Robert Sornat

Thesis title:

"Development and validation of an alternative method for teratogenicity test with the use of *Hydra attenuata* and *Brachydanio rerio*"

Abstract:

To evaluate the suitability of the tests for *Hydra attenuata* and *Brachydanio rerio*, 34 active substances used in plant protection products and 2 substances used in industry with known toxicity and known effects on antenatal development in laboratory animals and humans were selected. The substances were divided into three groups with different impact on the development process: group 1 - strong teratogens, group 2 - toxic to the development process along with maternal toxicity, group 3 - not toxic to the development process. Acute toxicity tests and regeneration tests were performed on hydrates for each compound, which were the basis for determining the TI toxicity index for each compound, which determines the degree of toxic influence on the development process. The zebrafish embryos were exposed to the tested substances, the concentrations of which were selected in such a way that the lowest concentration did not cause toxicity symptoms, and the highest concentration caused death. Any abnormalities that occurred during development were observed in the developing embryos. The results obtained in tests on hydras and embryos for individual substances were compared with the known effects of these substances on the mammals development process. The obtained results were assessed for individual groups and for the entire developed test. Additionally, for the quicker evaluation of the obtained results, the developed method introduces a scoring system for the evaluation of test substances and their quicker classification in terms of their impact on the development process.

Keywords:

Hydra attenuata, *Brachydanio rerio* embryos, screening test, alternative methods