Funding Opportunities at NSF

*Biological Sciences*

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Presentation adapted from
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*Division of Biological Infrastructure*

**OUTLINE**

- Overview of the NSF and the BIO Directorate
- Programs across the BIO directorate and NSF
- Types of Awards
- Navigating the NSF site- finding funding opportunities, using award databases, contacting your program officer
- NSF merit review criteria and the proposal review process
- More information, and keeping up to date
NSF vs NIH

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This slide updated 3/5/12
Types of NSF Awards

- **(Individual) Research Awards**
  - Faculty: Regular awards, CAREER
  - Post-docs: Emphasis areas
  - Graduate Students: Graduate Research Fellowships

- **(Institutional) Awards**
  - Research Instrumentation
  - Research Experiences for Undergraduates

- **Supplemental Awards**
  - Research Experiences for Teachers
  - Research experiences for High School Students
  - Research Opportunity Awards

Types of awards in BIO

- Graduate Research Fellowships
- Post-doctoral Research Fellowships
- Investigator-initiated research awards
  - Regular research grants, RUI, REU
  - CAREER Faculty Early Career Development Program
  - Research at Undergraduate Institutions
- Supplements to research awards
  - RAHSS: Research Assistantships for high school students (broadening participation)
  - Research Experiences for Teachers; Research Experience for Undergraduates
Graduate Research Fellowships

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5444

- Stipend (~32K/yr) + tuition
- Across all fields supported by NSF; specific areas emphasized, e.g., informatics recently added
- Only US citizens or permanent residents
- New announcement coming out soon—will not be very different

Post-doctoral Research Fellowships

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503622

- Small program (60-80 awards per year)
- Salary plus research allowance
- Applications must fit an area of emphasis: always broadening participation, plant genome, international experience; new 4th area to be announced for 2014 fall deadline
Latest publication from MCB for investigator-initiated proposals

nsf13-510

Faculty Early Career Development Program (CAREER)

- supports teacher-scholars who will become the academic leaders of the 21st century
- supports plans that effectively integrate research and education
- BIO minimum of $100,000 / year for 5 years
- No Pre-proposal; due on July’s CAREER deadline
Identifying Relevant NSF Programs: 
*Web Search, Contact a Program Director*

🔍 What is the “intellectual center of gravity” in my project?

- Population, Community, Ecosystem Structure, Dynamics?
- Structure and Function of Organisms?
- Molecular and Cellular Structures and Processes
- Research Infrastructure, Human Resources

🔍 Examine the websites of the relevant division(s)

- Try to identify more than one relevant programmatic Cluster
- Contact one of the listed Program Directors to ask about the relevance of your project to their program focus

🔍 Get feedback from your colleagues on your ideas and text!!!!!

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**MCB funds yeast research**

🔍 Cellular Dynamics and Function

🔍 Genetic Mechanisms

🔍 Molecular Biophysics

🔍 Systems and Synthetic Biology
The Division of Molecular and Cellular Biosciences (MCB) supports quantitative, predictive, and theory-driven fundamental research and related activities designed to promote understanding of complex living systems at the molecular, subcellular, and cellular levels. MCB is soliciting proposals for hypothesis-driven and discovery research and related activities in four core clusters:

- Molecular Biophysics
- Cellular Dynamics and Function
- Genetic Mechanisms
- Systems and Synthetic Biology

MCB gives high priority to research projects that use theory, methods, and technologies from physical sciences, mathematics, computational sciences, and engineering to address major biological questions. Research supported by MCB uses a range of experimental approaches—including in vivo, in vitro and in silico strategies—and a broad spectrum of model and non-model organisms, especially microbes and plants. Typical research supported by MCB integrates theory and experimentation. Projects that address the emerging areas of multi-scale integration, molecular and cellular evolution, quantitative prediction of phenome from genomic information, and development of methods and resources are particularly welcome.

