

Directorate for Biological Sciences (BIO)

NSF Grants Conference
June 3-5, 2024

Samuel Scheiner (Division of Environmental Biology)

Agenda



- BIO's Four Divisions
- BIO by the Numbers
- BIO Priorities in FY 2024



BIO
Programs



How to
Learn More & Reach Us

**Post questions
through Q&A**

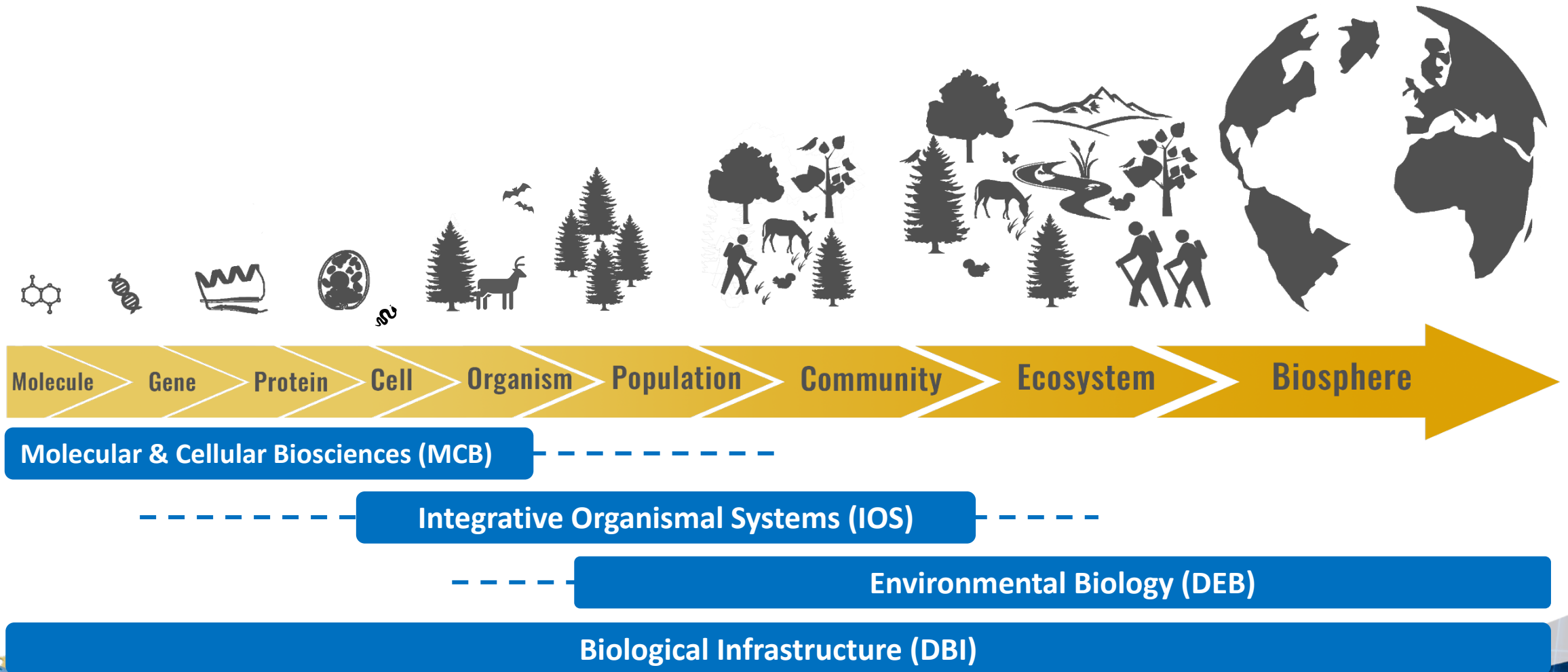


Directorate for Biological Sciences (BIO)

“To enable discoveries for understanding life, advance the frontiers of biological knowledge, and provide a theoretical basis for prediction within complex, dynamic living systems through an integration of scientific disciplines.”



