National Science Foundation
Directorate of Biological Sciences
BIO

Jennifer Weller, Program Director

BIO: Division of Biological Infrastructure

NSF Grants Conference
Portland OR Feb 29- Mar 1st 2016

Overview

- Orientation - Directorate of Biological Sciences
- BIO Science, our mission and priorities
- BIO Divisions/Clusters/Programs

- Some notes about Proposals in BIO
  - Deadlines, preproposals, etc.
  - Merit Review revisited

Demystifying NSF & the BIO Directorate

Arlington, VA (current)

Alexandria, VA (2017)

National Science Board

Director

Inspector General

Staff Offices

Biol. Sci.

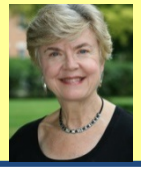
Computer Inf. S & E

Engineering Sci.

Geosciences

Math & Phys Sci.

Social, Behav. & Eco.



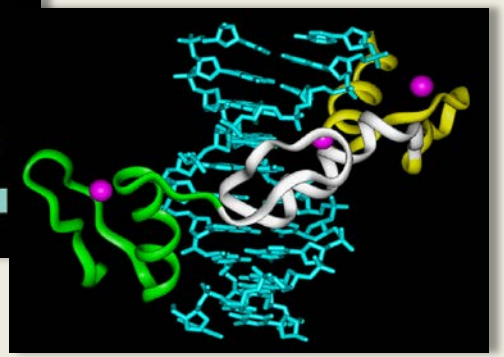
Education & HR

Budget, Finance & Award Management

Information Resource Management

The BIO Mission

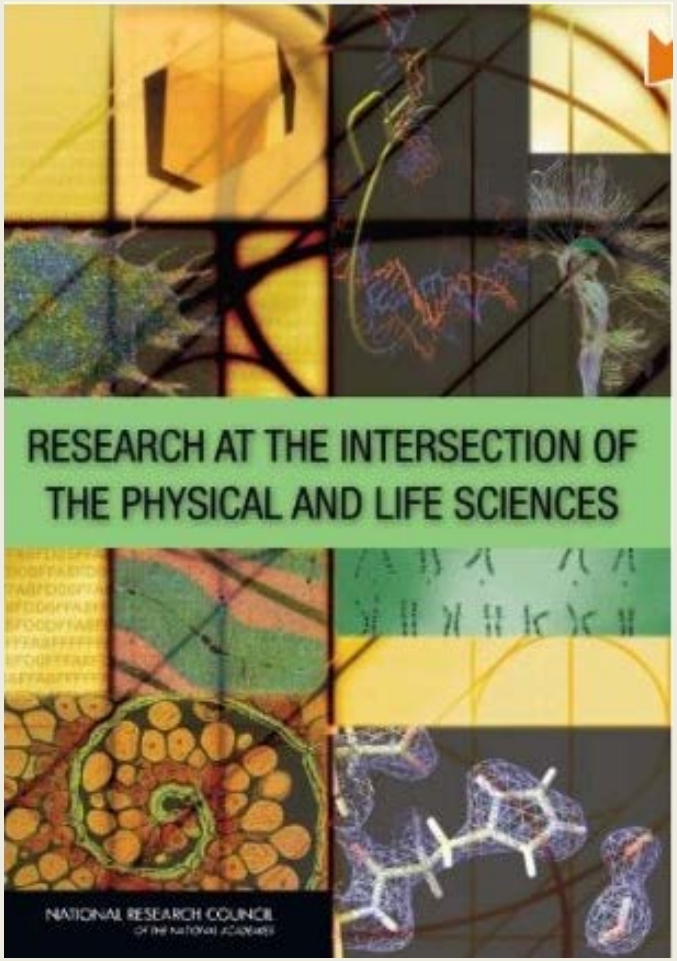
Enabling discoveries to understand life



BIO Priorities, Core +

Strengthening research that addresses *Grand Challenge questions*

1. **NSF-wide collaborations** to advance research in *Cognitive Science and Neuroscience*
2. **Stimulating** *research at the interface* of the biological, mathematical and physical, and engineering sciences
3. **Supporting** *cyberinfrastructure*, such as the National Ecological Observatory Network (NEON).

