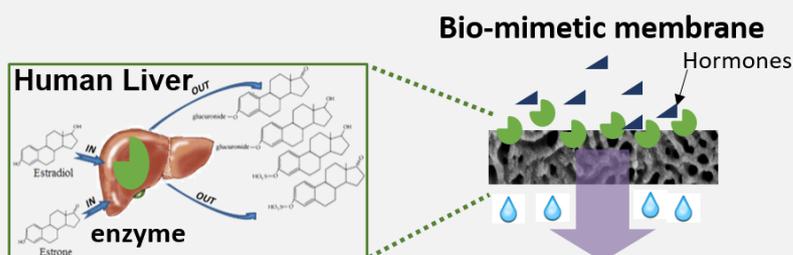


## Project

This PhD project aims to develop and apply a biocatalytic membrane for degradation of steroid hormone micropollutants. The project will focus on i) selection of different enzymes based on the enzymatic degradation process that occurs in human body, ii) explore different methods for the enzyme immobilization on the membrane by using green solvents and biocompatible materials, iii) investigate the enzymatic degradation process in small scale filtration system to evaluate the efficiency of hormone removal.

The three main research questions of the project are:

- ◆ What are the existent enzymatic degradation mechanisms of steroid hormones in nature and how can be reproduced in a membrane filtration support?
- ◆ What is the most suitable immobilization method on the membrane able to keep high specific activity and enzyme loading?
- ◆ What is the role of solute-membrane partitioning and system mass transfer in the control of the enzymatic degradation during filtration?



The PhD project will be largely experimental and will begin with an identification of a set of research questions based on detailed literature survey. The preliminary research proposal required for application (with a timetable for the 3 to 4 year research project) will be further expanded to 4 main experimental chapters. Required equipment will be set up and further development of relevant analytical methods will follow. Execution of the research plan through conducting of experiments, sample and data analysis and write up of results for scientific publication are part of the PhD process – a journey to become an independent researcher!

Throughout the project, there will be multiple opportunities for cooperation with internal and external partners, supervising bachelor and master students, giving oral presentations at conferences, writing high-impact journal articles, as well as sharing your knowledge via teaching.

**Qualifications** You will most likely already hold a Masters in Chemical, Process, Bio-Engineering, or equivalent. You are a naturally curious person who is eager to learn more and has a strong interest in research. Experience with membrane filtration systems (of any scale) is a definite advantage, as well as being comfortable in specifying system components and sound experimental problem solving skills – as well as a good common sense. Excellent English language proficiency is essential, basic German language skills of advantage.

**KIT** KIT is one of the biggest research institutions worldwide and has access to state-of-the art research facilities resulting from the merger of the National Research Centre of the Helmholtz Association and the former Technical University of Karlsruhe. This project is hosted by the Institute for Advanced Membrane Technology (IAMT). The PhD will be registered in the Faculty of Chemical and Process Engineering.

**Contact** **Dr. Alessandra Imbrogno**, Institute for Advanced Membrane Technology (IAMT), +49 (0)721 60824361, [Alessandra.imbrogno@kit.edu](mailto:Alessandra.imbrogno@kit.edu), <https://www.iamt.kit.edu>  
**Prof. Dr.-Ing. Andrea I. Schäfer**, Institute for Advanced Membrane Technology (IAMT), +49(0)721 608 26906, [Andrea.Iris.Schaefer@kit.edu](mailto:Andrea.Iris.Schaefer@kit.edu), <https://www.iamt.kit.edu>

**Applications** Please send applications with CV, publication list and your contribution to the publication (if relevant), academic transcripts, degree certificates, contact details for three references and a preliminary research proposal. A valid driver's licence will be required.