

Opportunity Title: Identifying Emerging Contaminants and Assessing Their Impacts on Great Lakes Fish and Wildlife

Opportunity Reference Code: EPA-ORD-NHEERL-MED-2017-02

Organization U.S. Environmental Protection Agency (EPA)

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How to Apply A complete application consists of:

- An application
- Transcripts – [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 references

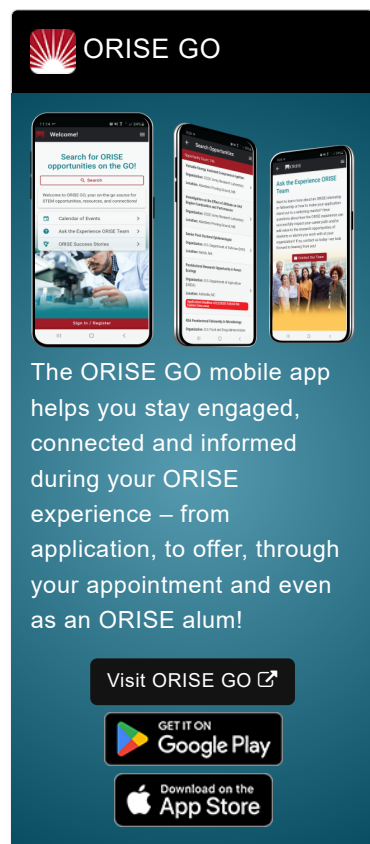
All documents must be in English or include an official English translation.

If you have questions, send an email to EPArpp@orau.org. Please include the reference code for this opportunity in your email.

Description A research opportunity is currently available at the U.S. Environmental Protection Agency's (EPA) Office of Research and Development (ORD)/National Health and Environmental Effects Research Laboratory (NHEERL). This appointment will be served with the Mid-Continent Ecology Division (MED) in Duluth MN.

The paradigm proposed for regulatory toxicity testing in the 21st century favors measurement of the ability of chemicals to cause biological perturbations that initiate toxicity, rather than relying on direct measurements of apical adverse outcomes in whole organism toxicity tests. In order to effectively utilize these type of "pathway-based" data to support decision-making, the adverse outcome pathway (AOP) framework was developed to establish and organize scientifically-credible predictive linkages between effects measured at low levels of biological organization or in simplified biological systems and adverse outcomes of regulatory significance (e.g., effects on survival, growth, and/or reproduction). However, it is recognized that to be practically applied in screening level risk assessment, it is important to couple the chemical-agnostic AOP framework to chemical-specific considerations of ADME (adsorption, distribution, metabolism, and elimination) which dictate whether or not a chemical can reach a molecular target in order to cause a biological perturbation, and if so, at what concentrations and over what durations that likely occurs. Similarly, translation of effect concentrations measured in *in vitro* bioassays to equivalent *in vivo* concentrations also requires consideration of ADME. The research participant will be involved in integration of ADME with the AOP framework in order to further enhance the utility of pathway-based chemical screening data for environmental decision-making, with a particular focus on contaminants in the Great Lakes.

The research participant will be trained in the application of high throughput estimates of ADME, along with pathway-based biological effects data and measured environmental concentrations, to prioritize contaminants in the Great Lakes with regard to their potential impacts on fish and wildlife. With



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guidance from the mentor, the research participant may be involved in any or all of the following training activities:

1. Identifying sources of data and information that can be used to estimate ADME for large numbers of compounds of diverse chemical structure.
2. Developing novel data, high throughput assays, and/or models that can be used to estimate differences in ADME across species.
3. Developing methods and frameworks for linking chemical-specific ADME estimates with the chemical agnostic adverse outcome pathway framework to address ecological risk assessment and risk management questions.
4. Conducting case studies aimed at practical demonstration of these tools, approaches, and frameworks.
5. Developing and describing novel aggregate exposure pathways and/or adverse outcome pathways relevant to the effects of organic contaminants on Great Lakes Fish and Wildlife.
6. Analyzing experimental data to support the assessment of impacts of contaminants on Great Lakes fish and wildlife.
7. Compiling, interpreting, and presenting research results internally and externally to project partners and stakeholders, via both written and oral communications.

The research participant will be afforded an opportunity to interact with internationally recognized leaders, both within and outside EPA, in the area of applying adverse outcome pathway framework to the practice of chemical risk assessment with a particular focus integration of ADME into high throughput screening and prioritization approaches. Through case studies applying these tools to effects based surveillance and monitoring within the Great Lakes basin the participant will explore the practical application of cutting edge science to meet the diverse needs of Regions and states with regard to chemical safety assessments. The participant will have the opportunity to contribute to and/or publish original research on novel ADME estimation approaches and their relevant applications to aquatic ecotoxicology and risk assessment.

This program, administered by ORAU through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education, was established through an interagency agreement between DOE and EPA.

Qualifications Applicants must have received a doctoral degree toxicology, biochemistry, biology, molecular biology, bioinformatics, computational biology, or a related field within five years of the desired starting date. Experience in dosimetry, biotransformation, in vitro to in vivo extrapolation (IVIVE), and/or physiologically-based pharmacokinetic modeling-related research is desirable.is desired.

The appointment is full-time for one year and may be renewed upon recommendation of EPA and contingent on the availability of funds. The participant will receive a monthly stipend. Funding may be available to

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reimburse the participant's travel expenses to present the results of his/her research at scientific conferences. No funding will be available to cover travel costs for pre-appointment visits, relocation costs, tuition and fees, or participant's health insurance. The participant must show proof of health and medical insurance. **The participant does not become an EPA employee.**

The mentor for this project is Dan Villeneuve (villeneuve.dan@epa.gov).
The desired start date is June 1, 2017.

- Eligibility Requirements**

- **Degree:** Doctoral Degree received within the last 60 month(s).
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([1](#) )
 - **Environmental and Marine Sciences** ([2](#) )
 - **Life Health and Medical Sciences** ([10](#) )