National Institute of Environmental Health Sciences
Your Environment. Your Health.

These slides will be posted on R01 webpage later this week. Audio available by request. *Text in italics has been added since the webinar based on Q/A.*

Connection Problems – please use Q/A pod, call or email sara.amolegbe@nih.gov.

March 9, 2020 2-3 pm EDT

Funding Opportunities Webinar for RFA-ES-20-004

Optimizing Natural Systems for Remediation: Utilizing Innovative Materials Science Approaches to Enhance Bioremediation (R01)

National Institute of Environmental Health Sciences (NIEHS)
National Institutes of Health (NIH)

Superfund Research Program: William A. Suk, Heather Henry, Danielle Carlin, Michelle Heacock, Brittany Trottier
NIEHS Scientific Review: Laura Thomas, Alfonso Latoni
NIEHS Grants Management: Lisa Edwards, Jenny Greer
Moderator: Sara Amolegbe (MDB, Inc.)

https://www.niehs.nih.gov/research/supported/centers/srp/funding/funding2/index.cfm

Purpose of the Webinar

- Introduce the NIEHS Superfund Research Program
- Overview of the RFA
- Tips for Applicants
  - Strategy for the Research Strategy (and other sections)
  - Budget Resources
- Submit Questions via Q/A box.
  - Submit a question “to all panelists” via the Q&A box in the bottom right-hand corner of your screen.
  - Questions related to application process will be answered as time allows.
  - Questions about the science/scope of a project will be answered in follow-up conversations/emails offline.

About the Superfund Research Program

- University-based basic research program established in 1986 under Superfund Amendments Reauthorization Act (SARA)
- Mandates Development of:
  - Advanced techniques for the detection, assessment, and evaluation of the human health effects of hazardous substances
  - Methods to assess the risks to human health presented by hazardous substances
  - Methods and technologies to detect hazardous substances in the environment
  - Basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances

https://www.niehs.nih.gov/research/supported/centers/srp/

Purpose of the R01 Program

- R01 Program Established 2006
  - Enhance breadth of environmental science and engineering portfolio
  - Complement the research in the P42 Multi-Project Center portfolio
- Five focused RFAs since established in 2006
  - Emphasis on application-oriented mechanistic research
  - Technology driven: from biological to nanotechnological
  - Sustainable approaches to remediation

RFA-ES-20-004 Optimizing Natural Systems for Remediation: Utilizing Innovative Materials Science Approaches to Enhance Bioremediation (R01)

Current Solicitation

- Using materials science to optimize conditions for bioremediation of hazardous substances
- Builds on NIEHS Strategic Plan of 2018 and SRP Strategic Plan Objectives and Goals: 2015-2020
  - a commitment to fostering innovation
  - advancing fundamental science through interdisciplinary and transdisciplinary research
  - sustainable solutions to reduce exposures to hazardous substances: achieve net environmental, economic, and societal gains (NRC, 2011)
  - data sharing, reuse, and its translation to knowledge to accelerate new breakthroughs

RFA-ES-20-004

Application Tips

Heather Henry, PhD
Program Officer, Superfund Research Program

Basic, Application - Oriented Science

- Elucidate the mechanisms of bioremediation through transdisciplinary research incorporating materials science
- Value-added of the transdisciplinary science
  - novelty of the collaboration, innovation of the proposed materials
  - collaboration addresses critical gap in the practice of bioremediation: improving speed, reducing toxic byproducts, enabling remediation of co-contaminants, etc.
- Advantage over current approaches improved energy/resource-efficiency, cost effectiveness, and/or reduced waste generation relative to other remediation technologies
- Describe criteria for success such as parameters that evaluate effectiveness or a set of criteria demonstrating achievement of technical milestones

Scope

- "Bioremediation involves the use of biota (*e.g.* bacteria, algae, fungi, plants, *etc.*) to reduce or detoxify hazardous substances in the environment."
- "Bioremediation of media relevant to Superfund (*e.g.* soil, groundwater, surface water, sediments, complex geological aquifers, fractured bedrock, *etc*)."
- "Approaches that are adaptable for *in situ* application are encouraged."
- "Recalcitrant emerging contaminants, and mixtures (*i.e.* a heterogeneous group of contaminants) as these may require carefully engineered systems to maximize the efficacy of bioremediation"
- "Platform approaches that may be adaptable/tunable for more than just one specific contaminant and/or exposure scenario"

