

**Internship/Research Participation Program
U.S. Environmental Protection Agency
Region 5 Chicago Regional Laboratory (CRL)**

Project #: EPA Region 5-CRL-2007-02

A research project is available with the U.S. Environmental Protection Agency (EPA) Chicago Regional Laboratory (CRL) in Chicago, Illinois. The purpose of this project is to include additional analytes into the Office of Water's LC/MS/MS method for triazine pesticides. This will require that the intern has a background in analytical methods related to LC/MS with good laboratory practices.

Project Background: As an U.S. EPA laboratory responsible for implementing the monitoring environmental concerns, CRL has a fundamental role to collect, analyze and disseminate data on the physical, chemical and biological integrity. The primary domain of CRL is to apply analytical chemistry to environmental samples to generate data in support of environmental research.

Triazine pesticides are widely used and have been the subject of extensive studies. Over 60 parent triazine pesticides were considered for inclusion in the OGWDW proposed method for triazine compounds. According to the USDA surveys, 11 different triazines have been applied over the past decade. These include anilazine, atrazine, ametryn, chlorosulfuron, cyanazine, cyromazine, metsulfuron-methyl, prometryn, simazine, thifensulfuron, triasulfuron and tribenuron-methyl. The most heavily used triazine pesticides in the U.S. in 2001/02 were atrazine and simazine with atrazine composing 80% of the usage tracked by the USDA. The acute toxicity of most of the triazine pesticides is not high, but their use is both heavy and widespread in Region 5 and the U.S. to the point that these herbicides are commonly found in surface water and ground water. Triazine pesticides are applied to a broad spectrum of crops such as, corn, sorghum, sugarcane, post-harvest wheat fields, guava, macadamia nuts, hay, pastures, rangelands, woodlands, conifers, woody ornamentals, Christmas trees, sod, artichokes, asparagus, berry crops, broad beans, citrus, farm ponds and fish hatcheries to name a few. Therefore one can expect to find triazine pesticides and their degradates in agricultural runoff water and groundwater throughout Region 5. Drinking water that is derived from these sources would be expected to contain these compounds.

The triazine candidates to date that have been selected for development of a GC/MS and/or LCMS and/or LC/MS/MS method are ametryn, anilazine, atrazine, chlorosulfuron*, cyanazine, cyromazine, diaminochlorotriazine, desethyl s-atrazine, desisopropyl s-atrazine, metsulfuron-methyl*, prometon, prometryn, propazine, prosulfuron*, simazine, simetryn, desethyl terbuthylazine, terbuthylazine, thifensulfuron methyl*, triasulfuron* and tribenuron methyl*. The compounds with the asterisks (*) require LC/MS analytical methods. The other compounds may be analyzed by GC/MS. Other triazine pesticides or degradates may be added or subtracted from the proposed list depending on the commercial availability of suitable standards, usage and toxicity data. Presently six deuterated commercially available pesticides are being investigated as good surrogates and/or internal standards and one C13 labeled standard.

Objectives: Project elements will include, but not be limited to: detailed analysis of environmental samples by LC/MS, preparation of environmental samples, and preparation of visual materials for oral presentations and communications.

Specific Tasks: The intern will be trained by CRL staff scientists in the analysis and reporting of environmental data and the planning and conducting of oral or poster presentations. Specific assignments and learning opportunities may include, but not be limited to:

- Extracting environmental samples utilizing accelerated solvent extraction, solid phase extraction or liquid-liquid extraction. Environmental samples may include soils, sludges, water and fish.
- Interpreting the data including statistical analyses, reviewing quality assurance data, and preparing 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 CRL scientists to plan and implement various logistic elements regarding future projects

Benefits: During this project the intern will:

- Learn about the many complex environmental analyses concerning CRL
- Increase skills in data analysis and reporting.
- Learn the many facets required to plan and implement a complex project
- Learn roles and responsibilities for working as part of a team
- Obtain professional contacts around the country
- Increase sense of professional responsibility

Qualifications: The applicant must have a bachelor's degree in chemistry or other physical science with a background in environmental issues. This project requires excellent communication and writing skills, as well as the ability to work in a team environment. Knowledge in using analytical equipment, especially GC/MS and/or LC/MS and extraction technology is desirable. Proficient in analytical techniques especially in preparing solutions and quantitative transfer procedures is desirable. Experience with MS Word, comfort with a wide variety of office computer applications, and the ability to use presentation graphics (e.g., PowerPoint) is also preferred. Limited travel to meetings may be involved.

Additional Information: The internship will initially be for one year. The preferred start date is April 16, 2007. 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 residence status is preferred. The intern does not become an EPA employee.

The technical contact for this project is Dr. Lawrence Zintek. He can be contacted at zintek.lawrence@epa.gov.

The Internship Program for EPA is administered by the Oak Ridge Institute for Science and Education. Please reference Project # EPA Region 5-CRL-2007-02 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, TN 37831 Phone: (875)576-8503 FAX: (865)241-5219 e-mail: betty.bowling@ornl.gov.

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