

**POSTGRADUATE RESEARCH PARTICIPATION PROGRAM  
NATIONAL EXPOSURE RESEARCH LABORATORY - CINCINNATI**

**CHEMICAL ANALYSES OF PESTICIDES AND ORGANIC COMPOUNDS  
DEVELOPMENT OF METHODS WITH IMPROVED SENSITIVITY**

***PROJECT # NERL 2002-04A***

A research project is available through the Postgraduate Research Participation Program at the National Exposure Research Laboratory, U.S. Environmental Protection Agency (EPA) in Cincinnati, Ohio. The research involves improved sensitivity of pesticides analyses in matrices such as vegetation and aquatic organisms. Under the guidance of a research mentor, the participant will gain educational benefits through involvement in development of chemical methods of analyses for organic compounds such as pesticides, flame retardants, and endocrine disrupting compounds. Current methodology for analyses in waters is sufficient to detect concentrations that are harmful to humans. Other matrices in the environment, such as vegetation or aquatic organisms, may contain organic compounds that are not detectable with current technology. In order to better assess the condition of the ecosystem, basic research to improve sensitivity of chemical methods are needed.

The research procedure(s) that is to be developed may require investigation into instrumental advancements (such as the use of large volume injectors for gas chromatography); optimization of conditions for automatic extraction systems; and development of clean-up procedures to remove or reduce matrix related compounds that interfere with the analyses. Different approaches may be required depending on the chemical and physical properties of the compound(s) and the nature of the sample (e.g. high lipid content in fish or extraneous materials in vegetation).

The appointment will afford the researcher the opportunity to gain significant knowledge and experience in extraction techniques, clean-up procedures, determinative steps and all necessary quality assurance that is needed to prove the results are accurate and precise. The scope of the task is quite wide due to the combination of the variety of organic compounds and matrices. Instrumentation that could be made available include automated solvent extraction system (high temperature and pressure); various column clean-up apparatus (e.g. florisil columns, alumina columns, and solid phase extractions units); high pressure liquid chromatographs with auto-injectors and various detectors; gas chromatographs with auto-injectors and various detectors; a time-of flight mass spectrometer and a quadrupole mass spectrometer.

**QUALIFICATIONS:** Applicant should have received a master's degree in chemistry within three years of the desired starting date, or completion of all requirements for the degree should be expected prior to the starting date. U.S. citizenship or lawful permanent residence status is preferred. The participant will be selected based on academic records, recommendations, research interest, compatibility of background and interests with research programs and projects at NERL, and the availability of funds, staff, programs, and equipment.

The appointment is for one year and may be renewed upon recommendation of NERL and subject to availability of funds. The participant will receive a monthly stipend based on research area and prior experience. The participant must show proof of health and medical insurance. The appointment is for full time research at NERL and is not to exceed four years.

Applications are accepted and processed on a continuous basis. *Please reference project #NERL-02-04A when inquiring about this project.*

The Postgraduate Research Program for NERL-EPA is administered by the Oak Ridge Institute for Science and Education (ORISE). For information and application material contact Debbie Alcorn at ORISE (strongly suggest interested candidate e-mail a résumé to Ms. Alcorn):

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