

**Opportunity Title:** Metabolomics and Non-Targeted Analysis to Support High-Throughput Exposure Screening

**Opportunity Reference Code:** EPA-ORD-NERL-EMMD-2017-08

**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.

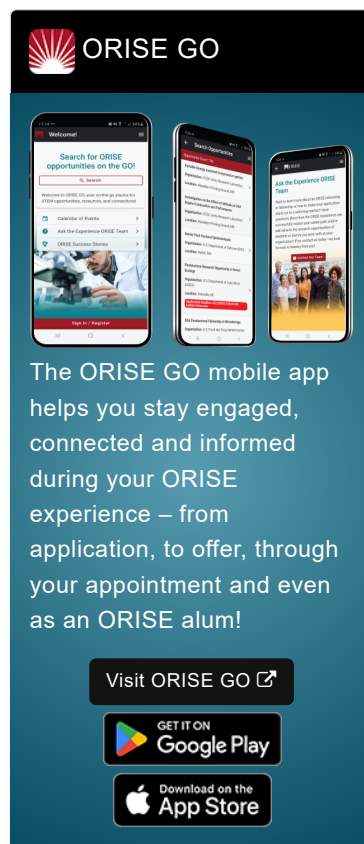
If you have questions, send an email to [EPArpp@oraui.org](mailto:EPArpp@oraui.org). Please include the reference code for this opportunity in your email.

**Description** A postdoctoral research project training opportunity is currently available at the U.S. Environmental Protection Agency (EPA) National Exposure Research Laboratory (NERL) in Research Triangle Park, North Carolina. This training opportunity is with NERL's Exposure Methods and Measurements Division (EMMD). This research project is in support of the EPA's "Chemical Safety for Sustainability" (CSS) research program and will focus on utilizing high-resolution mass spectrometry to evaluate human exposure to environmental chemicals.

A major goal of the CSS research program is to understand the extent to which environmental chemicals may impact human and ecosystem health. Understanding the health risks posed by chemical stressors requires a quantitative understanding of both dose-response relationships and chemical exposure. Computational models now allow rapid predictions of exposure and dose across thousands of chemicals. However, data with which to evaluate model predictions are lacking. Targeted analytical methods alone are unable to meet the demands of high-throughput (HT) exposure and risk assessment. Efficient non-targeted methods are therefore needed to expand existing measurement domains. Data generated from these methods will be used to evaluate predictions from HT exposure and dose models, prioritize previously unmeasured chemicals for future HT testing, and evaluate co-occurrence of individual analytes in various environmental and biological media. This project will focus on developing, refining, and applying analytical techniques, based on high-resolution mass spectrometry platforms, in order to better understand human exposure to xenobiotic chemicals.

The participant may be involved in the following training activities:

- Devising scientific approaches and investigations to better understand human exposure to environmental chemicals.
- Using existing software packages, chemical databases, and high-resolution mass spectrometry to screen for emerging chemical contaminants in environmental (e.g., drinking water) and biological



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(e.g., blood) samples.






- Using existing software packages and mass spectrometry data (i.e., exact mass, isotope patterns, MS and MS/MS spectra) to examine molecular features identified in environmental and biological samples.
- Implementing environmental degradation and human metabolism models to enhance existing non-targeted analysis methods.
- Integrating results of non-targeted analyses and metabolomic experiments to understand the effects of chemical exposures on living systems.
- Developing prediction models (for estimating retention time, chemical concentration, optimal method conditions, etc.) using cheminformatics and machine learning techniques.
- Writing peer reviewed manuscripts and responding to peer review comments by scientists in NERL, other parts of EPA, and external reviewers.
- Presenting research findings at national/international scientific meetings relevant to the research..

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. 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 made available to reimburse the participant's travel expenses to present the results of his/her research at scientific conferences. No funding will be made 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 Jon Sobus ([sobus.jon@epa.gov](mailto:sobus.jon@epa.gov)). The desired start date is November, 2017.


**Qualifications** Applicants must have received a doctoral degree in physical, chemical, biological, environmental, mathematical, computer, or engineering sciences within five years of the desired starting date, or completion of all requirements for the degree should be expected prior to the start date. Knowledge of analytical chemistry, organic chemistry, cheminformatics, computer programming, or applied mathematics/statistics is highly desirable.

**Eligibility Requirements**

- **Degree:** Doctoral Degree received within the last 60 month(s).
- **Discipline(s):**
  - **Chemistry and Materials Sciences** ([7](#) )
  - **Computer, Information, and Data Sciences** ([2](#) )
  - **Engineering** ([8](#) )
  - **Environmental and Marine Sciences** ([3](#) )
  - **Life Health and Medical Sciences** ([7](#) )

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- **Mathematics and Statistics** ([5](#) )
- **Physics** ([3](#) )