

Fish model species in human and environmental toxicology

Jessica Legradi, Riccardo Massei, Marek Pípal

May 11, 8:35 - 12:45, Hall 400

Fish models are commonly used in human and eco-toxicity testing to investigate the impact of chemicals on whole organisms. Many important biological functions are conserved between fish species and humans. Therefore fish have a wide utility domain, spanning from basic developmental biology, neurobiology, endocrinology to immunology. The small size of some available fish species including the zebrafish (*Danio rerio*) or medaka (*Oryzias latipes*) and their robust nature makes them ideally suited for application in automated high throughput screens. Furthermore, early life stages of these species offer all the key attributes of a complex in vivo system (e.g. including metabolism), as well as attributes of in vitro assays, as tests can be carried out in multiwell plates formats with small sample volumes and run in comparatively short periods of time. These attributes make them well suited for toxicity testing of environmental extracts and in effect directed analysis (EDA) to detect unknown contaminants in complex samples. Research on fish over the last decade has been greatly facilitated by the availability of sequenced genomes, which are available for over twelve species with more pending. This facility together with advances in genetic and epigenetic studies, including gene knockout and transgenesis technologies, is greatly facilitating understanding of the molecular mechanisms of toxicology. Due to the large similarity with other vertebrates, there is also a growing interest in the application of fish model species in human disease and development. Fish early life stages have been recently used in several cancer genetics studies and drug discovery tests. In the ecotox field fish are also studied outside of the laboratory in their native environment. Prominent models for native fish models are roach (*Rutilus rutilus*) and rainbow trout (*Oncorhynchus mykiss*). Studying fish in their natural habitat allows to go further than simple dose-effect assessments. Within this session we intend to show recent developments in toxicological research using a variety of different fish model species, focusing on novel systems, endpoints, assays and testing strategies. Results of toxicity studies of single compounds as well as complex environmental samples are of interest. Effects on individual fish, multigenerational exposure effects, and population level impacts will be considered. We especially welcome presentations highlighting new analytical methods and techniques for contaminants or their metabolites in exposure media or fish. The session will be interdisciplinary and bring together researchers across a wide range of research areas with the view to enhance approaches in human and ecotoxicity testing.