

Institut für Bio- und Lebensmitteltechnik (BLT 2)

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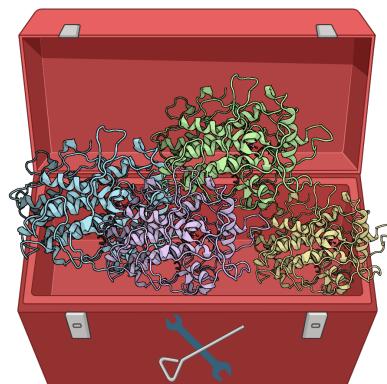
Call for Applications for a Master's Thesis on
„Exploring the Substrate Scope of Vanadium-Dependent Chloroperoxidases Using GC/MS Analysis“
Suitable for chemists, biologists and bioengineers

Background and Research Objective

Vanadium-dependent chloroperoxidases (VCPOs) are a fascinating class of enzymes that catalyze selective halogenation and oxidation reactions under mild conditions. Due to their ability to generate reactive halogen species, VCPOs have attracted increasing interest as environmentally friendly alternatives to traditional chemical catalysts.

Although several VCPOs have already been described in the literature, their catalytic potential remains far from fully explored, particularly with respect to substrate scope and reaction selectivity. A systematic investigation of their activity toward structurally diverse substrates is essential to enable an application of these enzymes in biocatalysis and chemoenzymatic synthesis.

The objective of this Master's thesis is to recombinantly express and purify three previously described VCPOs and to evaluate their catalytic performance with special focus on stereo- and enantioselective substrate conversion.



Content of this Thesis

The work will begin with the heterologous expression of three known VCPOs in *E. coli*, followed by their purification using affinity chromatography. After biochemical characterization of the purified enzymes, the main focus of the thesis will be a detailed substrate screening study. A broad range of organic substrates, with chemically relevant and structurally diverse compounds, will be investigated to evaluate enzyme activity, conversion efficiency, and product profiles. The substrate screening will constitute the major part of the thesis and aims to identify new or enhanced catalytic transformations mediated by VCPOs. Reaction products will be analyzed primarily by gas chromatography coupled with mass spectrometry (GC/MS). The results will contribute to a deeper understanding of VCPO substrate specificity and their potential use as biocatalysts in synthetic chemistry.

Prof. Dr.-Ing. Dirk Holtmann

For applications and further information
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