**Assessment of chronic data requirements for aquatic hazard evaluation by species sensitivity comparison using acute data**

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Based on the animal welfare concept and to avoid animal experiments (Art. 13, Art. 25), the REACh Regulation provides several options for waiving the chronic fish toxicity test. For the decision on the need of ecotoxicological tests on animals ECHA guideline R7b and R10 are applied. In particular guideline R7b provides guidance for the assessment of ecotoxicological endpoints and includes an integrated testing strategy (ITS). It is the aim of the ITS to avoid unnecessary vertebrate tests while being sufficiently protective. In this study 130 chemicals are analysed for species sensitivity between Daphnia and fish in acute and chronic testing to evaluate under what condition long-term fish tests can be waived without underestimating environmental hazard of vertebrates. The dataset used for analysis is based on data from the OECD eChemPortal and from the Information System Chemical Safety database (ICS) of the German Federal Environmental Agency. The results indicate that species sensitivity in chronic testing is associated with sensitivity in acute testing, and that chronic fish testing can be extrapolated from chronic Daphnia toxicity data for most substances. Thereby, the more sensitive species in chronic testing is determined with a very high probability if a species is 5x more sensitive in acute testing. Chronic fish toxicity is further covered with a high probability by the chronic Daphnia test and an additional interspecies factor of 5 for substances that are comparable or more toxic to Daphnia in acute testing. As an outcome of this study a categorization system for acute sensitivity comparison is developed to estimate chronic toxicity testing requirements for the regulation of chemicals. The findings suggests to adapt the current ITS as implemented in the corresponding guidance documents by reducing the sensitivity factor from 10 to 5. Moreover, the physicochemical property octanol-water partitioning have a supporting character if fish were 2x to 5x more sensitive than Daphnia in the acute tests but do not seem to be good indicators for the requirement of long term or vertebrate tests in general.

Key words:

Environmental risk assessment, mode of action, acute to chronic extrapolation, aquatic toxicity