Postgraduate Internship Opportunity
U.S. Environmental Protection Agency
Region 5 Chicago Regional Laboratory
Chicago, Illinois

Project #: EPA Region 5–CRL/RMD 2009–01

A postgraduate internship is available with the U.S. Environmental Protection Agency (EPA) Chicago Regional Laboratory (CRL) in Chicago, Illinois. CRL has a fundamental rote to collect, analyze, and disseminate data on the physical, chemical, and biological integrity. The primary domain of the CRL is to apply analytical chemistry to environmental samples to generate data in support of environmental research.

Project Background: Staff at the EPA CRL are conducting a study to document the mass spectrometer response and spectral anomalies that are encountered using hydrogen as a carrier gas for electron ionization gas chromatography/mass spectrometry (GC/MS). Helium has almost exclusively been used as a carrier gas in GC/MS and is required in the majority of methods written for GC/MS. Helium is both expensive and a non-renewable recourse and there is the inconvenience and safety issues of the high pressure helium storage cylinders that are used for the gas. Hydrogen has superior chromatographic qualities but the gas is more reactive and causes many different reactions in a mass spectrometer source. Hydrogen can also be produced locally through the use of a hydrogen generator where He must be obtained through high pressure gas cylinders. There is also an issue of overall reduction of sensitivity using H_2. The project will take a suite of compounds from the Office of Solid Waste organic volatile and semivolatile lists and characterize and quantify the sensitivity and spectral issues that are encountered. The final stage will be to document the observations in a summary paper. Although these issues are well known throughout the environmental industry there is little documentation to define H_2 usage which is what this project will attempt to compliment.

Objectives: Project elements will include, but not be limited to: project planning, the set-up of instrumentation for H_2, characterizing the response of the compounds both in standards (compounds in pure solvents) and various matrices like sediment, soil and water extracts.

Specific Tasks: The intern will be trained by CRL staff scientists in the analysis and reporting of environmental data and the creation of a quality assurance project plan. The intern will be involved in the analysis of standards and extracts using various GC/MS instruments to determine the response differences. The intern will extract samples from a number of matrices that are going to be analyzed on the instruments. Specific tasks and learning opportunities may include, but not be limited to:

- Extraction of environmental samples utilizing pressurized fluid extraction, solid phase extraction or liquid-liquid extraction of environmental samples that may include but not limited to: soils, sludges, biosolids, water.
- Interpretation of the data including statistical analyses, review of quality assurance data, preparation of tables and figures
- Writing papers to be presented at a conference and/or to be issued as post-conference reports.

- Helping to create or improve current methods and technologies.
- Assisting EPA and other participating scientists to plan and implement various logistic elements regarding future projects

Benefits to the Intern: During this appointment, the intern will:

- Learn about the many complex environmental analyses concerning EPA's Office of Solid Waste and CRL
- Increase skills in data analysis and reporting.
- Learn the many facets required to plan and implement a complex project
- Learn to operate under a quality control/assurance system
- Learn roles and responsibilities for working as part of a team
- Increase sense of professional responsibility

Qualifications: Applicants should have received a bachelor's degree in chemistry, environmental engineering or related analytical field within four years of the desired starting date. Candidates should have excellent oral and written communication skills and be self-motivated. Applicants should have the ability to learn analytical instrumentation analysis, scientific graphing, and presentation software programs. The applicant should have a background in using analytical equipment, especially GC/MS and extraction technology.

The program is open to all qualified individuals without regard to race, sex, religion, color, age, physical or mental disability, national origin, or status as a Vietnam era or disabled veteran. U.S. citizenship or lawful permanent resident status is preferred (but can also hold an appropriate visa status, however, an H1B visa is not appropriate). **The intern does not become an EPA employee.**

The EPA contact person for this project is Wayne Whipple. He can be contacted at: Whipple.wayne@epa.gov or at 312-353-9063.

The Internship/Research Participation Program for EPA is administered by the Oak Ridge Institute for Science and Education. ***Please reference Project # EPA Region 5-CRL/RMD 2009-01 when calling or writing for information.*** For additional information and application materials contact: Internship Program – EPA, Attn: Betty Bowling, MS 36, Oak Ridge Institute for Science and Education, P.O. Box 117, Oak Ridge, Tennessee 37831 Phone: (875)576-8503 FAX: (865)241-5219 e-mail: betty.bowling@orau.org.

An application can be found at http://www.orau.gov/orise/edu/EPA/app-gugrgpd.pdf.