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EHT

Judging Dept.

Lin Tao

Student

EHT

4

Kurunthachalam Kannan

Dept or Program Years in program

Mentor

Biomonitoring of Perfluorochemicals in Plasma of New York State Personnel Responding to the World Trade Center Disaster

Author (s)

Lin Tao, Kurunthachalam Kannan, Kenneth M. Aldous, Matthew P. Mauer, and George A. Eadon

The collapse of the World Trade Center (WTC) on September 11, 2001 resulted in the release of several airborne pollutants in and around the site. Perfluorochemicals which are used in soil and stain resistant coatings in WTC buildings were potentially released. In this pilot study, we analyzed eight perfluorochemicals in 458 plasma samples of New York State employees and National Guard personnel assigned to work in the vicinity of the WTC between September 11 and December 23, 2001, to assess perfluorochemicals exposure. Samples were grouped based on self-reported symptoms and estimated levels of exposure to dust and smoke. Perfluorooctanesulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorohexanesulfonate (PFHxS), and perfluorononanoic acid (PFNA) were consistently detected in almost all samples. PFOA and PFHxS concentrations in WTC responders were approximately two-fold higher than those reported for the US general population. No significant difference was observed in the concentrations of perfluorochemicals between symptomatic and asymptomatic groups. Concentrations of PFHxS and PFNA were respectively significantly higher in the more dust or smoke exposure group comparing to less dust or smoke exposure group. A significant negative correlation existed between plasma lipid content and concentrations of certain perfluorochemicals. Our initial findings suggest that WTC responders were exposed to perfluorochemicals, especially PFOA, PFNA, and PFHxS, through inhalation of dust and smoke released during and after the collapse of the WTC. Expansion of testing all archived samples may be possible to identify biological markers of WTC exposure and to improve our understanding of the health impacts of these compounds.