Recent award titles can be helpful

Important notes about proposal preparation-
format differs from NIH applications

SUMMARY
Overview, Intellectual merit, Broader Impacts

PROJECT DESCRIPTION
Align with program solicitation guidelines

DATA MANAGEMENT PLAN
Storage, Access, Sharing

POST-DOC MENTORING PLAN
Tailor to the individual

Grant Proposal Guide

NSF Review Process

1. Opportunity Announced
2. Proposal Submitted
3. Proposal Received
4. Reviewers Selected
5. Peer Review
6. Program Officer Recommendation
7. Division Director Review
8. Business Review
9. Award Finalized
NSF Review process

- Review Panels composed of scientists with broad range of expertise (~15-20/panel)
- Non-standing panel
- Ad hoc reviews requested from outside the panel; written reviews only
- Panel considers panelist reviews (2-3) plus ad hoc reviews (2-5)
- Each submission is considered new - no official resubmission

NSF Merit Review Criteria

Established by the National Science Board

*Intellectual Merit*: The Intellectual Merit criterion encompasses the potential to advance knowledge; and

*Broader Impacts*: The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.
Evaluation of Merit

1. What is the potential to advance knowledge and understanding? Benefit society or advance desired societal outcomes?

2. Does the project explore creative, original, or potentially transformative concepts?

3. Plan: well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success? For post-doctoral proposals, training potential?

4. Qualifications of the individual, team, or organization? For graduate and post-doctoral proposals, mentoring component here (required section for mentor in post-doctoral proposals)

5. Are resources adequate?
Dear Colleague Letters

Dear Colleague Letter: BRAIN EAGERS to Enable Innovative Neurotechnologies to Reveal the Functional and Emergent Properties of Neural Circuits Underlying Behavior and Cognition

Date: March 7, 2014

The National Science Foundation (NSF) is a partner in President Obama’s “Brain Research Accelerated by Innovative Neurotechnologies” (BRAIN) Initiative. As part of a broader range of activities related to the BRAIN Initiative, the Division of Integrative Organismal Systems (IOS) and Biological Infrastructure (DBI) in the Biological Sciences Directorate (BSS) seek Early Concept Grants for Exploratory Research (EAGERS) proposals with the potential to transform our ability to analyze brain function underlying behavioral and cognitive processes.

NSF’s interests lie in highly innovative projects in their early stages that utilize new and untested but potentially ground-breaking approaches and neurotechnologies that bridge multiple spatial, temporal, and organizational scales to provide fundamental insights into the emergent properties of neural circuitry that ultimately lead to behavior and cognition.

Behavior derives from the emergent properties of a large collection of overlapping neural circuits. A primary challenge in neuroscience is that these circuits incorporate neuronal activity at a variety of spatial and temporal scales. Additionally, circuit plasticity and temporal dynamics occur over time-scales significantly longer than the proximate behavior. Identification of relevant neural ensembles underlying cognitive behaviors that requires new neurotechnologies, including new reagents, instrumentation, analytic tools, modeling techniques and theoretical frameworks.

This Dear Colleague Letter is aimed at identifying opportunities to leverage and synthesize technological and conceptual innovation across disciplines and scales to accelerate progress toward an integrated understanding of neural circuits in relation to behavior. It is intended to be broadly inclusive, encouraging applications of the most creative ideas and solutions in other areas including, but not limited to genetics, physiology, synthetic biology, engineering, physics, mathematics, statistics, behavior and cognition are encouraged to work across disciplines to develop new approaches and neurotechnology focused on understanding the properties of circuits that underlie behavior and/or cognition in any organism. Projects that take advantage of existing DBI investments in informatics, computing and other infrastructure, such as the Neuroscience Gateway, in novel ways are also eligible.

Sign up to get emails!
Navigating NIH funding

Sue Biggins
sbiggins@fhcrc.org
Full Member, Division of Basic Sciences
Fred Hutchinson Cancer Research Center
Member, NIH NCSD study section

Yeast Genetics Meeting 2014 Bootcamp

Lorette Javois, Ph.D.
National Institutes of Health
Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)
JavoisL@mail.nih.gov
301-792-7664 (mobile)

The National Institutes of Health

NIH’s mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce the burdens of illness and disability.