Support for Biological Research Across Scales (Four BIO Divisions)



BIO Priorities in FY 2024



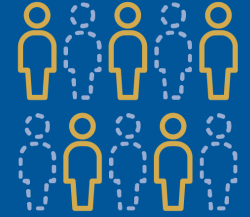
**Building a
Resilient Planet**



**Advancing the
Bioeconomy**



**Integration Across
the Biological
Sciences**



**Creating
Opportunities
Everywhere**

Agenda



BIO
Overview



BIO
Programs



How to
Reach Us

**Post questions
through Q&A**

- Delving Deeper into BIO's Four Divisions
- Cross-BIO/NSF & Interagency Programs
- Building Capacity - People



MCB Structure

Core Programs

Cellular Dynamics and Function

Genetic Mechanisms

Molecular Biophysics

Systems and Synthetic Biology

Special Programs & Tracks

Accelerating Innovations in
Biomanufacturing Approaches
through Collaboration Between
NSF and the DOE BETO- funded
Agile BioFoundry
(NSF-DOE/ABF Collaboration)

Building Synthetic Microbial
Communities for Biology,
Mitigating Climate Change,
Sustainability and Biotechnology
(Synthetic Communities)

Designing Synthetic Cells Beyond
the Bounds of Evolution
(Designer Cells)

Reproducible Cells and Organoids
via Directed-Differentiation
Encoding **(RECODE)**

Transitions to Excellence in
Molecular and Cellular
Biosciences Research
(Transitions)



IOS Structure

Core Programs

Behavioral Systems

Animal Behavior

Developmental Systems

Plant, Fungal, and Microbial Developmental Mechanisms
Animal Developmental Mechanisms
Evolution of Developmental Mechanisms

Neural Systems

Organization
Activation
Modulation

Physiological and Structural Systems

Symbiosis, Infection, and Immunity
Physiological Mechanisms and Biomechanics
Integrative Ecological Physiology
Plant Biotic Interactions (NSF-NIFA)

Plant Genome Research Program

Special Programs & Tracks

Enabling Discovery
through GENomics
(EDGE)

Organismal
Response to
Climate Change
(ORCC)

Partnership to Advance
Conservation Science
and Practice
(PACSP)



DEB Structure

Core Programs

Ecology

Ecosystem Sciences
Population and Community Ecology

Evolution

Evolutionary Processes
Systematics and Biodiversity Science
PurSUIT and ARTS

Special Programs & Tracks

Biodiversity
on a Changing
Planet (**BoCP**)

Ecology and
Evolution of
Infectious
Diseases
(**EEID**)

Long-Term
Ecological
Research
(**LTER**)

Long-Term
Research in
Environmental
Biology
(**LTREB**)

Macrosystems
Biology and
NEON-Enabled
Science
(**MSB-NES**)

Opportunities
for Promoting
Understanding
through
Synthesis
(**OPUS**)

Organismal
Response to
Climate Change
(**ORCC**)

Partnership to
Advance
Conservation
Science and
Practice
(**PACSP**)



Safe and Inclusive Field Plan

Required 2-page supplement including*:

1. a brief description of the field setting and unique challenges for the team;
2. the steps the proposing organization will take to nurture an inclusive off-campus or off-site working environment, including processes to establish shared team definitions of roles, responsibilities, and culture;
3. communication processes within the off-site team and to the organization(s) that minimize singular points within the communication pathway; and
4. the organizational mechanisms that will be used for reporting, responding to, and resolving issues of harassment if they arise.

***plan is in lieu of AOR certification when submitting to programs included in the pilot**



DBI Structure

Core Programs

Human Resources

Postdoctoral Research Fellowships in Biology (PRFB)
Research Coordination Networks in Undergraduate Biology Education (RCN-UBE)
Research Experiences for Undergraduates (REU)
Building Research Capacity for New Faculty in Biology (BRC-BIO)
Research and Mentoring for Postbaccalaureates in Biological Sciences (RaMP)
Research Experiences for Teachers Sites in Biological Sciences (BIO-RETS)
Leading Culture Change through Professional Societies of Biology (BIO-LEAPS)

Research Resources

Infrastructure Innovation for Biological Research (Innovation)
Infrastructure Capacity for Biological Research (Capacity)
Sustaining Infrastructure for Biological Research (Sustaining)
Major Research Instrumentation Program

Centers, Facilities, and Additional Research Infrastructure

Biology Integration Institutes (BII)
Center for Advancement of Synthesis of Open Environmental Data and Sciences
Management of Operations and Maintenance of the National Ecological Observatory Network (NEON)
Mid-scale Research Infrastructure-1
Mid-scale Research Infrastructure-2



BIO and Biomedical Research: What Isn't Funded

- Biological research on mechanisms of disease **in humans**, including on the etiology, diagnosis, or treatment of disease or disorder, **is normally not supported**.
- Biological research to develop animal models of such conditions, or the development or testing of procedures for their treatment, also are **not normally eligible for support**.
- However, research with etiology, diagnosis - or treatment-related goals that advances knowledge in **engineering, mathematical, physical, computer, or information sciences** is eligible for support. Bioengineering and assistive information technology research to aid persons with disabilities also is eligible.



