Opportunity Title: EPA Bioinformatics and Computational Toxicology Fellowship
Opportunity Reference Code: EPA-ORD-CCTE-GLTED-2020-02-A

Organization U.S. Environmental Protection Agency (EPA)

Reference Code EPA-ORD-CCTE-GLTED-2020-02-A

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 12/15/2020 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: Two research opportunities are available at the Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Computational Toxicology and Exposure (CCTE), Great Lakes Toxicology & Ecology Division (GLTED) located in Research Triangle Park, North Carolina or Cincinnati, Ohio.

Research Project: The Agency is faced with significant challenges related to characterizing the modes of action of chemicals, the effects of exposures to mixtures of chemicals, and in finding ways to group chemicals that facilitates read-across from data rich to data poor chemicals. The Molecular Indicators Branch within the Office of Research and Development is addressing these challenges through the characterization of molecular responses in aquatic organisms exposed to chemicals. In large part, MIB targets transcriptomic and epigenetic responses using next generation sequencing (NGS)-based tools (RNA-seq, reduced representation bisulfite sequencing - RRBS) to develop biomarkers that can discriminate chemical classes and provide an understanding of impacted biological processes and pathways. There are also opportunities to explore and analyze other omics data including metabolomic and proteomic data from whole animal responses and multigenerational studies. The research participant will be involved in designing of laboratory experiments, NGS data analysis and data interpretation, design and development of new statistical methods for integrated omics data analysis, and in the communication of results intra- and extramurally. The research participant will be trained in molecular genetics, bioinformatics, statistics, machine learning algorithms for big data

analytics, and advanced statistical analysis of complex omics data sets.

With guidance from the mentor, the research participant may be involved in the following training activities:

- Developing statistical methods and tools to analyze NGS-based gene expression and epigenetic data
- Designing analysis pipelines and performing analysis of RNA-seq, RRBS, other omics environmental exposure data
- Providing biological context and interpretation of NGS data to characterize chemical MOA
- Applying machine learning algorithms for identification of biomarkers and classification of environmental toxicants
- Contributing to the preparation of peer-reviewed journal articles and disseminating research results to project partners, stakeholders, and the research community
- Presenting research at regional, national, and/or international conferences and workshops

Learning Objectives: The research participant will be afforded the opportunity to interact with internationally recognized leaders, both within and outside the EPA, the area of bioinformatics and in ecotoxicogenomics. The research participant will have the opportunity to contribute to and to publish original research. This training opportunity will provide an early career scientist with knowledge, skills, and abilities needed to apply new technologies and associated data to regulatory decision-making at the local, national, or international scale and to pursue a professional career in life sciences research.

Mentor(s): The mentor for this opportunity is Weichun Huang (huang.weichun@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: Winter 2021. 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 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.

Questions: Please see the FAQ section of our website. After reading, if you have additional questions about the application process please email EPArpp@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, or be currently pursuing the degree and will reach completion by December 2020. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Solid interdisciplinary knowledge in statistics, biology, environmental sciences, and computer science
- Excellent programming skills, proficiency with at least two programming languages (e.g. R, Perl/Python, C++)
- Familiarity with Linux system and basic shell scripting
- Excellent written and oral communication skills to present scientific data and methods
- Experience in next-generation sequencing data or other large biological data analysis
- Familiarity with recent development in NGS platforms and sequencing data analysis (e.g., single-cell RNA-seq)
- Demonstrated experience in NGS data analysis and data visualization, or big-data mining
- Demonstrated knowledge and skills in developing new bioinformatics/statistics methods/tools

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 12/31/2020 11:59:00 PM.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (1)
  - **Computer, Information, and Data Sciences** (17)
  - **Life Health and Medical Sciences** (46)
  - **Mathematics and Statistics** (4)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).