

## ENVIRONMENTAL PCB EXPOSURE AS A RISK FACTOR – PROJECT PLATFORM FOR PHD PROGRAM

Lubica MURÍNOVÁ

*Faculty of Public Health, Slovak Medical University Bratislava*

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### Abstract

Human population is exposed to chemicals and chemical mixtures in the environment via inhalation, ingestion and dermal contact. Important problem are legacy pollutants left in the environment by former industrial production. Polychlorinated biphenyls (PCBs) are chemicals widely used by industry in the past. Their production was banned in 70-ies and 80-ies worldwide. They belong to persistent organic pollutants (POPs) which are ubiquitous chemicals, resistant to degradation, transported for long distances in the atmosphere and bioaccumulating in the living organisms. PCBs are endocrine disruptors, developmental toxicants, they are toxic to immune, reproductive and nervous systems and they are carcinogenic to humans. Factory Chemko in Strážske, Michalovce region, eastern Slovakia, produced PCBs within 1959 – 1984. During PCB production, waste containing PCBs was discharged directly into the environment. As a result, high PCB contamination of the area was found (soil, water sediments, locally produced food of animal origin), followed by high PCB exposure of population living in the area. Several international and national epidemiological studies were implemented in the region. Studies were focused on determination of human exposure to PCBs using human biomonitoring and association of environmental PCB exposure with health effects in the Michalovce region. Populations of interest included both, adults and children. PCB cohort was launched in 2003 – 2004 as a birth cohort study, subjects recently reached adulthood.

We have found a wide range of health effects associated with PCB exposure, including metabolic disorders, alterations of thyroid structure and function, ototoxicity, altered neurodevelopment and immune development of children. Our recent study focused on PCB exposure in 4 regions of eastern Slovakia confirmed continuing high PCB blood levels in people living in the Michalovce. More than half of women and 41% of men living in Michalovce region had PCB blood concentrations higher than critical values stated by the French Food Safety Agency (700 ng/g lipids for women up to 45 years and 1 800 ng/g lipids for men, boys over 3 years and women older than 45 years; AFSSA, 2008).

Despite the fact that production of PCBs in eastern Slovakia had been stopped more than 30 years ago, Michalovce region belongs among the most PCB polluted areas in the world. Decrease of PCB exposure is lower than expected, due to existing open sources of PCB environmental contamination.

Extended database on environmental PCB contamination and associated human PCB exposure and health outcomes represent a unique opportunity as a platform

for PhD studies.

### References

French Food Safety Agency (AFSSA), 2008: Request no. 2008-SA-0053:  
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### Adress for correspondence:

Lubica Palkovičová Murínová, MD, PhD.  
E-mail: [lubica.murinova@szu.sk](mailto:lubica.murinova@szu.sk)