

Proposal Submission and Review (and Resubmission) at National Science Foundation's Biological Sciences Directorate

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Biological Sciences Directorate (BIO)
Integrative Organismal Systems (IOS)
Physiological and Structural Systems (PSS)

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General Questions: Faculty P.I.s

How many of you have submitted proposals
to NSF as a principal investigator (P.I.)?

How many of you have been funded?

How many of you have been declined?

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General Questions: Administrators

How many of you work to enhance
researcher funding success?

How many of you administer grants for your
institution?

Are you uncertain about how a decline
reflects on the researcher and institution?

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Our goals today:

Declines are a normal part of the process

Insight into the process
of proposal evaluation and funding

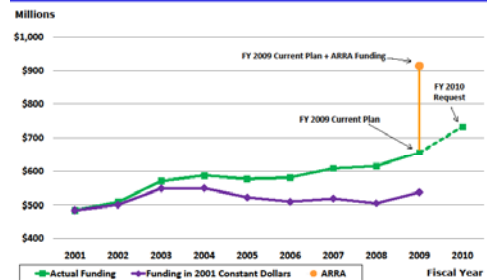
Provide some guidance on
making full use of the NSF process
maximizing your success

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How frequent are declines?

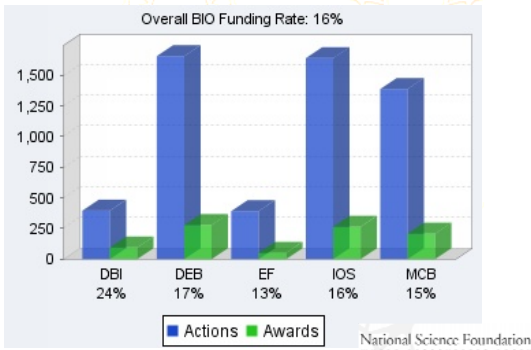
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Recent Funding History of BIO Directorate FY 2001-2009



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BIO Funding Rate FY 2008:



Who gets declined?

Misconception:
Not your science hero / role model

The average funded proposal
has been submitted over 3 times

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Why are proposals declined?

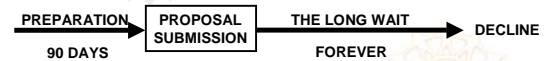
High competition for small purse
proposals must be of emergent quality

NSF funding priorities

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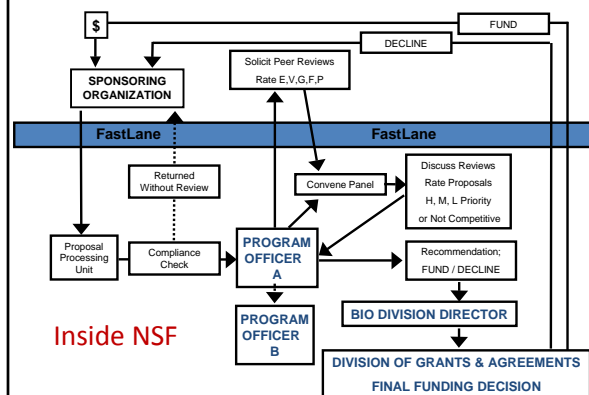
The Proposal Process

The Researcher's View



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The Proposal Process



NSF Merit Review Criteria:

Intellectual Merit.

Broader Impacts.

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NSF Merit Review Criteria:

Intellectual Merit

- How fundamental is the research question?
 - A fundamental question advances understanding of an entire discipline or unites previously disparate disciplines
- Are the specific aims, methods and analyses connected clearly to the fundamental questions?
- Is the P.I. convincing in asserting that they can be successful:
 - In completing the work
 - In disseminating the results

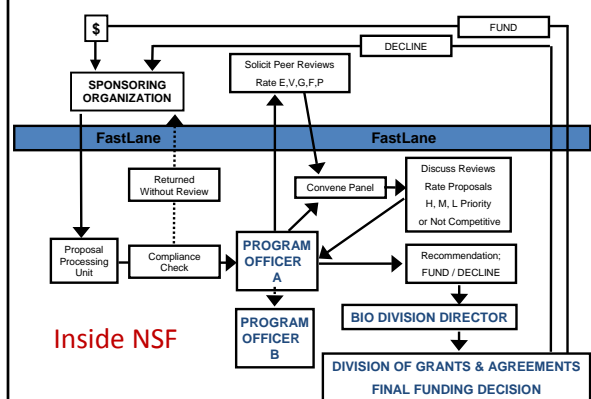
NSF Merit Review Criteria:

Broader Impacts

Is societal gain maximized?