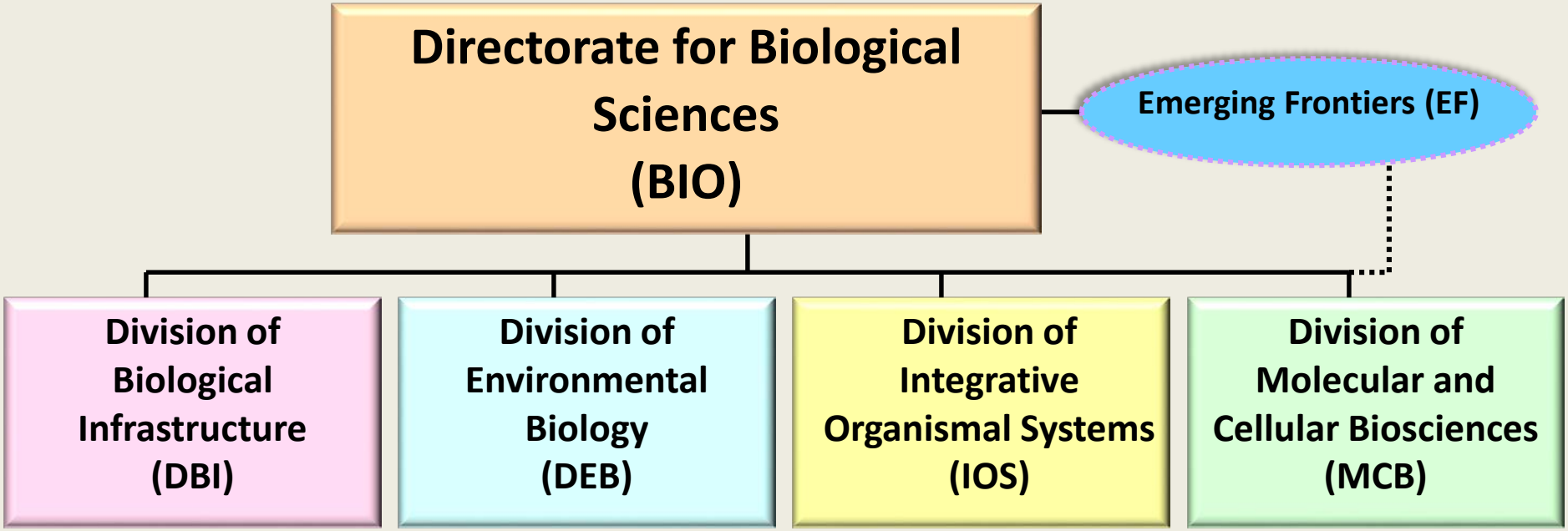


http://www.nap.edu/catalog.php?record_id=12809

Five Grand Challenges

- Systems and Synthetic Biology: Synthesizing life-like systems
- Cognitive Neuroscience: Understanding brains
- Genomes to Phenomies: Predicting traits from DNA (and DNA from traits)
- Deciphering interactions between earth and its climate and atmosphere
- Understanding biological diversity

Bio Divisions/Clusters/Programs



http://www.nsf.gov/bio/about.jsp#orgchart

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

Core Divisions of BIO

Division of Biological Infrastructure (DBI)

- Human Resources
- Research Resources

Division of Environmental Biology (DEB)

- Ecosystem Science
- Evolutionary Processes
- Population and Community Ecology
- Systematics & Biodiversity Science

Division of Integrative Organismal Systems (IOS)

- Behavioral Systems
- Developmental Systems
- Neural Systems
- Physiological & Structural Systems
- Plant Genome Research Program

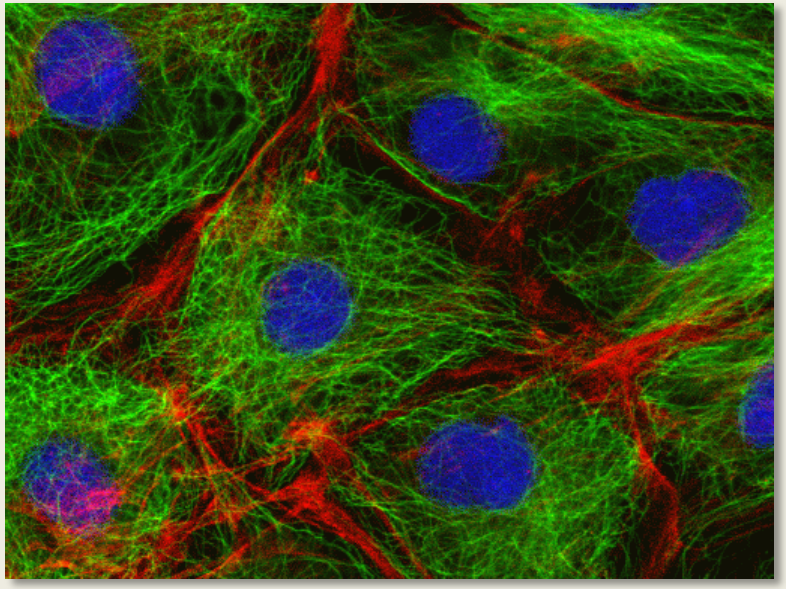
Division of Molecular and Cellular Biosciences (MCB)

