

## Society For Risk Analysis Annual Meeting 2010

### *Risk Analysis in Action*

W1-E: Wednesday, December 8, 2010

Exposure Assessment: Bugs, Drugs, and Metals

**W1-E.2 08:20 An analysis of global regulatory initiatives regarding pharmaceuticals and personal care products: The potential role of bioassays in risk assessment.** *Perez AL, McKinley MA\*, Donovan EP, Anderle de Saylor M, Thuett KA; ChemRisk* [aperez@chemrisk.com](mailto:aperez@chemrisk.com)

**Abstract:** Due to the increasing use and often unregulated disposal of both pharmaceuticals and personal care products (PPCPs), the presence of these chemicals and their breakdown products in wastewater and in drinking water has captured the attention of regulatory agencies worldwide. Uncertainty surrounds the fate of PPCPs not targeted by conventional wastewater treatment systems and the human health risks posed by their presence in drinking water are relatively unknown. There are few reported human toxicity data for many of these compounds at low concentrations; furthermore, the effect of chemical mixtures is not well understood. The threat to aquatic vertebrates and invertebrates is often poorly characterized. Traditional animal toxicity testing can be cost-prohibitive and not applicable to certain situations. In the past decade, there have been initiatives in the E.U., Canada, Australia, and the United States related to the use of bioassays to monitor chronic toxicity of PPCPs in water systems. Here, we conduct a review of the regulatory and published scientific literature; over 200 articles were considered. This paper contrasts and compares these various initiatives and offers a reflection on the future of the regulatory efforts. In addition, we provide a thorough analysis of the available bioassays for potential use in wastewater, post-treated effluent, and drinking water. The possible benefits of using bioassays to replace or supplement the measurement of individual chemicals is discussed. Further, we examine the potential for use of bioassays to estimate the aggregate risk associated with complex mixtures.