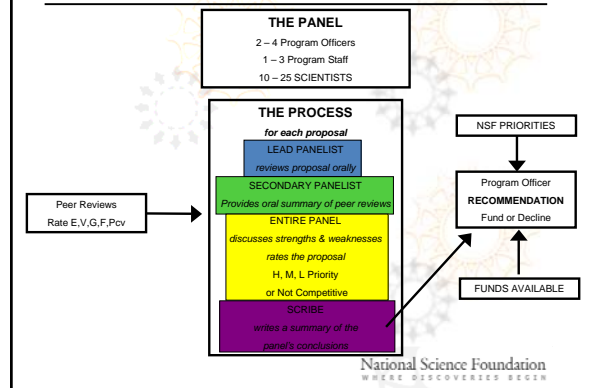
- An evolving criterion at NSF- *essential for success in funding.*
- Same three components for evaluation as intellectual merits
 - How fundamental are the societal goals?
 - How well do the broader impacts plans connect to goals?
 - How convincing are the P.I.s that they can carry out plans?

The Proposal Process



Inside NSF

The Panel Process:



Anticipate Each Step/Role In The Process:

- Make sure the proposal is compliant with the Grant Proposal Guide.
- Provide the program officer with reviewer suggestions.
- Provide the lead panelist with compelling statements to strengthen her/his ability to act as an advocate for the proposal.
- Provide the reviewers with
 - Compelling reasons to believe in the importance of the project
 - Clear goals
 - Explicit plan for reaching the goals
 - Possible outcomes and implications
 - Evidence of researcher's ability to complete the work
- Present a transparent and clearly justified budget.

What To Do With a Declined Proposal:

- Read reviews and panel summary carefully.
- Put them in a drawer and leave them alone while you cool off.
- Read the reviews and panel summary carefully
- Summarize how your proposal can be improved based on the reviews
- Contact your program officer
 - Ask questions when you can't make sense of review content
 - Discuss (briefly and succinctly) your plan for revision
 - Ask for feedback from the program officer
- Go to work on the revisions

Broader Impacts:

Any activity designed to increase participation of underrepresented groups (minorities, first-generation college students, faculty at small colleges including community colleges, etc.) in science

- Involve undergraduate students and **high school** students from underrepresented groups in research experience
- Partner with **community colleges** and build a bridge for students transferring to a four-year program
- Build **partnerships** with **minority-serving institutions** and facilitate student and faculty exchanges
- Take advantage of special programs on campus designed to broaden participation of **underrepresented groups**

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Broader Impacts:

Enhancing infrastructure for research and education

- Provide **research tools** and research **resources** for the community use
- Make unique facilities available to the scientific community
- Foster **interdisciplinary** research collaboration
- Build **partnerships with industry**
- **International** research collaboration and coordination

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Broader Impacts:

Broad dissemination to enhance scientific and technological understanding

- **Sharing** of the **results** from NSF-supported project to contribute to the advancement of the field in a timely manner and in an accessible format
- Communicating the outcomes of research to the **public**.
- **Participate in school activities** designed to increase **children's** interests in sciences

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FY 2010 BIO Priorities:

- Climate Research (\$46M)
- Innovation (+\$20M)
- Disciplinary Research: Enhancing the Core (+\$38M over FY09)
- Research Resources (+\$20M over FY09)
- National Ecological Observatory Network (+\$200K over FY09)
- Education & Learning (+\$11.5M over FY09)

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www.nsf.gov

The screenshot shows the NSF website homepage. At the top, there is a search bar and navigation links for HOME, FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT, and FastLane. Below the navigation is a banner for 'Evolution and Science 150 Years Later'. A 'Special Announcement' box is highlighted with a red circle, containing the text: 'NSF Biological Sciences Division announces...'. The box also includes a 'Get NSF Update by Email' link and a 'NSF at a Glance' link.

