# Master Project

*Research project opportunity (6 month) for students finishing their master at any university allowing student mobility*

**KIT** — Karlsruhe Institute of Technology

**IAMT**

## Project Summary

### Steroid hormone micropollutant removal with nanofiber–nanoparticle composite membranes

Nanoparticles (NP) types can be effective in removing micropollutants such as steroid hormones from water *via* adsorption or catalytic degradation.

To enhance the contact between the NPs and micropollutants and to overcome the challenge of recovering NPs, the NPs can be incorporated into electro-spun nanofibers through either physical interaction or chemical crosslinking. The resulting nanofiber –NP composites enable the removal of micropollutants.

The project aim is to evaluate the adsorption and (photo-) degradation of steroid hormone micropollutants by such composite membranes. Various types of nanoparticles are already available at IAMT-KIT as a result of collaboration between the lab and a number of mostly international collaborators.
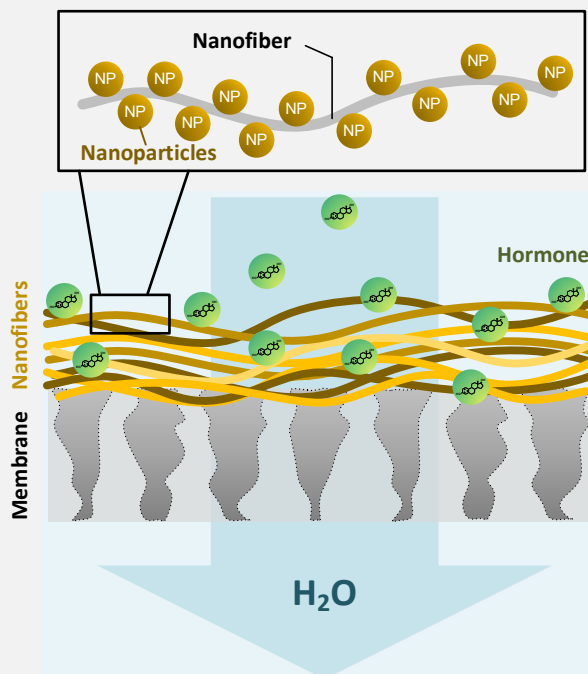


**The following tasks will be performed by the Master's student;**

- Literature review (fundamental and applied knowledge on nanofiber fabrication, steroid hormone micropollutants, ultrafiltration, adsorption and/or photodegradation);
- Operation of filtration experiments and steroid hormone analysis with liquid scintillation counting and flow scintillation technique;
- Discussions with external collaborators;
- 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
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