### Opportunity Title: EPA Fellowship on Biotechnology: Genetically Engineered Microorganisms with Synthetic Constructs

**Opportunity Reference Code:** EPA-ORD-CPHEA-PESD-2023-04

---

**Organization**  
U.S. Environmental Protection Agency (EPA)

**Reference Code**  
EPA-ORD-CPHEA-PESD-2023-04

**How to Apply**  
Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. All transcripts must be in English or include an official English translation. Click here for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations. Click here for detailed information about recommendations.

All documents must be in English or include an official English translation.

**Application Deadline**  
9/1/2023 1:27:50 PM Eastern Time Zone

**Description**  
*Applications may be reviewed on a rolling-basis and this posting could close before the deadline. Click here for information about the selection process.*

**EPA Office/Lab and Location:**  
A research opportunity is available at the Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Public Health and Environmental Assessment (CPHEA), Pacific Ecological Systems Division (PESD) in Corvallis, Oregon.

**Research Project:**  
Genetically engineered microorganisms are regulated by EPA’s Office of Pollution Prevention and Toxics (OPPT) under the amended Toxic Substances Control Act. Currently, microorganisms are being engineered through genome editing, synthetic biology, metabolic engineering, and other molecular methods for open release into the environment with various intended uses. When these microbes have unique properties and uncertain potential for risks to human health and the environment, they pose regulatory challenges for the Agency. ORD/PESD is leading research to improve the certainty and timeliness of biotechnology risk assessments made by OPPT.

Under the guidance of a mentor, the research activities may include:

- Developing methods for detection of genetically engineered microorganisms with synthetic biocontainment in complex environmental media
- Designing and executing experiments on the long-term stability and reliability of synthetic microbial biocontainment strategies that utilize xeno-nucleic acid (XNA) or non-standard amino acid (nsAA) auxotrophy
- Designing and executing experiments on the potential for horizontal transfer of genetic material out of and into engineered microorganisms
- Designing and executing experiments on the ecological impacts of synthetic genetic constructs in microbial genomes for bacteria or fungi used as biofertilizers or bioremediators
- Quality assurance for outcomes of this research
- Conducting scientific synthesis, data analysis, literature searches and manuscript preparation
- Publishing and presenting their research to the broader scientific community

**Learning Objectives:**  
The research participant will collaborate with a team of ORD scientists within the Chemical Safety for Sustainability, National Research Program and partners on research to inform risk assessments of such engineered microbes. The research participant will have the opportunity to gain experience designing policy-driven research and interacting with shareholders / research partners across sectors. There will be opportunities to develop skills in designing and execution of innovative experiments on the potential ecological impacts of genetically engineered microorganisms with synthetic constructs.

**Mentor(s):**  
The mentor for this project is Jay R. Reichman (reichman.jay@epa.gov). If you have questions about the nature of the research please contact the mentor(s).
**Opportunity Title:** EPA Fellowship on Biotechnology: Genetically Engineered Microorganisms with Synthetic Constructs  
**Opportunity Reference Code:** EPA-ORD-CPHEA-PESD-2023-04

**Anticipated Appointment Start Date:** August 1, 2023. All start dates are flexible and vary depending on numerous factors. Click here for detailed information about start dates.

**Appointment Length:** The appointment will initially be for one year and may be renewed upon EPA recommendation and subject to availability of funding.

**Level of Participation:** The appointment is full-time.

**Participant Stipend:** The participant will receive a monthly stipend commensurate with educational level and experience. Click here for detailed information about full-time stipends.

**EPA Security Clearance:** Completion of a successful background investigation by the Office of Personnel Management (OPM) is required for an applicant to be on-boarded at EPA.

**ORISE Information:** This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and EPA. Participants do not become employees of EPA, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

ORISE offers all ORISE EPA graduate students and Postdocs a free 5 year membership to the National Postdoctoral Association (NPA).

The successful applicant(s) will be required to comply with Environmental, Safety and Health (ES&H) requirements of the hosting facility, including but not limited to, COVID-19 requirements (e.g. facial covering, physical distancing, testing, vaccination).

**Questions:** Please see the FAQ section of our website. After reading, if you have additional questions about the application process please email ORISE.EPA.ORD@orau.org and include the reference code for this opportunity.

**Qualifications**

The qualified candidate should have received a doctoral degree in one of the relevant fields (e.g. Microbiology, Microbial Ecology, Biological Engineering, Chemical Engineering, Synthetic Biology, Cellular and Molecular Biology), or be currently pursuing the degree with completion before the appointment start date. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Strong background in synthetic auxotrophy, genome recoding, horizontal gene transfer, genomics, metagenomics, transcriptomics and bioinformatics.
- Microbial isolation and culturing
- Media preparation
- DNA/RNA extraction
- PCR/qPCR
- Molecular marker development
- High-throughput sequencing library preparation
- Genomics, metagenomics and transcriptomics
- Synthetic auxotrophy for biocontainment; xeno-nucleic acids and/or non-standard amino acids
- Genome recoding
- Horizontal gene transfer
- Microbial consortia/community interactions
- Bioinformatics and statistical analyses
- Risk analyses
- Excellent analytical, quantitative, and verbal (oral and written) communication skills
- Demonstrated skills working in team settings

**Eligibility Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.

Generated: 5/9/2023 12:03:40 PM
Opportunity Title: EPA Fellowship on Biotechnology: Genetically Engineered Microorganisms with Synthetic Constructs
Opportunity Reference Code: EPA-ORD-CPHEA-PESD-2023-04

- Discipline(s):
  - Communications and Graphics Design (1)
  - Computer, Information, and Data Sciences (1)
  - Engineering (2)
  - Environmental and Marine Sciences (1)
  - Life Health and Medical Sciences (7)
  - Mathematics and Statistics (2)
  - Other Non-S&E (1)
  - Other Physical Sciences (6)
  - Social and Behavioral Sciences (1)
Opportunity Title: EPA Fellowship on Biotechnology: Double-Stranded RNA Biopesticide Formulations
Opportunity Reference Code: EPA-ORD-CPHEA-PESD-2023-05

Organization: U.S. Environmental Protection Agency (EPA)
Reference Code: EPA-ORD-CPHEA-PESD-2023-05

How to Apply: Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. All transcripts must be in English or include an official English translation. Click here for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations. Click here for detailed information about recommendations.

