National Science Foundation Graduate Research Fellowship Program Project Proposal Tips

You must convince the readers that your plan of research: is worthwhile.

is feasible within the grant parameters.

should be undertaken by you.

Choosing a project:

- Begin with an area with which you are familiar. You should be comfortable with the concepts and vocabulary pertinent to the field.
- Complete a literature review to get an idea of what questions are being asked in your area, and what still remains to be done.
- Imagine the “next question” to ask of the work being done in the lab you work in (or have worked in).
- Frame your interest in a hypothesis driven manner.
- Brainstorm the experiments you will complete and outline what the results would mean one way or another for your hypothesis.
- Discuss your research plan with a faculty member. Verify that your program has the resources to complete your project and that your intellectual merit and broader impact are realistic within its scope.

Drafting your proposal:

Your project proposal must demonstrate: the significance of your research.

the originality and creativity of your idea.

the soundness and rigor of your methodology.

that you are in the right institution to pursue your plan.

Proposal components:

Title: Create a clear, concise but descriptive title.

Key Words: list several descriptors that best describe or categorize your study

Introduction: State the nature and scope of the specific problem(s). Cite key findings from literature that demonstrate the scope of the problem and the gap your research fills.

Hypotheses or Research Questions: List 2-3 specific hypotheses.

Research Plan: Describe your methods, connecting specific methods with specific hypotheses. Explain your timeline, any compliance issues, how you will monitor and evaluate progress, what limitations may exist, and what your contingency plan may be. Note anticipated results and give a rationale for these expectations. If your plan is part of a larger team effort, clearly explain your specific responsibilities and the role of your work in the larger project.

Intellectual Merit & Broader Impact: Restate the significance of the problem. Describe the potential outcome of the research, and who will benefit and how. Explain how you will communicate your findings.

References: Include key citations. References do count within the two-page limit.
Questions to ask of your draft:

**Intellectual Merit:**

- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- How well qualified is the proposer (individual or team) to conduct the project?
- To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources?

**Broader Impacts:**

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
- To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the proposed activity to society?

**General:**

- Is there sufficient documentation of the background and justification for the study?
- Does the plan address a significant need or problem?
- Does the plan address NSF funding priorities?
- Are the proposed methods rigorous and appropriate for the hypothesis? Are the steps or the process clear? Are potential pitfalls addressed and a contingency plan been outlined? Is the plan doable in the time allotted?
- Are the intellectual merits and broader impact suggested realistic for this project?
- Does the project proposal address the aims of the NSF, and the GRFP specifically?

From the NSF GRFP Solicitation:

“The program goals are to select, recognize, and financially support individuals early in their careers with the demonstrated potential to be high achieving scientists and engineers, and to broaden participation in science and engineering of underrepresented groups, including women, minorities, and persons with disabilities. GRFP is a critical program in NSF’s overall strategy in developing the globally-engaged workforce necessary to ensure the Nation’s leadership in advancing science and engineering research and innovation.”

From the NSF Strategic Plan:

The NSF’s mission is “to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes.” The second part of the mission statement “underscores NSF’s contributions to addressing the nation’s most pressing challenges. NSF supports the basic research and education that enable advances in many areas including technology-based innovations that spur economic prosperity; understanding, mitigating, and adapting to climate change; developing sustainable approaches to the utilization of energy, water, and other natural resources; and transforming undergraduate education for the preparation of tomorrow’s leading scientists. NSF integrates research and education to support the development of a world-class scientific and engineering workforce as well as nurture the growth of a scientifically and technologically aware public, one that is able to engage fully in a 21st century life that increasingly relies on technology to meet challenges and grasp opportunities.”