New Study on PCBs in Schools
Isrp researchers Dr. Keri Hornbuckle and Dr. Peter Thorne were interviewed by numerous newspapers and National Public Radio after the release of their findings of polychlorinated
biphenyls (PCBs) in schools in the journal Environmental Science and Technology.

The study showed that PCBs are present in older schools and that the source of the PCBs is most likely outdated building materials, such as window caulking and light ballasts.

The study, which collected indoor and outdoor air samples at six schools in Iowa and Indiana from 2012 to 2015, is the largest yet to examine airborne PCBs in schools. It shows that while the presence of PCBs can vary from school to school and even from classroom to classroom, children’s exposure rates are roughly the same in rural and urban areas.

It also shows that exposure to PCBs by inhalation may be equal to or higher than exposure through diet, a finding that surprised researchers. Besides PCBs, researchers looked for the first time at OH-PCBs, chemical compounds similar to PCBs, in schools. Although there is still much to learn about OH-PCBs and their potential health risks, some scientists believe they could be more toxic than PCBs.

Following publication of the article, representatives from the EPA and ATSDR and several community groups in the East Chicago area discussed the findings with staff.

More information on PCBs and schools can be found on our Iowa Superfund Research Program links page.

Above photo, courtesy of Tim Schoon, shows Dr. Hornbuckle and Dr. Rachel Marek (left) with a passive sampler.
A paper on PCBs and developmental neurotoxicity was picked as an Editor's Highlight in the journal Toxicological Sciences. The research was a joint collaboration between researchers at the University of Iowa, UC-Davis, and University of British Columbia. The lead author was Dr. Izabela Kania-Korwel from the isrp.

Dr. Korwel and collaborators presented a study focusing on the various aspects of neurodevelopmental toxicity of PCB metabolites. "Interestingly, the profiles of the OH-PCB metabolites were significantly different depending on the parent PCB, type of tissue, and age of exposure. These OH-PCBs can significantly influence the thyroid hormone homeostasis and interact with the ryanodine receptors forming a likely mechanistic basis for neurodevelopmental effects of these compounds."

The results of this study "clearly indicate that the underlying factors for neurotoxicity of these compounds are much more complex, if differences in enantioselective metabolism are taken into account. This complexity will clearly influence the risk assessment for PCBs with respect to neurotoxicity." Martin van den Berg.

Trainees Work and Learn in the Community
Six Trainees did a road trip to East Chicago, Indiana to support the outreach activities of the Iowa Superfund Research Program (isrp) at a junior high school. The students assisted Ashlee Johannes, Community Engagement Coordinator for the isrp. Students taught 8th grade students at Joseph Block Junior High about polychlorinated biphenyls (PCBs) during their science class.

East Chicago is home to several Superfund sites. The Indiana Harbor and Ship Canal, just a few blocks from Block Junior High, is being dredged. Dredging first began in 2012 in the Grand Calumet River, which contains PCBs and is considered one of the most polluted in the country.
Trainees really enjoyed the chance to interact with junior high students. It was a good lesson on how toxic substances affect the surrounding community and how toxicologists can assist communities as a part of their job.

External Advisory Committee Meeting
On October 3rd, the isrp held its External Advisory Committee (EAC) Meeting at the University of Iowa College of Public Health. The External Advisors provide important suggestions and recommendations regarding the Iowa Superfund Research Program.

In the morning, each Project and Core presented an update concerning their programs. The afternoon session provided additional time for the advisors to make recommendations about how they would like the Center to proceed in the future.

During the lunch hour, 22 posters were presented by isrp trainees to the EAC Advisors for their feedback. In addition to the EAC members, representatives from the Environmental Protection Agency and the National Superfund Research Program were also present.

Pictured above is isrp staff Andres Martinez (left), trainee Jessica Ewald (middle), and EAC advisor Dr. Terry Monks.
Reductive Dehalogenase Genes in Unenriched Sediments

Iowa Superfund researchers from Project 4 and Project 5 recently published in the journal *Environmental Science and Pollution Research* the first study to find PCB reductive dehalogenase genes (RDase) in unenriched sediments.

Twenty-seven sediment samples were taken from a former wastewater lagoon in Altavista, Virginia. The site is contaminated with a commercial mixture—Aroclor 1248. Comparison of PCB congener profiles in each sediment sample against the Aroclor 1248 PCB congener profile reveals that the extent of PCB dechlorination varies within the lagoon. It also appears that PCB dechlorination processes had occurred at some point in the past.