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Directorate for Biological Sciences

The screenshot shows the NSF Directorate for Biological Sciences (BIO) website. At the top, there is a search bar and navigation links for HOME, FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT, and FastLane. Below the navigation is a banner for 'Promoting and advancing scientific progress in biology'. A 'Special Announcement' box is highlighted with a red circle, containing the text: 'NSF Biological Sciences Division announces...'. The box also includes a 'Get NSF Update by Email' link and a 'NSF at a Glance' link.

Now on Twitter! http://twitter.com/NSF_BIO

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Funding opportunities in BIO:

"Regular" (Unsolicited) Proposals

Reviewed in core programs

Two Target Dates per year:

January 9-12 and July 9-12 (check dates)

Early-concept Grants for Exploratory Research (EAGER)

Grants for Rapid Response Research (RAPID)

Replace SGERs

Must contact Program Director prior to submission

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Funding opportunities in BIO:

Solicitations

Special programs with specific guidelines, deadlines, cycles (annual, biennial), etc.

Sample Solicitations

Research Coordination Networks in Biological Sciences (RCN)

- Encourage and foster interactions among scientists. Create new research directions or advance a field.
- Due Date: July 10, 2010 (09-554)

Plant Genome Research Project (PGRP)

Basic Research to Enable Agricultural Development (BREAD)

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Other opportunities:

Dear Colleague Letters

- Life in Transition (LiT)
- Microbial Systems in the Biosphere (MSB)
- Emerging Topics in Biogeochemical Cycles (ETBC)
- Multi-Scale Modeling (M-SM)

"Sandpits"

- Image Analysis and Acquisition
- Photosynthesis*

Wiki

- Tools Development*

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Funding to Develop Expertise and Broaden Participation:

High School Students

Research Assistantships to High School Students (RAHSS)
Supplement (06-027)

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Funding to Develop Expertise and Broaden Participation:

Undergraduates

Research at Undergraduate Institutions (RUI)

Same target date as core programs (announcement 00-144)

Research Experience for Undergraduates (REU)

Sites (Oct. 22, 2009) and
Supplements (contact PD) (09-598)

Undergraduate Research and Mentoring in the Biological Sciences (URM)

Due Dates: Preliminary Proposal: Sept. 15, 2009
Full Proposal: March 2, 2010 (06-591)

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Funding to Develop Expertise and Broaden Participation:

Graduate Students

Graduate Research Fellowships (GRFP)

(08-593). Education and Human Resources Directorate. NSF-wide program

Doctoral Dissertation Improvement Grants (DDIG)

(08-564). DEB and Behavioral Cluster in IOS

Integrative Graduate Education and Research Traineeship (IGERT)

(09-519). Education and Human Resources Directorate. NSF-wide program

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Funding to Develop Expertise and Broaden Participation:

Postdoctoral Fellows

Postdoctoral Research Fellowships in Biology (PRFB)
(09-573). Due date: Oct. 14, 2009
Division of Biological Infrastructure

- Broadening Participation of Under-represented Groups in Biology
- Biological Informatics

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Funding to Develop Expertise and Broaden Participation:

Faculty and Teachers

Faculty Early Career Development Program (CAREER)
(08-557). Deadline: July 20, 2010 -- Untenured Assistant Professors

Research Initiation Grants to Broaden Participation in
Biology (RIG BP)
(09-501) Deadline: Jan. 12, 2010 -- Beginning investigator, new faculty

Research Opportunity Awards (ROA)
(07-041) Supplement

Research Experience for Teachers (RET)
(07-039) Supplement

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Important Changes:

Postdoctoral mentoring plans
required if requesting support for
postdoctoral fellows.

