



Division of Molecular and Cellular Biosciences (MCB)

Virtual Office Hours

Welcome!

We will begin at 2pm ET



Questions and Answers

Submit your questions via the Q&A box on your screen

- You may elect to submit your question anonymously.
- For specific questions about your project, please contact a Program Director.

Next MCB Virtual Office Hours

March 20th, 2023: New Requirement - Safe and Inclusive Work Environments Plan (off-campus/off-site research)

April 12th, 2023: How to Write a Great NSF Proposal



MCB Virtual Office Hour

Today's Topic:

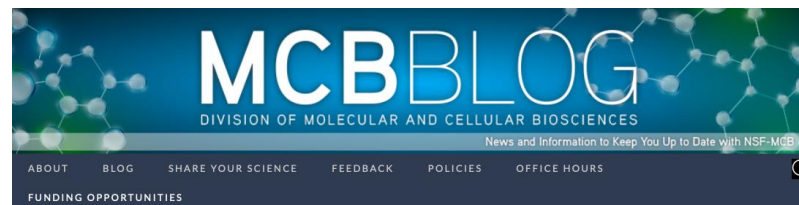
New MCB Solicitation for Core Programs

NSF 23-548

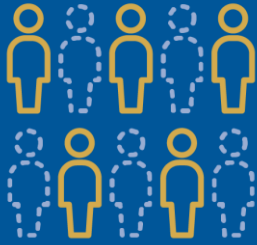
Slides and recordings of past presentations at

<https://mcbblog.nsfbio.com/office-hours/2/>

(Example: August 10, 2022 – Working with an NSF Program Director)



NSF and MCB Strategic Goals



Empower
STEM talent to fully
participate in
science and
engineering



Discover
new knowledge by
advancing research
frontiers and
enhancing research
capability



Impact
society through
translation of
knowledge to
solutions

MCB Core Program Priorities

MCB supports research that yields **mechanistic insights into fundamental and emergent properties of living systems** and leads to **quantitative and predictive understanding** of how life works at the molecular, subcellular, and cellular scales.

Priority research qualities:

- Explore **new concepts**
- Exploit **experimental and theoretical approaches** to solve new/long standing questions
- Incorporate **insights and approaches from other disciplines** (e.g., chemistry, computer science, engineering, mathematics, and physics), to illuminate molecular and cellular principles and processes governing life
- Utilize a **diverse spectrum of model and non-model** animals, plants, and microbes

Also welcome:

Use-inspired research with potential to address major societal challenges

Projects that pursue **potentially transformative ideas, even if higher risk**



MCB Core Program Priorities

In line with [NSF's strategic goal](#) of empowering STEM talent to fully participate in science and engineering, MCB **values**:

Broadening participation through efforts to promote diversity, equity and inclusion of **individuals traditionally underrepresented in STEM**, and build capacity in **diverse types of institutions** (MSIs, PUIs, 2-year colleges, institutions in EPSCoR jurisdictions – in addition to R1 institutions).

Examples of such efforts include, but are not limited to:

- Involvement of diverse students, post-doctoral scholars, senior personnel
- Collaborations, partnerships across diverse geographies and types of institutions



Support for Education and Broadening Participation Activities

**New
guidance!**

- Support should be requested at the time of proposal submission
- Post-award supplemental funding requests for these activities should be for unanticipated opportunities that arise after an award is made.
- Typical total budgets are:
 - RAHSS = \$6,000 per high school student
 - RET = usually less than \$15,000 per schoolteacher
 - REU = \$7,000 - \$9,000 per undergraduate student
 - REPS = \$650 per week over 12 months, plus fringe benefits and travel per postbaccalaureate student
 - INTERN = maximum \$55,000 per graduate student per 6-month period
 - ROA = usually less than \$15,000 per faculty member



MCB by the Numbers (FY 2022)

Research budget
\$154.5 M



690
Proposals

Avg decision time
5 months



233
Awards

Median award size
~\$230 K/year

Success rate
~34 %

Award duration
2-5 years

No deadline for submitting
proposals to core programs



MCB Core Clusters

MCB comprises four Core Clusters organized by disciplines/thematic areas:

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

All four clusters prioritize projects that:

- Integrate across spatiotemporal scales
- Investigate molecular and cellular evolution
- Synergize experimental research with computational or mathematical modeling
- Develop innovative, broadly applicable methods and technologies for new avenues of inquiry



Molecular Biophysics

Supports computational and experimental research on the structure, dynamics and function of biomolecules, supramolecular assemblies and their interactions.

