ENVIRONMENTAL HEALTH – FROM EXPOSURE TO BIOMARKERS

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Biological, biochemical and molecular markers are needed in order to find a pattern of measurable parameters for environmental health. Our project concentrates on a selection of potentially useful molecular biomarkers, by using human placental perfusion, cell culture models as well as animal models. Our studies pursue toxicokinetics of environmental chemicals in placental and human and animal hepatic models and their effects on the development of fetus in vitro.

We are among the first to systemically study human fetal exposure to chemical carcinogens and environmental chemicals by human placental perfusion. In addition to providing actual data on transplacental transfer processes our studies give more insight of the usability of placental perfusion as a method for fetal exposure. The function of placental transporter proteins that may cause variation in fetal exposure between individuals are not yet well understood. Already we have shown that ABCG2/BCRP, one of the major efflux transports in human placenta affect the transport of PhIP, a heterocyclic amine and food carcinogen. The studies on the role of ABCG2 in fetal protection will continue with environmental chemicals. The studies of bank and field voles living at the old sawmill area contaminated by chlorinated dibenzo-p-dioxins and –furans (PCDD/Fs) have a significant difference in their body burden of PCDD/Fs. Concentrations are much higher in bank voles, and the next steps of the research are the dose-response effects of TCDD on the xenobiotic metabolizing enzymes.

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