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Day 3 - NSF Overview and Funding Opportunities

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National Science Foundation *Overview and Funding Opportunities*

Bill Eggleston
Program Director
Molecular and Cellular Biosciences



Presentation created by Arcady Mushegian

Outline

- Overview of NSF
- Types of funding opportunities
- Submitting proposals
- Proposal review process



NSF Overview

- Supports basic research and education via grants
- Discipline-based structure
- Cross-disciplinary programs
- Rotators and permanent staff
- Annual budget ~\$7 billion
overhead is 6%, the rest is award budget
- >55,000 proposals; ~13,000 new awards per year
supporting ~200,000 scientists, educators and students



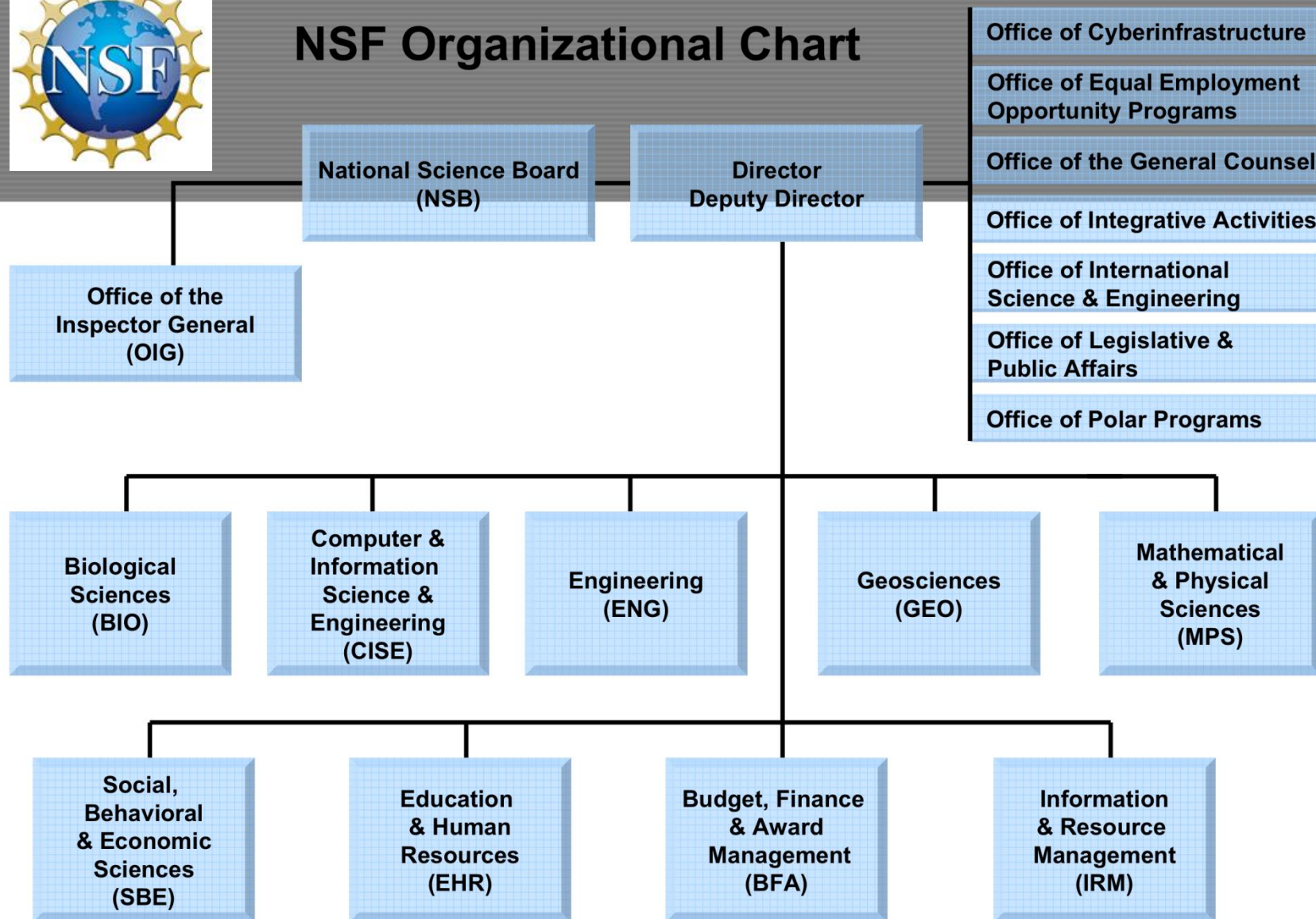
NSF Mission

- Strengthen connections between discovery and technological innovation
- Modernize U.S. research and education infrastructure
- Position U.S. to benefit from global science and engineering investments
- Broaden participation, diversity and inclusiveness