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

Division of Molecular and Cellular Biosciences

- Research aims to understand life processes at the molecular, subcellular and cellular levels.
  - Cellular Dynamics and Function
  - Genetic Mechanisms
  - Molecular Biophysics
  - Systems and Synthetic Biology

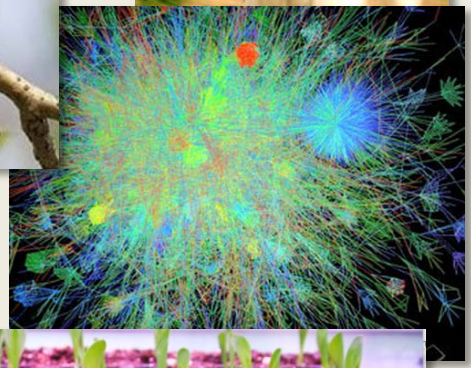
- Current solicitation: NSF 13-510
  - One deadline per year



http://www.nsf.gov/pubs/2013/nsf13510/nsf13510.htm

Division of Integrative Organismal Systems

- 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

  http://www.nsf.gov/pubs/2013/nsf13600/nsf13600.htm

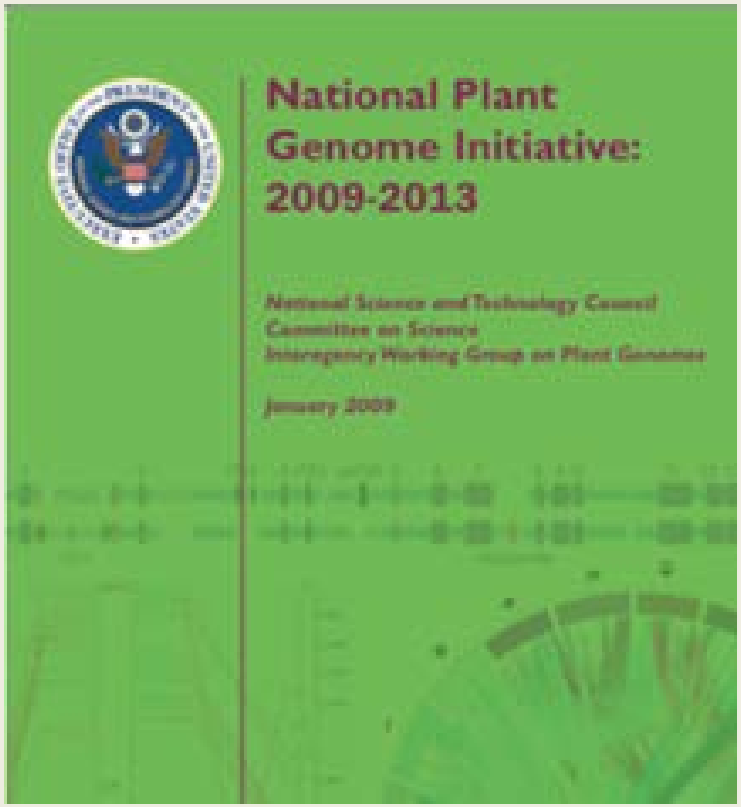
  * IOS/PGRP Full proposal only: NSF 15-548

  http://www.nsf.gov/pubs/2015/nsf15548/nsf15548.htm

IOS: Plant Genome Research Program

The National Plant Genome Initiative (NPGI) started in 1998

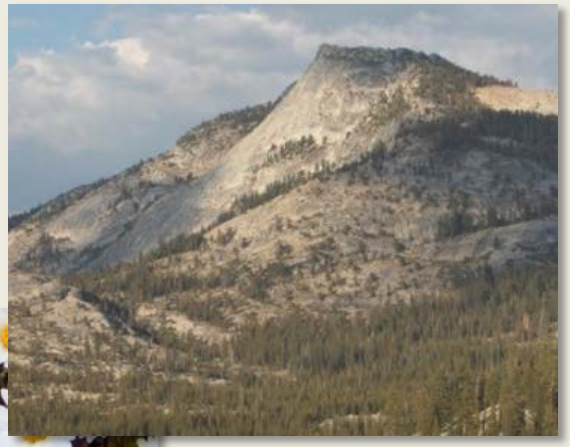
- Focus on plants & processes of agricultural importance
- Supports developing tools, resources, training and hypothesis-driven basic research on a *genome-wide* scale
- Requirements: rapid release and full sharing of all data and tools.