The program prioritizes studies that:

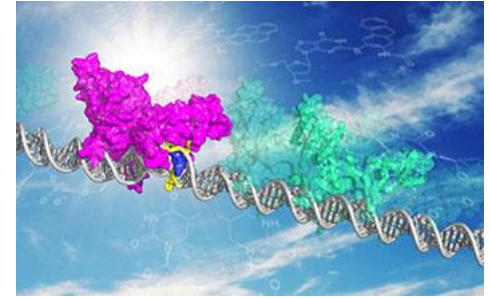
- Utilize [experimental and computational approaches](#) synergistically
- Relate to [physiological conditions](#)

The following areas are of particular interest:

- Large scale [computations that incorporate experimental constraints](#)
- [Biomolecular folding and dynamics](#) on multiple timescales exploring molecular recognition, function, and allostery
- Structure, dynamics, assembly, and interactions of [macromolecular complexes in membrane-bound or membraneless environments](#)
- Understanding biophysical principles that permit [life at the extremes](#)
- [Quantum phenomena in biological systems](#) or using quantum devices to investigate biological problems
- Development of [innovative experimental tools or techniques](#) at the frontiers of biophysics



Genetic Mechanisms



Supports research on fundamental mechanisms involved in the organization, dynamics, processing, expression, regulation and evolution of genetic and epigenetic information in diverse organisms.

The program is interested in predictive understanding of:

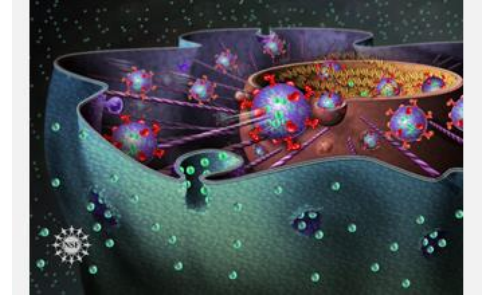
- **Spatiotemporal coordination and regulation** of processes that maintain, replicate, transcribe, and translate the genome
- Relationships between **genomic and epigenomic determinants** and **molecular/cellular phenotypes**
- Transcriptomic, epitranscriptomic, and other **RNA-based regulatory mechanisms**
- **Structure-function relationships**, interactions, and reactions of macromolecules in genetic and epigenetic processes
- Mechanisms of **evolution of genes and genomes**

Development of **novel technological solutions** to these challenges is encouraged.



Cellular Dynamics and Function

Supports interdisciplinary research aimed at mechanistic understanding of the structure, function and evolution of cellular and subcellular systems across the tree of life.



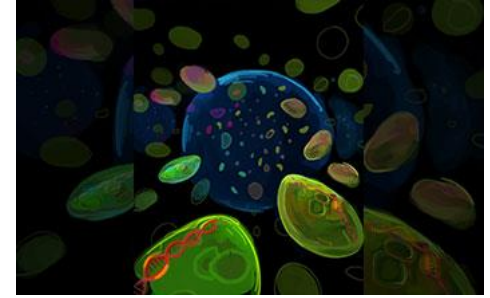
The following areas are of particular interest:

- **Predictive understanding of cellular behavior** through integration of computational modeling and experimentation
- **Evolutionary approaches** to understanding the rules governing cellular functions
- Integration of structure and function with **emerging cellular properties across broad spatiotemporal scales**, including cellular organization through soft condensed matter
- Development or adaption of **innovative tools or technologies** to enable new cellular research



Systems and Synthetic Biology

Supports research that employs systems biology or synthetic biology approaches to to understand molecular and cellular mechanisms in established, new, or emerging model systems.



