
Lecture: New developments in alternative testing methods

Predict-IV: Developing novel alternative testing strategies for use in pharmaceutical discovery and development

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Predict-IV is a new project supported by the EU research program for alternative testing strategies. The aim of Predict-IV is the improvement of assessing drug safety in the early stage of drug development and late discovery phase. The large-scale integrating project focuses on the development of a better prediction of the safety of an investigational compound. Predict-IV will combine classical *in vitro* toxicology with innovative technologies, profiling and modelling tools in a system biology approach. Partners with complementary expertise from academia, industry and SMEs participate in this project. This allows a highly integrative approach with an expertise in analytical chemistry, biochemistry, cellular model development, toxicogenomics, metabolomics, high-content imaging technologies, bioinformatics, kinetic modelling and toxicology.

Latest improvements in tissue technologies, molecular biology, toxicity modelling, and bioinformatics allow an advanced *in vitro* toxicity testing that increases notably the predictability of toxicity. The project will integrate these new developments to expand cell culture models for toxicity testing and to analyse the kinetics and dynamics of cellular responses to toxic effects *in vitro*. A focus of the applied models lies on the hepatic and nephritic cell culture systems; those two organs are most affected in toxicity. Due to the shortage of predictive assays for neurotoxicity the project also includes a development of new *in vitro* models for CNS toxicity testing.

Keywords: predictive toxicology; non-animal based test systems, cell culture