

# Gender Impacts on the Uptake of Organophosphate Flame Retardants by C57BL/6 Mice

Brittany Rickard, Stephanie Marco, Ali Yasrebi, Troy Roepke, Brian Buckley  
University of the Sciences and Rutgers, The State University of New Jersey

Endocrine disruptors such as organophosphate flame retardants are prevalent in the environment, often as contaminants. These compounds may have a profound impact on the body if inhaled or ingested that can lead to a disruption in human body homeostasis. If significant amounts of OPFRs are found in the kidneys of male and female mice in a daily ingestion model, it suggests a possible human uptake and accumulation as well. The purpose of this study is to compare the uptake of organophosphate flame retardants by examining the kidneys of male and female C57BL/6 mice, looking for possible gender differences in OPFR accumulation. Five male and female C57BL/6 mice were treated with 3mg/kg of a mixture of TCP, TPP, and TDCPP in peanut butter for four weeks. The mice were given their final dose 1.5-2 hours before being decapitated. Immediately after decapitation, trunk blood and organs were snap frozen and stored at -80 degrees until analysis. The kidneys were placed on dry ice and weighed individually. An analytical extraction method was developed for kidney sample analysis. For each 100mg tissue, 1 mL 50mM Tris-HCl was added then homogenized before spiking each sample with 50ppb TPP-D-15. The OPFR mixture was extracted from the kidneys using toluene and the samples were centrifuged for 5 minutes to allow full separation of the layers. Using liquid extraction, the top layer of the solution was transferred into a vial to be analyzed by the GC-MS for the OPFRs. Based on the data collected, the OPFR that is present in the greatest amount for both genders appears to be TDCPP. In the male mice, the range of TDCPP was 5.17pg/mg kidney-10.05pg/mg kidney, the range of TPP was 0.62pg/mg kidney - 4.02pg/mg kidney, and the range of TCP was 0.45pg/mg kidney - 2.66pg/mg kidney. In the female mice, the range of TDCPP was 5.73pg/mg kidney -9.12pg/mg kidney, the range of TPP was 0.26pg/mg kidney - 0.47pg/mg kidney, and the range of TCP was 0.19pg/mg kidney - 0.43pg/mg kidney. As a result of these preliminary findings, while the male kidneys had a broader range and much higher maximum values there appears to be no statistical significance between the uptake and distribution of organophosphate flame retardants in male and female C57BL/6 mice. Funding: The Center for Environmental Exposures and Disease NIEHS ES005022 and NIEHS ES020721.

