

ICB PhD public presentations**INTENSIFYING BIOMANUFACTURING BY FRONTAL CHROMATOGRAPHY****Sebastian Vogg**

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Supervisor: Prof. Dr. Massimo Morbidelli

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**ETH Hönggerberg, 16/04/2019****HCI J 4, 15.00 h**

Project Summary: Biopharmaceutical industry is facing the challenges of more competition in the market as well as an increasingly diverse product pipeline with modalities showing higher complexity or incompatibility to existing platform processes. Therefore, processes need to be developed, which allow high productivity and flexibility without sacrificing robustness. Also in this changing environment, chromatography remains the method of choice for protein purification due to its intrinsically high selectivity; however, bind-elute processes suffer from low productivity and high buffer consumption because of time-consuming elution steps. Frontal chromatography can overcome this limitation in case of binary separation tasks: The stationary phase is loaded beyond its binding capacity towards the target compound. The stronger adsorbing impurities are retained on the column, while product collection can be carried out throughout the loading step. Therefore, column loading is increased while elution steps are avoided resulting in higher productivity. In this work, we compare the performance of a membrane adsorber and a resin material for the separation of monomeric antibody from its aggregates, which often pose the most abundant impurity and need to be reduced to acceptable levels due to their potentially immunogenic nature.

CV. Sebastian Vogg obtained his BSc and MSc in Chemical and Bioengineering from ETH Zürich. During the Master's thesis, which he conducted in the group of Prof. Gregory Stephanopoulos at the Massachusetts Institute of Technology, he worked on metabolic state control during cultivation of a fatty-acid-producing yeast strain. Currently, he is pursuing a PhD in the group of Prof. Massimo Morbidelli.