The impact of bisphenol A (BPA) on the transcriptome of liver and kidney in the mouse (lac. *Mus musculus*).

Marta Wiszpolska, M. Sc.

The doctoral thesis was carried out at the Department of Human Physiology and Pathophysiology, Faculty of Medicine, Collegium Medicum University of Warmia and Mazury in Olsztyn, under the guidance of Marta Majewska, PhD, prof. of UWM (supervisor) and Ewa Lepiarczyk, PhD, prof. of UWM (ancillary supervisor).

Bisphenol A is a widespread environmental toxin found in many everyday products, such as food packaging and medical equipment. Due to its structure, it can disrupt the hormonal balance of the human body, thus affecting physiological processes.

The liver plays a fundamental role in the detoxification and metabolism of many toxic compounds, including BPA, which, by changing hepatocyte signaling pathways, may contribute to the development of liver diseases. BPA is excreted from the human body, among others, by the kidneys, where it increases the risk of oxidative stress and intensifies inflammatory processes. Although several harmful effects of BPA on the liver and kidneys have been demonstrated, the molecular processes underlying these interactions remain poorly understood.

The study was performed to investigate the impact of BPA on the liver and kidneys in mice at the molecular level. Transcriptomic studies enabled a detailed assessment of gene expression between the control and experimental groups, which were administered BPA for 3 months at a dose of 50 mg/kg. The results confirm that BPA affects gene expression in the liver and kidneys, contributing to their damage. In the liver, BPA disrupts the ribosome function and dysregulates the oxidative phosphorylation process. In the kidneys, the observed transcriptomic changes suggest that this toxin induces oxidative stress and disrupts the proper functioning of mitochondria. The fact that activation of processes that promote the development of carcinogenesis was observed in both organs studied is of concern.