When Should I Submit my Proposal?

- The Biological Sciences Directorate has **no deadlines** for investigator-initiated research proposals
 - Submit your proposal when you think it is ready
 - No limit on number of (non-overlapping) proposal submissions as PI or Co-PI
 - Panels are held periodically throughout the year to ensure timely review(average time to decision ~6 months)
- Some special programs **do have deadlines** (check the solicitation/DCL)

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

PROGRAM SOLICITATION
NSF 21-509

REPLACES DOCUMENT(S):
NSF 18-585



National Science Foundation

Directorate for Biological Sciences
Division of Molecular and Cellular Biosciences

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

Proposals Accepted Anytime

Enabling Discovery through GENomics (EDGE)

PROGRAM SOLICITATION
NSF 21-546

REPLACES DOCUMENT(S):
NSF 20-532



National Science Foundation

Directorate for Biological Sciences
Division of Integrative Organismal Systems



National Institutes of Health

National Human Genome Research Institute

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

March 16, 2021

February 17, 2022

Third Thursday in February, Annually Thereafter



Agenda



- BIO's Four Divisions
- **Cross-BIO/NSF & Interagency Programs**
- Building Capacity - People

**Post questions
through Q&A**



LIFE DCL Leveraging Innovations From Evolution

- **What:** Dear Colleague Letter encouraging proposals that use comparative approaches to identify evolutionary convergent adaptations to life's challenges and the mechanisms that underlie them. Proposals should include relevance of the proposed work to inform applications towards a sustainable global bioeconomy.
- **Where:** At any U.S. Institution of Higher Education or non-profit organization
- **When:** Proposals accepted anytime through IntBio Track or directly to Core Programs in DEB, MCB, IOS, and the Infrastructure Innovation program in DBI.



IntBIO Integrative Research in Biology

- **Who:** There are no restrictions
- **What:** Track within BIO core programs that supports integrative biological research that spans subdisciplines and incorporates cutting-edge methods, tools, and concepts from each to produce groundbreaking biological discovery. Research should be synergistic and produce novel, holistic understanding of how biological systems function and interact across different scales of organization.
- **Where:** At any U.S. Institution of Higher Education or non-profit organization
- **When:** Proposals accepted anytime

