German Enviroment Agency

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Bioassays to assess materials in contact with drinking water

Assessment of unpredictable substances

Within the project „bioassay-based test strategy to determine risk potentials of migration waters“ the German Environment Agency (UBA) and the Association for Pipe Systems Inside Buildings (VRH) had the common aim to develop a test strategy, that is based on well-established bioassays. This *in vitro* test strategy detects cytotoxicity, genotoxicity and estrogenic activity of migration waters. These effects are not only unwanted in migration water, but in all products. Especially since these effects pose a risk to human health and the environment they are relevant for assessment. In some cases migration water of organic materials in contact with drinking water contains reaction and degradation products, as well as contaminants of the starting substances, which are currently not assessed. This new approach also accounts for these contaminants.

The main objective of the project was to gain the scientific basis for the development of bioassay-based test strategies to determine risk potentials in migration waters with unknown as well as presently not assessed reaction and degradation products.

An assessment by this new *in vitro* test strategy does not replace the regular assessment of starting substances for the production of organic materials in contact with drinking water according to the present KTW guideline and the future UBA evaluation criteria document for organic materials. Nevertheless, it can serve as a helpful amendment. With this upcoming test strategy, it should be possible to rapidly detect a toxicological risk potential already at an early stage during material development, to optimize the process accordingly and to perform a quality control of the final product.

In the light of a large number of (detectable) substances bioassay-based test strategies give a starting point to determine risk potentials of organic materials in contact with drinking water, not only taking into account the assessment of single substances but also the mixture effects of complex solutions. The most relevant endpoints for this assessment are genotoxicity and estrogen-like effects. By the application of *in vitro* test strategies these biological end points are determined and reliably assessed in combination with cytotoxicity. The developed test strategy, including assessment criteria, is given in the following figure as a decision tree.

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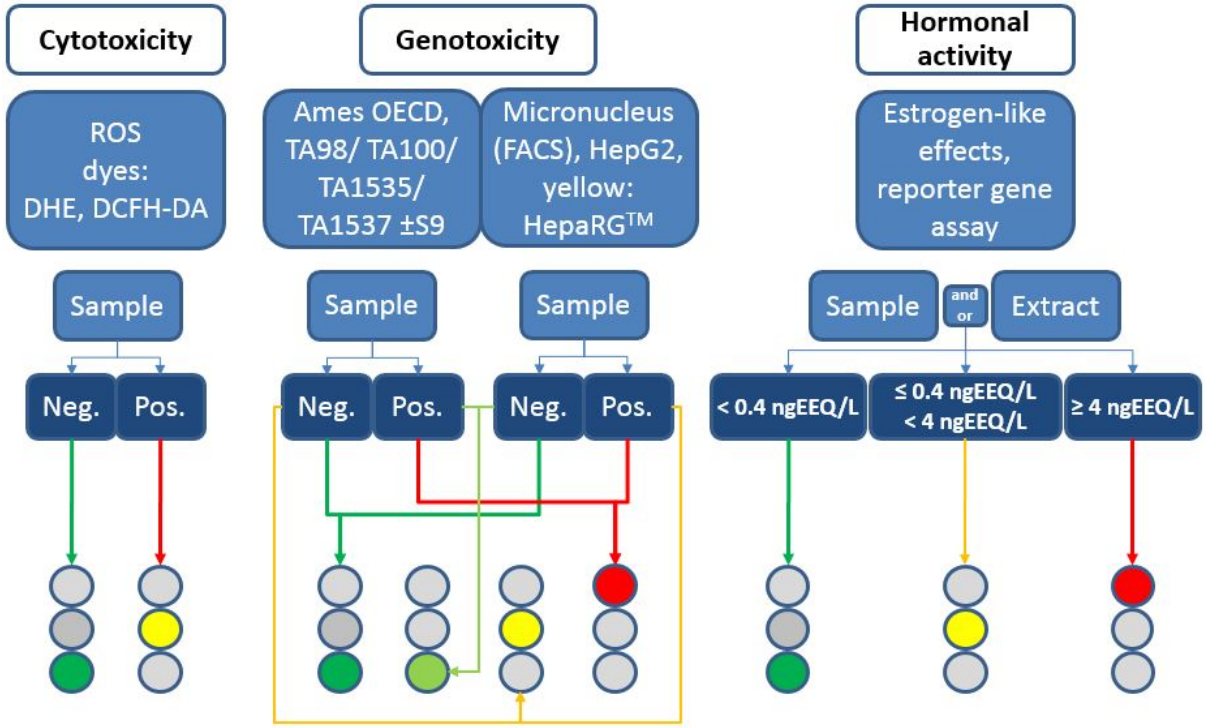
Figure: Schematic overview of the test strategy



Source: German Environment Agency

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