

Biomonitoring studies of environmental contaminants

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Abstract

There are a great number of studies looking at the exposure of select subgroups to environmental contaminants, using study populations to predict overall exposures to larger populations. Studies from our Institute include Treatment of Lead burdened Children (TLC) Childhood Lead exposure and Assessment (CLEARS) National Human Exposure and Assessment Study (NHEXAS) and most recently the National Children's Study (NCS). For all of these studies analytical measurement of biomarkers of exposure are the data acquired and reported. This presentation will focus on the fundamentals of establishing a bio-monitoring program for environmental studies with descriptions of the many past, present and possible future bio-monitoring studies worldwide. The presentations will include general descriptions of how to deal with sample handling logistics, characterization of biomarkers, and automation of sample preparation. Studies employing biomonitoring as a metric of exposure are often begun before the principal analyte (s) are commercially available. Accurate assessment depends on metabolite identification and quantification. Monitoring BPA in neonates, required measurement of its metabolites before commercial standards were available. The solution using laboratory generated surrogates as well as alternative approaches will be presented. As a final consideration this presentation will include a discussion on the role of biomonitoring in the exposome and how the increase in metabolomics will enable an interface between biomonitoring studies and the exposome.

Biography

Dr. Brian Buckley received his BS in chemistry from the University of New Hampshire in 1983 his PhD in analytical chemistry from North Carolina State University in 1989 and completed a postdoctoral fellowship at Oak Ridge National Laboratory. Currently he is working as the Executive Director of Laboratories at the Environmental and Occupational Health Sciences Institute at Rutgers University Dr Buckley is an NIEHS Center Facility Core Director a member of the graduate faculty of the Rutgers Environmental Sciences Department and the Joint Graduate Program in Toxicology as well as the UMDNJ School of Public health He is serving as an editorial member of several reputed journals like Journal of Environmental and Public Health and the Global Journal of Analytical Chemistry He has authored more than 50 research articles/book chapters He is a member of the American Chemical Society and the Society of Applied Spectroscopy and was honored as the Virgil Payne Award for Outstanding Chemical Service Achievement and has served on multiple review panels for NIH and EPA FIFRA Currently his research focus is on analytical mass spectrometric methods development and modification to measure environmental contaminants and their metabolites. His research has focused on innovative analytical techniques such as Microwave Assisted Solvent Extraction MASE solid phase micro extraction SPME and metal speciation to measure contaminants in multiple media His research projects include; using synthetic biofluid extractions for estimating bioavailability measurement of unregulated organic contaminants such as pharmaceuticals in drinking water quantifying arsenic species in human urine and extraction of BPA from tissue.