

Using less fish to test chemicals safety

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Zebrafish is one of the most commonly fish used in toxicological testing. Credit: © mirkorrosenau4, Fotolia.com

The JRC has released a new strategy on how to replace, reduce and refine the use of fish in testing of chemicals' effect on flora and fauna in water (aquatic toxicity) and chemicals' uptake and concentration in living organisms (bioaccumulation). Out of the 11.5 million animals used for experimental purposes in the EU (2011 data), cold blooded animals, namely reptiles, amphibians and fish represent 12.4%. In the case of specific testing for toxicological safety assessment, fish represent 18%

of the one million animals used.

Developed by the JRC-managed European Union Reference Laboratory for Alternatives to Animal Testing (EURL ECVAM), the strategy supports EU legislation on environmental hazard and risk assessment of chemicals and EU legislation on protection of animals used for scientific purposes.

Achievement of the of the strategic aims and related objectives outlined in the document will deliver alternative approaches for standard information requirements while ensuring that tests on fish are only conducted as a last resort. Success will depend on the proactive and coordinated engagement of the multiple stakeholders in the field. An important near-term impact could be the reduction in the number of these tests conducted on chemicals subject to the next REACH registration deadline (2018).

The strategy also proposes the further development of mechanistically-based replacement alternatives, as well as the need to revise existing test guidelines to reduce and refine testing on fish. Furthermore, the development of guidance on the application of integrated approaches to chemical assessment is recommended. Concerning bioaccumulation, efforts are encouraged to develop and apply *in silico* models such as quantitative structure-activity relationships and physiologically based toxicokinetic models, as well as the standardisation of *in vitro* methods for hepatic metabolism in fish.

Background information

Aquatic toxicity refers to adverse effects of chemicals on organisms living in the water and is usually determined by testing on organisms representing aquatic plants or algae, invertebrate (crustaceans) and vertebrate ([fish](#)) [animals](#). Bioaccumulation describes the uptake and

concentration of a chemical in an organism. Bioaccumulative properties pose a threat since a chemical can reach concentration levels causing toxic effects in organisms taking up the chemical or in those feeding on them.

Provided by European Commission Joint Research Centre

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