



**U.S. NATIONAL SCIENCE FOUNDATION
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ALEXANDRIA, VIRGINIA 22314**

NSF 24-054

Dear Colleague Letter: Special Guidelines for Submitting Collaborative Proposals under U.S. National Science Foundation (NSF) and the Department of Biotechnology (DBT) of India Collaborative Research Opportunities

February 08, 2024

Dear Colleagues:

The U.S. National Science Foundation (NSF) and the Department of Biotechnology (DBT) of the Government of India have signed an Implementation Arrangement on research cooperation. The Implementation Arrangement provides a framework to encourage collaboration between U.S. and Indian research communities and sets out the principles by which joint activities might be supported. Through this research agency partnership, U.S. researchers may receive funding from NSF and India researchers may receive funding from DBT respectively.

This NSF-DBT collaborative research opportunity focuses specifically upon discoveries and innovations in areas of mutual interest to support advancing knowledge, technologies, and innovation that advance biotechnology and promote the bioeconomy.

Proposals may be submitted that address complex scientific challenges and innovate novel solutions that leverage advances in synthetic and engineering biology, systems and computational biology, and other associated fields that are foundational to developing future biomanufacturing solutions and advance the bioeconomy. Examples of challenge areas include but are not limited to:

- Development of innovative tools, technologies, and resources for genome engineering, and genome manipulations of plants and other organisms of relevance in synthetic and engineering biology
- Designing organelles (ribosomes, mitochondria, membranes, regulatory modules, molecular machines, etc.), or synthetic components that could be integrated into cells or cell-like systems

- Understanding the biological principles for cell programming and strain engineering in microbes and host (plant) microbe interactions in phytobiomes and rhizosphere
- Engineering DNA, RNA, and protein/enzyme
- Modelling of metabolic networks and interactions among networks
- Designing host expression system for recombinant proteins
- Engineering novel microbial chassis
- Developing and applying synthetic gene circuits
- Engineering novel plant chassis
- Predictive models of cells and subcellular systems that support mechanistic understanding and engineering design

Proposals submitted to this opportunity may focus on the development of foundational tools that would support all application spaces or focus on specific applications. Examples of application domains of interest include:

- The production of smart proteins and high value small chemical molecules of industrial importance
- Development of climate resilient crops as well as plants tailored as feedstocks
- Engineering microorganisms for enhanced CO₂ capture and conversion abilities
- Expanding protein functional diversity to expand the biochemical diversity for bioeconomy applications
- Engineering of microbial communities that reduce fertilizer use, enhance plant productivity, improve sustainability, and/or have the ability to improve the circularity of biomanufacturing production

The list of examples is intended to be illustrative, not exhaustive.

Through a research agency partnership, NSF and DBT will allow investigators from both countries to collaborate to write a single proposal that will undergo a single review process at NSF, the Coordinating Agency.

The collaborative opportunity described in this Dear Colleague Letter (DCL) remains in effect until archived.

Proposals will be accepted for collaborative research in areas within research divisions and participating NSF programs. The following programs are participating in this opportunity:

NSF

- Directorate for Biological Sciences
 - Division of Integrative Organismal Systems
 - [Plant Genome Research Program](#)
 - Division of Molecular and Cellular Biosciences

- Systems and Synthetic Biology
 - Molecular Biophysics
- Directorate for Engineering
 - Division of Chemical, Bioengineering, Environmental and Transport Systems
 - Cellular and Biochemical Engineering
 - Biosensing
- Cross-Directorate
 - Future Manufacturing: Future Biomanufacturing Research Thrust

DBT

- Proposals will be accepted for collaborative research in the proposed areas and coordinated by the Global Innovation Directorate of DBT [<https://dbtindia.gov.in/>].

Proposals are expected to adhere to the research areas, funding limits, and grant durations for the participating NSF programs and for the DBT programs from which funding is sought. As details vary by NSF program, U.S. Principal Investigators (PIs) are encouraged to contact program directors of pertinent NSF programs for specific guidance. Indian Principal Investigators (PIs) are encouraged to contact program officers of the Global Innovation Directorate of DBT.

