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Alterations of swimming behaviour of *Daphnia magna* upon acute and chronic exposure as a sensitive endpoint

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The crustacean *Daphnia magna* is a useful model organism widely used in ecotoxicological testing with a substantial amount of toxicological data available for this organism. *D. magna* has a strong phototactic behaviour characterised by swimming towards (positive phototaxis) or away (negative phototaxis) from light and is therefore highly suitable to study behavioural responses. Daphnia swimming is in general dependent on body size and can also be affected by factors such as light, water temperature, presence of food and predators. Changes in the swimming behaviour of daphnids can be early indicators of stress and later on also for immobilization.

So far, according to the OECD guidelines 202 and 211, immobility and reproduction are the main endpoints used for the determination of toxicity. Sublethal effects can be induced by chemicals at lower levels and may require more sensitive biomarkers. As a first step alterations of swimming behaviour, phototactic behaviour and response to kairomones should be evaluated upon exposure to pharmaceuticals in environmentally relevant concentrations.

D. magna is exposed to a series of substances for 48 h and 21 days in order to evaluate the classical acute and chronic effects on immobilisation and reproduction, according to the OECD Guideline tests (202 and 211). Furthermore, the behavioural endpoints of *D. magna* will be investigated during acute and chronic exposure at different time points. In addition, in the reproduction tests with chronic exposure for 21 day beside the parental daphnia (F0 generation) also the juvenile daphnia (F1 generation) are investigated, in order to evaluate generational effects and differences in sensitivity.

The results of the different tests will be evaluated with respect to the sensitivity of the different endpoints and time points considered (classical ECx values vs. behaviour). In addition, the effects of each test substance will be compared with respect to the sensitivity of the different behavioural endpoints. The different behavioural endpoints will be evaluated according to their applicability, in order to use the behavioural endpoints as a more sensitive endpoint allowing a predictability of substance effects.