and other physical resources required for the proposal are available to the investigators.
  - b. If using institutional cores, include letters of support from the directors outlining what services they are providing.
  - c. State how the project will benefit from unique features of the scientific environment, subject populations, or collaborative arrangements. For example, leverage the NORCs, ADCs, CTSUs, ect at your institution.

## Common ways to annoy the R proposal reviewer

- 1. Significance
  - a. (B/T) Tearing down all other animal models of your disease/disorder. Every model is useful and none are perfect, emphasize what is unique about yours and what insights can be gained, while also acknowledging limitations.
  - b. (B/T) Forcing a connection with human disease if there isn't one. Basic science grants are appropriate, but know your audience!
  - c. (C) Trashing previous interventions or studies (you never know who may be reading your review). However, it is okay to mention limitations or gaps in the literature.
  - d. Turn your grant application into a bowl of alphabet soup – avoid unnecessary abbreviations and acronyms.
- 2. Investigators
  - a. Double/triple list publications on your biosketch.
  - b. Not having an investigator with a specific enterprise clearly needed for the proposal.
- 3. Innovation
  - a. Trying to make the proposal sound more innovative than it really is. If you lack innovation just state that and justify why.
- 4. Approach
  - a. Not providing enough detail about the intervention. A reviewer should have enough details to conduct your study after reading the proposal.
  - b. Not providing specific outcomes measures or providing if they have been previously validated in your given population.
  - c. Vague analysis plans.
  - d. (B/T) Not stating anticipated results or alternative approaches for every aim.
  - e. (B/T) Proposing to look at every possible intervention in every possible model at every possible time point. Put some serious thought into experimental design, be selective and prioritize experiments.
- 5. Environment
  - a. Assuming that because you're at a top 10 NIH-funded university that you don't have to describe the research environment or list all necessary equipment.
  - b. List pages of equipment unnecessary for the proposed trial.

## Rigor and Reproducibility – Address 4 points specifically in key sections of the grant

Excerpt from: <https://grants.nih.gov/policy/reproducibility/guidance.htm>

4 AREAS OF FOCUS	WHAT DOES IT MEAN?	WHERE SHOULD IT BE INCLUDED IN THE APPLICATION?
<b>Rigor of the Prior Research</b>	<p>A careful assessment of the <b>rigor of the prior research</b> that serves as the key support for a proposed project will help applicants identify any weaknesses or gaps in the line of research.</p> <p>Describe the strengths and weaknesses in the rigor of the prior research (both published and unpublished) that serves as the key support for the proposed project.</p> <p>Describe plans to address weaknesses in the rigor of the prior research that serves as the key support for the proposed project</p> <p><i>*See related <a href="#">FAQs</a>, <a href="#">blog post</a></i></p>	<p><b>Research Strategy</b></p> <ul style="list-style-type: none"> <li>➤ Significance</li> <li>➤ Approach</li> </ul>
<b>Scientific Rigor (Design)</b>	<p><b>Scientific rigor</b> is the strict application of the scientific method to ensure robust and unbiased experimental design, methodology, analysis, interpretation and reporting of results.</p> <p>Emphasize how the experimental design and methods proposed will achieve robust and unbiased results.</p> <p><i>*See related <a href="#">FAQs</a>, <a href="#">blog post</a>, <a href="#">examples from pilots</a></i></p>	<p><b>Research Strategy</b></p> <ul style="list-style-type: none"> <li>➤ Approach</li> </ul>
<b>Biological Variables</b>	<p><b>Biological variables</b>, such as sex, age, weight, and underlying health conditions, are often critical factors affecting health or disease. In particular, sex is a biological variable that is frequently ignored in animal study designs and analyses, leading to an incomplete understanding of potential sex-based differences in basic biological function, disease processes and treatment response.</p> <p>Explain how relevant biological variables, such as the ones noted above, are factored into research designs, analyses, and reporting in vertebrate animal and human studies. Strong justification from the scientific literature, preliminary data or other relevant considerations must be provided for applications proposing to study only one sex.</p> <p><i>*See related <a href="#">FAQs</a>, <a href="#">blog posts</a>, <a href="#">article</a></i></p>	<p><b>Research Strategy</b></p> <ul style="list-style-type: none"> <li>➤ Approach</li> </ul>
<b>Authentication</b>	<p><b>Key biological and/or chemical resources</b> include, but are not limited to, cell lines, specialty chemicals, antibodies and other biologics.</p> <p>Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources used in the proposed studies. These resources may or may not have been generated with NIH funds and:</p> <ul style="list-style-type: none"> <li>• may differ from laboratory to laboratory or over time;</li> <li>• may have qualities and/or qualifications that could influence the research data;</li> <li>• are integral to the proposed research.</li> </ul> <p>The authentication plan should state in one page or less how you will authenticate key resources, including the frequency, as needed for your research. Note: Do not include authentication data in your plan.</p> <p><i>*See related <a href="#">FAQs</a>, <a href="#">blog post</a>, <a href="#">examples</a></i></p>	<p><b>Other Research Plan Section</b></p> <ul style="list-style-type: none"> <li>➤ Include as an attachment</li> <li>➤ <u>Do not include</u> in the Research Strategy.</li> </ul>