

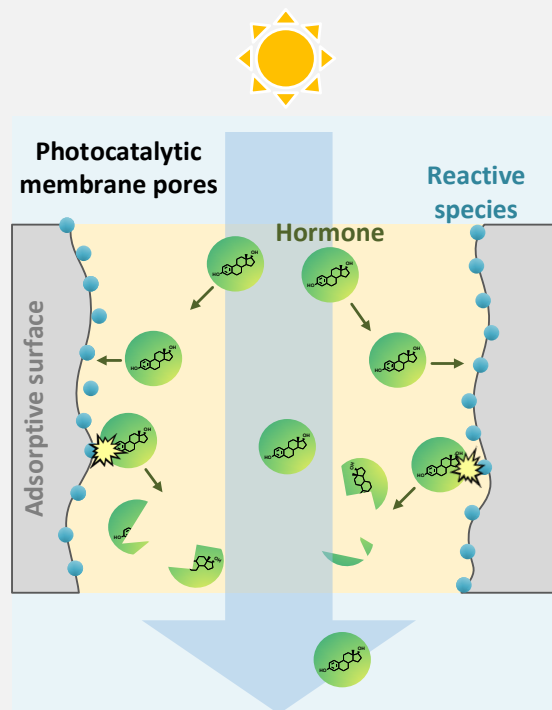
## Project Summary

### Steroid hormone micropollutant degradation by photocatalytic membrane reactors

Photocatalytic membrane reactors (PMRs) have demonstrated the high removal of steroid hormone micropollutants in lab-scale studies. Because photocatalytic activity occurs at the surface of the membrane pores where the hormone molecules are often adsorbed, PMR supports with high adsorption capacity can enhance the removal. In this project, supports composed of PTFE polymers and adsorbent materials will be used in photocatalytic filtration experiments.

Key factors affecting both adsorption and photocatalytic performance – including light intensity, type and quantity of photocatalyst, and applied pressure (which influences hydraulic residence time) – will be systematically examined.

The pristine and adsorptive supports are commercial products with controlled thickness and porosity. Photocatalyst incorporation will be performed by collaborators at either KIT-IMT or IOM (Leipzig).



#### The following tasks will be performed by the Master student;

- Literature review (fundamentals and applications of photocatalysis, reactive species chemistry, steroid hormones, adsorption, and nanopores);
- Operation of photocatalytic filtration experiments and steroid hormone analysis with flow scintillation technique;
- Data analysis and, if suitable, contribution to the preparation of a research publication;

Besides, the student will be participating in group activities and writing of reports and take part in collaborative discussions with colleagues from KIT-IAMT and other institutes. Language of all communications and writing will be English.

## Required Skills

#### Current enrolment in a Master in Chemical/Process Engineering or equiv. (Uni., TH)

Good knowledge in chemistry and membrane technology; proactive in learning; evidenced writing skills in English language; ability to use MS Word, Excel; willingness to acquire proficiency in Origin Labs and MS Visio software for data analysis and graphing, and Endnote for citation mgmt; interest in the possibility to contribute scientifically to the writing of a scientific publication.

## Institute/ Department

Institute for Advanced Membrane Technology (IAMT), Bldg. 352, Campus North, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany for information on team, research skills and research environment: <https://www.iamt.kit.edu/>

## Start Date

Flexible/Negotiable. Duration at least 6 months.

## Application Procedure

Please email CV, transcripts and motivation letter with available time period for evaluation. For external applicants please provide details of the local supervisor.

## Project Advisor(s)

Dr.-Ing. Minh Nguyen: [minh.nguyen@kit.edu](mailto:minh.nguyen@kit.edu)

Prof. Dr. Andrea Iris Schäfer: [andrea.iris.schaefer@kit.edu](mailto:andrea.iris.schaefer@kit.edu)