

Jerzy Haber Institute of Catalysis and Surface Chemistry is looking for a postdoc researcher in Beethoven Life project (NCN/DFG)

Period of contract: 12 months

Salary: 1300 euro /months (netto – after tax deduction)

Expected start of the call: October 2021

Expected start of the contract: December 2021-February 2022

Project webpage: <https://www.mlbke.com/projecto-4>

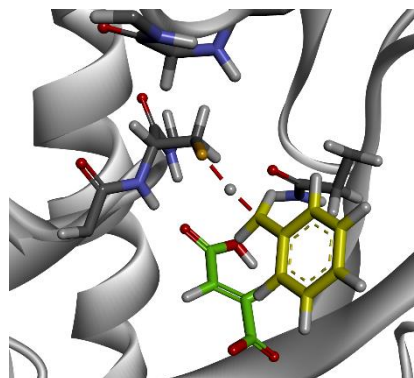
Research project:

The project FAEREACTION we investigate the biochemistry and reactions mechanisms of a class of novel enzymes which catalyse the radical-based addition of fumarate to a number of highly recalcitrant compounds, like hydrocarbons. These fumarate-adding enzymes (FAE) form a subclass of the glyceryl radical enzymes which are highly oxygen-sensitive and need to be activated to the radical state by special activating enzymes.



The proposed project is highly interactive between the German and Polish partners and will follow the following major aims: (A) mutagenesis studies to identify the functions of particular active site constituents and to extend the available product spectra, (B) characterization of other FAE after recombinant expression to investigate the respective accommodations to other substrates and including crystallization of various FAE to extend the structural knowledge basis on these enzymes, (C) studies on the activating enzyme to establish *in-vitro* activation, (D) multiscale high-level computational investigations of the FAE reaction mechanism, backed up with experimental input, and (E) developing methods to apply FAE and their mutant variants for biotechnological production of novel compounds.

The project will employ state-of-the-art techniques from the field of molecular biology and enzymology combined with molecular modelling and engineering of biotechnological processes. The results will improve current understanding of bioremediation processes of environmental contaminations caused by fossil fuel and chemical industries and will deliver fundamental biochemical data which will improve the use of microorganisms in bioremediation of hydrocarbons. The elucidation of mechanism for the whole class of FAE will provide new insights into a novel chemical reaction principle exploited by these enzymes. Finally, studies of FAE will also provide new tools of biotechnological processes to synthesized fine chemicals and substrates for biodegradable polymers.



We are looking for researcher with following expertise:

- in molecular biology, development of overexpression systems,
- in microbiology, especially of anaerobic bacteria
- in development of analytical methods (LC-MS assays, coupled enzyme assays) for kinetic measurement
- development of bioprocesses, monitoring bacterial growth and bioprocess optimization,
- whole-cell bioprocess optimisation
- in molecular modelling, especially MD simulation and QM modelling
- teaching student
- writing reports,
- writing papers,
- preparation of experiments for examples to potential patent application

Due to highly collaborative nature of the project and expected requirement of travel between Kraków and Marburg the candidate should possess COVID-19 passport (i.e. be vaccinated against SAR-COV-2)