Assessment of Toxicity and Risk of Inhaled Environmental PCB Mixtures

Prior to Project 7's studies, little was known about the toxicity of inhaled semi-volatile PCBs. Over the past 5 years, the research team has developed a PCB vapor generation apparatus, nose-only and whole-body exposure systems, and methodology for quantifying exposures to all 209 congeners and measurement of those congeners plus OH-PCB and PCB sulfate metabolites in tissues and excreta.

There is a paucity of published data on the toxicity of inhaled PCBs, which are a growing concern in our nation's public schools. Project 7 will carry out experiments to address three specific aims:

- Conduct inhalation studies using their Chicago Air Mixture (CAM+) to identify adverse outcome pathways and derive in vivo data for an integrated risk assessment. In 2017, Project 7 performed a 4-week inhalation rat study of PCB mixture that simulated PCB profile found in the indoor air of East Chicago school (enrolled in AESOP study, Project 6).
- Conduct Absorption, Distribution, Metabolism, and Excretion (ADME) toxicology studies with lung exposure to radiolabeled tetra- and penta-chlorobiphenyls to provide data for toxicokinetic modeling.
- Investigate developmental, immune, and neurologic toxicity after prenatal inhalation exposure to airborne PCBs.

Core Leader: Peter S. Thorne, PhD
Dr. Thorne is Professor and Head of the University of Iowa's Department of Occupational and Environmental Health with a secondary appointment in the Department of Civil and Environmental Engineering. He has over 23 years experience in toxicology research involving laboratory animals. He is the founder and director of the closely aligned Inhalation Toxicology Facility within the Environmental Health Sciences Research Center. Dr. Thorne served for many years on the Institutional Animal Care and Use Committee. He will have overall responsibility for the Core and will serve as the primary contact with other Project and Core Leaders in the isrp.

Andrea Adamcakova-Dodd, PhD.
Dr. Andrea Adamcakova-Dodd is an Assistant Research Scientist who has been involved in toxicology research of environmental pollutants since 1998. She has worked in the Pulmonary Toxicology Facility for 12 years. In her current position at the Pulmonary Toxicology Facility, she has led or collaborated on toxicity studies of inhaled particulate aerosols and vapors. In recent years she has been extensively involved in development of generation systems for inhalation exposures to PCBs vapors and toxicity assessment of PCBs using animal models.