*Seek other funding sources if you cannot make your work broadly relevant to health
NIH Grant Mechanisms (aka Activity Codes)

- R21: Exploratory/Developmental Research Grants
- R03: Small Grants
- R15: Academic Research Enhancement Awards [AREA awards]
- R01: Traditional Research Project Grants
- P01: Program Project Grants
- Supplement Programs (Diversity, Administrative, and Competitive Revisions)
- And others…F’s (fellowships), K’s (mentored career development)

NIH grants for pre and post-docs

Pre-doctoral:
F31
The purpose of the Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31) is to enable promising predoctoral students to obtain individualized, mentored research training from outstanding faculty sponsors while conducting dissertation research.

Post-doctoral:
F32
The purpose of the Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32) is to support promising applicants during their mentored postdoctoral training under the guidance of outstanding faculty sponsors. The integrated program of research and training should enhance the individual’s potential to develop into a productive, independent researcher.
K99/R00 pathway to independence Award

**Purpose of the Award**

Increases and maintains a strong cohort of new and talented NIH-supported independent investigators

Facilitates a timely transition from a mentored intramural or extramural postdoctoral research position to a stable independent extramural research position with independent NIH or other independent research support at an early stage

Provides opportunity for promising postdoctoral scientists to receive both mentored and independent research support from the same award

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**Other funding sources for pre- and post-docs**

**Pre-doctoral:**
- NSF
- American Heart Association
- Department of Defense
- HHMI

**Post-doctoral:**
- American Heart Association
- Jane Coffin Childs
- Damon Runyon
- Helen Hay Whitney
- Leukemia and Lymphoma
- ACS
- Life Sciences
- Susan Komen

*Many require US residency or citizenship*
Websites list funding opportunities

http://sciencecareers.sciencemag.org/tools_tips/how_to_series/how_to_get_funding

The National Institutes of Health

27 different Institutes and Offices

- Illness-specific: cancer, allergy
- Organ-specific: heart/lung, CF
- Other: aging, genome, nursing, minority health, child health, environmental health sciences

*Most yeast work will be funded by GM (general medicine)*
What You Need to Know

Policies and operating structures vary across the different Institutes

- Become familiar with the NIH website
- Talk with a Program Officer
  - advice on best Institute for your science
  - assistance in navigating the NIH
  - suggestions for appropriate funding mechanisms

How Does the Process Work?

Institution → Center for Scientific Review

Study Section

Institute

Advisory Council

Institute Director
What is a Program Officer?
- a scientist and an administrator who works for an NIH IC
- manages grants, contracts, cooperative agreements
- identifies needs in scientific areas of special interest and works to fulfill needs
- monitors research progress
- *advocates for the best science*

What is a Scientific Review Officer?
- a scientist and an administrator who works for CSR or an IC
- manages the review of grants, contracts, cooperative agreements
- Appoints members to initial review groups/study sections/special emphasis panels
- Prepares summary statements

What is a study section?
*group of experts in an area (about 20 people)*
*3 members are assigned to review an application*
*members usually rank-order their grants*
*critiques and preliminary scores submitted before meeting*
*members meet to discuss and prioritize grants (usually top 50% are discussed)*
*final scores and critiques decided at the meeting*
What are the criteria assessed?

*fellowship applicant
*sponsors, consultants, collaborators
*research training plan
*vertebrate animals
*biohazards

What are the scores?

1-3, high impact
3-6, medium impact
6-9, low impact
What are the keys to getting good scores?

*research plan must be solid - the science should be done

*Training plan is key - you must have a good one
  - be detailed and specific (list courses, etc)
  - state you are taking ethics training, not just that it is available

*For K99 grants, needs to convince them that you need additional training - it is not a reward for doing well
  - learn a new technique or switch organisms, etc.