Dos and Don'ts

- Excluded:
  - "petroleum and natural gas…(including hazardous substances associated with hydraulic fracturing)" – per SARA legislation
  - "applications…focused on a specific hazardous site"
  - Non-innovative or commonly used nanomaterials: "nano zero valent iron (NZVI) alone," "other first-generation nanoparticles," "commercially-available nanotechnology/advanced materials"

R Application Guide

- **R Application Guide** is tailored to the R01 mechanism
  - Guide to assembling your application available in pdf: https://grants.nih.gov/grants/how-to-apply-application-guide/forms-i/general-forms-i.pdf
  - Additional instructions found in "Section IV. Application and Submission Information" in the FOA.
  - Note – the General (G) Application Guide can also be a resource for this FOA since the G Application Guide applies to all grant mechanisms and is conveniently available online as well as in pdf format.
- **Other Project Information** (Starts on Page R-34 in R Application Guide)
- **Research Plan** (Starts on Page R-79 in R Application Guide)
  - Includes:
    - Specific Aims (1 page)
    - Research Strategy (12 page "nuts and bolts") – see RFA for additional instructions…

Other Project Information

Starts on Page R-34 in R Application Guide

4. Environmental Questions (positive/negative impact, 55 characters, if appropriate, cite sections where more details provided)
5. (not applicable)
6. Foreign collaborators? (if yes, must add "Foreign Justification" in 12. Other Attachments, see #12 below)
7. Project Summary/Abstract (please write for a general scientifically literate audience (think "Scientific American")
8. Project Narrative (relevance of this research to public health, relevance to Superfund)
9. Bibliography & References Cited
10. Facilities & Other Resources (biohazard handling, resources for early stage investigators, in-kind support from institution, etc)
11. Equipment (equipment available for this project)
12. Other Attachments ("Foreign Justification" goes here)

See the guidelines for additional details.

Biohazards – (Other Project Information 10 Facilities and Other Resources)

- **From RFA:** "Biohazards: Procedures for proper handling and disposal should be included for biological materials, hazardous chemicals, as well as procedures to ensure safe handling of advanced materials (such as nanomaterials)."
- **Guidance: This information can be provided in** in "10. Facilities & Other Resources." Generally, this is a brief summary of laboratory practices, with attention to any materials (biological, chemical, nanoscale) that might be perceived as harmful for the work environment. Including citations/webpages of your institutions' policy/handbook, laboratory certifications, safety training practices (including OSHA, HAZWOPER), and disposal practices are a good way to indicate procedures are in place for proper handling and disposal.

Research Plan

Starts on Page R-79 in R Application Guide. Sections for this FOA:

2. Specific Aims (1 page) - usually hypothesis-oriented, generally 3-4 aims, very important resource for assigned and unassigned reviewers.

3. Research Strategy (12 pages) includes sections: Significance, Innovation, Approach, Preliminary Studies.

7. Multiple PD/PI Leadership Plan (as applicable)

8. Consortium/Contractual Arrangements (as applicable)

9. Letters of Support Letters from collaborators, advisors/consultants, potential stakeholders/end-users

10. Resource Sharing Plan(s): Data Sharing Plan (per FOA, this should include details about 1) Data Management as well as 2) Research Translation), Sharing Model Organisms, and Genomic Data Sharing

11. Authentication of Key Biological and/or Chemical Resources (good place to detail QA/QC and "Rigor and Reproducibility")

Research Strategy (Research Plan Section 3)

- Include in Research Strategy (from the RFA):
  - Basic bioremediation - Applications should include…a clearly stated hypothesis based on a mechanistic bioremediation research question(s).
  - Describe how the research will advance fundamental knowledge and apply that knowledge to address challenging scenarios where bioremediation may be a solution
  - Describe the transdisciplinary science opportunity gained (value-added and/or novelty) from the combination of bioremediation and materials science expertise
  - Success criteria and milestones to evaluate effectiveness of strategy (timeline)
  - Brief statement about sustainability considerations and economic/cost savings (1-2 paragraphs)…see next slide

This note added post-webinar: Reviewers may be looking for some aspects of Rigor and Reproducibility in your "Research Strategy: https://grants.nih.gov/policy-and-compliance/policy-topics/reproducibility/guidance"

Research Strategy (Research Plan Section 3)

- More about: “brief statement about sustainability considerations and economic/cost savings” (1-2 paragraphs)
- **Guidance:** For sustainability considerations, applicants may wish to include a “Sustainability Considerations” section (1-2 paragraphs) to describe how the proposed project offers sustainability advantage over current approaches, including improved energy/resource-efficiency, cost effectiveness, and/or reduced waste generation relative to other remediation technologies. Also, if the approach utilizes/generates materials for which the hazards are unknown, applicants are strongly encouraged to describe how potential environmental impacts will be mitigated/minimized. Applicants may wish to include plans to utilize life cycle assessment tools to assist in these considerations. Note: details about facilities to handle hazardous materials use/disposal can be detailed in “Other Project Information: 10. Facilities & Other Resources.”

