National Science Foundation
Directorate of Biological Sciences
BIO

Peter McCartney, Program Director
Division of Biological Infrastructure
NSF Grants Conference
Arlington November 2-3, 2015
Overview

1. Directorate of Biological Sciences
   – BIO Science
   – BIO Organization
   – BIO Divisions/Programs

2. Preparing and submitting proposals
   – Proposal Preparation
   – Writing for Success

3. Questions and answers
Demystifying NSF & the BIO Directorate
Resources for Information

Sign up for BIO email alerts

Read the BIO blogs!

Follow NSF BIO tweets

Join

Pick up the phone!

The BIO Mission

Enabling discoveries to understand life
BIO Priorities

1. **Strengthening** research that addresses *Grand Challenge questions*

2. **Coalescing** NSF-wide collaborations to advance research in *Cognitive Science and Neuroscience*

3. **Stimulating** research at the interface of the biological, mathematical and physical sciences, and engineering

4. **Supporting** *cyberinfrastructure*, including the National Ecological Observatory Network (NEON).

http://www.nap.edu/catalog.php?record_id=12809

Five Grand Challenges at Disciplinary Intersections

• Synthesizing life-like systems
• Understanding the brain
• Predicting traits from DNA (and DNA from traits)
• Deciphering interactions between earth and its climate and atmosphere
• Understanding biological diversity

http://www.nap.edu/catalog.php?record_id=12809

Division of Molecular and Cellular Biosciences (MCB)

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

- Current solicitation: NSF 13-510
  - One deadline per year

Division of Integrative Organismal Systems (IOS)

• Supports research aimed at understanding the living organism -- plant, animal, microbe -- as a unit of biological organization.
  – Behavioral Systems*
  – Developmental Systems*
  – Neural Systems*
  – Physiological and Structural Systems*
  – Plant Genome Research Program*

• Solicitations:
  * IOS Pre and full proposals: NSF 13-600
  * IOS/PGRP Full proposal only: NSF 15-548
IOS: Plant Genome Research Program

- Part of the National Plant Genome Initiative (NPGI) in 1998
- Focus on plants and processes of agricultural importance
- Supports tools, resources, training and hypothesis-driven basic research on a genome-wide scale
- Rapid release and sharing of all data and tools has always been required

Division of Environmental Biology (DEB)

- Supports fundamental research on the origins, functions, relationships, interactions, and evolutionary history of populations, species, communities, and ecosystems.
  - Ecosystems Science
  - Evolutionary Processes
  - Population and Community Ecology
  - Systematics and Biodiversity Science

- Solicitation: NSF 15-500
  - Preliminary Proposals Required

Division of Biological Infrastructure (DBI)

- **Research Resources Cluster**
  - Advances in Biological Informatics
  - Collections in Support of Biological Research
  - Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories
  - Instrument Development for Biological Research
  - Major Research Instrumentation
- **Human Resources Cluster**
  - Postdoctoral Research Fellowships in Biology (PRFB)
  - Research Coordination Networks (RCN)
  - Research Experiences for Undergraduates (REU)
- **Centers**
  - Synthesis Centers
  - Science and Technology Centers
Division of Emerging Frontiers (EF)

- Multidisciplinary research and networking activities that arise from disciplinary research

- **Current Programs**
  - Advancing Digitization of Biodiversity Collections
  - Dimensions of Biodiversity
  - MacroSystems Biology
  - Ocean Acidification

- **Current Activities**
  - Advancing Theory in Biology
  - Cracking the Olfactory Code
  - Innovations in Bio Imaging and Visualization
  - Surpassing Evolution: Enhancing Photosynthetic Efficiency
Preparing and Submitting Proposals

• Know the system
• Pitch your ideas
• Take time and be on time
HOW TO WRITE A SUCCESSFUL GRANT PROPOSAL: Quotes from 5,650,000 google entries
"Grant writing is like playing the stock market; there is seldom a guarantee that your efforts will be rewarded, but the more you know about the process and the more you use this knowledge, the greater the probability for success."

“Good grant proposals begin with good research questions.”

“The goal is to build a better mousetrap.”

“By failing to prepare, you are preparing to fail.”

“A successful grant proposal is one that is well-prepared, thoughtfully planned, and concisely packaged.”

"The trick is to think like a reviewer"
"Grant writing is like playing the stock market; there is seldom a guarantee that your efforts will be rewarded, but the more you know about the process and the more you use this knowledge, the greater the probability for success."
Preparation

- Explore the different programs and clusters
- Read about the process in the current GPG 15-1
- Find the solicitation for your program
- Read about prior awards
- Read the solicitation
- Call your Program Director
- Read the solicitation
- Read the solicitation
- Read the solicitation
Proposal Deadlines/Target Dates

MCB: One full proposal deadline per year
DBI: Multiple full proposal deadline per year
Proposal Deadlines/Target Dates

IOS* and DEB: One full proposal deadline per year

*except PGRP

Write full proposal

Pre-proposal Submission
MCB: One full proposal deadline per year
Pre-proposal review panels
Full-proposal submission (plus CAREER)
Notification of Invite/DNI
Notification of award/decline
# Proposal Deadlines/Target Dates

**DBI: Multiple full proposal deadline per year**

<table>
<thead>
<tr>
<th>Month</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
</tr>
</thead>
</table>
| Write proposal
| Proposal review panels
| Notification of proposal award/decline
| CAREER proposal submission
| CAREER review panels
| Notification of CAREER award/decline
| Proposal submission |
the C8 & B Rule

- Creative
- Concise
- Compelling
- Clear
- Convincing
- Corrected
- Complete
- Compliant
- Balance

Risk

Feasibility Certain – Feasibility Uncertain

Incremental - Innovative – Compelling

Invite / Fund

Not Invite / Do Not Fund

Return
Remember NSF Merit Review Criteria

• Intellectual Merit

• Broader Impacts
NSF Merit Review Criteria

INTELLECTUAL MERIT

- Potential for advancing knowledge in/across fields
- Qualifications of investigators
- Creativity & originality
- Organization
- Access to resources
- *Transformative Research*
NSF Merit Review Criteria

BROADER IMPACT

• Promoting teaching, training and education
• Enhancement of infrastructure for research and education
• Community resources
• Participation of underrepresented groups
• Benefits to society/Outreach activities
Think Like a Reviewer

Intellectual Merit

Applicants

• Present a NEW idea
• Explain the expected results and alternative plans
• What you will do
• Demonstrate your qualifications
  – Preliminary Data
  – Publications

Reviewers

• Is it a big or little step in science?
• Will the negative results be important too?
• Can the applicants do the project?

One of TWO merit criteria
(Required but not sufficient...)

Think Like a Reviewer

Broader Impacts

**Applicants**
- Present an integrated clear plan.
- Document a history of outreach/impact.
- Show who you will impact and how.
- Describe how you will know it works.

**Reviewers**
- Is it connected to the research?
- Can it be executed?
- Are they targeting an appropriate goal/group?
- Will it have an impact and how will the PI know?

One of **TWO** merit criteria
(Required but not sufficient...)
The News

• Now you have to do what you said
  – After celebrating, reread your proposal
  – *Then get started*
  – And keep in touch with your Program!

• OR........ Remember you are not alone
  – Give yourself 24 hrs
  – *Then get started*
  – Contact your Program Director

http://pixgood.com/monopoly-pass-go.html
“Good grant proposals begin with good research questions.”
pmccartn@nsf.gov
703-292-7160