The following areas are of particular interest:

- Molecular to system-wide events driving **assembly, function, and emergent properties of natural and synthetic microbial communities**
- Functional modules for **synthetic cells or cell-like systems**
- Origins of life and the **minimal cell**
- Synthetic systems that explore **biological diversity beyond current living systems**
- **Synthetic systems employing epigenetic regulation**
- Biological **information storage and processing**
- **Integration of multi-omics data** for mechanistic insights
- Mechanistic modeling of gene regulatory control, signaling and metabolic **networks, and interactions among networks**
- Development of **novel experimental, computational, or mathematical tools** to advance systems or synthetic biology



Does “Use-Inspired” Include Medical Research?

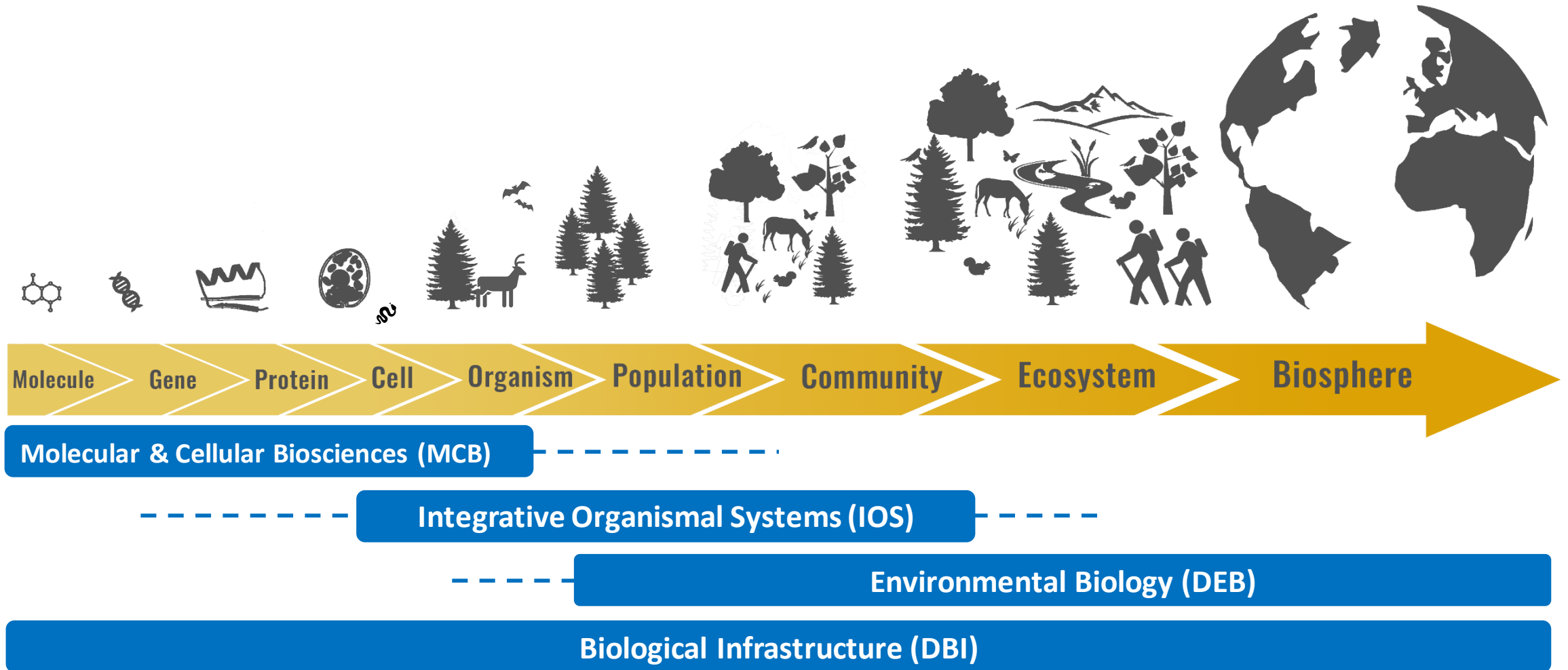
- Biological research on **mechanisms of disease in humans**, including on the etiology, diagnosis, or treatment of disease or disorder, is **normally not supported**.
- Biological research to develop **animal models** of such conditions, or the **development or testing of procedures for their treatment**, also are **not normally eligible for support**.
- **However**, **use-inspired basic research** with societal benefits (such as future implications for human health) **can be supported**.
- For example, research on:
 - Mechanisms of DNA damage and repair – **YES**
DNA repair pathway/enzyme as drug target – **NO**
 - Fundamental questions about viral structure, replication, evolution, etc. – **YES**
Therapeutic interventions against infection – **NO**
 - Mechanisms underlying cell motility – **YES**
Metastasis of tumor cells – **NO**