http://www.nsf.gov/pubs/2015/nsf15548/nsf15548.htm

Division of Environmental Biology

- 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

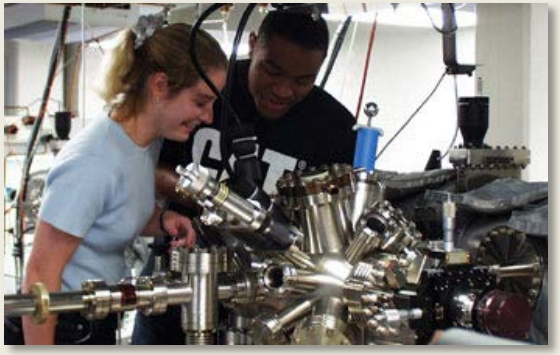


- Solicitation: NSF 15-500
  - Preliminary Proposals Required

http://www.nsf.gov/pubs/2015/nsf15500/nsf15500.htm

Division of Biological Infrastructure

- 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

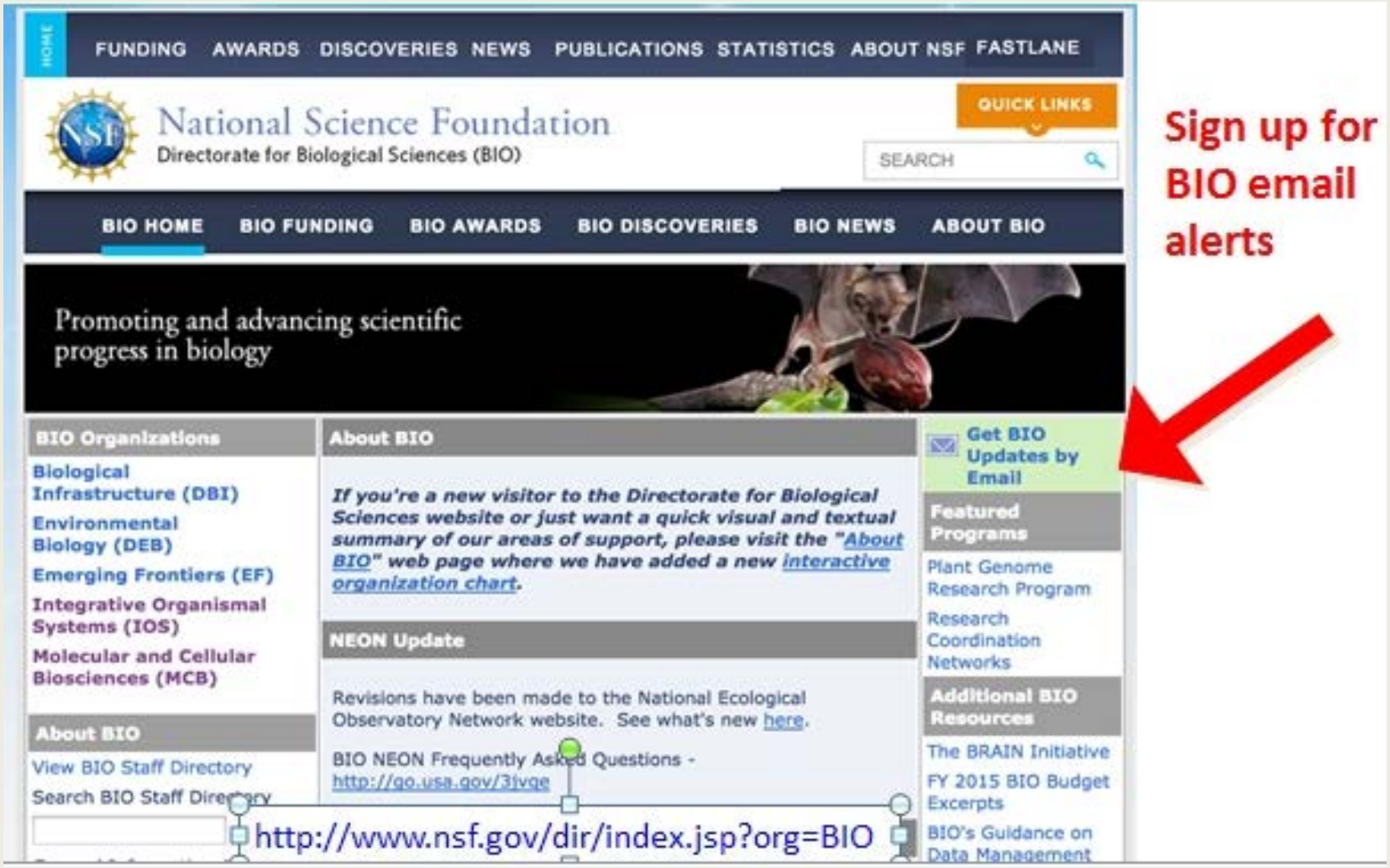


Division of Biological Infrastructure

- 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

NESCent transitions to TriCEM June 2015.
This site is maintained for reference only.
NESCent
National Evolutionary Synthesis Center

Resources for Information



Or…..

