Material taken from

National Science Foundation Graduate Research Fellowship

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THE GRADUATE COLLEGE

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Application Materials
GRFP FastLane

Personal Statement, Relevant Background, and Future Goals Statement (3 pages incl. figs)

Graduate Research Statement (2 pages incl. figs)

Three Letters of Reference

Transcripts (uploaded into FastLane)

(GRE Scores NOT ACCEPTED!)

Graduate Research Plan Statement

"Present an original research topic that you would like to pursue in graduate school. Describe the research idea, your general approach, as well as any unique resources that may be needed for accomplishing the research goal (i.e., access to national facilities or collections, collaborations, overseas work, etc.) You may choose to include important literature citations. Address the potential of the research to advance knowledge and understanding within science as well as the potential for broader impacts on society."

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1. Research Idea
2. Approach
3. Intellectual Merit
4. Broader Impacts

What is a research proposal?

An example outline for the NSF GFP

Introduction

Research Objectives

Hypotheses **(no "fishing" expeditions!**)

Preliminary Results (**IF** you have any from previous research)

Experimental Approach

Intellectual Merit

Broader Impacts

References

http://www.malloryladd.com/nsf-grfp-advice.html

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Graduate Research Plan Statement

- Introduce general theory/area of study and importance - a few references will demonstrate understanding of field

- Panelists are experts in general field; *may not* be experts in your specific research specialty - <u>avoid</u> <u>jargon</u>

- Describe your motivation to go into that area and discuss plans to prepare for that field of study - mention school(s), degree programs, potential advisor, etc.

- Spell out specific details of your research and study plan but avoid jargon, specific experimental details, etc.

- Comment on the broader impacts of your activities

- Let the reader know of your career plans, even if tentative

- Demonstrate flexibility ("plan B")

Personal Statement, Relevant Background, and Future Goals (NOT REQUIRED FOR THIS CLASS)

- Three pages—provide the narrative of your story

    - Your <u>motivation</u>, <u>preparation,</u> & <u>potential</u> to contribute to scientific research, education, and innovation

    - Examples of <u>leadership</u> skills, <u>creativity</u>, <u>perspective</u> & <u>unique characteristics </u>(avoid arrogance)

    - How the GRFP will assist you with <u>career goals </u>

- Opportunity for evaluators to see you as a person and understand what "makes you tick"

- Chance to respond to broader impact merit criterion – How will you contribute to science and society?

Relevant Background

- Emphasize experience relevant to your application but include all examples of "research", even if not in field

- List experience with hypothesis formulation and testing, experimental design, data management and analysis, interpretation of results, dissemination of findings

- Highlight what you did (independence) but discuss collaborators (teamwork) and leadership

- A global worldview is important – mention international experience, collaborators, research opportunities, etc.

- List any publications, posters, presentations, prizes, awards, grants, special recognition, etc.

Review criteria

- What is the potential for the proposed activity to
  - a) <u>advance knowledge</u> and understanding within field or across different fields (**Intellectual Merit**); and
  - b) <u>benefit society</u> or advance desired societal outcomes (**Broader Impacts**)?

- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?

- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale?

- **Does the plan incorporate a mechanism to assess success?**

- How well qualified is the individual, team, or organization to conduct the proposed activities?

- Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Intellectual Merit Criterion

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? (If appropriate, the reviewer will comment on the quality of prior work.) 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?

- Academic performance & background (grades, curricula)
- Awards/honors
- Communication skills
- Research experience
- International experience
- Independence/creativity
- Publications/presentations
- Research plan
- Choice of institution
- References

Broader Impacts Criterion

- "advance societally relevant outcomes"

- Accomplished through the research itself, activities directly related to specific research projects or that are complementary to the project.

- Full participation of women, persons with disabilities, and minorities underrepresented in STEM fields

- STEM education and educator development at any level – increased public scientific literacy & development of STEM workforce

- Partnerships between academia, industry, and others

- Improved national security

- Increased economic competitiveness of the US

- Enhanced infrastructure for research and education

Broader Impacts Criterion

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?

- Prior accomplishments
- Community outreach
- Impact on society and connectivity
- Future plans
- Leadership potential
- Individual experiences
- Integration of research and education
- Potential to communicate to diverse audiences

The life of a scientist sounds way more fun when you describe it like you're a six year old.

Letters of reference

- Three required - should know you as scientist and person

- Will compare you with NSF Graduate Research Fellows & other successful students they have known based on: potential to make unique contributions to discipline, ability to conduct original research, leadership potential, productive member of scientific community, and originality of plan of study

- Will state their role in assisting with the application

- Provide referees sufficient time; share application materials with them; ask for advice

- Track letters on FastLane - remind referees about deadline

Panelist Review of Applications

- Applications are sent to panelists in December allowing <u>several weeks for review</u>

- Applications are scored numerically for overall merit by three panelists. Applications are also ranked by each panelist using standard NSF categorical ranks (poor/fair/good/very good/excellent)

- Panelists comment on intellectual merit and broader impacts criteria highlighting strengths and areas for improvement – comments are provided to applicants

Panelist Review of Applications

- Program office normalizes the numerical scores using a z-score approach and ranks applications by an average of these scores

- Virtual panel sessions held in Jan & Feb to permit discussion and recommendations to NSF

- Applications with inconsistent scoring (Z-score) are discussed and/or re-evaluated

- Final ranking is primary determinant of award choice but NSF uses ranking and other factors to determine awardees and honorable mention

Award Announcement

Usually in late March or early April

Awardees and recipients of Honorable Mention listed on the program FastLane website

Final numbers dependent upon funding made available to the program office

Success rates across disciplines not always equal