NSF Proposal & Award Policies and Preparation Guide
([PAPPG 23-1](#))

Contact a Program Director!
(send ~1-pg summary)



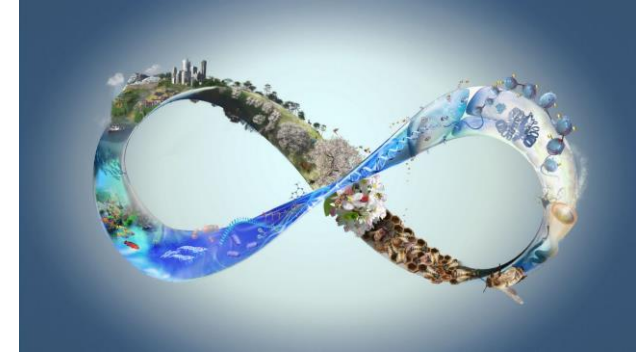
How does MCB Support Interdisciplinary Research?



**New
track!**

Integrative Research in Biology (IntBIO) Track

Support for **collaborative proposals** that tackle bold questions requiring an **integrated approach across subdisciplines of biology** to advance fundamental **understanding of biological systems across different scales** of organization.



Special requirements for proposals:

- Two or more **investigators with diverse perspectives and expertise**
- **Graphical illustration of the integrative strategy**
- **Integrative training** and education plan (part of broader impacts)
- Title must start with “**IntBIO:**”

Contact a Program
Director to determine
suitability for IntBIO track

Experimental strategies, modeling, integrative analysis, advanced computation, or other research approaches are encouraged to stimulate new discovery and general theory in biology.



Other Opportunities for Cross-disciplinary MCB Research

Mathematical and Physical Sciences Directorate

- **Chemistry of Life Processes - CLP** supports fundamental experimental and computational studies at the interface of chemistry and biology.
- **Physics of Living Systems - PoLS** supports research on basic physical principles that underlie biological function in dynamic and diverse environments.
- **Mathematical Biology - MathBio** supports research in areas of applied and computational mathematics with relevance to the biological sciences.

Engineering Directorate

- **Engineering Biology and Health - EBH** supports research in areas that intersect with molecular and cellular biosciences, including Biosensing; Biophotonics; Cellular and Biochemical Engineering.

Computer and Information Science and Engineering Directorate

- **Foundations of Emerging Technologies - FET** supports research at the intersections of biology and computer science.



Two DCLs: Bioinspired Design Research & Development across NSF

NSF 23-055: Bioinspired Design Collaborations to Accelerate the Discovery-Translation Process (BioDesign)



Goals:

- Encourage early-stage, transdisciplinary collaboration of two or more investigators in biological and engineering sciences with the potential for bioinspired design applications, and
- Accelerate translation of research findings into projects with potential societal and economic impacts that could be ready for commercialization.

Participating Directorates and Programs: BIO (IOS, MCB); ENG (CBE, CMMI); TIP (TI)

NSF 23-066: Convergence Accelerator (TIP) – Track M: Bioinspired Design Innovations

Convergence Accelerator funds cross-disciplinary teams through a 2-phase process – (i) team convergence & proof-of-concept development and (ii) prototyping & sustainability planning to deliver impactful solutions to societal needs.

Goal: Inform the community of an upcoming funding opportunity for Bioinspired Design Innovations, which aims to bring together scientists and practitioners to develop concepts, approaches, and technologies that build and control like nature does – capitalizing on evolution to find novel solutions to major societal challenges.



DCLs: Opportunities for International Collaboration



NSF 20-094

NSF - US-Israel Binational Foundation Collaborative Research (across NSF)

- **For MCB:** Basic research at molecular, subcellular or cellular level aligned with core program priorities.
- Integrated collaborative effort that aligns with both NSF merit review criteria.
- No deadlines for BIO proposals.