NSF Organizational Chart





**Directorate for Biological
Sciences
(BIO)**

Emerging Frontiers (EF)

**Division of
Biological
Infrastructure
(DBI)**

**Human
Resources**

**Research
Resources**

**Division of
Environmental
Biology
(DEB)**

**Population and
Community Ecology**

**Ecosystem
Science**

**Evolutionary
Processes**

**Systematic Biology &
Biodiversity Inventories**

**Division of
Integrative
Organismal Systems
(IOS)**

**Behavioral
Systems**

**Developmental
Systems**

Neural Systems

**Physiological &
Structural Systems**

**Plant Genome
Research Program**

**Division of
Molecular and
Cellular
Biosciences
(MCB)**

Molecular Biophysics

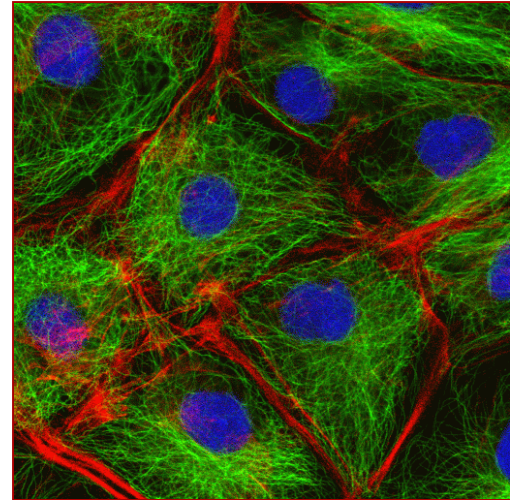
**Cellular Dynamics
And Function**

Genetic Mechanisms

**Systems and
Synthetic Biology**

Molecular and Cellular Biosciences (MCB)

- Research aimed at understanding life processes at the molecular, subcellular and cellular levels
 - Molecular Biophysics
 - Cellular Dynamics and Function
 - Genetic Mechanisms
 - Systems and Synthetic Biology



Integrative Organismal Systems (IOS)

- Research aimed at understanding the individual organism - plant, animal, microbe - as a unit of biological organization
 - Behavioral Systems
 - Developmental Systems
 - Neural Systems
 - Physiological and Structural Systems
 - Plant Genome Research Program



Environmental Biology (DEB)

- Research on populations, species, communities, and ecosystems, including evolutionary and ecological patterns and processes at all spatial and temporal scales
 - Ecosystem science
 - Evolutionary Processes
 - Population and Community Ecology
 - Systematics and Biodiversity Science



Biological Infrastructure (DBI)


- **Research Resources**
 - Biological Informatics
 - Biological Research Collections
 - Biological Field Stations and Marine Labs
 - Instrument Development
 - Living Stocks
- **Human Resources**
 - Undergraduate Mentoring
 - Research Experiences for Undergraduates
 - Postdoctoral Research Fellowships



Finding Funding Opportunities

- www.nsf.gov
- NSF Updates
- Award Search
- Division Websites

HOME FUNDING AWARDS DISCOVERIES NEWS PUBLICATIONS STATISTICS ABOUT NSF FASTLANE

 National Science Foundation
Directorate for Biological Sciences (BIO)

QUICK LINKS

SEARCH

BIO HOME BIO FUNDING BIO AWARDS BIO DISCOVERIES BIO NEWS ABOUT BIO

Promoting and advancing scientific progress in biology

BIO Organizations


- Biological Infrastructure (DBI)
- Environmental Biology (DEB)
- Emerging Frontiers (EF)
- Integrative Organismal Systems (IOS)
- Molecular and Cellular Biosciences (MCB)

NEON Update

Revisions have been made to the National Ecological Observatory Network website. See what's new [here](#).