This slide was added post-webinar.

Research Strategy (Research Plan Section 3)

- ***Rigor and Reproducibility**: Reviewers will assess whether the applicant adequately addresses "Guidance on Rigor and Reproducibility" see NIH Guidance: http://grants.nih.gov/reproducibility/index.htm.*
  - *Where to add Rigor and Responsibility into your application: https://grants.nih.gov/policy-and-compliance/policy-topics/reproducibility/guidance*
  - *The research strategy may:*
    - *Describe the strengths and weaknesses in the rigor of the prior research that serves as key support.*
    - *Describe plans to address weaknesses in the rigor of the prior research.*
    - *Describe how your experimental design and methods will achieve robust and unbiased results.*
    - *Explain how relevant biological/environmental variables are factored into research designs and analyses.*
- ***Guidance:** Note: some R&R details can also be provided in Authentication of Key Biological and/or Chemical Resources (Research Plan Section 11).*

Resource Sharing Plan (Research Plan Section 10)

- Individuals are required to comply with the instructions for the Resource Sharing Plans as provided in the SF424 (R&R) Application Guide: ‘omics data
- Also for this FOA:
  - Data Sharing Plan: see details in the RFA
  - Research Translation Plan: see details in the
- **Guidance:** The Data Sharing Plan is required for all applicants and, for this FOA, includes 1) **Plans for Data Management** and 2) **Plans for Research Translation**. These plans are meant to be flexible, allowing applicants to explore opportunities for data sharing and research translation throughout the duration of their grant. Hence, it is acceptable that some aspects of data sharing / research translation may still be under development at the time of submission; however, the plan should identify how the investigators intend to move towards making their data Findable, Accessible, Interoperable, and Reusable (“FAIR”) and opportunities that might be expected for translating findings to end-users. RFA

Resource Sharing Plan (Research Plan Section 10)

- As the FOA describes, elements of the **"Plans for Data Management"** would include:
  - types of data expected to be generated from the application
  - an approach for ontology (e.g. identifying/utilizing existing ontologies or developing new ones)
  - a synopsis of proposed data management/sharing activities
  - a timeline for sharing data publicly, including integrating with SRP website and/or public databases
- Helpful resources **"Plans for Data Management"**:
  - NIH is currently developing policy for Data Management and Sharing for grantees and encourage applicants to develop plans to propose.
  - Details about FAIR data sharing concepts of Findable, Accessible, Interoperable, and Reusable (FAIR) (see Wilkinson MD et al. Sci Data. 2016)
- In addition, data sharing facilities/infrastructure may be appropriate to include in the "Facilities and Other Resources" section. You may also include a biosketch for staff who are facilitating data management and sharing.

Resource Sharing Plan (Research Plan Section 10)

- Research Translation Plan: (subsection of Resource Sharing Plan)
  - "Plans for translating findings to end-users (*i.e.* research translation) may include, but would not be limited to: plans to involve potential end-users throughout the duration of the project; innovative approaches (*e.g.* social media) to deliver outcomes to broad audiences; coordination with end-users to optimize for cost-effectiveness or sustainability of technology; plans to format SRP-generated data/findings for use in advanced site characterization tools; plans to develop technical guidelines (*e.g.* standard operating procedures) to aid end-users seeking to adopt the technology; and/or plans for transferring technology and/or incorporating opportunities to broaden the scenarios where the technology may be tested."
- Guidance:
  - Again, it is acceptable that some aspects of research translation may still be under development at the time of submission, so use this space to describe how you plan to explore the items above.
  - Ask for, include, and reference any "Letters of Support" from individuals who you see as potential stakeholders/end-users who you'd like to involve in the development and execution of your grant.
  - We encourage use of SRP's data collection tool: https://tools.niehs.nih.gov/srp/rtc/index.cfm.