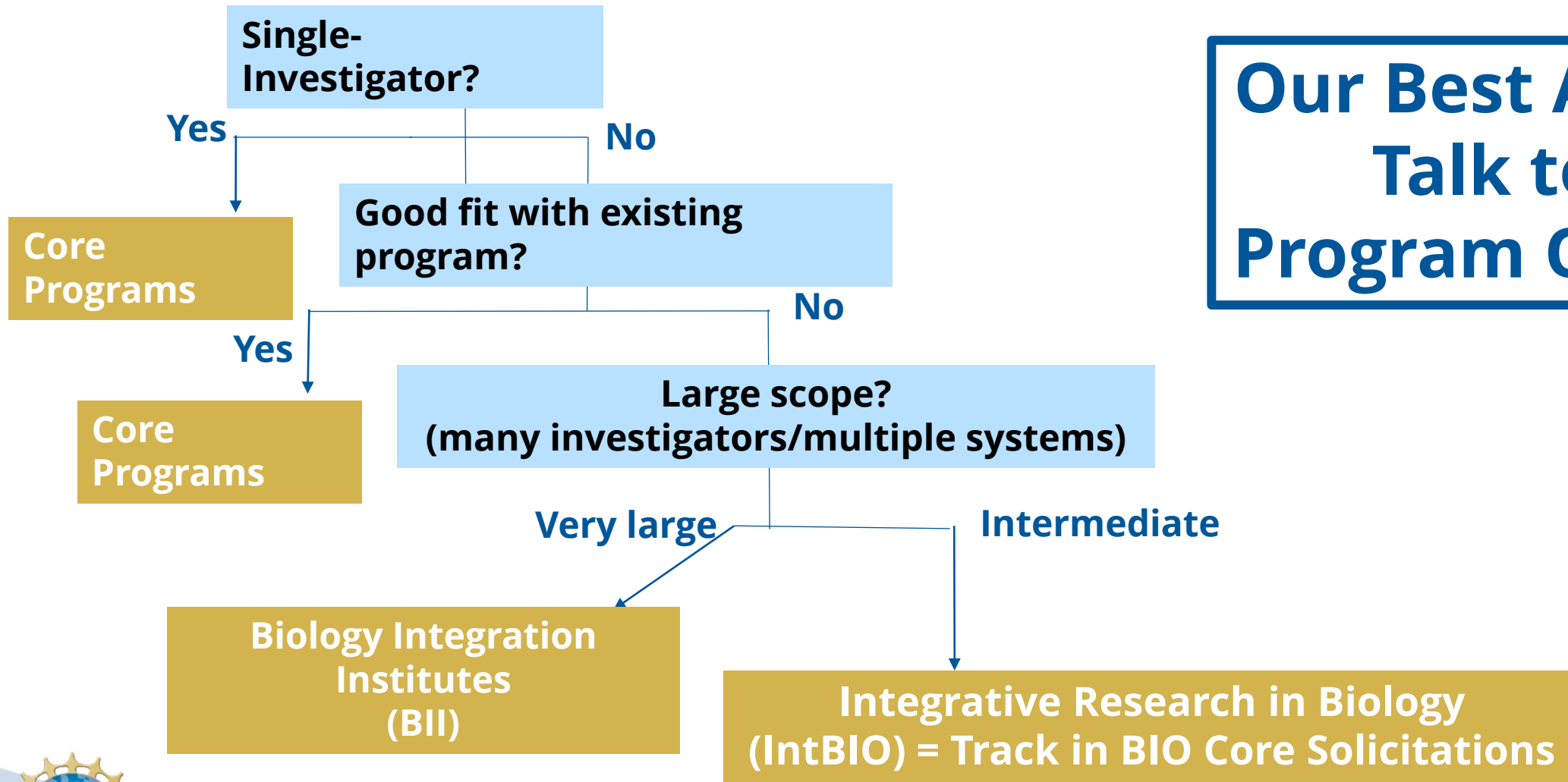


BII Biology Integration Institutes

- **Who:** There are no restrictions
- **What:** Integrative research that furthers the common goal of understanding how the processes that sustain life and enable biological innovation operate and interact within and across different scales of organization, from molecules to cells, tissues to organisms, species, ecosystems, biomes and the entire Earth.
- **Where:** At any U.S. Institution of Higher Education or non-profit organization
- **When:** Usually end of January



Possibilities for Integrative Projects



**Our Best Advice:
Talk to a
Program Officer!**



BoCP Biodiversity on a Changing Planet

- **Who:** There are no restrictions
- **What:** Interdisciplinary proposals addressing grand challenges in biodiversity science within the context of unprecedented environmental change. Proposal may include researchers that will be supported by the federal science agencies of China, Brazil, and/or South Africa.
- **Where:** At any U.S. Institution of Higher Education or non-profit organization
- **When:** September 5, 2024



EDGE Enabling Discovery through Genomic Tools

- **Who:** There are no restrictions
- **What:** Supports the development of tools and resources, and the testing of hypotheses in non-model systems, in partnership with NIH
- **Where:** At any U.S. Institution of Higher Education or non-profit organization
- **When:** Third Thursday in February, annually



NSF-DOE/ABF Collaboration Accelerating Innovations in Biomanufacturing Approaches through Collaboration Between NSF and the DOE BETO funded Agile BioFoundry

- **Who:** No restrictions or limits on who can serve as a PI
- **What:** Supports using the Design-Build-Test-Learn capabilities at the Agile BioFoundry to develop testable prototypes based on the latest advances in synthetic engineering biology.
- **Where:** At any U.S. Institution of Higher Education or non-profit organization
- **When:** Deadline to be posted



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- BIO's Four Divisions
- Cross-BIO/NSF & Interagency Programs
- **Building Capacity - People**

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Supporting Researchers Throughout Their Career

STEM Professional

K - 12

Undergrad

Postbacc

Grad

Postdoc

New Faculty

Mid-Career Faculty

Research Experiences for K-12 Teachers (BIORETS)

Research Experiences for Undergrads (REU)

Research Coordination Networks for Undergraduate Biology Education (RCN-UBE)

Research and Mentoring Networks for Postbaccs (RaMP)

Graduate Research Fellowships (GRFP)

Postdoc Fellowships (PRFB)

Faculty Early Career Development (CAREER)

Capacity Building (BRC-BIO)

Mid-Career Advancement (MCA)

Leading Culture Change Through Professional Societies of Biology (BIO-LEAPS)



