Opportunity Title: EPA Postdoctoral Fellowship to Develop High Throughput Toxicokinetic Models to Include Co-exposure of Chemicals for Risk Assessments

Opportunity Reference Code: EPA-ORD-CCTE-CCED-2022-08

Organization	U.S. Environmental Protection Agency (EPA)
Reference Code	EPA-ORD-CCTE-CCED-2022-08
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	3/21/2023 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 Computational Toxicology and Exposure (CCTE), Chemical Characterization & Exposure Division (CCED) located in Research Triangle Park, North Carolina.

Research Project: The EPA Center for Computational Toxicology and Exposure (CCTE) is responsible for developing new computational tools and providing predictions for improving public health and environmental risk assessments. One of the major goals of computational approaches is to address the large number of chemicals needing assessments but lacking sufficient information. For this purpose, new approach methodologies (NAMs) are being developed. The research participant will be trained in NAMs that allow rapid estimation of potential risks from chemicals, even when traditional toxicity or exposure data are lacking. Using these NAMs, large numbers of chemicals can be rapidly screened and prioritized for more detailed risk assessment. Specifically, a generic, high throughput open-sourced toxicokinetic (TK) model ("httk") is being developed to (1) combine chemical-specific in vitro measures of TK with reproducible, transparent, and open-source models that place data generated by NAMs in a public health risk context and (2)
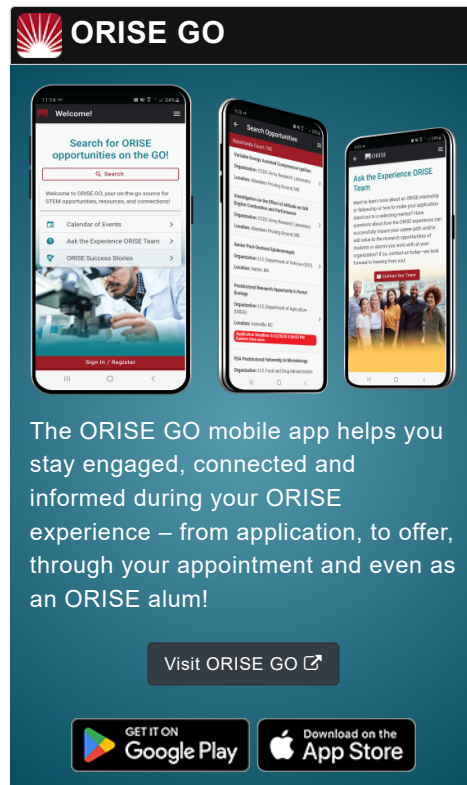
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enhance interpretation of biomonitoring data.

NAMs previously have been developed and applied to advance the research of individual chemical toxicity but not of chemical mixtures. Environmental exposures usually occur as combinations of multiple chemicals. Further, even a single chemical often produces multiple metabolites. Modeling of co-exposures will address the concentrations of both parent chemicals and their metabolites – an addition essential for determining the overall toxicity resulting from multiple co-exposures – using NAMs developed in the ToxCast Program to reflect metabolic activation and deactivation. The overall impact on metabolism by co-exposure of multiple chemicals can determine either inhibition or enhancement of overall toxicity, depending on whether the parent or the metabolite is the toxic species.

The research participant may be involved in the following activities:

- Parameterizing and running existing or newly developed computational models for high-throughput toxicokinetics, particularly for chemical mixtures.
- Developing approaches to address data gaps, inconsistencies, and uncertainties
- Presenting results in the form of internal presentations, conference presentations, reports, and/or peer-reviewed publications

Learning Objectives: The research participant will be trained in state-of-the-art NAMs, including high-throughput toxicokinetic modeling, in vitro-in vivo extrapolation, and risk assessment. (The participant is not expected to already be familiar with these NAMs; this is a training opportunity.) The tools to be used include existing databases of chemicals of environmental interest; data from animal-based (in vivo) toxicity studies; data from in vitro high-throughput screening assays; data from environmental toxicity studies; toxicokinetics data; and computational models of toxicokinetics, exposure, and hazard. The research participant will be trained in the use of these databases and models, and in combining them to estimate potential risk.

Mentor(s): The mentor(s) for this opportunity is Peter Egeghy (egeghy.peter@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: March 20, 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 three years 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. Engineering, Statistics, Physics, Chemistry, Mathematics, Exposure Science). Degree must have been received within five years of the appointment start date.

Preferred Skills:

- Significant coding/programming experience
- Experience coding in R (the project will use some existing R packages and R code).
- Experience in other programming languages (e.g., Python, Matlab, Javascript, C++, C, etc.) and the demonstrated ability to quickly learn a new language
- Some experience with statistical data modeling approaches would be helpful, particularly optimization and sensitivity

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- analysis.
- Some experience in physiologically based pharmacokinetic
  (PBPK) modeling

Eligibility Requirements	- **Citizenship:** U.S. Citizen Only
	- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
	- **Discipline(s):**
	    ○ **Chemistry and Materials Sciences** (4 👁)
	    ○ **Communications and Graphics Design** (6 👁)
	    ○ **Computer, Information, and Data Sciences** (3 👁)
	    ○ **Engineering** (3 👁)
	    ○ **Environmental and Marine Sciences** (1 👁)
	    ○ **Life Health and Medical Sciences** (8 👁)
	    ○ **Mathematics and Statistics** (4 👁)
	    ○ **Physics** (2 👁)
	    ○ **Social and Behavioral Sciences** (1 👁)