Developing and Demonstrating Nanosensor Technology to Detect, Monitor, and Degrade Pollutants

Informational Webinar for Applicants

EPA STAR Funding Opportunity

August 29, 2024

Webinar Objectives

- Review application information for the EPA STAR Funding Opportunity:

  "Developing and Demonstrating Nanosensor Technology to Detect, Monitor, and Degrade Pollutants"

- Provide guidance for eligibility, submission, technical aspects of application process
- Answer questions about the application process

Webinar Rules

Webinar Ground Rules

- Please hold your questions until the presentation is complete.
- You may type your questions in the comments box.
- Specific research projects or ideas should not be discussed but clarifying questions regarding the funding recommendation may be answered.
- Slides and Q&A transcript will be provided after the webinar.
- Please keep yourself muted during the presentation.

Agency Contacts

- **Technical Contact:** Hayley Aja, Project Officer (aja.hayley@epa.gov); phone: 202-564-6427
- **Eligibility Contact:** Ron Josephson, Eligibility Officer (josephson.ron@epa.gov); phone: 202-564-7823
- **Peer Review Contact:** Mirtha Cápiro, Science Review Officer (capiro.mirtha@epa.gov); phone: 202-564-8617
- **Electronic Submissions:** electronic-grant-submissions@epa.gov

Funding Opportunity and Award Information

- Funding opportunity will close on **November 13, 2024**, 11:59:59 p.m. Eastern Time
- Estimated Number of Awards: 1
- Total Funding Amount: $1,500,000 (including direct + indirect costs)
- Project Period: 3 years
- No cost sharing required
- Award information details can be found in **Section II** of the funding opportunity

Read the funding opportunity very carefully, all necessary information is provided

STAR Research Grants

- Science to Achieve Results (STAR) is a competitive, peer-reviewed, extramural research program that provides access to the nation's best scientists and engineers in academic and other non-profit research institutions.
- The STAR program's goal is to stimulate and support scientific and engineering research that advances EPA's mission to protect human health and the environment.

Background

- Advances in nanotechnology have significantly advanced the field of environmental science. Because of their unique properties, nanomaterials have enabled advances in sensor design to improve specificity and sensitivity.
- Nanomaterials are also being used to develop new environmental remediation technologies to capture and degrade pollutants.
- Per- and polyfluoroalkyl substances (PFAS) are persistent pollutants that are difficult to detect at low levels and to degrade without toxic by-products.
- EPA is soliciting research to develop and demonstrate nanosensor technology with functionalized catalysts that have potential to **degrade**, in addition to **detecting** and **monitoring,** PFAS chemicals in drinking water sources.

Research Interests and Questions

Applications must address <u>both</u> of the following research areas:

1. Develop and demonstrate nanosensor technology to **detect and monitor PFAS in drinking water sources**
   - Groundwater and surface water that may be used as drinking water sources.

2. Develop and demonstrate nanosensor technology with **functionalized catalysts to degrade PFAS**
   - Degradation should include a mineralization process with destruction of carbon-fluorine bond without creating harmful by-products

Research Specifics

- Different nanomaterials may be used for detection/monitoring and degradation portions, but should focus on the same PFAS.
- Specific PFAS studied should be listed in EPA's Fifth Unregulated Contaminant Monitoring Rule (UCMR5).
- EPA is seeking projects with expected results that can be practically applied in real-world settings. This funding opportunity is not seeking proof-of-concept or bench-scale projects.
- This funding opportunity is seeking nanotechnology that is ready to be validated and demonstrated – not a new prototype – equivalent to a Technology Readiness Level (TRL) of 4-6.
  - Applicants should clearly define the TRL of their technology
  - STAR grant funding cannot be used for commercialization purposes

Expected Outputs/Outcomes

Nanosensor technology with…

- Proven sensitivity and selectivity to monitor spatial and temporal changes in PFAS.
- Scalable and practical beyond laboratory settings to provide real-time, remotely accessible data on PFAS levels.
- Demonstrated ability to remove and/or degrade PFAS in drinking water sources.
- Potential to address unmet environmental sensing and management needs.
- Evidence for development, implementation, and scaling for environmental sensing and management.
- Established test cases for future applications of nano-enabled sensing and catalysis.
- Cutting-edge techniques in sensing and monitoring.
- Outreach materials for stakeholders demonstrating the benefits of nanosensor technology for environmental sensing and management.

