

## DYNAMIC PROCESS CONTROL OF CONTINUOUS TWIN-COLUMN CHROMATOGRAPHY

Thomas Müller-Späth, ChromaCon AG, Switzerland  
thomas.mueller-spaeth@chromacon.com  
Lars Aumann, ChromaCon AG, Switzerland  
Richard Weldon, ChromaCon AG, Switzerland  
Sebastian Vogg, ChromaCon AG, Switzerland  
Giulio Lievore, ChromaCon AG, Switzerland

**Key Words:** Dynamic Process Control, Continuous Chromatography, CaptureSMB, MCSGP

Continuous downstream processing offers large improvements in product quality and production economics. Twin-column periodic counter-current chromatography equipment has become available for both process development and GMP manufacturing scale and has been used for the purification of monoclonal antibodies (mAbs), bispecific antibodies, antibody conjugates, fusion proteins and peptides.

For robust operation, continuous processes need dynamic process monitoring in view of clinical and commercial manufacturing. This presentation deals with the dynamic UV-based control of twin-column capture (CaptureSMB) and twin-column polishing (MCSGP) processes. For the capture process, the “AutomAb” control accounts for changes in resin capacity, titer and adjusts the operating parameters such that capacity utilization and yield are kept constantly at the set point. In the case of twin-column polishing, the “Autopeak” tool ensures that changes in temperature and buffer/solvent composition are compensated to maintain good yield and purity despite product peak shifts in the chromatogram. Both controls are essential tools to ensure robust long-term operation over multiple cycles.

This presentation briefly explains the two control concepts and provides cases studies.