Additional Tips

* apply earlier than later
  - typical post-doc fellowships are 3 years, so they will reduce the # of years if you get award later

* Many private post-doctoral fellowships require that you apply in first year

* Don’t forget that your application needs to be submitted by OSR (office of sponsored research)
Post-Review Strategies

- **Contact your PO**
  - POs do not see the written reviews until they are released to you
  - POs often hear the discussion, but aren't necessarily willing to talk until the summary statement is released

- **PO input on resubmission**
  - Was there anything brought up or emphasized in discussion that is not apparent in the written reviews?
  - Resubmission timing and responding to reviews
    - Is more preliminary data needed?
    - Which concerns should be addressed by changes and which by further explication?
    - Many POs are willing to read your Introduction (response to reviews) and new specific aims page

Funding Recommendation Process

- **Scores/percentiles are important, but not the only thing**
  - NIH program staff examine applications, overall impact scores, percentile rankings (if applicable) and summary statements - consider these against the IC's needs
  - Program relevance, portfolio balance, New PI status, and many other factors involved

- **Funding recommendations are made by POs, Branches and Divisions, and finally by the IC Director**
  - The Advisory Board/Council also considers the IC's goals and needs and advises the IC director
  - Council does not make funding plans, although at some IC's they review them in detail
How to Find Programs/Program Officers

Through the Institute/Center websites:
“About Us” “Organization”
“Extramural Research Programs”
“Offices, Divisions, Branches”

NIH RePORTer
Abstract and Aims
Funding Institute/Center
Program Officer contact information

How Else to Find a Program Officer

• Look at list of Scientific/Research Contact(s) on Funding Opportunity Announcements (FOAs)

• NIH POs from different ICs work together on many Trans-NIH committees and initiatives

Start somewhere (contact Lorette!)
She will get you to the right person
What to ask a Program Officer

• Is your IC interested in this type of research?

• Are there any open FOAs for this topic?

• Does your IC use the mechanism I’d like to use?

• Can you help me determine the most appropriate study section?

A Word about Review Groups

• Assignment to an IC and a review group are separate processes

• Assignments are made by Division of Receipt and Referral (DRR) at the Center for Scientific Review (CSR)
  – **Cover letter:** Requests for IC (name PO) and Study Section assignment are generally honored

• Descriptions and rosters of standing study sections are on the CSR website
International Funding Sources

(i.e., for research outside the US or non-US citizens)

European Research Council (ERC)  http://erc.europa.eu/funding-schemes
ERC grants support individual, independent researchers of any nationality and age. The ERC encourages in particular proposals that cross disciplinary boundaries, pioneering ideas that address new and emerging fields and applications that introduce unconventional, innovative approaches.

EMBO Fellowships (Short-Term Fellowships fund research visits of up to three months to laboratories in Europe and elsewhere in the world; Long-term Fellowships promote international exchange and support post-doctoral research visits of up to two years to laboratories throughout Europe and the world): http://www.embo.org/funding-awards/fellowships

Human Frontier Science Program (HFSP)  http://www.hfsp.org/funding
HFSP postdoctoral fellowships encourage early career scientists to broaden their research skills by moving into new areas of study while working in a new country. The Career Development Award (CDA) funds HFSP fellows who return to their home country or move to an HFSP member country to establish their independent laboratory.

German Academic Exchange Service (DAAD)  https://www.daad.de/deutschland/en/
Several funding opportunities for foreigners wishing to do research in Germany and for Germans wishing to do research abroad.

Deutsche Forschungsgemeinschaft (DFG; German Research Foundation)  http://www.dfg.de/en/research_funding/programmes/index.jsp
Several funding programmes and prizes for researchers at varying stages.

Alexander von Humboldt Foundation (postdocs, early-career researchers, PIs; varying lengths/amounts for research or collaboration in Germany): http://www.humboldt-foundation.de/web/programmes-by-target-group.html

Boehringer-Ingelheim Fonds (PhD fellowships and travel grants for training for Europeans to work anywhere, or for non-Europeans to work in Europe) http://www.bifonds.de/fellowships-grants/our-programmes.html


Marie Curie Fellowships (PhD and postdoctoral, both European and global):
U.S. government internship and fellowship opportunities for graduate students and postdoctoral fellows (N.B. some may be only for US citizens)
https://www.science.gov/internships/graduate.html

National Science and Engineering Research Council of Canada (NSERC)
NSERC offers scholarships and fellowships for every stage of study, from undergraduate to postdoctoral.

Canadian Institutes of Health Research (CIHR) http://www.cihr-irsc.gc.ca/e/37788.html