

Diplomarbeit / Masters Project

Project Summary: **Biomimetic Membranes for Removal of Micropollutants from Water**

Access to safe drinking water is essential for human survival, yet for one in six people this is unattainable luxury. Energy-efficient, portable purification technology is a key to solving the problem of water shortages and generally to improving the quality of drinking water. A common approach to purifying water from natural as well as anthropogenic contaminants is filtration through a suitable set of membranes.

Currently available engineered filtration membranes are durable polymer structures can be tailor-made (e.g., desired pore size, surface charge, mechanical & chemical stability) and mass-produced, but lack molecular level selectivity and specificity. Consequently, they often show limited removal of micropollutants such as endocrine disrupting chemicals and certain ions. The contraceptive pill, for example, is discharged to rivers due to incomplete removal in wastewater treatment and then enters water supplies. With a closed water cycle and an increasing world population this raises severe concerns and nature may offer inspiration.

Biological membranes are selective and specific and can be used to remove unwanted salts or organic molecules, however, they are fragile, self-assembled structures. The technology to mass-produce and manipulate, or machine, these structures is currently lacking.

The objective of this project is to make the first steps in combining artificial and biological membranes and investigate their ability to remove micropollutants such as hormones.

Qualifications: **Studies in Chemical/Process Engineering, Biochemistry, Biophysics.**

Interest and at least preliminary experience in water quality & analytical chemistry, water treatment and specifically membrane technology, or lipid biochemistry.

Hands on technical skills, ability to liaise with workshop personnel and laboratory technicians, strong motivation for research, resourcefulness, creative problem solving skills, common sense, communication and ability to interact in a multicultural team.

Willingness to lead or contribute to the writing of a scientific publication.

**Institute/
Department:** Institute for Functional Interfaces (IFG) / Faculty of Chemical Engineering and Process Engineering

c/o KIT Campus North

Start Date: Anytime / To be discussed

**Project
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