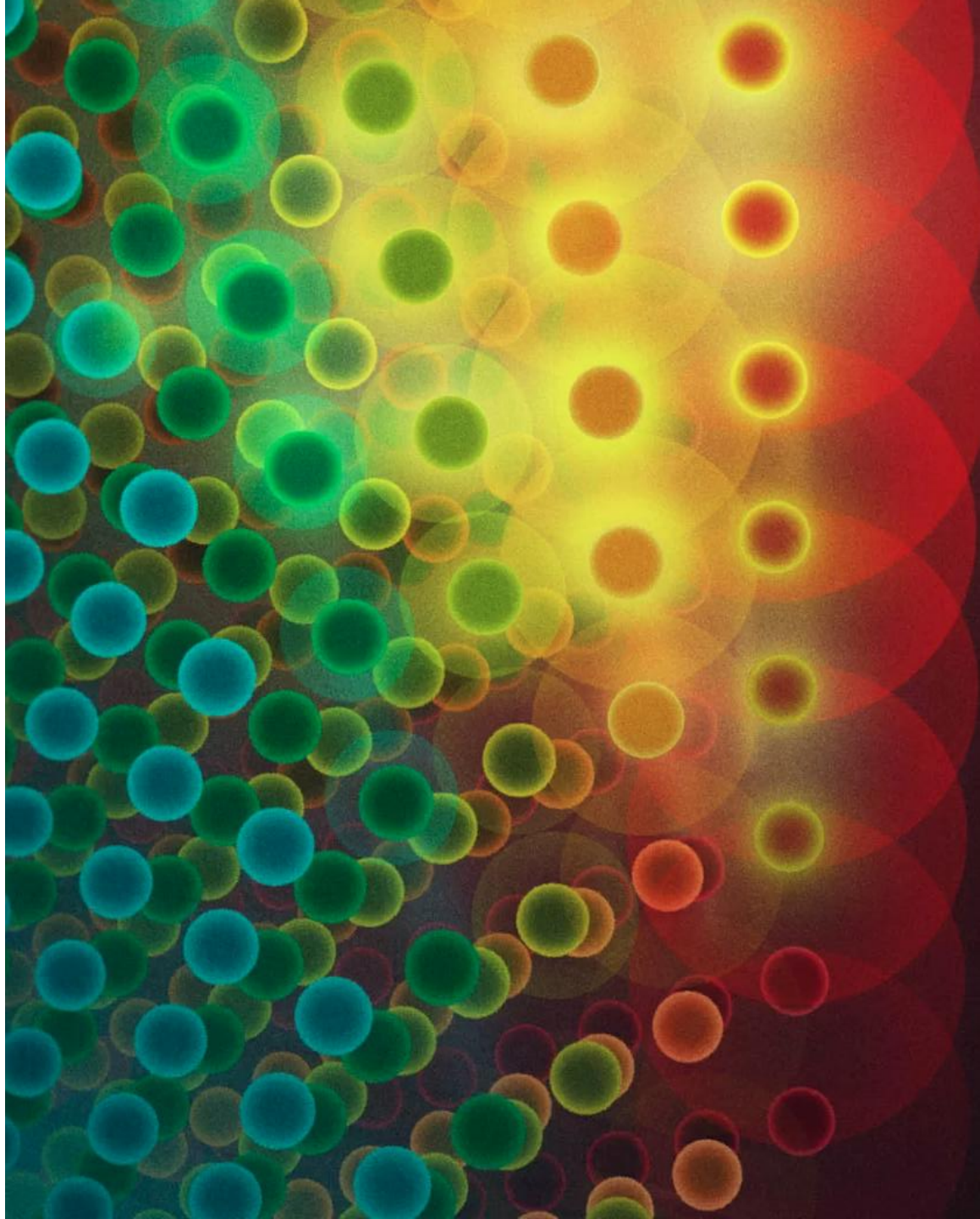
National Science Foundation

Molecular and Cellular Biosciences Division (MCB)

Virtual Office Hours

Welcome!

We will begin at 2pm ET



MCB Virtual Office Hour

Today's Topic:

Meet MCB Program Directors

Slides and recordings of virtual office hours will be posted on the Events page

https://www.nsf.gov/events

(search for "MCB")

What are We Doing Today?

Presentation

- MCB priorities and programs
- Role of program directors

Breakout sessions

- Breakout rooms are set up for each program

  After the presentation, please join the program of most interest to you (***Room 1***)

  - Molecular Biophysics (MB)
  - Genetic Mechanisms (GM)
  - Cellular Dynamics and Function (CDF)
  - Systems and Synthetic Biology (SSB)
- You are welcome to move between rooms
  (return to main room and pick another program)
- Please keep your questions about research or broader impacts general
  (e.g., about overall fit of your research program, submission/review process, etc.)