Read the BIO blogs! (DBI coming soon)

DEBrief

Blog of the Division of Environmental Biology, NSF

ios in focus

MCBBLOG

DIVISION OF MOLECULAR AND CELLULAR BIOSCIENCES

Follow NSF BIO tweets

$$!

Join

Pick up the phone!

Preparing and Submitting BIO Proposals

Endorsed by Program Officers:

"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."

Proposals - What and When?

PROGRAM GUIDELINES

Solicitation 15-582

Important Information for Proposers

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 16-1), is effective for proposals submitted, or due, on or after January 25, 2016. Please be advised that, depending on the specified due date, the guidelines contained in NSF 16-1 may apply to proposals submitted in response to this funding opportunity.

DUE DATES

Full Proposal Deadline Date: September 9, 2016
Second Friday in September, Annually Thereafter

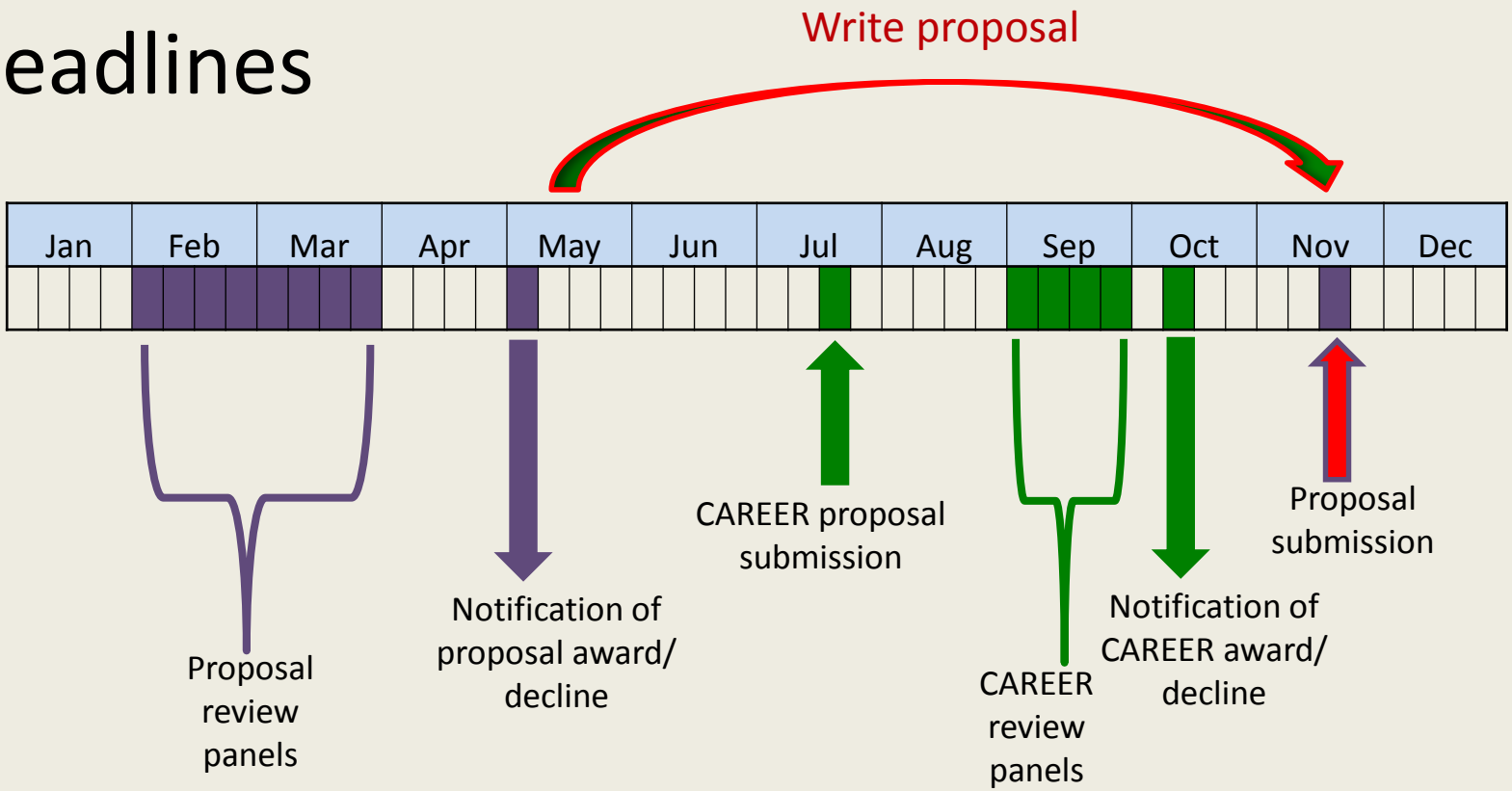
SYNOPSIS

The Advances in Biological Informatics (ABI) program seeks to encourage new approaches to the analysis and dissemination of biological knowledge for the benefit of both the scientific community and the broader public. The ABI program is especially interested in the development of informatics tools and resources that have the potential to advance- or transform- research in biology supported by the Directorate for Biological Sciences at the National Science Foundation. The ABI program accepts three major types of proposals: Innovation awards that seek to pioneer new approaches to the application

