

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

## PROGRAM SOLICITATION

NSF 21-508

## REPLACES DOCUMENT(S):

NSF 20-505



**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

## IMPORTANT INFORMATION AND REVISION NOTES

### IMPORTANT INFORMATION

Innovating and migrating proposal preparation and submission capabilities from FastLane to Research.gov is part of the ongoing NSF information technology modernization efforts, as described in [Important Notice No. 147](#). In support of these efforts, the Directorate for Biological Sciences (BIO) is now requiring the use of Research.gov for the preparation and submission of proposals in response to its core programs that do not have deadline dates (see Dear Colleague Letter [NSF 20-129](#)). As such, full research proposals submitted in response to this program solicitation must be prepared and submitted via Research.gov. Proposals also may continue to be submitted via use of Grants.gov.

NSF is taking proactive steps to move the preparation and submission of all proposals from FastLane to Research.gov, however until capabilities are fully implemented, the other types of proposals outlined in Chapter II.E of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), as well as accomplishment-based renewal proposals, must be prepared and submitted via FastLane or Grants.gov in accordance with the applicable guidance contained in the PAPPG or the *NSF Grants.gov Application Guide*.

### REVISION NOTES

The Division of Molecular and Cellular Biosciences (MCB) has revised the solicitation to indicate the flexibility in timing of the sabbatical or professional development year, to allow for the inclusion of a letter from the sabbatical host lab, and to update the cross-cutting areas of research of interest to MCB.

Full research proposals submitted in response to this program solicitation can no longer be prepared and submitted via FastLane.

Any proposal submitted in response to this solicitation should be submitted in accordance with the [NSF Proposal & Award Policies & Procedures Guide](#) (PAPPG).

## SUMMARY OF PROGRAM REQUIREMENTS

### General Information

#### Program Title:

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

#### Synopsis of Program:

The Division of Molecular and Cellular Biosciences (MCB) has developed a new opportunity to enable researchers with a strong track record of prior accomplishment to pursue a new avenue of research or inquiry. This funding mechanism is designed to facilitate and promote a PI's ability to effectively adopt empowering technologies that might not be readily accessible in the PI's

current research environment or collaboration network. Transformative research likely spans disciplines and minimizing the practical barriers to doing so will strengthen research programs poised to make significant contributions. The award is intended to allow mid-career or later-stage researchers (Associate or Full Professor, or equivalent) to expand or make a transition in their research programs via a sabbatical leave or similar mechanism of professional development and then develop that research program in their own lab. This award will also enable the PI to acquire new scientific or technical expertise, facilitate the investigator's competitiveness, and potentially lead to transformational impacts in molecular and cellular bioscience. The award would fund up to six months of PI salary during the first sabbatical or professional development year, followed by support for continued research for two subsequent years upon the PI's return to normal academic duties. Requests for flexibility in the timing of the sabbatical or professional development year will be considered with appropriate justification. Please contact the cognizant program director for the solicitation. Through this solicitation MCB and NSF hope to develop a novel mechanism that will encourage investigators to expand and/or transition to new research areas aligned with MCB priorities, to increase retention of investigators in science, and to ensure a diverse scientific workforce that remains engaged in active research.

Highest funding priority is given to proposals that have outstanding intellectual merit and broader impacts, while proposals with weaknesses in either category (or those that are perceived as likely to have an incremental impact) will not be competitive. Proposals should also demonstrate a strong record of prior accomplishment, a compelling plan for professional development that will enable the PI to forge a new direction in their scholarship, and a strong rationale for why this support is needed for the PI to become competitive in the new research area. Support for the proposed transition from the PI's department, described in a letter from the department chair or equivalent, will also be required. Proposals that do not describe a plan for a transition in research direction will be considered unresponsive. Proposals that are motivated to understand the molecular and cellular basis of disease and disease treatments are not appropriate for the Division and will be returned without review.

Proposals addressing major open questions at the intersections of biology with other disciplines, such as physics, chemistry, mathematics, computer sciences, and engineering are of particular interest to the program.