Enrichment of PCB-dechlorinating microorganisms from these sediments along with concurrent application of molecular diagnostic tools is expected to reveal which RDase genes participate in PCB congener reduction.

Two Trainees Awarded KC Donnelly Externships
Two trainees from the Iowa Superfund Research Program have been awarded KC Donnelly Externships from the NIEHS Superfund Program. The KC Donnelly Externships provide current SRP funded graduate students/post-doc researchers translational experiences with other SRP funded centers, government agencies, or other agencies (state, local, or Tribal).

Eric Uwimana and Victoria Parker will receive support for up to three months consisting of supplies, travel, and housing costs for the duration of the externship and travel funds to attend the SRP Annual Meeting where they are invited to present their research.

Eric will be doing his externship with Isaac Pessah, Ph.D., at the University of California, Davis. Through this externship, he will use a high-throughput screening approach to study the relationship between PCBs and liver disease. The externship will expand upon his current work by exploring the underlying mechanisms of how PCBs contribute to liver disease and by including experiments with liver cells from both mice and humans. He will evaluate species differences, important information for extrapolation from animal data to human risk.

Victoria traveled to the University of Kentucky where she worked with Lisa Cassis, Ph.D. The KC Donnelly externship will expand upon her current work with human adipocytes exploring important differences between human and rodent cell models in PCB metabolism and effects.

Isrp Assists in the Community Reporting of Air PCBs
The Iowa Superfund Research Program, the Boston University Superfund Program (BUSRP), and three community groups formed a partnership of five project leaders to measure the amount of airborne PCBs in the New Bedford Harbor area. The three community groups were the Toxics Action Center, Alternatives for Community and Environment (ACE), and the Hands Across the River Coalition (HARC).
ACE and HARC developed research questions related to New Bedford Harbor and shared these questions with BUSRP. BUSRP engaged researchers at the Iowa Superfund Research Program, who have a long history of studying lower molecular weight PCBs and their sources. HARC’s role was to recruit air monitor hosts interested in New Bedford Harbor environmental health concerns.

Two workshops were held with monitor hosts so that they could understand the data collected. Monitor hosts worked in pairs with assistance from the Toxic Actions Center and BUSRP to translate the data. The hosts became much more confident in interpreting the data and comparing them to data generated by the EPA. This outreach and cooperation model can be used for other communities impacted by environmental pollutants.

The complete article describing the results of their cooperation can be found in Environmental Science and Pollution Research.

Above image is courtesy of the Environmental Protection Agency.

Isrp in Atlantic Magazine
Researchers from the Iowa Superfund Research Program were included in an article in the Atlantic magazine about the history and evolution of benzene. This interesting article traces the history of benzene from 19th century Germany to 1929 production of PCBs to the discovery of PCBs in the deepest part of the oceans. Six isrp researchers were cited in the article.
Risk Assessment Course
Isrp trainees participated in an Environmental Protection Agency (EPA) Risk Assessment Course at the University of Iowa on October 2, 2017. The daylong course was led by Dr. Xabier Arzuaga and Dr. Geniece Lehmann of the U.S. EPA.

Trainees were given an introduction to risk assessment, an overview of human health risk assessment, learned how toxicology research is used in human health risk assessment, and were given the chance to do a real risk assessment using the EPA's Exposure Factors Interactive Resource for Scenarios Tool. Students received an EPA certificate at the end of the course.

Former Trainee Spotlight
The former isrp trainee highlight for this edition will be Dr. Bingxuan Wang, a 2011 graduate of the University of Iowa Interdisciplinary Graduate Program in Human Toxicology.
"I’m a toxicologist at the consulting firm ToxServices. I work with private industries, government agencies and nonprofit organizations on a variety of projects involving qualitative and quantitative risk assessments, such as establishing safety levels of drinking water contaminants originated from plumbing parts, and evaluating the safety and regulatory compliance of food ingredients, cosmetic formulations, electronic devices, medical devices, and textile treatment chemicals."

I also evaluate the human health and environmental safety of household cleaning products under the U.S. EPA’s Safer Choice program, building components (such as elevators, cables, insulating materials) under the Cradle to Cradle certification program, and chemicals (such as pesticides, preservatives, plasticizers) using the GreenScreen for Safer Chemicals paradigm. In doing this, I help industries select safer ingredients in their products and remove chemicals that are harmful to human health or the environment."

Good job, Bingxuan, keep up the good work!