ETH zürich

ICB PhD public presentations

PROCESSES FOR THE REACTION AND SEPARATION OF PROTEINS

Nicole Ulmer
ICB Morbidelli Group
Supervisor: Prof. Dr. Massimo Morbidelli
Co-examiner: Prof. Andrew deMello

ETH Hönggerberg, 10/04/2018
HCI H 2.1, 15.00 h

Project Summary: Chemical modification is an important option for producing new protein based pharmaceuticals. Proteins themselves are heterogeneous and unstable molecules, and often the reaction conditions are too harsh, as for example too high or low pH or reducing agents. This leads to reduced yield, purity, recovery and selectivity.
We studied the digestion of an antibody into the Fab and the Fc fragment with immobilized papain. The papain need a reducing agent for activation, acting on the protein as well. We developed a continuous process in which the antibody flows through a papain functionalised column, followed by a multicolumn chromatographic process for purification.
With respect to antibody drug conjugates, a new continuous process has been developed for a model system. This is based on the reaction between the amines on the surface of the antibody and a N-hydroxysuccinimidyl ester functionalized dye. The mono-conjugated and multi-conjugated forms and isomers of them were separated using chromatography. To solve the problems of reduced yield from the reaction as well as from the separation, a multicolumn process was used.

CV. Nicole Ulmer has obtained her Master in 2011 from ETH. She then joined ChromaCon as a scientist. In 2015 she joined the group of Prof. Morbidelli.