#### **Cognizant Program Officer(s):**

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

- Wilson A. Francisco, telephone: (703) 292-7856, email: [wfrancis@nsf.gov](mailto:wfrancis@nsf.gov)
- Anthony G. Garza, telephone: (703) 292-8440, email: [aggarza@nsf.gov](mailto:aggarza@nsf.gov)
- Manju M. Hingorani, telephone: 703-292-7323, email: [mhingora@nsf.gov](mailto:mhingora@nsf.gov)
- Richard J. Cyr, telephone: 703-292-8440, email: [rcyr@nsf.gov](mailto:rcyr@nsf.gov)

#### **Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):**

- 47.074 --- Biological Sciences

#### **Award Information**

**Anticipated Type of Award:** Standard Grant or Continuing Grant

**Estimated Number of Awards:** 5 to 8

**Anticipated Funding Amount:** \$6,000,000

Pending availability of funds

#### **Eligibility Information**

##### **Who May Submit Proposals:**

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

##### **Who May Serve as PI:**

There are no restrictions or limits.

##### **Limit on Number of Proposals per Organization:**

There are no restrictions or limits.

#### **Limit on Number of Proposals per PI or Co-PI:**

There are no restrictions or limits.

## **Proposal Preparation and Submission Instructions**

### **A. Proposal Preparation Instructions**

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
  - Full Proposals submitted via Research.gov: *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website at: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=pappg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg).
  - Full Proposals submitted via Grants.gov: *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov* guidelines apply (Note: The *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)).

### **B. Budgetary Information**

- **Cost Sharing Requirements:**

Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:**

Not Applicable
- **Other Budgetary Limitations:**

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

### **C. Due Dates**

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

Proposals Accepted Anytime

## **Proposal Review Information Criteria**

### **Merit Review Criteria:**

National Science Board approved criteria. Additional merit review criteria apply. Please see the full text of this solicitation for further information.

## **Award Administration Information**

### **Award Conditions:**

Standard NSF award conditions apply.

### **Reporting Requirements:**

Standard NSF reporting requirements apply.

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## I. INTRODUCTION

Through the Transitions to Excellence In Molecular and Cellular Biosciences Research” (Transitions Award) program, MCB is seeking proposals that (1) promote fundamental understanding of complex living systems at the molecular, subcellular, and cellular levels typical of its core research programs and (2) enable investigators with a strong prior track record of accomplishment to expand or change research direction, thus ensuring their continued competitiveness in science.

Core research programs in MCB place a high priority on projects that provide mechanistic insights that can be used predictively to establish and verify the rules governing life’s processes. MCB encourages proposals that address major biological questions at the intersections of biology with other disciplines, such as physics, chemistry, mathematics, computer sciences, and engineering.

The following cross-cutting areas of research, most notably where they elucidate the rules governing life’s processes, will be given high priority for funding in all clusters in MCB core programs.

- **Integrating Across Scales:** Integrating knowledge from single molecules to molecular machines and from networks to subcellular and cellular complexity.
- **Transformative Methods and Resources:** Developing technologies for molecular and cellular biology research (when motivated by compelling biological questions), including biophysical, computational, and synthetic biology based methods for broad application and genetic resources for model systems.
- **Molecular and Cellular Evolution:** Discovering mechanisms and theoretical underpinnings of evolutionary changes in molecules, genomes and cells of all types, including archaeal, bacterial, and eukaryotic, along with their respective phages/viruses.
- **Synthesizing Life-Like Systems:** Using synthetic molecular parts and processes to understand the transition from simple to complex systems and to build novel living systems.
- **Understanding the Genome:** Integrating theoretical, computational, and high-throughput experimental approaches to determine and predict the function of the entire genome. Also, understanding how the structure and dynamics of the genome/epigenome, from the linear DNA sequence to 3D genome architecture, give rise to phenotype.

The Division recognizes that a basic understanding of life’s rules and processes has many potential applications to societal needs, and PIs are encouraged to consider these applications as Broader Impacts of the proposed work (e.g., bio-based technologies, addressing environmental issues, or medicine). However, research motivated by relevance to human disease and disease therapeutics is not supported by MCB, and proposals with such medical motivation will be returned without review.

