Session: 1.05.P Better Alignment of New Approach Methodologies and Adverse Outcome Pathways to Support Next Generation Risk Assessment
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Ecotoxicogenomic Hazard Assessment of Artificial Sweeteners in Aquatic Model Organisms

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Since their approval as food additives, artificial sweeteners are commonly used in food, beverages as well as in personal care products all around the world. The widespread and intensive consumption of artificial sweeteners in combination with their high stability and water solubility has led to their release into the aquatic environment, where they prove to be persistent. Given that no detailed environmental risk assessment was carried out as part of the food additive approval process, it is still unclear whether and to what extent ecotoxic effects are to be expected. Although this has already been pointed out in literature multiple times, studies regarding the ecotoxicity of artificial sweeteners are still lacking. The few studies that have been carried out, could already reveal some ecotoxic effects, such as neurotoxicity in zebrafish embryos caused by Acesulfame K or increased immobility of daphnids caused by Sucralose.

With this in mind, the aim of this project is to enable an assessment of the ecotoxic potential of artificial sweeteners, using OMIC-methods. To fill the existing data gaps, investigations regarding their effects on ecotoxicologically relevant model organisms from different eukaryotic kingdoms will be performed. More precisely, the aquatic plant *Lemna minor*, the Crustacean *Daphnia magna* and the teleost fish *Danio rerio (embryo)* will be examined. In addition to the performance of the corresponding guideline of the Organisation for Economic Cooperation and Development (OECD), effects will be recorded at the gene expression level using RNA sequencing and thus enable insights into the modes of action that correspond to the hazardous effects. This promising combination of methods will be performed on artificial sweeteners for the first time, which finally may show that the assessment of ecotoxicity should no longer be neglected in the approval procedures for food additives.