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ICB PhD public presentations

INSIGHTS FROM PHYSICAL CHEMISTRY ON THE CHARACTERISATION, PRODUCTION AND ENGINEERING OF EXTRACELLULAR VESICLES

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Prof. Dr. Petra Dittrich

03/10/2024, 2:00 pm
ETH Hönggerberg, HIT E51 (Siemens Auditorium)
and on Zoom (https://ethz.zoom.us/j/68178831647)

Project Summary: Extracellular vesicles (EVs) are biological nanoparticles released by all cells. They function as a mailing system between cells, delivering a variety of functional messages to specific addressed cells. Despite a high potential and large interest, their application as pharmaceuticals has been limited. This thesis aims to help the transition of EVs to marketable products by giving fundamental understanding of the EV life-cycle through an applied physical chemistry viewpoint. We developed diverse analytical techniques for the characterisation of both native and engineered EVs. Furthermore, we developed a microfluidic device for the encapsulation of nanoparticles in a vesicle membrane. In addition, we demonstrated how shear or corona formation can change the properties of vesicles in substantial ways. This knowledge can be leveraged to enhance the characterisation, production, engineering and application of EVs.

CV: Karl graduated with a BSc in Chemistry from the University of Tartu before coming to Zürich in 2018 to obtain a MSc in Chemistry from the Swiss Federal Institute of Technology in Zürich (ETHZ). In 2020, he joined the group of Prof. Paolo Arosio as a PhD student in the Institute of Chemical and Bioengineering.