

## **CLIB<sup>2021</sup> Project:**

### **Biotechnological pathways for functional polymer and oligomer products;**

Microorganisms (yeast and bacteria) as whole cell biocatalysts

Sub-project: Biocatalytic synthesis of hydroxylated compatible solutes

### **Description:**

The experimental working-plan of bitop AG includes the biocatalytic synthesis of hydroxylated compatible solutes (3-hydroxyectoine, 3-hydroxyhomoectoine, 3-hydroxy-DHMICA, 3-Hydroxy-ADPC, 3-Hydroxyazetidine carboxylic acid) with the help of strains developed at the Institute of Microbiology, University of Bonn and at the company Artes Biotechnology GmbH, Langenfeld. The whole cell biotransformation process is designed for lab scale as well as for pilot plant scale (up to 250 L). The substrates for the biotransformation will also be synthesized by bitop. On the basis of the above experiments the biotechnologically hydroxylation process with the use of particular whole cell biocatalyst displaying monooxygenase activity will be established on the example of ectoine hydroxylase. Together with Artes, the enzymatic synthesis of glucosyl glycerol (2-O-glyceryl- $\alpha$ -D-glucopyranoside), already established at bitop on pilot plant scale, will be developed to a whole cell biotransformation process. Coincidentally the suitability of the *Hansenula* technology for whole cell biotransformation will be evaluated. The crude product suspension derived from the whole cell biotransformation process will be separated from biomass applying suitable separation techniques (e.g. filtration) prior to purification of the product to a defined grade and chemically as well as biochemically characterisation. The commercial applicability of the new substances will be initially tested in vitro in the fields of cosmetics and health care followed by analysing the applicability as precursors for chemical or biotechnological synthesis of polymers. These experimental studies will be primarily carried out on gram scale

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