

## **Literature review of dose-response analyses in toxicology**

Dose-response (or concentration-response, time-response) analyses are an integral part of toxicological research. Often, the goal is to find the lowest condition, where a (significant) change of the response in comparison to a negative control can be observed. For this, both observation-based methods (e.g. Dunnett-test, LOEC) or model-based methods (e.g. ED-values, BMD) are used. For viability assays, parametric modelling with sigmoidal models is well-established. In recent methodological research, parametric modelling and calculation of alert doses based on this parametric modelling has been addressed also for gene expression data

In this talk, a review of dose-response analyses, published in 2021 in three major toxicological journals, is presented. Dose-response analyses from published figures were included when at least four concentrations were measured, where the control is also counted. The review was performed in terms of the biological background (the kind of assay, the kind of exposition), in terms of the design (the number of considered conditions and the actual condition values as well as the sample sizes) and in terms of the statistical analysis (the display, the analysis goal, the used methods for testing/modelling and the alert dose of interest).

The results from this review are presented comprehensively. Supported by the findings from the review, a comprehensible guidance is provided, which aspects to consider when designing and analysing dose-response analyses in toxicological research.