

# NIH Grant Proposal Guidelines

This guide is organized according to the major sections of the National Institutes of Health Grant Application Instructions (SF424). This document is not exhaustive and should not be used as a replacement for a thorough review of federal guidelines and advice and guidance from experienced colleagues and Hamovitch Center staff. It is largely based on a summary guide for grant applications<sup>1</sup> provided by the National Institutes of Health.

## Project Summary/Abstract

The purpose of the project summary/abstract is to succinctly describe every major aspect of your proposed project. It should contain a statement of objectives and proposed methods. Consider the significance and innovation of the proposed research when preparing the project summary.

The second component of the project summary is a description of your proposal's relevance to public health. Use plain language that can be understood by a general audience, and don't include any proprietary or confidential information.

The summary must be no longer than 30 lines of text and follow the required font and margin specifications (use Arial, Helvetica, Palatino Linotype, or Georgia typeface, a black font color, and a font size of 11 or 12 points; margins must be set at 0.5 inches on all sides of the document).

The abstract should include the following components:

- brief background of the project
- specific aims, objectives, or hypotheses
- significance and relevance of the proposed research to public health
- unique features and innovation of the project
- methodology to be used
- expected results
- description of how your results will affect other research areas

Be succinct but include all necessary information. Avoid describing your past accomplishments, and avoid using the first person. A good strategy is to write your abstract last so it reflects the entire proposal.

## Research Plan

The research strategy/plan is organized into three sections: significance, innovation, and approach. The assessment of this research plan will largely determine whether or not your application is favorably recommended for funding. For an application with multiple specific aims, you may address the significance, innovation, and approach for each aim individually or address all the aims collectively.

Length requirements vary depending on the grant format (for example, R01 grants must not exceed 12 pages). Visit the NIH Grants website<sup>2</sup> for detailed information on page length restrictions for varying application types and sections.

---

<sup>1</sup><http://deainfo.nci.nih.gov/extra/extdocs/gntapp.pdf>

<sup>2</sup>[http://grants.nih.gov/grants/forms\\_page\\_limits.htm](http://grants.nih.gov/grants/forms_page_limits.htm)

The research strategy should answer the following questions:

- What do you intend to do?
- What is the significance of the research?
- How is it innovative?
- What is already known in this field?
- What will this new work add to the field of knowledge?
- What has your research team done to establish the feasibility of your proposal?
- How will the research be accomplished?

Use a numbering system to label sections and subsections, and make sure all sections are consistent and easy to find. Have one person revise and edit the final draft to ensure consistency in numbering and headings. Indicate your knowledge of recent literature and explain how the proposed research will advance the knowledge base. Emphasize the innovative aspects of your proposal, such as a novel hypothesis, significant preliminary data, or a new experimental system or approach. Finally, establish the credibility of the principal investigator and collaborating researchers.

### **Specific Aims**

The purpose of this section is to concisely and realistically describe the goals of the proposed research and summarize expected outcomes, including the potential effect of the proposed research. Your specific aims should not exceed one page in length.

The specific aims should include the following components:

- broad, long-term goals
- specific objectives and hypotheses to be tested
- expected outcomes
- expected effect on the research field

The specific aims section should include a brief narrative describing your long-term goals or objectives and the hypothesis to be tested. Follow this narrative with a numbered list of aims. Ensure your specific objectives or hypotheses are clearly stated, testable, and adequately supported by citations and preliminary data, and explain how the results will be used to test the hypothesis. Each aim should consist of only one sentence. Use a brief paragraph under each aim if more detail is needed. In general, successful applications have between two and four specific aims. Strive for clarity and cohesiveness. This is the most important page of your entire application. It may be the only section that unassigned reviewers read to understand your proposal's approach and innovation.

### **Significance**

The significance section should outline the importance of the problem or describe the critical barriers to progress in the field that your proposal addresses. Explain how your research project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields. Describe how the concepts, methods, technologies, treatments, services, or preventative interventions in this field will be changed if the proposed aims are achieved.

