How to win graduate fellowships

Jonathan Karr
karr@mssm.edu

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karrlab.org/resources/grad-fellowships

How to win graduate fellowships

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Fellowships benefit you!

- Prestigious
- Funding (generally 3 years: $120-350 k)
- Higher stipend
- Stipend bonus from Mount Sinai
- Frees up lab funds for research, conferences, etc.
- Fringe benefits: supercomputing time, travel support, networking events
- *Gives more freedom to select adviser*
- *Relieves teaching requirements*

Reasons not to apply

Unless you're ineligible, you should apply

What happens once I win?

- Generally you can only accept 1 fellowship
- Fellowship/Mount Sinai handles the logistics
- Submit yearly progress reports
- Acknowledge funding in publications
- May have to attend a yearly conference or internship
- List all awards on your CV, including declined

What happens if I don't win?

Funded by NIH training or research grant

Major fellowship programs

- **NSF GFRP**: 10/26
  Largest fellowship program; eligible up to grad year 2; US citizen, national or permanent resident
- **DoD NDSEG**: 12/18
  Eligible up to grad year 2; US citizen or national
- **DoE CSGF**: January
  Only supports computational science; matriculating and first year students only; US citizen or permanent resident
- **Hertz**: 10/30
  Matriculating and first year graduate students only
- **Soros**: 11/1
  Naturalized as US citizen, green card holder, citizen by birth AND parents are naturalized citizens, born outside US and adopted by US citizens, or granted deferred action under DACA
- **NIH F31**: 12/8, 4/8, 8/8 (diversity +5 days)
  Apply with adviser; eligible up to grad year 6
- **Ford Foundation**: 11/20
  Underrepresented minorities; US citizen, national, or permanent resident

Other fellowship programs

- Many focused fellowships for specific fields, demographics
- Typically support a few students and don't provide full tuition and stipend
- Explore fellowship databases at Cornell, Columbia, etc.

NSF GRFP statistics

- 16,500 applications
  - 2,050 awards (12.4%)
    - 51% female
    - 24% URM
  - 1,901 honorable mention (11.5%)
- Life sciences
  - 564 awards
  - 641 honorable mention
- Biochemistry, biophysics, and structural biology
  - 311 applicants
  - 76 awardees (24.4%)
  - 74 honorable mention (23.8%)
- My reviews
  - 30 applications
  - 2 awards
  - 3 honorable mention

	Award	HM	Other
GPA	3.1-3.98	3.6-3.92	3.0-4.0
Level	1,3	2,3	1-3

Application components

- Courses, grades
- GRE scores
- Awards
- Research experience
- Publications, presentations – a bonus, but not required
- Service and leadership
- Generally 1-3 essays
  - Previous research
  - Research interests
  - Long-term career goals
- Letters of recommendation

Logistics

Now	Create application account, download essay prompts
	Tell adviser you're applying and will want feedback
	Request (3-5) letters of recommendation
	Request transcript
	Request GRE scores
Sept	Write essays
	Assemble CV
Oct	Solicit feedback from advisers, peers
	Review essays, CV
	Track reference letter submission
Late Oct-Dec	Submit application online

Panels

- BIOCHEMISTRY, BIOPHYSICS & STRUCTURAL BIOLOGY Panel:
  - Biochemistry
  - Biophysics
  - Structural Biology
- CELL BIOLOGY Panel:
  - Cell Biology
- ECOLOGY Panel:
  - Ecology
  - Environmental Biology
- EVOLUTIONARY BIOLOGY & Systematics Panel:
  - Evolutionary Biology
  - Systematics and Biodiversity
- GENETICS, GENOMICS & PROTEOMICS Panel:
  - Bioinformatics and Computational Biology
  - Genetics
  - Genomics
  - Proteomics
- MICROBIAL BIOLOGY Panel:
  - Microbial Biology
- SYSTEMS & MOLECULAR BIOLOGY Panel:
  - Systems and Molecular Biology
- NEUROSCIENCES Panel:
  - Neurosciences
- PHYSIOLOGY, ORGANISMAL & DEVELOPMENTAL BIOLOGY Panel:
  - Developmental Biology
  - Organismal Biology
  - Physiology

How to win

- Read and follow the prompts carefully
- Remember, unlike a grant, you're not constrained to your proposal
- Tailor your application for each funder agency's focus
  - NSF: focus on hypothesis drive basic science; stay away from clinical research, clinical trials, etc.
  - NSF: highlight outreach efforts to address broader impacts criterion
  - DoE CSGF: focus on high performance computing
  - NDSEG: address military's scientific priorities; Google search "Army research priorities", "Navy research strategic plan", "Air force", ...
  - Hertz: focus on contribution to United States