SPECIAL ANNOUNCEMENTS

NEW Dear Colleague Letter: Special Guidelines for submitting Collaborative Proposals under the US NSF/BIO/DEB - UK NERC Lead Agency Opportunity. Click [here](#) for details regarding this funding opportunity

 **Get BIO Updates by Email**


Featured Programs

- Plant Genome Research Program
- Research Coordination Networks

Additional BIO Resources

Solicitations

[HOME](#) [FUNDING](#) [AWARDS](#) [DISCOVERIES](#) [NEWS](#) [PUBLICATIONS](#) [STATISTICS](#) [ABOUT NSF](#) [FASTLANE](#)



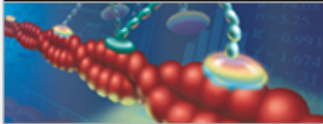
National Science Foundation

Directorate for Biological Sciences (BIO)

[QUICK LINKS](#)

[BIO HOME](#) [BIO FUNDING](#) [BIO AWARDS](#) [BIO DISCOVERIES](#) [BIO NEWS](#) [ABOUT BIO](#)

Molecular and Cellular Biosciences (MCB)



[MCB Home](#)

- [About MCB](#)
- [Funding Opportunities](#)
- [Awards](#)
- [News](#)
- [Events](#)
- [Discoveries](#)
- [Publications](#)
- [Career Opportunities](#)
- [Examples of Broader Impacts](#)
- [Supplements & Other Opportunities](#)
- [See Additional MCB Resources](#)
- [View MCB Staff](#)

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Division of Molecular and Cellular Biosciences: Investigator-initiated research projects (MCB)

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PROGRAM GUIDELINES

Solicitation [13-510](#)

Important Notice to Proposers

A revised version of the NSF Proposal & Award Policies & Procedures Guide (PAPPG), [NSF 13-1](#), was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that, depending on the specified due date, the guidelines contained in [NSF 13-1](#) may apply to proposals submitted in response to this funding opportunity.

Dear Colleague Letters



National Science Foundation
WHERE DISCOVERIES BEGIN

NSF Web Site



Home Funding Awards Discoveries News Publications Statistics About FastLane

NSF 11-057

Dear Colleague Letter for Biological and Computing Shared Principles (BCSP)

Directorate for Biological Sciences
Directorate for Computer & Information Science & Engineering
Offices of the Assistant Directors

February 24, 2011

The biological and computing research communities have a history of mutual influence; the transfer of questions, ideas, techniques, and technologies has resulted in significant advances in both fields. As these fields become more integrated, the conversations between biology and computing are becoming less about applying one discipline to another, and more about convergence of the central ideas and problems requiring the theoretical, experimental, and methodological competencies of both biology and computing¹.

The Biological Sciences (BIO) and Computer & Information Science & Engineering (CISE) Directorates invite proposals that advance research focused on principles shared between the two disciplines. Proposals that include sustained, synergistic collaborations, leading to new advances in both disciplines, will be the most competitive. Proposals should address **shared principles** that contribute to conceptual advances in both biology and computing. We recognize that new ideas are emerging rapidly at the crossroads of the biological sciences and computing, and we encourage investigators to pursue novel focus areas that identify **shared principles**. Potential topics could include, but are not limited to:

- Knowledge extraction
- Cross-scale/Multi-scale information flow, processing, and analysis
- Adaptation to unanticipated novel conditions
- Robustness and reliability
- Representations and coding
- Integrated and continual learning
- Self-repair and maintenance
- Pattern recognition and pattern generation
- Network structure, function and dynamics
- Functions of stochasticity

Funding Opportunities

- “Regular” research proposals
- Supplements to active NSF awards



"Regular" Proposals

- Address questions relevant to any research area in division
- Require substantial preliminary data
- Typical project duration: 3-5 years



Research in Undergraduate Institutions (RUI)

- For predominantly undergraduate institutions
- Research scope and expected progress smaller than regular research grants
- Significant preliminary data expected
- Typical duration: 3 years



Research Opportunity Awards (ROA)