Eligibility Information

Eligible Applicants (Section III):

- Public and private nonprofit institutions/organizations
- Public and private institutions of higher education
- Hospitals located in the U.S.
- State and local governments
- Federally Recognized Indian Tribal Governments
- Foreign collaborators, data collection or use are OK

Eligibility Information (2)

Not Eligible to Apply (Section III)

- Profit-making firms
- Individuals
- Foreign governments or international organizations
- Federal agencies
- Federally-Funded Research and Development Centers (FFRDCs)

- FFRDC employees may cooperate or collaborate with eligible applicants within the limits imposed by applicable regulations
- Eligible entities can partner with some ineligible entities under EPA's Subaward Policy
- For-profit companies may NOT be subawardees, but they may be consultants subject to competitive procurement requirements (Section IV.C.5.iv.f)

Eligibility Information (3)

- **Applications must be submitted via Grants.gov**
  - If you cannot access Grants.gov, see Exceptions to Grants.gov Submission Requirement.
  - You must have SAM.gov registration ACTIVE in order to apply via Grants.gov.
- **Applications that exceed federal funding or performance period time limits will not be reviewed.**
  - Project start date does not really matter, as long as period of performance is within three years.
  - Research usually starts six to nine months after the close of the funding opportunity.
- **Applications from ineligible organizations, or that are somehow not substantially compliant, will not be reviewed.**
- **Organizations and investigators may submit more than one application, as long as they are substantially different.**

Application Materials and Process

- Applications must be received electronically through **Grants.gov** under the funding opportunity number (EPA-G2024-STAR-G1)
- Application and submission information can be found in **Section IV**
- Formal instructions for submission can be found in **Section IV.F**
- Institution must have active SAM.gov registration in order to apply
- Applications must include all information requested in **Section IV.C**
- All necessary forms are available at: How to Apply and Required Forms
- Required application package materials include:
  - Human Subjects Research Statement (HSRS)
  - Scientific Data Management Plan (SDMP)

Make sure to include the Current and Pending Support form in your Grants.gov submission

Application Materials and Process (2)

- If you have trouble with Grants.gov, perform the steps in Section IV.F.5 **before** the close of the funding opportunity.
- You may resubmit an application before the deadline, but changes are not permitted after a funding opportunity closes. If we see duplicates of the same application, we will process the most recent one.
- If you are experiencing a natural disaster and cannot submit on time, please contact us immediately.
- Letters of support or intent from EPA employees are prohibited, and we will remove such letters if we find them.

Application Materials and Process (3)

Component	NOFO Section	Page Limit
¥SF-424 (Application for Federal Assistance)	IV.C.1	N/A
¥EPA Form 5700-54 (Key Contacts)	IV.C.2	N/A
¥EPA Form 4700-4 (Preaward Compliance Review Report)	IV.C.3	N/A
¥SF-424A Section B (Budget Information for Non-Construction Programs)	IV.C.4	N/A
Table of Content	IV.C.5.i	none
Abstract	IV.C.5.ii	1
Research Plan	IV.C.5.iii.a	15
Quality Assurance Statement (QAS)	IV.C.5.iii.b	3
Human Subjects Research Statement (HSRS)	IV.C.5.iii.c	4
Scientific Data Management Plan (SDMP)	IV.C.5.iii.d	2
References	IV.C.5.iii.f	none
Budget Justification	IV.C.5.iv	3
Resume	IV.C.5.v	2 per investigator/senior personnel
§Current and Pending Support (w/ certification statements)	IV.C.5.vi	N/A
Letters of Intent/Letters of Support	IV.C.5.vii.a	1 per letter
§Additional Key Contacts Form, if appropriate	IV.C.2	N/A

Submit as one PDF

¥Available at https://www.grants.gov; §Available at https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms

Application Review Process

- Detailed information about review criteria can be found in **Section V**.
- Peer Review
  - All eligible applications are reviewed by external technical experts for scientific merit.
  - Peer review criteria (listed in descending order of importance):
    1. Research Merits
    2. Responsiveness
    3. Project Management
  - Peer reviewers rate the applications with a score of Excellent, Very Good, Good, Fair, or Poor
  - Applications receiving final peer review scores of Excellent or Very Good will then undergo an internal relevancy review, as described on the next slide.

Application Review Process

- Relevancy Review
  - Applicants who pass peer review will undergo an internal relevancy review by EPA experts to ensure an integrated research portfolio for the Agency.
  - Relevancy review criteria:
    1. The degree to which the proposed science/research is relevant to EPA's priorities as described in Goal 7: Ensure Safety of Chemicals for People and the Environment, Objective 7.2: Promote Pollution Prevention, of EPA's FY2022-2026 Strategic Plan.
    2. The degree to which results (i.e., outputs/outcomes) of the research have broad application or affect large segments of society.
    3. The degree to which the research is designed to produce data and methods that can immediately and/or with little to no translation be utilized by the public, states, and tribes to better assess or manage environmental problems.
- Past Performance History Review
  - Applicants who pass peer review will be asked to provide additional information on the PI's performance and reporting history under Federal grants.
  - If you do not have any relevant or available past performance/reporting information, please indicate this in your response and you will receive a neutral 'nothing to report' score

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  If you are interested in potentially serving on the external scientific Peer Review Panel, rather than applying, please send your contact information and a copy of your CV to Mirtha at your earliest convenience.

- **Electronic Submissions:** electronic-grant-submissions@epa.gov

Thank you!