Proposals must represent the collaborative effort describing the integrated U.S. and India PI efforts including roles and responsibilities and means of collaboration. The budget submitted by the U.S. investigators must be within the program limit and will reflect U.S. research activities only. For U.S. investigators, involvement in a joint international proposal will count towards the limit on the number of submissions, as specified in the NSF program webpage or program solicitation to which the proposal is submitted.

Investigators are advised that all documents submitted to NSF or DBT may be shared with the other agency in order to implement the two-way agency activities.

PROPOSAL PREPARATION AND SUBMISSION

Proposals will be submitted to NSF, with a separate copy of the same proposal submitted by the India applicants to DBT on the same day as the NSF submission. The proposals will be reviewed by experts contacted by NSF, the Coordinating Agency, in competition with other proposals received for the same funding round of the program to which the proposal is submitted, using NSF's merit review process. DBT will check that the Indian investigators have active and appropriate roles and confirm their eligibility at the onset of the process. DBT officials may attend and observe any discussions as part of the merit review process of U.S.-India collaborative proposals submitted in response to this opportunity but will not conduct a parallel review. DBT officials will have access to unattributed reviews and panel summaries

where applicable. NSF intends to make awards to the U.S. investigators participating in the recommended collaborative proposals, and DBT intends to make awards to the Indian investigators participating in the recommended collaborative proposals.

There are no separate NSF funds available for this effort; proposals must compete with all other proposals submitted to the NSF program competitions listed above.

WHEN TO SUBMIT

There is only one round of proposal submissions related to this DCL. Proposals submitted to an NSF program that accepts proposals at any time must be submitted by April 11, 2024. Proposals submitted to any other participating NSF program must be submitted following the program due dates for calendar year 2024.

GUIDELINES

1. The proposed work submitted under an NSF-DBT collaboration must represent an integrated collaborative effort. The Project Summary and Project Description of the proposal must include a description of the collaboration, including an explanation of the role(s) of the India collaborator(s) and an explanation of how the team will work together. The Project Summary, Project Description, and references used must be exactly the same when submitted to both NSF and DBT.
2. The proposal must describe the intellectual merits of the proposed research, including the value of the international collaboration and the anticipated broader impacts (including societal benefits) of the effort. As broader impacts are a review requirement for both NSF and DBT, the proposal should include relevant societal benefits as well.
3. The proposal should describe the full proposed research program, including the total U.S. and Indian resources that will be part of the project. NSF investigators should indicate only the NSF expenses in the NSF budget. DBT investigators should indicate only the DBT research expenses on the DBT budget form. **The DBT budget and budget justification must be included in the NSF proposal as a Supplementary Document.** The Budget Justification section of the NSF proposal should clearly differentiate the NSF budget from any similar funds requested by the India team and justify the full NSF project budget. Proposals that request duplicative funding may be returned without review.
4. DBT investigators will submit their full proposal as per DBT guidelines (<https://dbtindia.gov.in/>) through DBT eProMIS: <https://dbtepromis.nic.in/>, DBT NSF portal under International Cooperation-Bilateral Program in e-ProMIS.
5. Proposals must be submitted to a participating NSF program following the requirements outlined in this DCL as well as the guidance contained in the relevant program solicitation or program description. As specified in the relevant funding opportunities, proposers are to comply with the proposal preparation requirements outlined in NSF's

Proposal and Award Policies and Procedure Guide (PAPPG – https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg) and submit the proposal through Research.gov (<https://www.research.gov/research-web/>) or Grants.gov (<http://grants.gov>). Where programs have a solicitation, the requirements in the solicitation take precedence over those listed in the PAPPG.

