

Master Thesis

For the field of environmental hygiene and trace substances, we are looking for a master student from February 2022 on:

"Effect-directed analysis for the assessment of endocrine effects in surface waters"

The Institute

The Institute for Energy and Environmental Technology e. V. (IUTA) is a non-profit research institute in Duisburg and an affiliated institute of the University of Duisburg-Essen. It forms the bridge between basic research and industrial application.

Background of work

Effect-directed analysis (EDA) makes it possible to determine effects along various endpoints of both individual trace substances and unknown mixtures. The latter is of particular importance since pollutants do not occur alone in the environment. They exist in complex matrix compositions and mixtures of substances, which may have toxicological effects. This holistic view of the water quality together with the instrumental analysis makes it possible to clarify the causes and identify improvements.

Task

This thesis is about the application of effect-related analytics to monitor endocrine effects in surface waters. Using a reporter gene assay based on transgenic yeast cells (*Arxula adenivorans*), four hormone receptor classes are covered: the estrogen, androgen, progesterone and glucocorticoid receptor. In addition, the acetylcholine esterase assay (enzyme inhibition) should be added to agricultural influenced waters, as some pesticides rely on this mechanism. Thus, a broad spectrum of bioactive substances and their cumulative effect can be recorded and an effect pattern of different entries can be created.

To implement the project, the following activities must be carried out:

- Assistance with sampling of surface water
- Preparation of the samples by means of solid phase extraction (SPE)
- Application and evaluation of the effect-directed analysis

Contact person for applications and questions:

Michelle Klein, M.Sc. Environmental Toxicology

E-Mail: klein@iuta.de

Tel.: 02065 418 206