

CFC02: Leveraging automation and other advances in conducting systematic reviews for toxicology and risk assessment: hands-on applications in assessment of hazard, risk, and uncertainty

Chairs:

Andrew Rooney, US | Sebastian Hoffmann

Presentations:

LECTURE: Global orientation to systematic review –successes, challenges, and preparing for next generation decision making on mechanistic data

Elisa Aiassa, Assessment and Methodological Support Unit/ EFSA, Parma, Italy

HANDS ON ACTIVITY 1: PECO, Inclusion/Exclusion

LECTURE: Automated and semi-automated approaches for literature searching, screening, and data extraction

Vickie Walker, National Institute of Environmental Health Sciences, Research Triangle Park, US

HANDS ON ACTIVITY 2: Critical appraisal/Risk of Bias

LECTURE: Synthesis, Certainty (GRADE), and qualitative integration of human, animal, and mechanistic data

Sebastian Hoffmann, Evidence-based Toxicology Collaboration (EBTC), Paderborn, Germany

LECTURE: Quantitative evidence integration supporting toxicity value development and characterization of uncertainty

Daniele Wikoff, ToxStrategies, Asheville, US

HANDS ON ACTIVITY 3: Evidence certainty/GRADE

LECTURE: Conduct and reporting standards for systematic reviews in toxicology and risk assessment

Paul Whaley, Lancaster University, Lancaster Environment Centre, Lancaster, UK

Abstract:

Systematic review is rapidly being established as the new standard in the field of toxicology – but the actual conduct of a “fit for purpose” systematic review remains difficult, particularly for practitioners outside of entities that have established processes. The course will introduce cutting edge methods for text mining and emerging approaches for automation. Instructors will demonstrate use of all data types in systematic review framework including approaches for next generation decision making on datasets that increasingly emphasize in vitro studies and mechanistic data. This course builds on momentum in the field and addresses major challenges in adopting systematic review in practice: 1) lack of experience in application of key systematic review methods and concepts, and 2) the time intensive nature of planning, conducting and reporting a systematic review. By providing hands-on practical experience of several key steps, the course will help participants develop a working knowledge and understanding of the systematic review process. Simplified hands-on activities will provide experience designing research questions that support diverse toxicological and risk applications, applying

critical appraisal tools to different study types (including mechanistic studies), and assessing certainty with a GRADE (Grading of Recommendations, Assessment, Development and Evaluations) framework as part of evidence integration. The course emphasizes evidence to decision components, including how systematic review can facilitate development of qualitative conclusions, as well as quantitative conclusions or toxicity values and uncertainty assessment. Particular focus will be placed on complex elements of conducting a review which includes heterogenous study types both within and across streams involving human, animal, and mechanistic data. The session closes with a lecture on publication requirements – a notable addition as many journals in the field of toxicology and risk assessment are moving to standardized conduct and reporting standards. Collectively, the applied course will provide the participant with hands-on knowledge and experience to conduct systematic reviews in support of diverse toxicological and risk objectives.