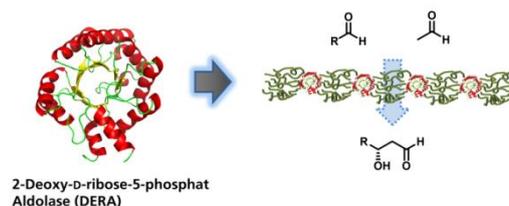

Bachelor or Master Thesis – Biocatalytically active membranes

The chair of Polymer Materials and Polymer Technologies offers interdisciplinary **bachelor- and master theses** for chemists, biologists or biotechnologists. As the chair is a joint appointment between the University of Potsdam and the Fraunhofer-Institute for Applied Polymer Research (IAP), we are located at the interface between fundamental and application driven research.

Enzymes are biocatalysts that enable highly efficient and selective chemical conversions, which would normally require harsh reaction conditions or the use of toxic and/or expensive co-components. However, a fundamental problem regarding the application of enzymes outside their natural environment is their lack of stability, which often prohibits a broad use for synthetical purposes. Fortunately, the stability and thus the usefulness of particular enzymes can be significantly improved by an immobilization of the respective biocatalyst.

Recently, we managed to immobilize the enzyme 2-Deoxy-D-ribose-5-phosphat aldolase (DERA) within thin polymeric layers on membranes supports in order obtain biocatalytically active material for the synthesis of α,β -dihydroxyaldehydes in a continuous mode. By that, product accumulation and in turn unwanted enzyme inhibition is prevented. In a proof-of-principle, we could verify the maintenance of enzymatic activity after the immobilization step. The purpose of the project is now to optimize the immobilization procedure and to set up a membrane reactor on the lab scale for testing of the performance of the immobilized enzyme.

The project involves polymer synthesis, handling of enzymes, fabrication and characterization of thin films and finally a systematic study of enzymatic activity using the membrane reactor. Consequently, the project is settled at the interface between biotechnology, synthetic polymer chemistry and membrane engineering.



If you are interested and feel encouraged to work on this topic, contact Dr. Stefan Reinicke for more information.

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