EDGE Webinar

Enabling Discovery through GEnomics

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15 January 2021

BIOEDGE@NSF.GOV

EDGE Webinar Outline

1. Program Overview

a. Purpose and goals
b. Examples of programmatic fit
c. Partnership with the National Human Genome Research Institute

2. Submission Requirements

a. Deadline
b. Proposal sections

3. Review Criteria

a. NSF merit review criteria
b. Solicitation-specific criteria
c. NIH review criteria

4. Questions

Program Overview

Purpose

Enable advancement of understanding the relation between genomes and phenomes—relevant to *Understanding the Rules of Life: Predicting Phenotype*

Goals

To support:

(1) development of **tools**, approaches, and infrastructure for testing cause and effect hypotheses between gene function and phenotypes in **organisms for which such methods are presently unavailable**

(2) hypothesis-driven **research** that tests cause-and-effect relations between genotype(s) and phenotypes **in diverse organisms within the context (environmental, developmental, social, and/or genomic) in which they function.** Use of traditional model organisms is permitted, but proposals must **demonstrate the generalizability of the results** beyond the focal species across contexts.

Program Overview

Functional Genomics Tools (FGT) track

For example:

- Development of mutant libraries and/or high-quality reference genomes
- Generalizable high-throughput phenotyping methods
- Innovative approaches for manipulating individual genes or multiple genes simultaneously
- Innovative approaches to test gene function in targeted, single cells in organisms
- Innovative approaches for establishing function of single or networks of genes

Complex Multigenic Traits (CMT) track

For example:

- Systems-level analysis of the gene regulatory networks underlying complex traits
- Innovative analytical approaches to linking genes and complex traits
- Elucidation of the causal connections across levels of biological organization that underlie complex multigenic traits
- Elucidation of multi-genome/epigenome interactions with the environment, with the goal of predicting complex organismal phenotypes across contexts

Use of Diverse Organisms to Advance Functional Genomics

Program Overview

Both tracks:

Higher priority will be given to projects that:

- **cross disciplines** within biology, combining organismal biology with cellular, evolutionary, or ecological research
- demonstrate approaches that are **generalizable** beyond single-gene, single-trait, or single-diseases relevant phenotypes

Program **considers applications** that:

- can demonstrate utility or relevance to human or disease-relevant model organisms
- will advance the science of genomic medicine
- will incorporate genomics to improve the effectiveness of healthcare

Use of Diverse Organisms to Advance Functional Genomics

Program Overview

Functional genomics EDGE does not support:

- Genome-scale research or tool development for agriculturally relevant plant species
- Proposals focused exclusively on bioinformatic tool development

Questions about your project's fit for the EDGE Program
and for which track?

Send a **brief synopsis** (~ 1 page) to **BIOEDGE@nsf.gov**

Program Overview

NSF program in partnership with the National Human Genome Research Institute of the National Institutes of Health

To:

- Promote scientific exchange across communities traditionally supported by the respective agencies and allow for synergies that will accelerate advancement in functional genomics
- Leverage evolutionary relationships in advancing understanding of the functional mechanisms that connect genotype-to-phenotypes and the ability to predict phenotype
- Strengthen the links between fundamental research and societal needs

NIH National Institutes of Health

NSF

Program Overview

National Human Genome Research Institute

Supports development of resources, approaches, and technologies that will accelerate genomic research

- Structure of genomes, biology of genomes, genomics and biology of disease
- Use of genomics to advance the science of medicine and improve the effectiveness of healthcare
- Genomic research in the ethical, legal and societal implications of genomics and genetics research, bioinformatics, technology development, and research training and career development
- Generalizable methods and knowledge about genomics in relation to human health

NHGRI will consider EDGE applications that can demonstrate ***utility or relevance to human health or disease***, provided they also focus on the ***development of methods or novel applications*** that demonstrate ***approaches that are generalizable*** beyond single-gene, single-trait, or single-disease relevant phenotypes

NSF 21-546

Submission Requirements
(Section V of the solicitation)

Proposal submission deadline

16 March 2021, 5 PM submitter's local time

Title

Functional Genomic Tools track: "FGT:…."
Complex Multigenic Traits track: "CMT:…."

Titled sub-sections of the Project Description

FGT and CMT proposals:

- Intellectual Merit
- Broader Impacts

additional sub-section for FGT proposals:

- Research Community Impact

Submission Requirements
(Section V of the solicitation)

Supplementary Documents

FGT or CMT proposals that involve multiple organizations:

- Project Management Plan

Additional Supplementary Document for FGT proposals:

- Dissemination and Education Plan

Where relevant:

- Human Subjects Protection
- Vertebrate Animal Section

Data Management Plan

required per the Proposal and Award Policies and Procedures Guide NSF 20-1

Submission Requirements
(Section V of the solicitation)

Letters of Collaboration

- prescribed format per the Proposal and Award Policies and Procedures Guide NSF 20-1
- **letters of support are not allowed**

Budget and Duration

- up to $2 million in combined direct costs (summed over all components of the project if the proposal is a collaborative submission)
- up to 4 years

Review Criteria
(Section VI of the solicitation)

Intellectual Merit – Potential to advance knowledge

Broader Impacts – Potential to benefit society and contribute to the achievement of specific societal outcomes

Elements considered in the review for both criteria:

- What is the potential for the proposed activity to
  - Advance knowledge and understanding within its own field or across different fields (**Intellectual Merit**); and
  - Benefit society or advance desired societal outcomes (**Broader Impacts**)?
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- How well qualified is the individual, team, or organization to conduct the proposed activities?
- Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Review Criteria
(Section VI of the solicitation)

Solicitation-specific review criteria

For **FGT** proposals:

- Potential catalytic impact on advancing research and research communities using organisms named in the proposal
- Potential catalytic impact of the enabling tools, approaches, and infrastructure on advancing research and research communities
- Quality and potential for rapid and high impact of the Dissemination and Education Plan

For **CMT** proposals:

- Extent to which the proposed hypotheses test or demonstrate causal links between genomes and phenomes
- Potential to advance theory and understanding of complex multigenic trait expression
- Potential to inform predictive understanding of complex phenotypes based on genomic information
- Degree to which generalizability of the conclusions across diverse research organisms will be demonstrated

Review Criteria
(Section VI of the solicitation)

Solicitation-specific review criteria

For FGT or CMT proposals that involve **multiple organizations**:

- Quality of the Project Management Plan and likelihood of successful project coordination

NIH Review Criteria:

- Overall impact
- Significance
- Investigator(s)
- Innovation
- Approach
- Environment

If applicable:

- Protection of human subjects
- Vertebrate animals
- Biohazards
- Budget and period of support

Process at-a-glance

1. Proposal submission in accordance with submission requirements specified in Solicitation NSF 21-546
2. Proposal review managed by NSF in consultation with NHGRI
3. Identification of meritorious proposals that may be recommended for funding by either NSF or NIH
    a. Proposals selected for funding by NSF will be handled in accordance with standard NSF procedures
    b. Proposals selected for funding consideration by NIH will be invited to submit reformatted applications to NIH's Center for Scientific Review

Proposal submission deadline

16 March 2021, 5 PM submitter's local time

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EDGE Program page:
https://nsf.gov/funding/pgm_summ.jsp?pims_id=505480

EDGE contact: BIOEDGE@NSF.GOV