6. By submitting, PIs and their organizations agree that NSF may share proposal materials, unattributed reviews and information pertaining to the review process with DBT.
7. If applicable, for NSF investigators, involvement in a joint international proposal will count towards the limit on the number of submissions in which an individual may participate as PI, co-PI, or senior personnel, as specified in the relevant program solicitation to which the proposal is submitted.
8. The title of the proposal should be prefixed with "NSF-DBT:", after any solicitation-specific title requirements, to indicate that the document is to be considered by both NSF and DBT.
9. If the proposal is arranged as separate submissions from multiple U.S. organizations, it must be submitted via Research.gov and the title of the proposal should begin with "Collaborative Research:" followed by "NSF-DBT". **Do not check "separately submitted collaborative proposal" unless more than one U.S.-based organization will be submitting the same proposal for separate funding** (i.e., the "separately submitted collaborative proposal" check box only applies if there is more than one collaborating organization on the U.S. side, each submitting the same proposal).
10. For proposals submitted to NSF, DBT investigators should be listed in the Overview section of the Project Summary as "Non-NSF funded collaborators." This listing is for administrative purposes and is not intended to characterize the level or value of the contribution of DBT investigators to the project. Guidance on information to provide for "Non-NSF funded collaborators" is below.
 - Biographical Sketch – Required. The biographical information must be clearly identified as "non-NSF funded collaborators" biographical information and uploaded as a single PDF file in the Other Supplementary Documents section of the proposal. Use of a specific format is not required.
 - Current and Pending (Other) Support – Not required for DBT investigators.
 - Results from Prior NSF Support – Not required for DBT investigators.
 - Collaborators and Other Affiliations (COA) information must be provided through the use of the [COA template](#), identified as "non-NSF funded collaborators" information, and uploaded as a PDF file in the Single Copy Documents section of the proposal.
11. NSF investigators should indicate only the NSF expenses in the NSF budget. DBT investigators should indicate only the DBT research expenses on the DBT budget form. The DBT budget and budget justification must be included in the NSF proposal as a Supplementary Document including expenses in U.S. dollars. The Budget Justification

section of the NSF proposal should clearly differentiate the U.S. budget from any similar funds requested by the India team and justify the full U.S. project budget requested. Proposals that request duplicative funding may be returned without review.

12. The Data Management Plan must include mechanisms for sharing and archiving data including experimental data, results, and software developed, in accordance with NSF and DBT policy and U.S. and India statutes, with consideration of associated privacy and security aspects. Please review and follow the program specific requirements for data management plans.
13. For projects involving human subjects/participants or vertebrate animals, investigators should follow both NSF and DBT policies, submitting documentation to each as appropriate.
14. Letters of collaboration may be included; however, they must comply with the requirements in [PAPPG Chapter II.D.2.i](#).
15. For DBT Investigators, there are limits on the number of submissions per NSF-DBT call for proposals:
 - PIs can submit one proposal.
 - Co-PIs can be involved in up to two proposals.
 - DBT Investigators involved in the implementation of two or more projects that were previously supported by the DBT International Cooperation programme and that are not expected to be completed before 31 March 2024 are not eligible to be a member of a research team. This limitation does not apply to projects supported by other divisions or groups within DBT.

POST AWARD CONSIDERATIONS

Recipients will be expected to comply with the award conditions and reporting requirements of the agencies from which they receive funding.

Recipients will be required to acknowledge both NSF and DBT in any reports or publications resulting from the award. Requests for changes in awards (for example, changes in scope) will be discussed by NSF and DBT before a joint decision is made.

Questions about this DCL may be directed to india-collaboration@nsf.gov. Additionally, the NSF Office of International Science and Engineering helps to coordinate the overall engagement between NSF and DBT. The current OISE program manager for India is listed at <https://www.nsf.gov/od/oise/country-list.jsp>.

Sincerely,

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Assistant Director, Directorate for Biological Sciences

Susan Margulies
Assistant Director, Directorate for Engineering

Kendra Sharp
Office Head, Office of International Science and Engineering