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Parallel loading and complete automation of a 3-step mAb purification process for multiple samples using a customized preparative chromatography instrument with networked pumps

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Highlights

- A customized ÄKTA Pure was built to fully automate several different purification processes.
- The user can select a unique purification process for each sample.
- This paper focuses on a 3-step purification process.
- Parallel loading, customized flow paths and dedicated columns are a unique design.
- Processing time of the 3-step process is reduced by 83%.

Abstract

Advancement in high-throughput screening methods of novel therapeutic proteins for early stage research and development, specifically mAbs, have given mid-scale (milligram to gram scale) purification groups access to more of these molecules. The available purification technologies built to support mid-scale production was not efficient or versatile enough to keep up with this surge. To remedy this problem, we have designed and built a custom instrument using an ÄKTA Pure. This system enables parallel processing up to 5 samples and has the versatility to perform 1- to 3-step purification processes in a single queue. Furthermore, a unique purification scheme can be selected for each of the five samples in the queue. Overall processing time has reduced by 83% compared to manual, non-parallel load methods. Here, we describe our novel approach and demonstrate the flexibility, speed and efficiency of the instrument.