NSF Personal statement

- Please outline your educational and professional development plans and career goals. How do you envision graduate school preparing you for a career that allows you to contribute to expanding scientific understanding as well as broadly benefit society?
- Describe your personal, educational and/or professional experiences that motivate your decision to pursue advanced study in science, technology, engineering or mathematics (STEM). Include specific examples of any research and/or professional activities in which you have participated. Present a concise description of the activities, highlight the results and discuss how these activities have prepared you to seek a graduate degree. Specify your role in the activity including the extent to which you worked independently and/or as part of a team. Describe the contributions of your activity to advancing knowledge in STEM fields as well as the potential for broader societal impacts (See Solicitation, Section VI, for more information about Broader Impacts).
- NSF Fellows are expected to become globally engaged knowledge experts and leaders who can contribute significantly to research, education, and innovations in science and engineering. The purpose of this essay is to demonstrate your potential to satisfy this requirement. Your ideas and examples do not have to be confined necessarily to the discipline that you have chosen to pursue.
- Reviewers will read both statements. Please address Intellectual Merit and Broader Impacts in both written statements in order to provide reviewers with the information necessary to evaluate your application with respect to both Criteria. Please refer to the Program Solicitation for further information on the NSF Merit Review Criteria and Broader Impacts activities.

NSF Research 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. The research discussed must be in a field listed in the Solicitation (Section X, Fields of Study).

NSF intellectual merit & broader impacts criteria

Intellectual merit

- The Intellectual Merit criterion encompasses the potential to advance knowledge.
- For example, panelists evaluating applications submitted to the Graduate Research Fellowship Program may consider the following with respect to the Intellectual Merit Criterion: the potential of the applicant to advance knowledge based on a holistic analysis of the complete application, including the Personal, Relevant Background, and Future Goals Statement, Graduate Research Plan Statement, strength of the academic record, description of previous research experience or publication/presentations, and references.
- The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

Broader impacts

- Panelists may consider the following with respect to the Broader Impacts Criterion: the potential of the applicant for future broader impacts as indicated by personal experiences, professional experiences, educational experiences and future plans.

Both

- What is the potential for the proposed activity to:
- Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
- Benefit society 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?

NSF statements & criteria

Research statement

- Novel research proposal

Personal statement

- Personal goals
- Career goals
- Outreach activities

Intellectual merit

- Research statement
- Courses, grades
- Research experience
- References

Broader impacts

- Educational outreach
- Mentoring
- Community service
- Volunteering
- Especially with respect to underserved communities

Statement structure

- Organize statements into sections, heading with bolded/underlined headings
  - Research: Background; Aim 1, 2, 3; Expected outcomes; Broader impacts
  - Personal: Career/scientific goals, research experience, broader impacts
- Bold/underline important statements

Common avoidable pitfalls

- Insufficient description of past, present, AND future outreach activities
  - Dedicate much of your personal statement to discussing outreach activity
  - Don't be modest. If you need to mention even small activities.
  - Propose big activities for future, including past graduate school
  - Ask referees to emphasize outreach activity (they have no word limit)
- Insufficient description of long-term research and career goals
  - Describe in more detail than "I want to be a professor"
  - Broadly, what scientific questions interest you?
  - Why do you want to be an academic?
- Insufficient emphasis on graduate school
  - Why are you attending graduate school? What skills do you hope to gain? Technical, communication, leadership, etc.
- Insufficient emphasis on leadership
  - Address this in long-term goals. Describe interest in leading field through developing new methods and educating students.
- Poorly structured proposal
  - Start with motivation and background
  - Organize into 2-3 aims, each with a plan, expected outcomes and alternatives

Acknowledging weaknesses

- No publications
  - Publications are a bonus, but not expected at this stage
  - Emphasize any poster and/or oral presentations, no matter how small
- More than 1 year graduate education due to masters degree at another institution
  - Call NSF office to discuss
- Little past outreach activity
  - Enumerate every previous activity, no matter how small
  - Emphasize activities you plan to engage in
- Poor grades
  - Provide an explanation. Highlight improvements in your grades late in college or in your major.
- Little research experience
  - Explain why you did not engage in research until late. Did you attend a small college?

Review process

1. Application reviewed by 3 academic/government scientists
   - Each reviewer reads ~30 applications. Reviewer will be broadly knowledgeable, but likely do not work in your exact field.
2. Reviewer assigns 3 scores and comments
   - Intellectual merit (1-5)
   - Broader impact (1-5)
   - Overall (1-50)
   - Reviewers provided guidance and training, but assign scores at their discretion
3. NSF normalizes scores to each reviewer
4. NSF averages z-scores across 3 reviewers
5. Reviewers discuss top applicants online, especially those at the preliminary funding cutoff and those with discrepant scores
6. Top scoring applicants are recommended to NSF for funding
7. NSF decides which applicants to fund based on scores, demographics, and field
   - Ethnicity/race
   - Geography

Sample NSF statements

The sample statements are confidential.
Please destroy them when you are finished.
Do not distribute the statements.

Resources

- NSF GRFP advice
  - http://www.pgbovine.net/fellowship-tips.htm
  - http://www.alexhunterlang.com/nsf-fellowship
  - http://www.jenniferwang.org/nsf.html
- Sample NSF GRFP essays
  - http://rachelcsmith.com/academics/nsf.htm
  - http://grads.astro.cornell.edu/sample_essays
  - http://www.graduate-mentor.com/nsf-graduate-fellowship
- Official NSF GRFP presentation
  - http://www.nsfgrfp.org/general_resources/outreach/promotional_materials

Questions

Jonathan Karr

karr@mssm.edu
karrlab.org/resources/grad-fellowships