- Support faculty from predominantly undergraduates institutions to participate in ongoing, NSF-funded research projects
- Goals are to enhance research at both participating institutions and to improve research and teaching at the undergraduate institution
- Duration: summer or semester



Faculty Early Career Development (CAREER) Awards

- For non-tenured faculty members who will become the next generation of academic leaders
- Support projects that effectively integrate research and education
- Require substantive preliminary data
- 5-year awards with minimum funding of \$100,000 / year



Research Coordination Networks (RCN)

- To advance a field or create new directions in research or education
- Two tracks
 - Research focused on broad research question, specific group or organisms, or technical advances
 - Undergraduate biology education focused on improving undergraduate biology curricula



RAPID and EAGER

- **RAPIDs**
 - Grants for Rapid Response Research
 - Maximum \$200,000, 1 year
- **EAGERS**
 - EARly-concept Grants for Exploratory Research
 - High-risk, potentially transformative research
 - Maximum \$300,000, 2 years
- **Contact your program director to discuss !!**



BIO Supplementary Funding

- For researchers with active NSF awards
 - Research Opportunity Awards
 - Research Experiences for Teachers
 - Research Experiences for Undergraduates
 - Research Assistantships for High School Students



International Collaborations

- Offer opportunities for collaborations of PI or students with international labs
- Coordinated by your program director and a program director in the Office of International Science and Engineering Program



Questions?

Questions?

Questions?





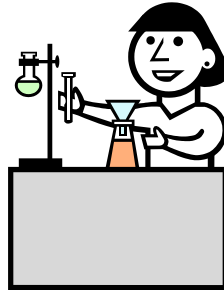
The Proposal Cycle



The IDEA



A Decline



Preliminary Results



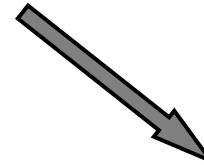
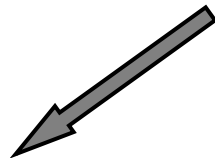
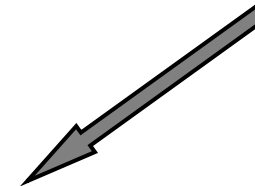
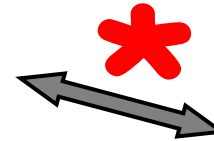
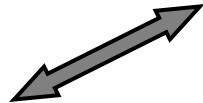
Proposal
Preparation



Merit Review



An AWARD!



How to submit a proposal

- Discuss your idea with your program director
- Review submission guidelines (Grant Proposal Guide)
- Cover all the bases
 - Intellectual Merit and Broader Impacts
 - Postdoctoral Mentoring Plan
 - Data Management Plan



Steps in Review Process

- Receipt
- Assignment to a program (or cluster)
- Administrative Review
 - Checked for compliance
 - Both review criteria addressed
 - Formatting
 - Appropriateness (Disease-related?)



Steps in Review Process

- **Scientific Review**
 - *ad hoc* reviews
 - Panel review
- **Decisions**
 - Award or decline recommendation by Program Director
 - Concurrence by Division Director
 - Award notifications by Division of Grants and Agreements



NSF Merit Review Criteria

- What is the intellectual merit and quality of the proposed activity?
 - Creativity, originality, potentially transformative concepts
 - Potential to advance knowledge and understanding within and across fields
 - Conceptualization and organization
 - Qualifications of investigators
 - Access to resources



NSF Merit Review Criteria

- What are the broader impacts of the proposed activity?
 - Discovery while promoting teaching, training and learning
 - Participation of underrepresented groups
 - Enhancement of infrastructure for research and education
- Needs to be addressed in both project summary and project description



NSF Needs You!



Questions?

wbeggles@nsf.gov

www.nsf.gov



Research Experiences for Teachers (RET)

- For K-12 or community college teachers
- Provide opportunities for teachers to engage in research, with eventual aim of transferring new knowledge to the classroom
- Typical duration: summer or semester



Research Experiences for Undergraduates (REU)

- Provide undergraduates with research training through hands-on participation in research, leading to presentations and publications
- Typical duration: 8-10 weeks in summer



Research Assistantships for High School Students (RAHHS)

- To foster interest in pursuit of studies in biological sciences
- Targeted at high school students from underrepresented groups
- Typical duration: summer, semester, or academic year