This section should total between one and two pages. Its content should include the following components:

- state of existing knowledge, including literature citations and relevant data
- rationale of the proposed research
- gaps that the project is intended to fill
- expected contribution of this research to science and public health

Use this section to make a compelling case for your proposal. Explain why the topic is important and why your research team is qualified to address your specific research questions. Conduct a careful review of published data in the field, including your own, and avoid outdated research. Use citations to support specific statements and show your familiarity with relevant publications and perspectives. Note any related grants, and indicate your awareness of potential barriers. Explain how your findings will have significance beyond your specific project. Clearly state the implications for public health. Indicate how you plan to attain each objective within your stated time frame. Highlight any innovative strategies or research methods you plan to use.

### **Innovation**

Describe how your proposal challenges existing research or seeks to influence clinical practice, if applicable. Explain any new or emerging theories, approaches, methods, instruments, or interventions. Describe why they are more advantageous than existing theories, methods, or tools. This section should be no longer than one page.

The innovation section should feature the following components:

- concepts and methods that are novel to the research field
- innovations in study design and outcomes
- novel findings to be presented as preliminary data

In general, describe how your application differs from current research, provide an overview of the current literature to support your approach, and demonstrate familiarity with new methods by citing publications authored by members of your research team.

### **Approach**

In the approach section, explain how your research proposal will be carried out, including a detailed overview of the study design and methods.

This section should address the following items:

- preliminary studies, data, and relevant experience
- overview of the experimental design
- description of methods and analyses
- discussion of potential difficulties and limitations and strategies to overcome them
- expected results and alternative approaches if unexpected results are found
- projected sequence or timetable
- detailed discussion of how results will be collected, analyzed, and interpreted
- description of any new methodology and how it improves upon existing methods

In the approach section, number each subsection to correspond with the numbers of your specific aims. Avoid excessive citing of publications that describe the methods to be used, and cite your own work to

indicate that the research team is experienced with the necessary techniques. Explain why you selected one approach or method instead of others. Document proposed partnerships and agreements with letters of support.

### **Budget and Justification**

The purpose of this section is to outline and justify all expenses required to achieve project aims and objectives. Special forms are provided for the budget and justification for each funding opportunity. Read and follow the instructions carefully, and consult with Hamovitch Center staff. This section should address personnel, consultants, equipment, supplies, travel, and other expenses.

Be realistic about your costs, and don't deliberately overstate or understate your budget. Briefly describe the duties of each member of the research team listed in the budget. Identify specific individuals for each position requested; unnamed personnel are often deleted by reviewers. For nonmodular budgets, identify and justify all expenses for equipment and travel.

### **Human Subjects**

This section describes the involvement of human subjects to ensure the protection of the rights and welfare of participants in research projects. Consult the grant application instructions to determine whether your project is exempt from this requirement. If applicable, succinctly describe the involvement of human subjects in your research. You must explain how your research plan meets federal policy requirements and regulations related to human subjects protection.

### **Resources and Environment**

The purpose of this section is to describe the resources, facilities, and support available to the research team. Although there is no maximum length, be succinct and describe the following components:

- description of how resources and environment support the proposed research plan
- justification of reliance on any external resources
- description of the capability of subcontractors and partners to perform assigned tasks
- consistency between resources and budget requests

### **General Suggestions**

Observe and follow all specific application guidelines.

Review NIH sample applications.<sup>3</sup>

Use basic English and avoid jargon.

Spell out all acronyms on first reference.

Follow font and length specifications.

Only include tables and graphs that are essential to understanding your research plans.

Provide complete references for all publications and materials cited in your proposal.

Have a colleague or editorial staff member at the Hamovitch Center review your application for clarity and consistency.

Maintain consistency in terms, references, and writing style.

Proofread your proposal by reading it aloud rather than relying on spell check functions.

Work with Hamovitch Center staff to ensure your application is received by the deadline.

---

<sup>3</sup><http://www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx>

## Common Pitfalls

### Significance

- not significant, exciting, or novel
- lack of compelling rationale
- incremental and/or low-impact research

### Specific Aims

- too ambitious or overly complicated
- unfocused aims and/or unclear goals
- limited aims and uncertain implications

### Experimental Approach

- inappropriate level of experimental detail
- lack of feasibility
- lack of appropriate controls
- failure to directly test hypotheses
- no discussion of potential pitfalls
- correlative or descriptive data
- no discussion of alternative models or hypotheses
- no description of how data will be interpreted

### Research Team

- no expertise or publications related to research plan or approach
- low productivity and/or few recent papers
- no collaborators or lack of support from partners