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WORK\$HOP

NEW TREND\$ IN CHEMICAL EXPOSURE ASSESSMENT

THE RESULTS OF TWO EU FUNDED PROJECTS: 4FUN AND LOVE-TO-HATE

PIACENZA (ITALY), 18TH JANUARY 2016





4FUN and LOVE-TO-HATE have received funding from the European Unions's Seventh Framework Programme

INTRODUCTION TO 4FUN

The assessment of risks to human health from chemicals is of major concern for policy and industry, and benefits all citizens. In this process, exposure assessment is generally considered to be the weakest point, as currently available tools show major flaws: lack of integrated approach for assessment of combined stressors, widespread use of 'worst-case' scenarios leading to over-conservative results, lack of uncertainty/sensitivity tools that allow identifying the important exposure drivers. To overcome these drawbacks, the 4FUN project, funded under the EU 7th Framework Programme, delivered a standardised tool for human exposure assessment to chemicals, the MERLIN-Expo tool.

This tool integrates environmental multimedia, PBPK, and dose-response models, allowing to cover the whole exposure assessment chain (from concentration in water, air and/or soil to internal dose to target organs) for different human populations. Furthermore, a wide range of chemical substances (metals, organics) can be modelled. The tool includes functionalities that enable to build long-term environmental scenarios, to make provision of uncertainty margins, and to identify sensitive pathways and risks. MERLIN-Expo was subject to a rigorous standardisation, which included benchmarking, documentation and demonstration. To demonstrate the reliability of modelling estimations and the feasibility of building complex realistic scenarios, case studies based on actual datasets were performed. Furthermore. training courses were delivered to ensure technology transfer of the software.

In the long term the tool could be useful in exposure assessment to: prevent excessive adverse human health effects due to under-regulation, contribute to the promotion of sustainable products/technologies, lead to homogeneous integration of exposure health concerns across the policy spectrum at the Community level.

WEBSITE: <u>4funproject.eu</u>

\$CHEDULE

10.00	Welcome and registration
10.30	Introduction
10.40	 The 4FUN project: History and objectives of the 4FUN project. The MERLIN-Expo tool and its key features; Simple demonstration of the software and its application in case studies; Results for end-users and regulatory context of MERLIN-Expo.
12.45	Buffet lunch
14.00	 The LOVE-TO-HATE project: Advances in the assessment of soil microbial toxicity of pesticides: the EU project LOVE-TO-HATE and future trends in regulatory frameworks; Towards the identification and quantification of pesticides transformation products in soil by combining suspect screening and molecular typology.
16.00	Discussion and Farewell



INTRODUCTION TO LOVE-TO-HATE

LOVE-TO-HATE is an Industry Academia Partnership project funded by the EC within the frame of Marie Curie Actions FP7 and Pathways scheme. It started in January 2013 and will last 48 months. The project is expected to shed light into the complex interactions between pesticides and soil microbes and the parameters controlling which way the balance will go (i.e. toxicity or adaptation). The objective is to define a new framework of wellestablished experimental protocols and a toolbox of standardized and advanced methods for soil microbial toxicity assessment of pesticides. The final aim is to set the scene for the revision of the current regulatory framework.

A tiered approach is proposed, where pesticides soil microbial toxicity is first assessed at lab scale (Tier I, high exposure) and then, if needed, by a field assessment (Tier II, realistic exposure) using advanced and standardized methods.

Three pesticides (isoproturon, chlorpyrifos, tebuconazole) were selected as model pesticides for assessing their toxicity. The level and duration of exposure of soil microbes to pesticides was assessed via chemical analysis, while exposure to metabolites was also determined via advanced chemical analysis. The impact on the diversity and function of soil microbes were determined via standardized enzymatic and molecular tools: advanced molecular tools (Next Generation Sequencing, Phyllochip) were also applied. In this way a comparison between exposure and effects will be performed. Temporal samplings will allow us to identify recovery of the microbial community.

Another focus of the project is the development of a prototype functional microarray chip which will allow the estimation of the biodegradation potential of agricultural soils against pesticides, limiting the chances of failures due to microbial adaptation

WEBSITE: lovetohate.bio.uth.gr