A key component of successful Transitions Award proposals will be the demonstration of the potential for the PI to transition to a new and potentially transformative research area or direction. Evidence of that potential is expected to be in the form of a strong track record of prior accomplishments coupled with a compelling plan for professional development such as a sabbatical that would enable the PI to change research direction. The new research direction should align with MCB program priorities. There should also be a plan to continue that research direction at the PI’s home institution once the professional development period is completed. Highest priority will be given to those proposals that articulate a compelling need of support for a change in research direction and an outstanding plan for the new research direction.

Successful proposals often demonstrate close integration between scientific and educational aims and include a plan to assess the effectiveness of the proposed activities. Innovative activities that seek to broaden participation of underrepresented individuals in molecular and cellular research will be given high priority. MCB is particularly interested in increasing the participation of underrepresented groups in biological research and education such as women, persons with disabilities, and underrepresented minorities <sup>[1]</sup> <sup>[2]</sup>, and those from geographically underrepresented areas in science, technology, engineering, and mathematics (STEM). Proposals submitted to any program described in this solicitation are strongly encouraged to involve PIs, co-PIs, postdoctoral fellows, students, and other personnel who are members of these groups. Proposers are also strongly encouraged to consider involving veterans of the U.S. Armed Forces as part of NSF’s broader effort to promote veteran involvement in

STEM research and education.

[1] <https://nces.nsf.gov/pubs/nsf19304/digest/introduction>

[2] [https://nsf.gov/resources.nsf.gov/2022-03/2019-2020-ceose-biennial-report-508\\_1.pdf](https://nsf.gov/resources.nsf.gov/2022-03/2019-2020-ceose-biennial-report-508_1.pdf)

## II. PROGRAM DESCRIPTION

MCB welcomes proposals for the Transitions Award solicitation from mid-career or later stage researchers (Associate or Full Professor, or equivalent) for projects that would enable PIs to obtain up to 6 months of professional development (sabbatical leave or similar mechanism) to make a transition in their research program that would increase their competitiveness and enhance their ability to perform potentially transformative research in the molecular and cellular biosciences. The award would fund up to 6 months of PI salary during the first sabbatical or professional development year, followed by support for continued research for two subsequent years upon return to their normal academic duties. Requests for flexibility in the timing of the sabbatical or professional development year will be considered with appropriate justification. Please contact the cognizant program director for the solicitation.

Proposals for this solicitation are welcome in all areas of science supported by the Division of Molecular and Cellular Biosciences as described in the [MCB 18-585](#) solicitation for the following clusters.

[Cellular Dynamics and Function \(CDF\)](#)

[Genetic Mechanisms \(GM\)](#)

[Molecular Biophysics \(MB\)](#)

[Systems and Synthetic Biology \(SSB\)](#)

Proposals are expected to address a fundamental biological research question, aligned with the sciences supported by MCB, and document a plan for a substantial change or capacity in research direction. This change in research direction should enhance the PI's potential to carry out transformative research. A detailed description of the plan for professional development should be provided that addresses why the professional development is needed, and how the professional development activities will enable the PI to change research directions. The plan for continuation of the new research direction after the professional development period should also be provided that is strong in both intellectual merit and broader impact.

To be responsive to this solicitation, successful proposals will:

- Develop or enable innovative approaches to fundamental questions in biological sciences at the molecular or cellular scale.
- Describe previous successful research efforts.
- Demonstrate the need and potential to move into a new and/or cutting-edge area of research.

## III. AWARD INFORMATION

Pending availability of funds, approximately \$6M will be committed in total for all new awards in each fiscal year. Awards of up to \$750,000 each will be given through this solicitation. The anticipated duration of awards is three years.

## IV. ELIGIBILITY INFORMATION

### Who May Submit Proposals:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), Chapter I.E. Unaffiliated individuals are not eligible to submit proposals in response to this solicitation.

### Who May Serve as PI:

There are no restrictions or limits.

### Limit on Number of Proposals per Organization:

There are no restrictions or limits.