NSF 22-107

NSF/BIO - UK Research and Innovation (BBSRC) Collaborative Research (select topics)

- 2022-2023 topics: Biological Informatics; Host-Microbe Interactions; Synthetic Cells and Cellular Systems (**MCB**); Synthetic Microbial Communities (**MCB**).
- Deadline for BBSRC was in February. Contact NSF if interested.

NSF 22-129

NSF/MCB/PHY - French Agence Nationale de la Recherche (ANR) Collaborative Research (select topics)

- 2023 topic: Physics from Molecules to Cells.
- Deadlines apply for ANR.



DCLs: Opportunities for International Collaboration

NSF 22-015

NSF/MCB - German DFG Lead Agency Opportunity

- Basic research at molecular, subcellular or cellular level aligned with MCB core program priorities.
- No deadlines.



NSF 23-049

NSF-Swiss NSF Lead Agency Opportunity (across NSF)

- **For MCB:** Basic research at molecular, subcellular or cellular level aligned with core program priorities.
- Expression of Interest form required.
- No deadlines for MCB proposals; deadlines apply for Swiss NSF.

NSF 22-056

Supplemental Funding for Collaborations between NSF and European Research Council Awardees

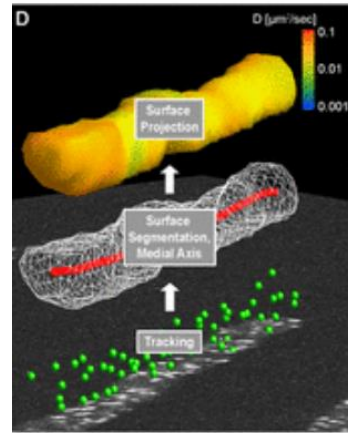
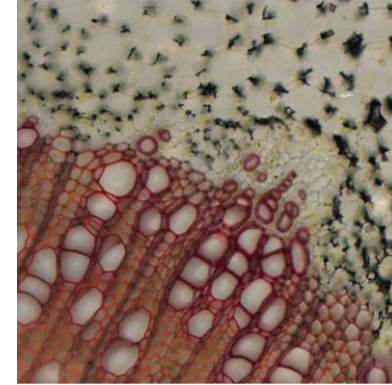
- Supports NSF awardees for research visits to appropriate ERC-funded European research group.



Other Types of Core MCB Proposals: EAGER, RAISE, RCN

EAGER: EArly-concept Grants for Exploratory Research

For pioneering work on untested but potentially transformative research ideas or approaches. Must demonstrate high risk/high reward. 2 yr/\$300K. By invitation only ([PAPPG II.F.3](#)).



RAISE: Research Advanced by Interdisciplinary Science and Engineering

Supports bold, interdisciplinary research that promises transformational advances by combining approaches from multiple fields. 5 yr/\$1M. By invitation of 2 program officers from distinct programs ([PAPPG II.F.4](#)).

RCN: Research Coordination Networks

For establishment and organization of networks of researchers spanning disciplinary, organization, geographical, or international boundaries. 5 yr/\$500K maximum (with exceptions). Submit to most appropriate program ([Solicitation NSF 23-529](#)).



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

NSF 21-508

Support for **mid-career or later-stage scientists** to pursue **exciting new avenues of inquiry** and expand or transition their research toward greater impact.

Special requirements for proposals:

- **Prior accomplishments plan** indicating strong foundation
- **Professional development plan** providing compelling goals, rationale and plan for moving research in new, potentially transformative, direction
- **Research plan** for continuing in new direction
- Department letter of support
- Letter from sabbatical host (optional)

Notes:

- PI eligibility: Associate or Full professor
- Budget: \$750 K total costs (up to 3 years, including sabbatical)
- Deadline: None



New
requirements!

New PAPPG 23-1 is in Effect

NSF 23-1 - effective date January 30, 2023

Summary of Changes: <https://beta.nsf.gov/policies/pappg/23-1/summary-changes>

- **Safe and Inclusive Working Environments for Off-campus/Off-site Research:** After April 18, 2023, **BIO and GEO proposals** that involve off-campus or off-site research must submit a plan for safe and inclusive research (PAPPG II.E.9). This requirement reflects NSF's efforts to foster safe and harassment-free environments wherever science is conducted. Webinar: March 20th 3-4 pm.
- **Potential Life Sciences Dual Use Research of Concern (DURC):** Proposals that could potentially be considered DURC or involve enhanced potential pandemic pathogens must self-identify and comply with US Govt. policy requirements (PAPPG II.E.6). Governed by policies released in [2014](#) and [2017](#)
- **Biographical Sketch and Current and Pending Statement:** After October 23, 2023, biosketches and C&P statements must use SciENCv format (PAPPG II.D.2.h).

