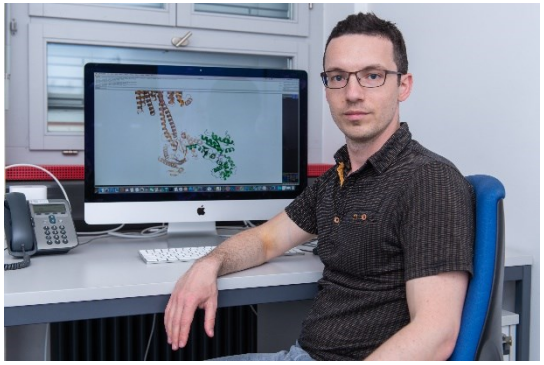
The Doctoral Program **ION CHANNELS AND TRANSPORTERS AS MOLECULAR DRUG TARGETS** („MolTag“)

is pleased to invite you to the following lecture (in the frame of the **Pharma and Food Lecture series**)

"Structure and function of membrane adenylyl cyclases”



by Prof. Volodymyr M. KORKHOV, PhD

Laboratory of Biomolecular Research, Paul Scherrer Institute &
Institute of Molecular Biology and Biophysics, ETH Zurich
https://www.psi.ch/en/lbr/people/volodymyr-korkhov

On: Thursday, January 13th,2022, 17:15 (Pharma and Food lecture series)

Where: ONLINE here (zoom Link UniVie)

Host: Univ.Prof.Dr. Harald SITTE, Institute of Pharmacoloy, Medical University of Vienna

Abstract: Membrane adenylyl cyclases (ACs) are the key enzymes in mammalian signal transduction. The ACs convert ATP to cyclic adenosine monophosphate (cAMP), thus regulating a wide range of cellular responses to extra- and intra-cellular stimuli, including hormones, drugs, changes in intracellular Ca^{2+}, etc. **I will present the cryo-EM structures the mammalian membrane AC, AC9, in the presence of several different activating agents.** Analysis of five conformations of AC9 captured in distinct activation states provides unique insights into the mechanisms of membrane AC regulation. Furthermore, **I will present our recent biochemical and structural characterisation of the *Mycobacterium tuberculosis* Rv1625c/Cya, an evolutionary ancestor of the membrane ACs**. The first high resolution cryo-EM structure of the mycobacterial full-length membrane AC provides clues to the functional role of the enigmatic membrane domains of the ACs, which are structurally conserved in the bacterial and mammalian enzymes.

Biography: Volodymyr Korkhov is a professor at ETH Zurich and a group leader at the Paul Scherrer Institute. He has studied various aspects of membrane protein structure and function throughout his career. During his doctoral studies in the group of Prof. Michael Freissmuth (MedUni Vienna) he investigated the structure-function relationships of neurotransmitter transporters. He then spent time as a postdoctoral scientist at the MRC Laboratory of Molecular Biology working on the structure of multidrug transporter EmrE (in the group of Dr. Chris Tate), and at ETH Zurich working on ABC transporters (in the group of Prof. Kaspar Locher). In 2014 he started his independent group at the Paul Scherrer Institute and ETH Zurich, focusing on biochemical and structural studies of membrane proteins involved in signal transduction.

Key Publications: https://www.psi.ch/en/lbr/people/volodymyr-korkhov#key-publications

Organisation: *Doctoral Program MolTag; http://moltag.univie.ac.at/, Office.moltag@univie.ac.at*