All documents must be in English or include an official English translation.

Application Deadline: 9/15/2023 3:00:00 PM Eastern Time Zone

Description: *Applications may be reviewed on a rolling-basis and this posting could close before the deadline. Click here for information about the selection process.*

EPA Office/Lab and Location: A research opportunity is available at the Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Public Health and Environmental Assessment (CPHEA), Pacific Ecological Systems Division (PESD) in Corvallis, Oregon.

Research Project: Biopesticides are regulated by EPA's Office of Pesticide Programs (OPP) under the Federal Insecticide, Fungicide, and Rodenticide Act and other Acts. Currently, biopesticides are being engineered through genome editing, synthetic biology, metabolic engineering, and other molecular methods for open release into the environment with various intended uses. When these biopesticides have unique properties and uncertain potential for risks to human health and the environment, they pose regulatory challenges for the Agency. ORD/PESD is leading research to improve the certainty and timeliness of biotechnology risk assessments made by OPP.

Under the guidance of a mentor, the research activities may include:

- Developing methods for standardized dsRNA biopesticide formulation exposures
- Design and execution of experiments on how formulations change the persistence, uptake, and toxicity of exogenously applied dsRNA biopesticides intended for RNA interference (RNAi) in target pests
- Designing and executing experiments on how formulations change the persistence, uptake, and toxicity of exogenously applied dsRNA biopesticides through RNAi in nontarget animals and plants
- Quality assurance for outcomes of this research
- Conducting scientific synthesis, data analysis, literature searches and manuscript preparation
- Publishing and presenting their research to the broader scientific community

Learning Objectives: The research participant will collaborate with a team of ORD scientists within the Chemical Safety for Sustainability, National Research Program and external partners on research to inform risk assessments of variously formulated double-stranded RNA (dsRNA) biopesticides. The research participant will have the opportunity to gain experience designing policy-driven research and interacting with shareholders / research partners across sectors. There will be opportunities to develop skills in designing and execution of innovative experiments on the impacts of formulators on exogenously applied dsRNA biopesticides.

Mentor(s): The mentor for this project is Jay R. Reichman (reichman.jay@epa.gov) at the EPA's Pacific Ecological Systems Division. If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: August 1, 2023. All start dates are flexible and vary depending on numerous factors. Click here for...
detailed information about start dates.

**Appointment Length:** The appointment will initially be for one year and may be renewed upon EPA recommendation and subject to availability of funding.

**Level of Participation:** The appointment is full-time.

**Participant Stipend:** The participant will receive a monthly stipend commensurate with educational level and experience. Click here for detailed information about full-time stipends.

**EPA Security Clearance:** Completion of a successful background investigation by the Office of Personnel Management (OPM) is required for an applicant to be on-boarded at EPA.

**ORISE Information:** This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and EPA. Participants do not become employees of EPA, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

ORISE offers all ORISE EPA graduate students and Postdocs a free 5 year membership to the National Postdoctoral Association (NPA).

The successful applicant(s) will be required to comply with Environmental, Safety and Health (ES&H) requirements of the hosting facility, including but not limited to, COVID-19 requirements (e.g. facial covering, physical distancing, testing, vaccination).

**Questions:** Please see the FAQ section of our website. After reading, if you have additional questions about the application process please email ORISE.EPA.ORD@orau.org and include the reference code for this opportunity.

**Qualifications**

The qualified candidate should have received a doctoral degree in one of the relevant fields (e.g. Molecular Toxicology, Ecotoxicology, Biological Engineering, Chemical Engineering, Synthetic Biology, Agricultural Sciences, Botany, Forestry Sciences), or be currently pursuing the degree with completion before the appointment start date. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Strong background in RNA interference (RNAi), toxicology, plant/pest interactions, biopesticides, entomology, genomics, transcriptomics and bioinformatics.
- RNAi
- Toxicology
- Plant/pest interactions
- Biopesticides
- Plant propagation
- Insectary maintenance
- Invertebrate development and physiology
- DNA/RNA extraction
- PCR/qPCR
- High-throughput sequencing library preparation
- Genomics and transcriptomics
- Bioinformatics and statistical analyses
- Risk analyses
- Excellent analytical, quantitative and verbal (oral and written) communication skills
- Demonstrated skills working in team settings

**Eligibility Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
Opportunity Title: EPA Fellowship on Biotechnology: Double-Stranded RNA Biopesticide Formulations
Opportunity Reference Code: EPA-ORD-CPHEA-PESD-2023-05

- Communications and Graphics Design (1)
- Computer, Information, and Data Sciences (1)
- Engineering (2)
- Environmental and Marine Sciences (2)
- Life Health and Medical Sciences (10)
- Mathematics and Statistics (2)
- Other Non-S&E (1)
- Other Physical Sciences (6)
- Social and Behavioral Sciences (1)