Authentication of Key Biological and/or Chemical Resources (Research Plan Section 11)

- **From RFA: "Authentication of Key Biological and/or Chemical Resources":** Given the biological and materials science structure of this FOA, applicants should describe methods to ensure the identity and validity of biological resources involved in the study (*e.g.* microbiological, fungal, plant, *etc.*) as well as authenticity of materials/chemicals used in the application. For projects involving field samples or studies, methods to assure adequate standards/replicates should be described. Applicants may wish to include other aspects of quality assurance and quality control (QA/QC) procedures including, but not limited to:
  - A brief description of existing QA/QC procedures (*e.g.* at the research institution(s) and/or within the laboratory, *etc.*) including how staff will be trained to implement quality assurance, and who will be responsible for training.
  - A brief description of calibration procedures and performance evaluation of key analytical instrumentation.
  - References to standard methods (*e.g.* EPA, National Institute of Standards and Technology (NIST), *etc.*) utilized as part of the study.
  - Discussion of any computer models to be designed or utilized with associated verification and validation techniques.
  - Description of procedures for the handling and custody of samples, including sample collection, identification, preservation, transportation, and storage.
  - Details of data quality control such as how data will be analyzed (*e.g*. data/statistical analysis methods and references to software) and managed (collected, backed-up, collated, transferred, stored, documented, and shared, as appropriate). Note: this should not duplicate information provided in the "Data Sharing Plan."*"*
- *Note added post webinar:* ***Rigor And Reproducibility:*** *Reviewers may look for some aspects of "Rigor and Reproducibility" in your "Authentication of Key Biological and/or Chemical Resources" section.* *For more information: https://grants.nih.gov/policy-and-compliance/policy-topics/reproducibility/guidance"*

Expertise of Your Team

- **From RFA:**
  - "The Program Director/Principal Investigator must describe how their experience and training in bioremediation or materials science position them to lead this project."
  - "The investigative team must include personnel or consultants with expertise to accomplish the goals of this FOA and would be required to include, at a minimum, at least one investigator with expertise in bioremediation and at least one investigator with expertise in materials science."
  - "The application should also identify the individual(s) responsible for data management, coordination and reporting of research translation, and, as applicable, a point of contact for entering trainee (graduate and postdoctoral) data into the NIH CareerTrac database (https://careertrac.niehs.nih.gov/public/home)."
- **Guidance:** SF424(R&R) Senior/Key Person Profile section includes an opportunity show the expertise of team members. In addition, the budget justification section may be a way to identify staff roles, such as staff who are coordinating data management, research translation, and CareerTrac reporting. Please be sure to cross-reference these other sections (e.g. biosketch, budget justification, etc) so reviewers reading your Research Strategy know where to find details about staff expertise and roles.

This note added post-webinar: in response to Q/A – other areas of expertise may be advisable for your project. Though the RFA calls out bioremediation and materials science expertise, other expertise such as hydrology, geology, biogeochemistry, etc may be needed (as a co-PI, advisor, consultant etc) for your project to be fully successful, particularly with the stress placed on in situ strategies.

NIEHS Grants Management

Budget

Lisa Edwards, MBA

Electronic Budget

- R&R or Modular Budget - All instructions in the SF424 (R&R) Application Guide must be followed.
- Prepare the Application using ASSIST: https://grants.nih.gov/grants/how-to-apply-application-guide/prepare-to-apply-and-register/submission-options/assist.htm
- FAQs: https://grants.nih.gov/faqs#/Modular-Research-Grant-Applications
- Budget pages required for parent site and all consortium sites.
- Subawards/consortium F&A costs are excluded from the parent grant Subtotal Direct Costs, which may be subject to budget caps *(added post webinar: for this RFA, the budget cap is $200K Direct Cost).*
- Subawards/consortium F&A costs are NOT included as part of the direct cost base when determining whether the application can use the modular format (direct costs < $250,000 per year)

Other Budget Preparation Tips

- Other Support
  - "0%", "Varies", "As Needed", etc., are not acceptable
  - Total time commitment cannot exceed 12 calendar months
- Important Notices
  - Revised Grants Policy Statement: https://grants.nih.gov/policy/nihgps/index.htm
  - Salary caps: NOT-OD-20-065

    https://grants.nih.gov/grants/policy/salcap_summary.htm

Other Budget Preparation Tips

- Per RFA – Meetings
- "Meetings: The budget shall include funds to travel at least one PD/PI to a 1.5-day focused meeting for grantees of this FOA in years 1 and 3 of the award. In addition, the grantee must include funds to travel one PD/PI and at least one trainee (graduate student or postdoctoral researcher) to the 2-day SRP Annual Meeting occurring in the fall of each year. The location of the meetings (FOA-Focused meeting and SRP Annual Meeting) will rotate among the different SRP grantees and Research Triangle Park, NC."
- Note: Since this is a Modular Budget, the travel costs for these meetings will not be broken out in the application, but should be taken into account when developing your budget. Attendance of these meetings will become a term/condition of the award.