### Limit on Number of Proposals per PI or Co-PI:

There are no restrictions or limits.

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

### A. Proposal Preparation Instructions

**Full Proposal Preparation Instructions:** Proposers may opt to submit proposals in response to this Program Solicitation via Research.gov or Grants.gov.

- Full Proposals submitted via Research.gov: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *NSF Proposal and Award Policies and Procedures Guide* (PAPPG). The complete text of the PAPPG is available electronically on the NSF website at: [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=pappg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg). Paper copies of the PAPPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov). The Prepare New Proposal setup will prompt you for the program solicitation number.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the *NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov*. The complete text of the *NSF Grants.gov Application Guide* is available on the Grants.gov website and on the NSF website at: ([https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=grantsgovguide](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov).

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

**Collaborative Proposals.** All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via Research.gov. PAPPG Chapter II.D.3 provides additional information on collaborative proposals.

See PAPPG Chapter II.C.2 for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the PAPPG instructions.

The proposal should be prepared as outlined by the PAPPG except for the following:

The **title** of the proposed project should be prefaced by the word, "Transitions:"

In the Project Description, within the discussion of Intellectual Merit, the proposal must contain **three separate sections** entitled:

- **Prior Accomplishments** in which the proposer's prior research accomplishments are summarized.
- **Professional Development Plan** in which the proposer articulates a compelling plan and goal(s) for the sabbatical, professional development, or related activity. In this section, the PI must also describe why this support is needed and how it will enable the PI to transition their research program into a potentially transformational area in the molecular and cellular biosciences.
- **Research Plan** in which the proposer describes the plan for continuation of the research activities begun during professional development at their home institution.

Within the Project Description, a section labeled "Broader Impacts" is still required as per the PAPPG.

Also required is a **letter** (up to 2 pages) from the Departmental Chair documenting support for the proposer and their professional development plan. A letter from the host lab for the sabbatical (up to 2 pages) may also be included. Both documents should be uploaded under Special Information and Supplementary Documents."

### B. Budgetary Information

#### Cost Sharing:

Inclusion of voluntary committed cost sharing is prohibited.

#### Other Budgetary Limitations:

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

### C. Due Dates

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

Proposals Accepted Anytime

## D. Research.gov/Grants.gov Requirements

### For Proposals Submitted Via Research.gov:

To prepare and submit a proposal via Research.gov, see detailed technical instructions available at: [https://www.research.gov/research-portal/appmanager/base/desktop?\\_nfpb=true&\\_pageLabel=research\\_node\\_display&\\_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html](https://www.research.gov/research-portal/appmanager/base/desktop?_nfpb=true&_pageLabel=research_node_display&_nodePath=/researchGov/Service/Desktop/ProposalPreparationandSubmission.html). For Research.gov user support, call the Research.gov Help Desk at 1-800-673-6188 or e-mail [rgov@nsf.gov](mailto:rgov@nsf.gov). The Research.gov Help Desk answers general technical questions related to the use of the Research.gov system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

### For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: <https://www.grants.gov/web/grants/applicants.html>. In addition, the NSF Grants.gov Application Guide (see link in Section V.A) provides instructions regarding the technical preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: [support@grants.gov](mailto:support@grants.gov). The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

**Submitting the Proposal:** Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

Proposers that submitted via Research.gov may use Research.gov to verify the status of their submission to NSF. For proposers that submitted via Grants.gov, until an application has been received and validated by NSF, the Authorized Organizational Representative may check the status of an application on Grants.gov. After proposers have received an e-mail notification from NSF, Research.gov should be used to check the status of an application.

## VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in PAPPG Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: [https://www.nsf.gov/bfa/dias/policy/merit\\_review/](https://www.nsf.gov/bfa/dias/policy/merit_review/).

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Building the Future: Investing in Discovery and Innovation - NSF Strategic Plan for Fiscal Years (FY) 2018 - 2022*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

## A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

### 1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

### 2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (PAPPG Chapter II.C.2.d(i). contains additional information for use by proposers in development of the Project Description section of the proposal). Reviewers are strongly encouraged to review the criteria, including PAPPG Chapter II.C.2.d(i), prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
  - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
  - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. 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?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?



Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

### **Additional Solicitation Specific Review Criteria**

In addition to the standard NSF review criteria, reviewers will be asked to evaluate: 1) does the Professional Development Plan describe a compelling strategy to enable the PI to gain new expertise in an area that is likely to enable the PI to engage in potentially transformational research in the molecular and cellular biosciences; 2) does the Professional Development Plan convey convincing justification for the need for support for the professional development activity; and 3) does the Research Plan describe a strategy that is likely to be effective in enabling the PI to transition to the new research area in at their home institution? In addition, reviewers will be asked to evaluate if the professional development plan is likely to be successful given the PI's track record of Prior Accomplishments" and the institutional support for the activity as documented in the letter from the Department Chair.

## **B. Review and Selection Process**

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will generally be completed and submitted by each reviewer and/or panel. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

## **VII. AWARD ADMINISTRATION INFORMATION**

### **A. Notification of the Award**

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

### **B. Award Conditions**

An NSF award consists of: (1) the award notice, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award notice; (4) the applicable award

conditions, such as Grant General Conditions (GC-1)\*; or Research Terms and Conditions\* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

\*These documents may be accessed electronically on NSF's Website at [https://www.nsf.gov/awards/managing/award\\_conditions.jsp?org=NSF](https://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-8134 or by e-mail from [nsfpubs@nsf.gov](mailto:nsfpubs@nsf.gov).

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=pappg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg).

## Administrative and National Policy Requirements

### Build America, Buy America

As expressed in Executive Order 14005, [Ensuring the Future is Made in All of America by All of America's Workers](#) (86 FR 7475), it is the policy of the executive branch to use terms and conditions of Federal financial assistance awards to maximize, consistent with law, the use of goods, products, and materials produced in, and services offered in, the United States.

Consistent with the requirements of the Build America, Buy America Act (Pub. L. 117-58, Division G, Title IX, Subtitle A, November 15, 2021), no funding made available through this funding opportunity may be obligated for an award unless all iron, steel, manufactured products, and construction materials used in the project are produced in the United States. For additional information, visit NSF's [Build America, Buy America](#) webpage.

## C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer no later than 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). No later than 120 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through [Research.gov](#), for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via [Research.gov](#) constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using [Research.gov](#). This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) Chapter VII, available electronically on the NSF Website at [https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=pappg](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg).

## 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:

- Wilson A. Francisco, telephone: (703) 292-7856, email: [wfrancis@nsf.gov](mailto:wfrancis@nsf.gov)
- Anthony G. Garza, telephone: (703) 292-8440, email: [aggarza@nsf.gov](mailto:aggarza@nsf.gov)
- Manju M. Hingorani, telephone: 703-292-7323, email: [mhingora@nsf.gov](mailto:mhingora@nsf.gov)
- Richard J. Cyr, telephone: 703-292-8440, email: [rcyr@nsf.gov](mailto:rcyr@nsf.gov)

For questions related to the use of FastLane or Research.gov, contact:

- FastLane and Research.gov Help Desk: 1-800-673-6188

FastLane Help Desk e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

Research.gov Help Desk e-mail: [rgov@nsf.gov](mailto: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](mailto:support@grants.gov).

## IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF [Grants Conferences](#). Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on [NSF's website](#).

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this mechanism. Further information on Grants.gov may be obtained at <https://www.grants.gov>.

## ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

*Facilitation Awards for Scientists and Engineers with Disabilities (FASED)* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See the *NSF Proposal & Award Policies & Procedures Guide* Chapter II.E.6 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <https://www.nsf.gov>

- **Location:** 2415 Eisenhower Avenue, Alexandria, VA 22314
- **For General Information** (703) 292-5111  
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## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See [System of Record Notices](#), NSF-50, "Principal Investigator/Proposal File and Associated Records," and NSF-51, "Reviewer/Proposal File and Associated Records." Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton  
Reports Clearance Officer  
Policy Office, Division of Institution and Award Support  
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Alexandria, VA 22314

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