  You can follow up by email for specific project-related questions.

MCB Priorities

MCB supports research that yields:

- Mechanistic insights into fundamental and emergent properties of living systems
- Quantitative and predictive understanding of life at molecular-to-cellular scales

MCB prioritizes research that:

- Explores new concepts
- Exploits experimental and theoretical approaches to solve new/long standing questions
- Incorporates insights and approaches from different disciplines to illuminate molecular and cellular principles and processes governing life
- Utilizes a diverse spectrum of model and non-model animals, plants, and microbes

MCB welcomes:

- Use-inspired research with the potential to address major societal challenges and contribute to the bioeconomy
- Projects that pursue potentially transformative ideas, even if higher risk

MCB Priorities

In line with NSF's priorities, MCB supports work that has broader impacts (i.e., the potential to benefit society and enable specific, desired societal outcomes).
For example:

- Increasing U.S. economic competitiveness
- Advancing American public health and welfare
- Supporting the U.S. national defense
- Enhancing partnerships
- Developing the American STEM workforce
- Improving US public science literacy and engagement

When planning activities that broaden participation, note that all outreach, recruitment, or participatory activities in NSF projects must be open and available to all Americans.

See https://www.nsf.gov/updates-on-priorities

MCB Core Clusters

Molecular Biophysics

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

Genetic Mechanisms

Fundamental mechanisms involved in the organization, dynamics, processing, expression, regulation and evolution of genetic and epigenetic information in diverse organisms.

Cellular Dynamics and Function

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

Systems and Synthetic Biology

Systems biology or synthetic biology approaches to understand molecular and cellular mechanisms in established, new, or emerging model systems.

Core Programs in MCB: Solicitation NSF 24-539 **No deadline – submit proposal anytime**

Role of NSF Program Directors

Program Planning and Management

- Conduct proposal merit review
- Advise applicants and awardees

Stewardship

- Plan activities to promote science and advance national welfare
- Post-award management and oversight

Organization, Coordination and Liaison

- Provide leadership and direction to support NSF's mission
- Communicate/coordinate within NSF and with other agencies, the scientific community, and the public

Outreach

- Broaden participation in NSF activities

Professional Development

- Maintain current knowledge in scientific fields

When/Why Connect with a Program Director?

Before

Introduce yourself and your research idea(s)

- Provide brief information about your background, current position
- One-page summary of your project idea
- Offer to participate in peer review (especially if new PI/new to NSF)

Seek input on which NSF program(s) align with your research

- Do some homework about NSF policies, programs ahead of contact
- Indicate which program(s) appear appropriate to you

Ask clarifying questions about NSF review criteria and process

NSF PAPPG 24-1

Your 1-page Project Summary

Describe your **research idea**

- Brief introduction to research field
- Motivation ("what" and "why" in the context of current state/gaps in field)
- Specific hypotheses/questions driving the project
- Plan to address them (cover the "how" with specific aims)
- Expected outcomes (how they support/refute hypothesis)
- Anticipated impact in/beyond the field
- Particularly novel, innovative, or transformative aspects

Outline your **broader impacts interests and goals**

- Brief description of motivation, how many participants, plans, and impacts for proposed activities.

What Program Directors Do with Your Query

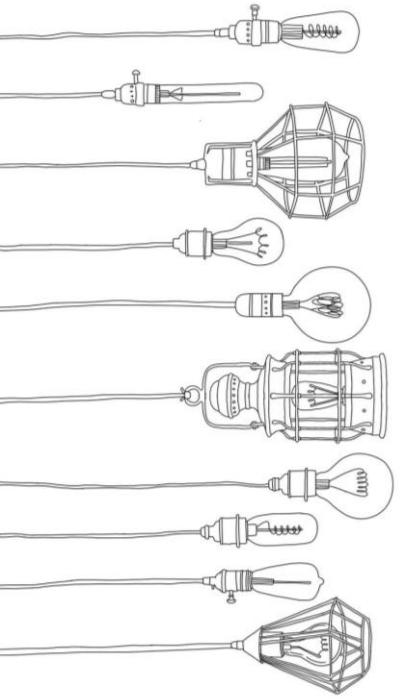
- Acknowledge receipt of your email (within a couple weeks)
- Behind the scenes we may
  - Consult with colleagues in the program
  - If it's not a good fit (or may be of interest to other programs), shop the idea in MCB, and/or BIO and/or other NSF Directorates
- Respond with information on
  - Whether the idea is appropriate for review in the program or what other programs you might consider
  - Whether other programs might be interested in co-review
  - Whether a phone conversation might be helpful, etc.