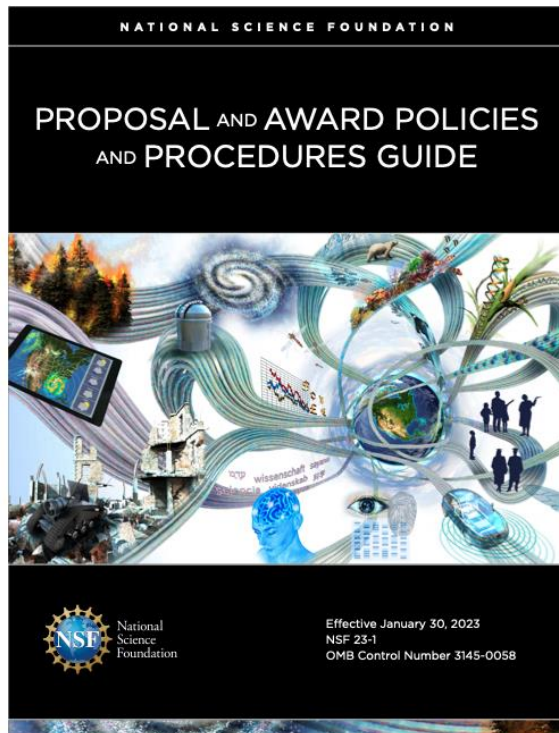


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Supports research on living systems at the molecular levels. Core areas supported include cellular dynamics, mechanisms, molecular biophysics, and systems and synthetic biology.

Synopsis

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Matthew J. Buechner, telephone: (703) 292-4675, email: mcb-cdf@nsf.gov
- Manju M. Hingorani, telephone: (703) 292-7323, email: mcb-gm@nsf.gov
- Jaroslaw Majewski, telephone: (703) 292-7278, email: mcb-mb@nsf.gov
- Anthony G. Garza, telephone: (703) 292-8440, email: mcb-ssb@nsf.gov

For questions related to the use of NSF systems contact:

- NSF Help Desk: 1-800-673-6188
- Research.gov Help Desk e-mail: rgov@nsf.gov

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.
should they occur, clearly outlined?

among others. PIs
Directors with any

NSF and MCB are
the nation's health
all the more timely

projects through efforts to promote diversity, equity, and inclusion of individuals and institutions traditionally underrepresented in STEM. NSF is interested in ensuring the inclusion of individuals from diverse social categories and/or identities including but not limited to: race, ethnicity, gender, sexual orientation, socio-economic status, disability status, veteran status, or geography—recognizing that underrepresentation can vary by career stage and discipline and that there are additional considerations of intersectionality. Proposers submitted to this solicitation *are strongly encouraged* to involve PIs, co-PIs, postdoctoral fellows, students, and other personnel who are members of these groups. MCB also recognizes

Browse projects funded by this program

Program guidelines



Take-Home Messages

- MCB core programs have **no deadlines** – submit your proposal when ready
- MCB is receptive to **high-risk projects** with potential for high impact
- Plenty of mechanisms to support **interdisciplinary research**, including international collaborations
- Funding for **education, outreach and broadening participation** in STEM
- Support for PIs at **different career stages**

Contact relevant Program Director to discuss your ideas

Send a 1-page summary of your **research and broader impacts** plans
([Tips for preparing summary](#))



Next MCB Virtual Office Hours

- Monday March 20th, 2023, 3-4 pm ET (note special date and time)
**New Requirement - Safe and Inclusive Work Environments Plan
(off-campus/off-site research)**
- Wednesday April 12th, 2023, 2-3 pm ET
How to Write a Great NSF Proposal
- Wednesday May 10th, 2023, 2-3 pm ET
Faculty Early-Career Development Program (CAREER; [NSF 22-586](#))
- Wednesday June 7th, 2023, 2-3 pm ET
Let's Talk Broader Impacts

Send VOH topic suggestions to:
Olaf Corning: ocorning@nsf.gov



SCIENCE HAPPENS HERE

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#NSFstories

Join NSF in highlighting your amazing research, discoveries, innovation and more happening across the country and around the world.