Other Budget Preparation Tips

- It is recommended that you identify someone from your university early in the process that is familiar with submitting NIH grants who can assist you (these are very different than DOD, NSF, EPA applications).
- Submit your application at least 3 days before the due date (error correction window)

eRA Commons Help Desk:

Hours: Mon-Fri, 7AM-8PM EDT/EST;

Web: http://grants.nih.gov/support/;

Toll-free: 1-866-504-9552. Phone: 301-402-7469

Resources

- SF424 (R&R) Application and Electronic Submission Information" webpage:
  - http://grants.nih.gov/grants/funding/424/index.htm#inst
- Help with ASSIST https://grants.nih.gov/grants/how-to-apply-application-guide/prepare-to-apply-and-register/submission-options/assist.htm
- "New" NIH Biographical Sketch Format: https://grants.nih.gov/grants/guide/notice-files/not-od-16-080.html
- **NIH Guidance on Rigor and Reproducibility**: http://grants.nih.gov/reproducibility/index.htm
  - Where to add Rigor and Responsibility into your application: https://grants.nih.gov/policy-and-compliance/policy-topics/reproducibility/guidance
- **eRA Commons -** https://commons.era.nih.gov/commons/index.jsp
  - Registered PD/PIs can check assignment/contact information, review outcome, and other important information.

Resources on the R01 Webpage

- **Currently Funded SRP-Grantees:** Applicants are encouraged to propose research that fills gaps or needs not currently addressed within the SRP: https://tools.niehs.nih.gov//srp/programs/index.cfm.
- **How to Write Your Application:** The following guidance may assist you in developing a strong application that allows reviewers to better evaluate the science and merit of your proposal. This page provides tips for demonstrating to reviewers and NIH staff the high quality of the personnel involved in you project and documenting resources and institutional support of the project. Please follow this link: https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm.
- **Sample Applications and Summary Statements:** The National Institute of Allergy and Infectious Diseases (NIAID) posts sample applications and summary statements, giving applicants a good sense how to format the sections of the application: https://www.niaid.nih.gov/grants-contracts/sample-applications#r01.
- **The "Emerging Contaminants of Concern"** are chemicals that present unique issues at contaminated federal facility sites. Note that compounds 2,4,6-trinitrotoluene (TNT), dinitrotoluene (DNT), and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) are considered military-specific and are not a priority for the SRP. Researchers studying these compounds (TNT, DNT, RDX) may wish to inquire with Strategic Environmental Research and Development Program (SERDP) / Environmental Security Technology Certification Program (ESTCP) grant programs.
- ***Added post-webinar: CERCLA Priority List of Superfund Contaminants:*** *The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires ATSDR and EPA to provide a list, in order of priority, of substances that are most commonly found at facilities on the National Priorities List (NPL) (Superfund) sites: https://www.epa.gov/superfund/superfund-national-priorities-list-npl.*

Will include slides for this webinar as well as key dates…

https://www.niehs.nih.gov/research/supported/centers/srp/funding/funding2/index.cfm

Letter of Intent (March 20, 2020)

- Submission of Letter of Intent (LOI):
  - Assists in review planning
  - Email to Dr. Laura Thomas at laura.thomas@nih.gov.
  - Requested by March 20, 2020 (highly recommended)
- Include in the LOI:
  - Descriptive title of proposed activity
  - Name(s), address(es), and telephone number(s) of the PD(s)/PI(s)
  - Names of other key personnel (please specify bioremediation and materials science team member expertise)
  - Participating institution(s)
  - Number and title of this funding opportunity
- All other questions pertaining to review: please contact Dr. Thomas

Note added post webinar: you may list in your LOI areas of expertise needed to review your application but please DO NOT list names of people you recommend as reviewers (they will be put on a Conflict of Interest list).

Please Remember: Submit your application at least 3 days before the due date (error correction window).

THANK YOU!

QUESTIONS?

- Please submit questions – whether on a general or scientific basis. General application questions will be answered online for all to hear – questions specific to a proposal will be answered offline after the call.
- Note, only moderators can see your questions.
- Submit your question “to all panelists” via the Q&A box in the bottom right-hand corner of your screen.
- If you don’t see a Q&A box, you may need to turn it on by clicking on the Q&A icon at the bottom of your screen.