

Call for Master Thesis

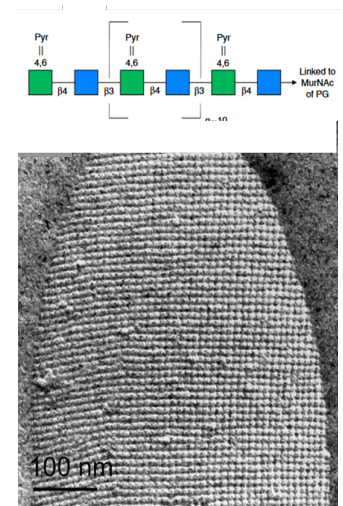
Unexplored bricks in bacterial cell walls: Pyruvylated cell wall glycopolymers

Towards the characterization of essential carbohydrate-active cell wall enzymes

Time schedule Start: any time right now; Duration: ~6 months

Short summary of project

Pyruvate-ketals on *N*-acetylmannosamine residues within peptidoglycan-linked glycopolymers are essential for sticking the cell wall of several Gram-positive bacteria together, including that of *Bacillus anthracis*. We have reconstituted distinct enzymatic steps within the glycopolymer assembly route of the model bacterium *Paenibacillus alvei*: The pyruvyl-transferase CsaB catalyzes the 4,6-ketalpyruvyl transfer to a lipid-linked glycopolymer repeat precursor. This compound was produced chemo-enzymatically using the UDP- α -D-ManNAc:GlcNAc-lipid-carrier transferase TagA. Of both TagA and CsaB no viable knockout mutants could be obtained indicating essentiality of the enzymes. Thus, TagA and CsaB are promising new targets for the design of antibiotics.



Aims

Investigation of the enzymatic activity of TagA (determination of kinetic parameters using a HPLC-based method) and of CsaB (screening of rationally designed mutants using a high throughput assay and revealing key amino acid residues involved in catalysis and substrate recognition) from *P. alvei*.

Methods

Recombinant protein production, protein purification, CD- and UV-VIS spectroscopy, enzyme kinetics, HPLC, LC-MS, NMR.

Requirements

The candidate should be focused on the field of biotechnology, microbiology, biochemistry or related studies. We appreciate highly motivated students who are excellent team players with the ability to work independently under supervision in an interdisciplinary and very friendly research environment.

We offer

Motivating scientific environment at BOKU, cutting edge research in glycomicrobiology, weekly seminars and learning of various techniques. Participation in workshops and international conferences are possible.

As outlined above, we have two aims to reach and therefore **we offer two master projects.**

Applicants

Please e-mail your CV along with contact addresses to DI Cordula Stefanovic (cordula.stefanovic@boku.ac.at) or Ao.Univ.Prof. Christina Schäffer (christina.schaeffer@boku.ac.at); Department for NanoBiotechnology/ NanoGlycobiology, Universität für Bodenkultur Wien, Muthgasse 11, 1190 Wien, Austria