MCB: Proposal Deadlines/Target Dates

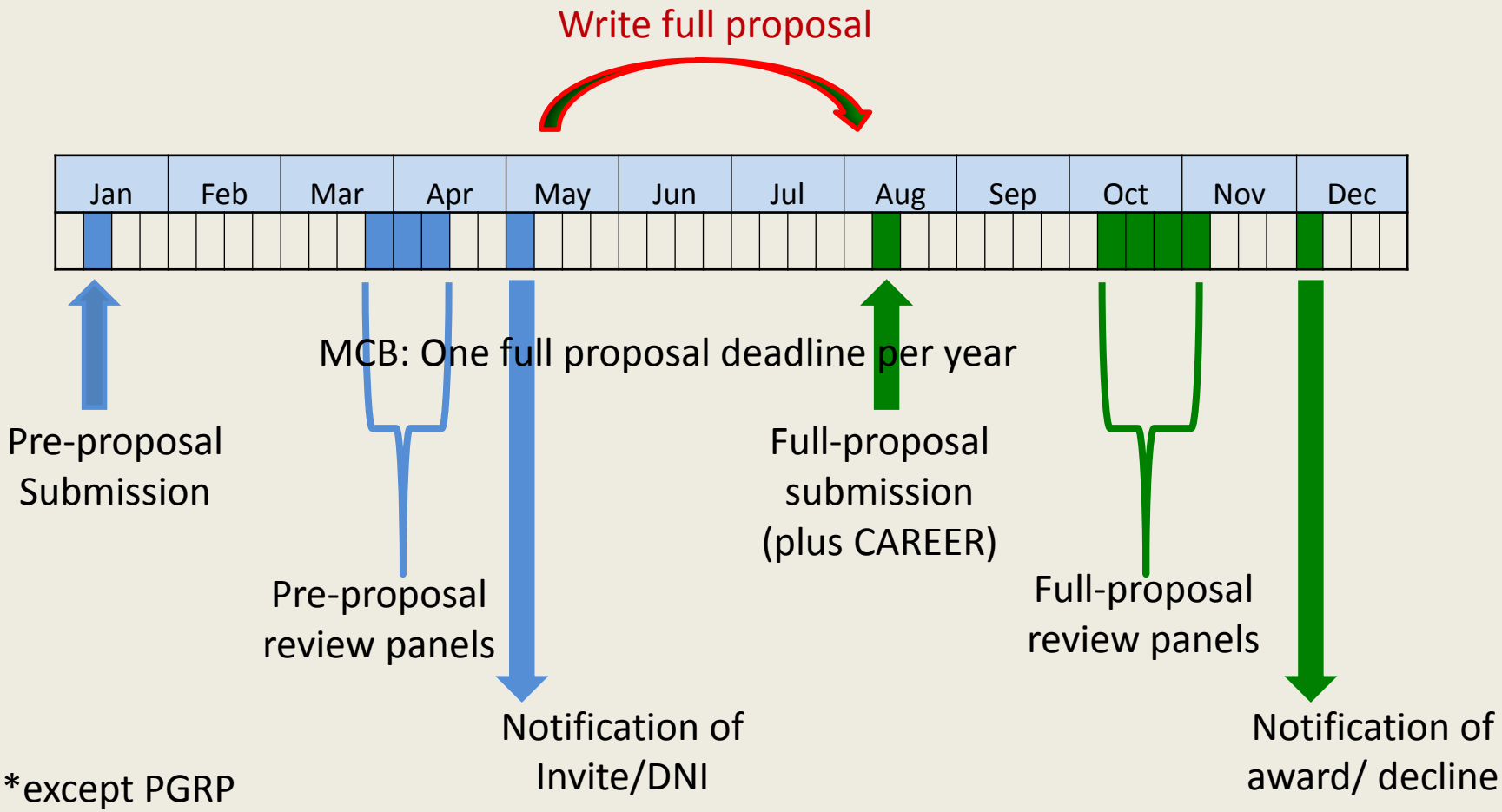
MCB: One full proposal deadline per year

