**Master thesis project at the Institute of Biological Information Processing – Molekular- und Zellphysiologie, Forschungszentrum Jülich**

Proton coupling in the bacterial anion transporter DgoT

Living cells use secondary active transporters to selectively transport small molecules across biological membranes. To achieve substrate transport against their concentration gradient, such transporters couple substrate transport to other solutes that are moved along their concentration gradients. In intracellular organelles of mammalian cells, the vast majority of secondary active transporters are proton-coupled; however, the mechanisms underlying this transport coupling remain insufficiently understood.

The bacterial galactonate transporter DgoT is a model protein for the SLC17 family that encodes – among others - mammalian vesicular glutamate transporters (VGLUT) and the lysosomal sialic acid transporter sialin. We use DgoT to understand how these physiologically very important proteins have specialized into distinct cellular functions (Kolen et al, (2023) *Nature Communications*, *14*(1), Leano et al (2019) *PLOS Biology*, *17*(5)). We study DgoT with computational and experimental techniques to understand its transport processes at highest possible resolution.

We are looking for a Master student for the functional characterization of selected DgoT mutants (Batarni et al (2023) *Journal of Biological Chemistry*, 104646), in order to test current concepts about the transport cycle. The student will study mutant DgoT variants using solid-supported membrane electrophysiology. She/he will get a thorough introduction in the biophysical characterization of membrane proteins (Bazzone et al (2021) *The Journal of Biological Chemistry*, *298*(2), 101505, Alleva et al (2020) *Science Advances*, *6*(47)) as well as in molecular biology and heterologous protein expression and purification. If necessary, fluorescence-based techniques might also be applied.

For further information, please contact:

Prof. Dr. Christoph Fahlke

Lehrstuhl Biophysik der Zelle Heinrich-Heine-Universität Düsseldorf

Institute of Biological Information Processing 1 (IBI-1) Zelluläre Biophysik, Forschungszentrum Jülich

[c.fahlke@fz-juelich.de](mailto:c.fahlke@fz-juelich.de)

Telefon: +49 2461 61-3016

Telefax: +49 2461 61-4216