

**ECOTOXICOGENOMIC APPROACHES FOR MONITORING
EXPOSURE AND EFFECTS OF EMERGING CHEMICALS IN AQUATIC SYSTEMS**

Helen Poynton*, Henri Wintz, Rick Zuzow, Chris Vulpe

ABSTRACT: Emerging Chemicals including Endocrine Disrupting Compounds (EDCs) and Pharmaceuticals pose unique threats to aquatic systems because of their non-conventional mechanisms of action. While the toxicity of most toxicants can be assessed using routine acute and chronic bioassays, EDCs and Pharmaceuticals cause subtle effects to the organism, usually not measured in these assays, but which still have the potential to adversely affect the population. We propose an ecotoxicogenomics approach for monitoring these emerging chemicals. By measuring thousands of biomarkers in a single experiment, cDNA microarrays and other genomic tools create a holistic view of how the toxicant is affecting the organism. Therefore, these techniques reveal subtle effects to reproduction or immunity often caused by EDCs and Pharmaceuticals. In our laboratory, we have utilized cDNA microarrays for *Daphnia magna* and fathead minnow (*Pimephales promelas*) to demonstrate the potential for monitoring water quality for effects caused by metals and Ordnance Related Compounds using genomic tools. In a similar manner, these techniques could be applied to emerging chemicals. We are currently using Suppressive Subtractive Hybridization to select for genes involved in the daphnid endocrine system. Including these genes on our third generation *Daphnia magna* array, will enable us to monitor for toxicants that target the invertebrate endocrine system.

* Graduate Student, University of California-Berkeley, 119 Morgan Hall, Nutritional Sciences and Toxicology, Berkeley, CA 94720, USA, Phone: 510-643-2351, Fax: 510-642-0535, Email: helecp@calmail.berkeley.edu