Note: PDs will not provide evaluative feedback on your proposed project

If you don't receive a response, feel free to follow up in a couple weeks

When/Why Connect with your Program Director?

After (Decline)



Don’t give up

Reflect on the feedback

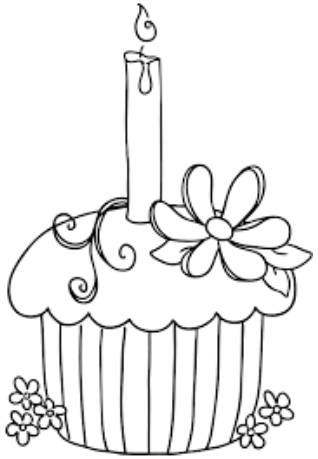
- Pay attention to the panel summary (explains proposal ranking)
- What are common messages in the reviews?
  - Inadequate preliminary data
  - Lack of focus or clarity in rationale/experimental approach/analysis /interpretation, etc.

Seek advice on resubmitting your proposal

- What are important considerations?
  - What aspects need substantive revision/minor revision?
  - What pitfalls can be avoided?

When/Why Connect with your Program Director?

After (Award)



What to expect?

- Possible budget revisions
- Resolution of any current/pending support overlap
- Other: public abstract, additional documents (e.g., IACUC/IRB approval)

Post-award reporting

- Annual report: progress on research and broader impacts; challenges; plans

Get in touch

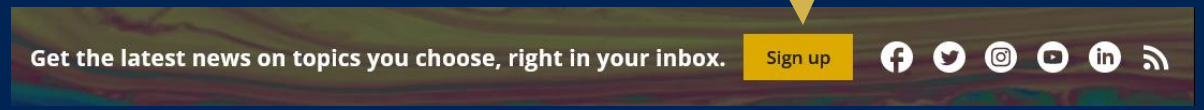
- Hearing your success stories as they happen helps us convey the impact of the science and education supported by NSF. For example:
  - Email your PD news of an exciting manuscript accepted for publication.
  - Amplify your NSF-funded successes on NSF social media (#NSFFunded)
- Discuss funding opportunities - supplements, new ideas, programs etc.

BIO News and Updates

Sign-up for:

- emails on new solicitations, events, and due date reminders
- 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.



Q: How is NSF implementing executive orders?

NSF continues to apply the statutorily required Intellectual Merit and Broader Impacts review criteria, as well as any solicitation-specific review criteria.

For additional information on implementation of recent executive orders, please visit https://www.nsf.gov/executive-orders.

For information on NSF's updated policies, please visit https://www.nsf.gov/updates-on-priorities.

Breakout Sessions

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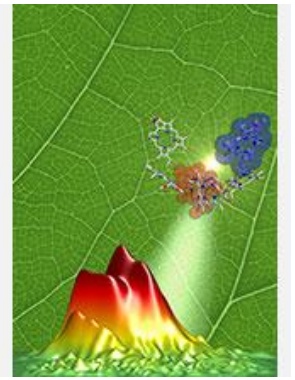
Molecular Biophysics

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



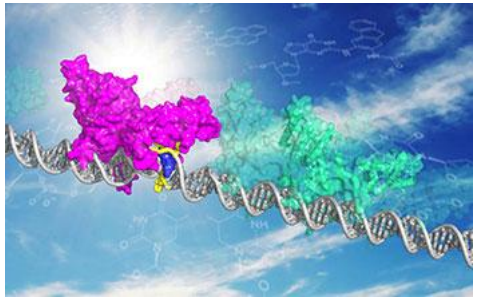
The program prioritizes studies that:

- 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.

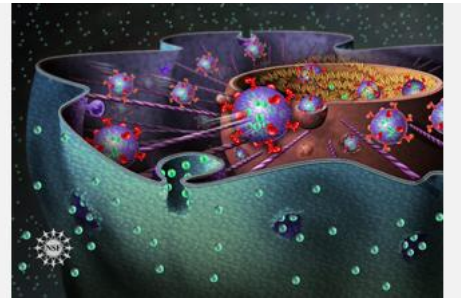
The program is interested in predictive understanding of:

- 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.

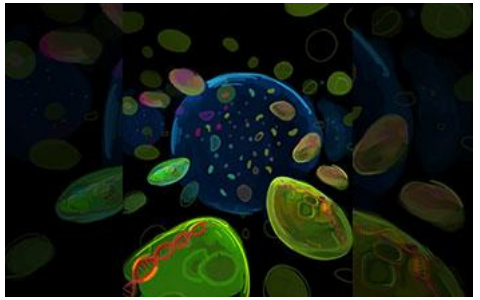


The following areas are of particular interest:

- 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.

What about 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.

PAPPG 24-1

Contact a Program Director
(send ~1-page summary)

- **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**