Opportunity Title: EPA Fellowship Regarding Biologically Active Drinking Water Filtration
Opportunity Reference Code: EPA-ORD-CESER-WID-2022-03

Organization U.S. Environmental Protection Agency (EPA)

Reference Code EPA-ORD-CESER-WID-2022-03

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 9/12/2022 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 Environmental Solutions and Emergency Response (CESER), Water Infrastructure Division (WID) located in Cincinnati, Ohio.

Research Project: Ongoing research evaluating the removal of harmful algal blooms (HABs)-related toxins and associated toxicity through biologically active drinking water filters is of critical importance to CESER's Water Infrastructure Division. The research project will investigate and study continuous loadings of algal organic matter (AOM) and toxins in drinking water treatment plants and their impacts for the performance of biologically active filtration processes. Also, the differences in population dynamics of toxic cyanobacteria and non-cyanobacteria involved in the degradation of cyanotoxins using molecular techniques will be examined. This study will provide insights into the effectiveness of biofiltration systems on removing cyanotoxins and the fate of AOM in conventional biological filters.

Besides biological treatment processes, applications of both classical microbial techniques and novel molecular tools will be used for this research. The selected research participant will collaborate with a multi-disciplinary research team which includes EPA scientists and external collaborators. The research participant may present their research at conferences.

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Research activities may consist of:

- Preparation of Quality Assurance Project Plans and Standard Operating Procedures for biologically active filtration and microbiological analysis which includes basic knowledge of microbiological techniques, molecular analysis, and bioinformatics tools
- Nucleic acid extraction of processed samples using in-house developed protocols and/or commercially available kits
- Characterization of microbial community using molecular techniques (e.g., qPCR and sequencing)
- Basic Laboratory Practice
- Participating in relevant meetings and communications between researchers and stakeholders

Learning Objectives: Under the guidance of a mentor, the research participant's learning objectives will include:

- Understanding how to develop and test biological treatment setup for water treatment
- Learning the conditions that enhance the treatment efficacy of biologically active filtration in drinking water treatment application
- Learning about microbial populations of filter media through the treatment process
- Understanding the use of microbiological analysis tools
- Advancing the research participant’s knowledge in project management and scientific communication

Mentor(s): The mentor for this opportunity is Hodon Ryu (ryu.hodon@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: September 12, 2022. 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 three to four additional years 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

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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. Environmental Engineering). Degree must have been received within five years of the appointment start date.

Preferred skills:

- At least one year of biological filtration study and research experience related to pilot-scale column setup.
- Coursework and lab work related to biological/environmental engineering principles or related fields
- Basic knowledge of microbiological techniques, molecular biology research, including nucleic acid extraction, PCR, RT-PCR, gel electrophoresis, and sequencing
- Ability to analyze data using statistical analyses and bioinformatics: R and QIIME.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 month(s).
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (3 👁)
  - **Communications and Graphics Design** (1 👁)
  - **Engineering** (5 👁)
  - **Environmental and Marine Sciences** (2 👁)
  - **Life Health and Medical Sciences** (3 👁)