International Society of Exposure Science (ISES) Annual Meeting

Utrecht, Netherlands

October 9-13, 2016

Symposium: New Data Streams for 21st Century Exposure Science

Presentation Title: New Data from EPA's Exposure Forecasting (ExpoCast) Project

Authors: John Wambaugh, Alice Yau, Anne M Gregg, Ann Louise Sumner, Kristin A Favela, Derya Biryol, Peter Egeghy, Chris Grulke, Kristin Isaacs, Xiaoyu Liu, Kamel Mansouri, Chantel Nicolas, Katherine Phillips, Ann Richard, Caroline Ring, R. Woodrow Setzer, Jon Sobus, Antony Williams, Russell S Thomas

Abstract: The health risks posed by the chemicals in our environment depends on both chemical hazard and exposure. However, relatively few chemicals have estimates of exposure intake, limiting risk estimations for thousands of chemicals. The U.S. EPA Exposure Forecasting (ExpoCast) project aims to provide rapid, provisional exposure predictions for these thousands of chemicals. In order to provide rapid predictions of human and ecological exposure for thousands of chemicals that have little exposure-related information, the EPA is developing mathematical models, organizing and analyzing extant data, and using new tools such as screening-mode mass spectrometry (MS) to collect new data on chemical properties, use, and occurrence. The pilot phase of the ExpoCast data collection has focused on four activities: 1) high throughput physicochemical property measurements, 2) new biomonitoring data, 3) chemical emissivity data for articles of commerce, and 4) chemical deformulation of consumer products and articles of commerce. As an example of ExpoCast data collection, a selection of 100 objects that might be found in the home was screened using gas chromatography (GC) x GC time of flight MS, and 3803 unique chemical signatures were observed in test objects. 1608 of the signatures could be confirmed or tentatively identified. Only 184 of the 1608 chemicals had previously been known to have potential proximate or "near field" sources of exposure. The new data streams will be used to expand the domain of applicability, and to refine, and validate existing ExpoCast models. *This abstract does not necessarily reflect U.S. EPA policy.*