



# INVITATION TO LECTURE

## Dr. Markus Hecker

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## Investigations into the molecular initiating events that drive the sensitivity of fishes to dioxin-like chemicals

**Date:** 17. April 2018, 9:00 h

**Venue:** lecture room RCX1 (A29/252), 2nd floor, RECETOX, Kamenice 5, Brno

### Syllabus of lecture:

Adverse effects of exposure to dioxin-like compounds (DLCs) in vertebrates are primarily driven by activation of the aryl hydrocarbon receptor (AHR). However, mechanisms for the great differences in sensitivity to these effects among species of fish were unknown. Therefore, this study 1) investigated sensitivities to activation by the model DLC, 2,3,7,8-TCDD, of AHR1s and AHR2s among seven species of fish known to greatly differ in sensitivity to TCDD, 2) characterized the relationship between in vitro sensitivity to activation of AHRs and in vivo sensitivity of embryos to TCDD, and 3) and developed a quantitative adverse outcome pathway (qAOP) model for AhR-mediated toxicity across oviparous vertebrate species. Results of this study provide empirical evidence for the hypothesis that sensitivity to activation of AHR2, but not AHR1, mediates adverse effects of and sensitivity to TCDD among phylogenetically diverse species of fish, which is comparable to that previously demonstrated for AHR1 of birds, resulted in a single equation for predicting sensitivity to TCDD across species of oviparous vertebrates. Based on these findings as well as mechanistic toxicity information available for DLCs in fishes, a quantitative AOP was successfully established. This biological model has the potential to guide more objective ecological risk assessment of DLCs for species of fish that are not easily studied, including threatened or endangered species.

### About the lecturer:

Markus Hecker is a Professor and Canada Research Chair in Predictive Aquatic Toxicology, with 21 years of experience in conducting research in ecotoxicology. He is considered a global expert in ecotoxicogenomics, hazard characterization of contaminants in native fishes and amphibians, and development of alternatives to live animal testing. Dr. Hecker served as an expert to the US-EPA EDSP and the OECD Validation & Management Group for Non Animal Testing, and is a member of the College of the Royal Society of Canada. He is a visiting/guest professor at the Peking Union Medical College and Xiamen University, China, and serves as an editor for Environmental Science and Pollution Research and Environmental Science Europe. Markus has authored or co-authored over 160 peer-reviewed papers, review articles, editorials and book chapters, and currently serves on the board of directors of the Society of Toxicology and Chemistry (North America).