BIO no longer allows proposal updates

Target dates are now DEADLINES

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NSF Review Rating Scale:

- **Excellent:** Outstanding proposal in all respects; deserves highest priority for support
- **Very Good:** High quality proposal in nearly all respects; should be supported if at all possible
- **Good:** A quality proposal, worthy of support
- **Fair:** Proposal lacking in one or more critical aspects; key issues need to be addressed
- **Poor:** Proposal has serious deficiencies

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NSF Panel Rating Scale:

- Outstanding / Fund Highest priority for support 10%
- Highly Competitive/ Fund If Possible
Fundable project but not as highly ranked 15%
- Competitive / Meritorious
- Not Competitive / Do Not Fund
Key issues need to be addressed

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Additional program considerations:

- PI Career Point (tenured/"established"/ "beginning")
- Scientific diversity in Program portfolio
- Other support for PI
- Impact on institution/state
- Special programmatic considerations (CAREER, RUI, EPSCoR)
- Diversity (including underrepresented groups)
- Educational impact
- Availability of infrastructure/community facilities

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Know your audience:

- Mail or “ad hoc” reviewers are the experts
- Panelists may also be experts, but read 10 - 20 proposals – provide a comparative, general evaluation.
- All reviewers consider both intellectual merit and broader impact.
- Panelists read ad hoc reviewer comments.
- Panelists discuss the merits openly and then assign an overall ranking.

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A Good Proposal:

A good proposal is a creative, generally important idea, well motivated in theory, clearly expressed and justified with background data, and with appropriate methods for pursuing the idea, evaluating the findings, and making them known to all.

<http://sev.itsernet.edu/~bmilne/tencommands.htm>

Bruce Milne's 10 commands to proposal writing

Appropriate for the Program
Responsive to the Program Announcement

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What makes a proposal competitive?

- *Compelling* - clearly spells out the novel and exciting elements and general scientific importance
- Well-written and organized
- Knowledge of subject area, relevant literature
- Experience in essential methodology
- Succinct, focused project plan with sufficient detail
- Logical experimental design
- Sound scientific rationale and theoretical context
- Realistic amount of work
- Critical approach (considers alternatives)
- Likelihood of high impact

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Proposal Planning Tips:

- Space Allocation – plan for a balance
 - Introduction and synopsis (within first page)
 - Background (scholarship) and conceptual framework
 - Frame question(s) clearly and broadly
 - Work plan
 - Overall approach philosophy
 - Details of methodology and feasibility
 - Integration of results and analysis to address questions
 - Broader impacts
 - Timeline for work
 - Prospectus
 - Special sections

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Valued aspects:

- Integrative:
 - Approaches (pluralistic, interdisciplinary)
 - Scales
 - Conceptual frameworks
- Risky – but feasible
- Potentially transformative to field
- Significant Broader impacts
- Quantitative
- Theoretically-driven (hypothesis-driven)

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Don't forget the little things:

- Formatting requirements & readability
 - (density of text, white space, references, figures)
- Compliance check before submitting or risk RWR
 - (FastLane won't do it for you!)
- Suggest reviewers (*but avoid conflicts of interest*)
- Include all conflicts of interest in your CV
- Respond explicitly to previous reviews
 - (Panels may be asked to comment on this)
- Avoid verbiage, sloppiness & poor scholarship
 - (numbered references can be annoying)
- Remember special need documents (e.g. ship time, animal use, permits, commitment letters, etc.)
- When in doubt on something – email or call your Program Director

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Other advice:

- Contact the program officer with specific questions (*but we can't design your project*)
- Collaboration is good, if appropriate
- Give yourself plenty of time
- Have a near final draft reviewed by two NSF funded PIs: An expert in your discipline & someone distant from your discipline (generalist).
- Discover alternative funding sources

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If declined:

- Learn to accept rejection as part of life
- Study reviews carefully – be open minded
- Compare reviews and panel summary
- Talk to your Program Officer
- Revise – resubmit *if reasonable*
- Explicitly address prior panel criticisms in a constructive way
- Persist (*but take review and program advice seriously*)

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NSF Needs You!

