

Exposing, Evaluating, and Preventing Health Contaminants at the Greater Chicago Study Center

Greater Chicago Study Center

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Abstract

A goal of the National Children's Study is to increase the understanding of the relationship between the environment and mother's and children's health. The GCSC is exploring three innovative methods to examine these relationships through three distinct sub-studies using biological samples (e.g, placenta, dried blood spots, hair, etc). The presence of lipophilic organic pollutants will be examined in placenta employing a novel method using the unique combination of matrix solid phase dispersion (MSPD) extraction with silica gel cleanup which lowers extraction time, cost, and solvent consumption as compared to traditional methods (Chart 1).

Chart 1. Comparison of MSPD to Alternatives

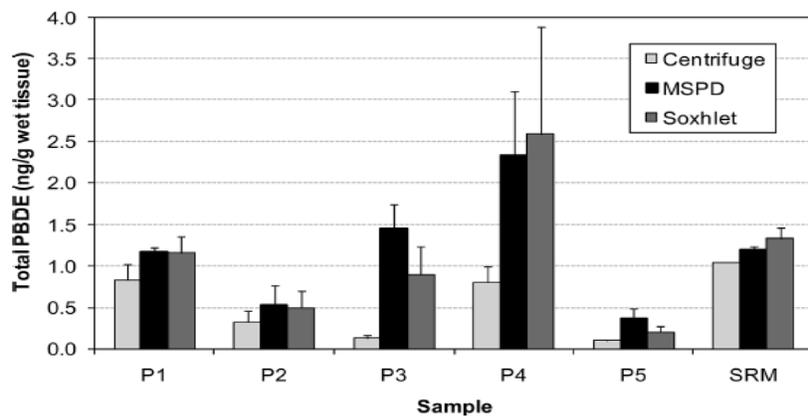


Figure 3. Total PBDE concentration from five individual placenta samples and fish tissue SRM extracted using MSPD, liquid and Soxhlet extraction methods. SRM concentrations are 10 times diluted. The error bars represent one standard deviation of duplicated analyses.

Dassanayake, P., Wei, H., Chen, R., Li, A. Optimization of the Matrix Solid Phase Dispersion Extraction Procedure for the Analysis of Polybrominated Diphenyl Ethers in Human Placenta. *Analytical Chemistry*, 81 (23), 9795 – 9801.

Novel, minimally invasive methods of detecting and extrapolating contaminants in the blood through the collection of finger prick or heel stick blood spots will also be examined. The effectiveness of using dried blood spots (DBS) compared to the more intrusive and costly alternative, venous blood draws, is being assessed. A third innovative approach includes analyzing biomarkers to assess the association between biomarkers and self reported stress in pregnant women (Figure 1). The scale to accurately measure pregnant women's self reports of stress compared to biological indicators is currently in

development.

These projects exemplify the GCSC's mission to not only identify the relationship of the environment to maternal and children's health, but also to find cost-efficient, minimally invasive procedures to eradicate poor health in future populations of mothers and children.