CAREER: are NSF-wide, have their own deadlines



IOS*/DEB Proposal Deadlines/Target Dates

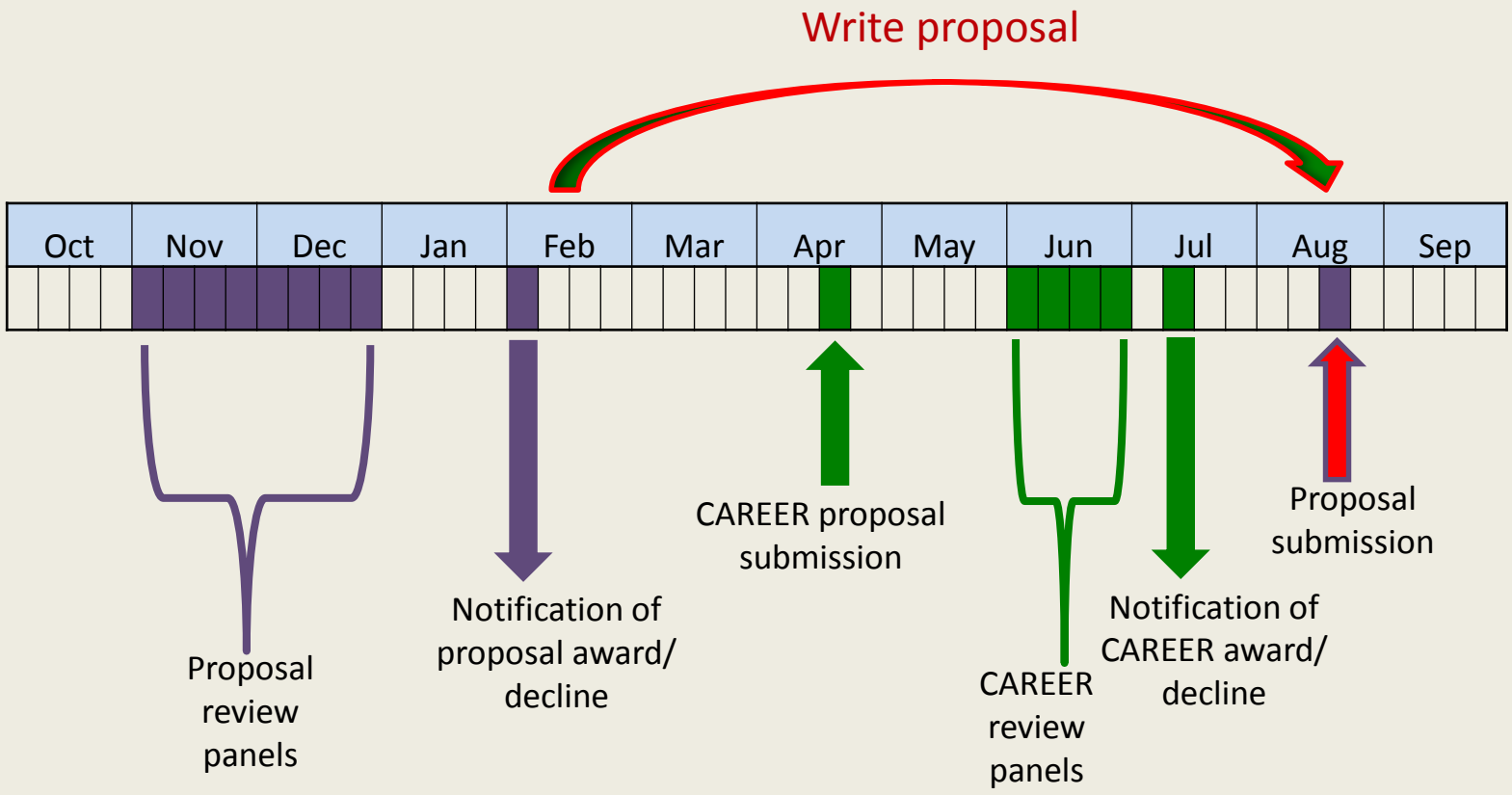
One full proposal deadline per year



*except PGRP

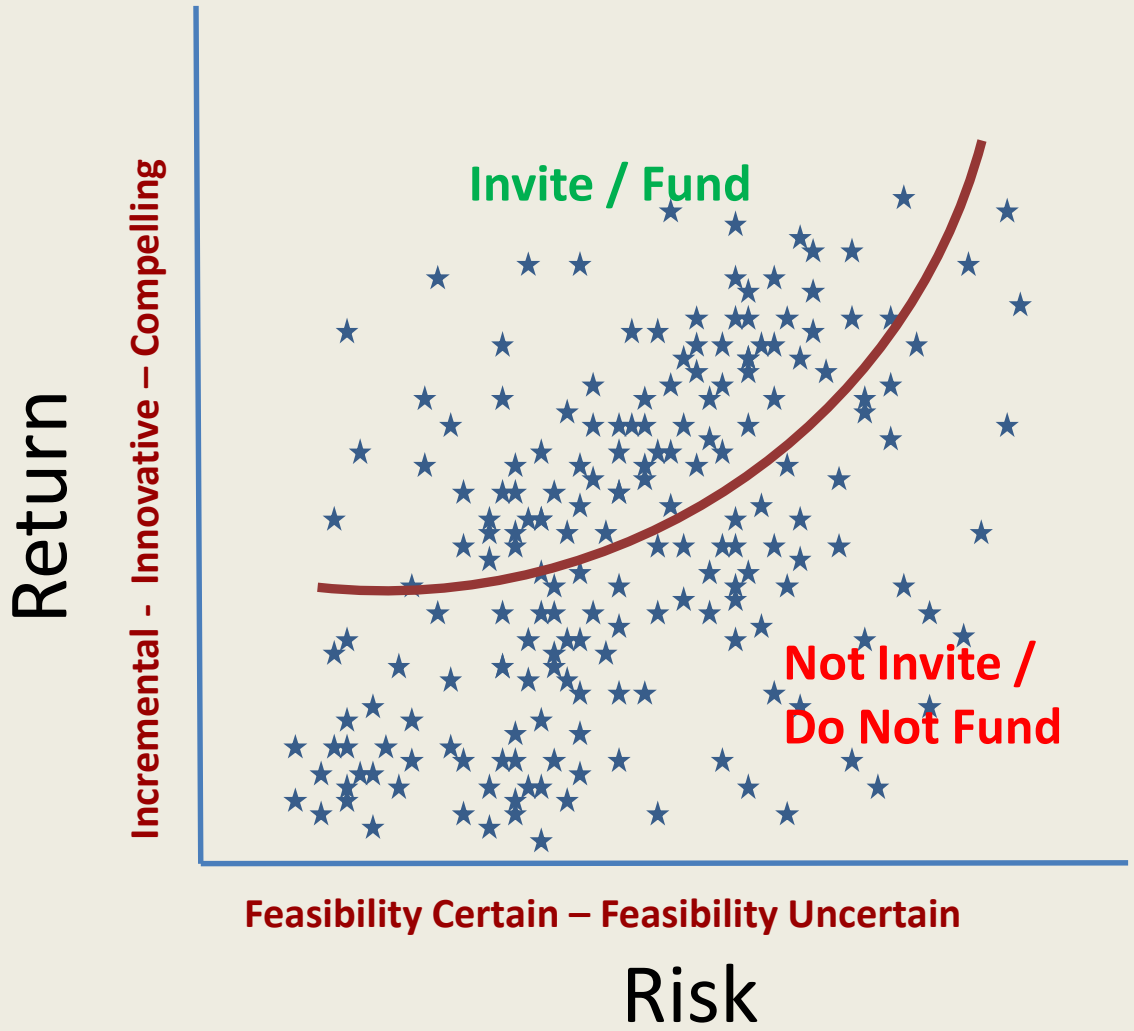
DBI: Proposal Deadlines/Target Dates

Multiple full proposal deadlines per year



The Ellis mnemonic: *the C8 & B Rule*

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



National Science Foundation's

MERIT REVIEW CRITERIA

Review and Revisions

National Science Board

National Science Foundation

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, risk mitigation
- Demonstrate your qualifications
  - Preliminary Data
  - Publications

Reviewers

- Advancing the field: is it a big or little step in science?
- Will the negative results be important too?
- Can the applicants do the project?

One of <u>TWO</u> 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

- Connected to the research?
- Can it be executed?
- Targeting an appropriate goal/group?
- Will it have an impact and *how will the PI know*?

One of <u>TWO</u> merit criteria
(Required but not sufficient…)

What are the funding rates?

- Biological Sciences $744
  - # of Competitive Proposals 5400
  - Number of new awards 1400
  - Funding Rate 24%

  - Research Grants 4500
  - Number of new awards 1100
  - Funding Rate 24%

  - Median Award* size $195,000
  - Avg Award* size $250,000
  - Avg Award duration 3.2 years

* Annualized

- Special programs
  - Clean Energy
  - UtB, BRAIN*
  - INFEWS*
  - Microbiome
  - NEON*
  - BioData
  - BioMaPS
  - Rules of Life
  - RTG
  - INCLUDES
  - Innovations* (Origin of Life)

* Emerging Frontiers

Example: Funding in ABI

- In the past 5 years, ABI has run from 18-28% (with 24% in 2015)
  - Projected in 2016: ~23 new awards out of 235 new proposals but 183 projects
  - There are 60 Continuing Grants being funded at the same time (the mortgage).

“Good grant proposals *begin* with good research questions.”

The DBI Program Officers are:

Peter McCartney (pmccartn@nsf.gov)
Reed Beaman (rsbeaman@nsf.gov)
Jennifer Weller (jweller@nsf.gov or 703-292-7121)

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