Tag your location and use our IG filter, graphics or simply post a photo or video with #NSFstories



We will amplify your posts and share your stories. We will also share your stories at events, hold competitions, feature on our blog and more!

[Toolkit: nsf.gov/ScienceHappensHere](https://nsf.gov/ScienceHappensHere)



NSF

SCIENCE
HAPPENS **HERE**

 *Cape Royds,
Ross Island, Antarctica*

#NSFstories



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.
 - Panels are held periodically throughout the year to ensure timely review.
 - (avg time to decision ~5 months)
 - Funding rates are held steady throughout the year.
 - Note: review of proposals submitted in early summer may take ~2 months longer (due to fiscal year closeout activities).
- Some special programs do have deadlines (check the solicitation/DCL)

MCB Blog: [When should I submit my proposal?](#)

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

Building Research Capacity of New Faculty in Biology (BRC-BIO)

PROGRAM SOLICITATION NSF 22-500



National Science Foundation

Directorate for Biological Sciences
Division of Biological Infrastructure

Submission Window Date(s) (due by 5 p.m. submitter's local time):

January 03, 2022 - January 31, 2022

June 01, 2022 - June 30, 2022

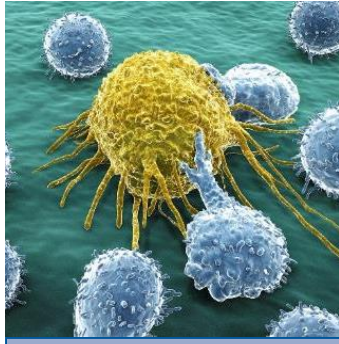
December 01, 2022 - December 30, 2022

June 01, 2023 - June 30, 2023

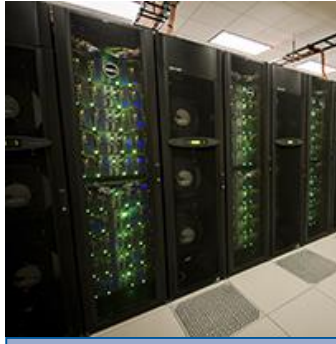
December 01, 2023 - December 29, 2023



NSF Organization – 8 Directorates and 2 Offices Fund Science



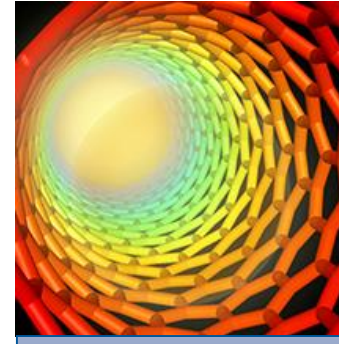
Biological Sciences



Computer & Information
Science & Engineering



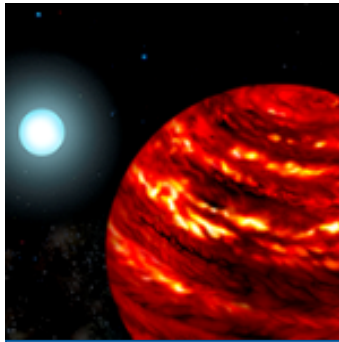
Education &
Human Resources



Engineering



Geosciences



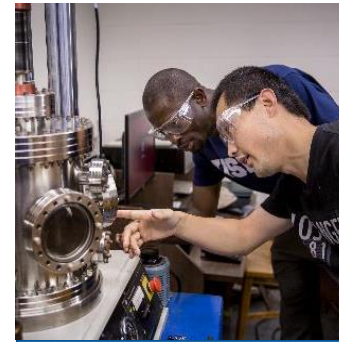
Mathematical & Physical
Sciences



Social, Behavioral &
Economic Sciences



Technology Innovation &
Partnerships



Integrative Activities



International Science &
Engineering





**Directorate for Biological Sciences
(BIO)**

Emerging Frontiers (EF)