BIO-LEAPS Leading Cultural Change through Professional Societies of Biology

- **Who:** There are no restrictions
- **What:** Leverage the work of professional societies towards facilitating necessary culture change in the biological sciences to advance diversity, equity, and inclusion at scale.
 - Evaluation Track: Assessment and research of the values, norms, priorities, and practices associated with the culture of the discipline or sub-discipline.
 - Design Track: Develop an evidence-based plan to address broad-scale culture change within a discipline or sub-discipline.
 - Implementation Track: Implement evidence-based cultural change strategies that leverage the influence of biological professional societies.
- **Where:** Institution of higher education or other non-profit organization in the U.S.
- **When:** July 1, 2024



BRC-BIO Building Research Capacity of New Faculty in Biology

- **Who:** PIs must hold at least a 50% tenure-track (or tenure-track equivalent) position as an assistant professor (or equivalent rank), who are untenured, have both research and teaching components to their appointment, and are within the first three years of their appointment.
- **What:** Proposed projects should enable the establishment of research programs for new faculty to position them to apply for future grants to sustain their research and should also enrich undergraduate research experiences and thereby grow the STEM workforce.
- **Where:** MSIs, PUIs, and other universities and colleges that are not among the nation's most research-intensive and resourced institutions.
- **When:** Proposal windows are June 1-20, 2023, and May 1-July 1, 2024.



MCA Mid-Career Advancement

- **Who:** Scientists and engineers at the Associate Professor rank (or equivalent) with at least 3 years at that rank
 - Pilot Track in **BIO** and **GEO** extends eligibility to Full Professors (or equivalent) at Primarily Undergraduate Institutions (PUIs) only
- **What:** An opportunity to substantively enhance and advance the PI's research program and career trajectory through synergistic and mutually beneficial mentored partnerships
- **Where:** At any U.S. Institution of Higher Education or non-profit organization
- **When:** Submission window between February 1 and March 1, annually



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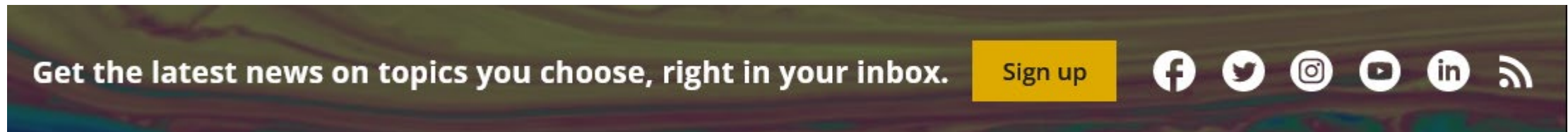
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BIO News and Updates

Sign-up for emails on new solicitations; events; due date reminders; and BIO's quarterly newsletter, including information on new priorities and solicitations, highlights from the community, and more!

Visit www.nsf.gov and scroll down until you see the Sign up and social media banner, click on the yellow box, and follow the prompts.



BIO Blogs

News, features, highlights, and more from OAD and the BIO Divisions

- BIO Buzz (OAD): <https://oadblog.nsfbio.com/>
- DBInfo (DBI): <https://dbiblog.nsfbio.com/>
- DEBrieF (DEB): <https://debblog.nsfbio.com/>
- IOS in Focus (IOS): <https://iosblog.nsfbio.com/>
- MCB Blog (MCB): <https://mcbblog.nsfbio.com/>



BIO Virtual Office Hours (VOH)

- Informational webinar focused on:
 - New and ongoing funding opportunities
 - Topics of general interest
 - Open questions from audience to be answered live
- Days & Times by Division (occasionally rescheduled due to holidays)
 - Division of Biological Infrastructure – 3rd Tuesday from 3-4 p.m.
 - Division of Environmental Biology – 2nd Monday from 1-2 p.m.
 - Division of Integrative Organismal Systems – 3rd Thursday from 1-2 p.m.
 - Division of Molecular and Cellular Biosciences – 2nd Wednesday from 2-3 p.m.



Take-Home Messages

- BIO core programs have **no deadlines** – submit your proposal when ready
- Multiple funding mechanisms support:
 - interdisciplinary research
 - researchers across different career stages
 - infrastructure
 - education, outreach and broadening participation in STEM
- Contact relevant Program Officer to discuss your ideas
 - Send a 1-page summary of your research and broader impacts plans
(Tips for preparing summary)



NSF Needs You!



Questions? Post to Q&A

