

Short course I

Environmental Risk Assessment Considerations for Biologically Active Chemicals: Focusing on Pharmaceuticals and Personal Care Products (PPCPs) and endocrine active chemicals (1/2 day)

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Deterministic and probabilistic environmental risk assessment (ERA) approaches are commonly employed both retrospectively and prospectively to support management decisions for chemical, physical and biological stressors. Studies of pharmaceuticals and personal care products (PPCPs) and endocrine disruptors identify that aspects of historical ERA frameworks must be augmented with additional exposure and effects data to appropriately characterize risk. This short course will: 1. Review relevant ERA principles; 2. Identify key considerations for biologically active chemicals; 3. Present the Adverse Outcome Pathways concept as part of conceptual model development to guide ERA; and 4. Examine the major research questions associated with PPCPs.



Short course II

Human Health Risk Assessment

Prof. Mark Gregory Robson

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The basic risk assessment process will be described and discussed as well as exposure measurement, routes of exposure, basic toxicology, dose/response, avoidance of risk, risk reduction, and risk communication. Practical examples of application of risk assessment in human health with air pollution, water pollution, pesticides, etc., will be presented to illustrate the process. Also a discussion on the one in one million risk standard versus realistic standards of risk.



Short course III

Analysis of Microplastics in Water

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Institute of Environmental Assessment and Water Research (IDAEA-CSIC)

COURSE OUTLINE

1. Introduction to Microplastics (MPs), types of MPs, polymer composition,
2. Plastic litter from rivers to the sea
3. Sampling, Sample preparation and Cleanup of MPs in water and related matrices
4. Identification, Size Distribution, Quantification and Confirmation
5. Microscopy, FT-IR and RAMAN, pyrolysis GC-MS, LC-High Resolution MS, MALDI-TOF-MS. First inter-laboratory studies
6. Considerations about Green Analytical Chemistry protocols applied to the analysis of MPs in water
7. Case studies of occurrence and fate of MPs in Europe, US, Latin America, India, Middle East, and China
8. Toxicology of MPs to aquatic biota and risk to human
9. Increased plastic pollution after COVID-19 pandemic
10. Final remarks on analysis of plastics in the total environment, plastic remediation, green plastics, and citizen science

Participants should have some general knowledge about the general procedure in a chemical analytical laboratory for trace organics. Fundamental knowledge and principles of mass spectrometric and spectroscopic techniques is required as well. This is an ideal course for PhD students that want to learn more about the analysis of microplastics (MPs) in water. The course is also a good fit for chemists that plan to change jobs and move towards the analysis of MPs in water.

