

Two PhD positions
at the Institute of Biotechnology and Biochemical Engineering,
Graz University of Technology, Austria

Position

The positions of PhD's are available for 3 years at the Institute of Biotechnology and Biochemical Engineering at Graz University of Technology. The Institute is a leading Austrian university institution for basic and applied research at the interface of biological sciences and process engineering. Salary according to FWF regulations, 30 hours per week. The two PhD positions are offered in the DeoxyBioCat project.

DeoxyBioCat: Elucidation of the catalytic mechanisms of nucleotide sugar converting short-chain dehydrogenase/reductase (SDR) enzymes

Nucleotide-activated sugars are central intermediates in the biosynthesis of various glycosides, e.g. antibiotics, antigen structures and human milk oligosaccharides. SDR enzymes play a key role in interconverting nucleotide sugars by catalyzing multistep conversions at a single active site.^{1,2} Deciphering the complex catalytic mechanisms of these enzymes remains as a crucial challenge for mechanistic enzymology.

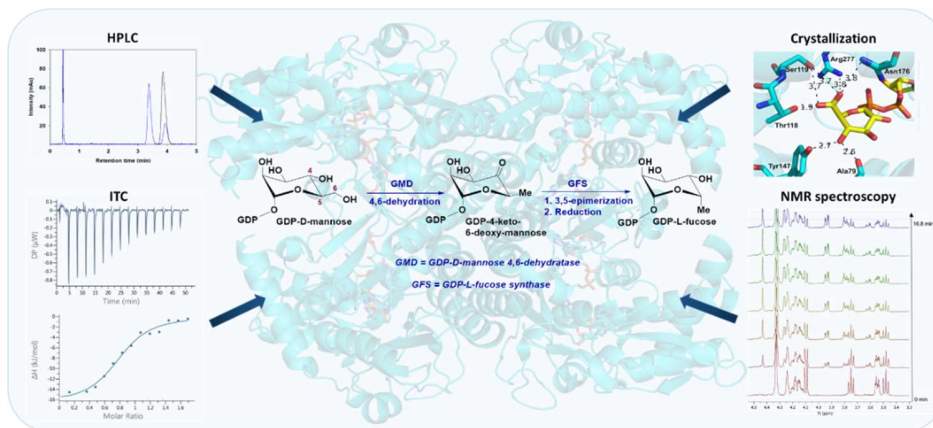


Figure 1. Biosynthesis of GDP-L-fucose starting from GDP-D-mannose catalyzed by GMD and GFS. Examples of methods utilized in the project are shown.

This project focuses on the mechanistic characterization of the catalytic events involved in the biosynthesis of GDP-L-fucose. The human GDP-L-fucose synthase (GFS) will be studied utilizing a variety of biochemical and analytical methods (Figure 1). The goal of the work is to clarify the mechanistic details of this fascinating reaction comprising 3,5-epimerization and reduction of GDP-4-keto-6-deoxy-D-mannose.

[1] Pfeiffer M, Johansson C, Krojer T, Kavanagh K.L, Oppermann U & Nidetzky B. (2019) A parsimonious mechanism of sugar dehydration by human GDP-mannose-4,6-dehydratase. *ACS Catal.* **9**, 2962-2968.

[2] Savino S, Borg A.J.E, Dennig A, Pfeiffer M, De Giorgi F, Weber H, Dubey K.D, Rovira C, Mattevi A & Nidetzky B. (2019) Deciphering the enzymatic mechanism of sugar ring contraction in UDP-apiose biosynthesis. *Nat. Catal.* **2**, 1115-1123.

Requirements

A Master's degree in molecular biology/microbiology/biochemistry is required. Candidates should have strong background in biochemistry and be interested in mechanistic enzymology as well as in the synthetic application of enzymes. Excellent skills in spoken and written English are required, as well as interpersonal skills conducive to teamwork and group research efforts.

Start of contract:

As soon as possible.

How to apply:

Please send your application including a motivation statement, a CV and names and addresses of 2-3 references (including telephone number and e-mail address) or letters of recommendation by e-mail to:

Univ.-Prof. Dipl.-Ing. Dr.techn. Bernd Nidetzky, bernd.nidetzky@tugraz.at