

Title: Role of human biomonitoring on population health in the era of environmental changes: from Lab to Cohorts

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Abstract

Human biomonitoring (HBM) is a powerful tool in environmental epidemiology that allows researchers to assess human exposure to environmental chemicals and evaluate their potential health risks. By measuring chemical pollutants and their metabolites in biological samples, HBM provides critical insights into exposure-response relationships in real-world settings. My major research is on applying biological monitoring markers in the studies of newly-emerging environmental disease, such as melamine exposure and renal damage, by mass spectrometry.

After 2008 melamine-tainted baby formula scandal, melamine chemical is still ubiquitously present in the environment. I first established the analytical method by mass spectrometry to measure urinary melamine in different clinical or community cohort studies. One paper published in JAMA Internal Medicine, was cited by Time magazine at <http://healthland.time.com/2013/01/22/hot-soups-can-cause-chemical-to-leach-from-melamine-bowls/> due to its significance in the public health. In this talk, I will introduce our series melamine studies, we found that 1) People still have the potential to expose to melamine in the daily life due to daily-use melamine-made tableware or kitchenware; 2) High urinary excretion of melamine is associated with the occurrence of adult urolithiasis; 3) Melamine chemical can be detectable in both uric acid- and calcium-containing stone samples by the analyses of matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS); 4) melamine tableware manufacturing workers who had higher urinary excretion of melamine had significantly higher N-acetyl-beta-D-glucosaminidase (NAG) level which is an indicator of early renal tubular damage; 5) behavior intervention of regular using of stainless steel-made meals boxes can mitigate melamine exposure from melamine tableware; 6) We further established such association in the different vulnerable population including early chronic kidney disease (CKD), type 2 diabetes mellitus (DM), pregnant women and infants from Taiwan Maternal & Infant Cohort Study (TMICS), phthalate-tainted foods affected children, and general adults population from the Taiwan Biobank. Through these studies, we have contributed greatly to our current knowledge regarding the renal health impacts of living-environmental toxicants in melamine, and how to mitigate their daily exposure in the vulnerable populations. The next big environmental topics certainly bound to affect large numbers of people: global warming. I'm particularly interested in the effect of increasing temperature on vulnerable population.

Biography

Dr. Chia-Fang Wu earned her Bachelor's degree in Public Health from Chung Shan Medical University, Taiwan, followed by a Master's degree in Molecular Epidemiology at the Graduate Institute of Occupational Safety and Health, Kaohsiung Medical University (KMU), Taiwan. She later obtained her PhD at KMU, doing human biomonitoring (HBM) with a focus on Mass Spectrometry, training at National Health Research Institutes (NHRI), Taiwan. With over 5 years of experience in human biomonitoring in Epidemiology in the Research Center for Environmental Medicine at KMU, she also served as an Assistant Professor at National United University (NNU) for three years. Currently, she changed her position to Research Center for Environmental Changes at Academia Sinica, Taiwan. Her primary research interest lies in developing biomarkers for studying newly-emerging environmental toxicants under climate change issue and their associated disease risk.