

# Purification of a synthetic peptide using multi-column chromatography (Contichrom® & MCSGP)

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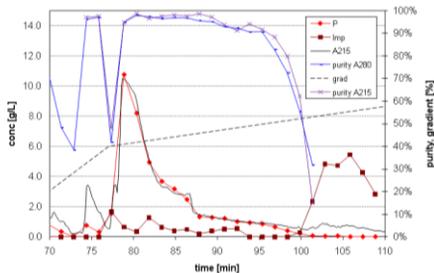
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## Purification challenge

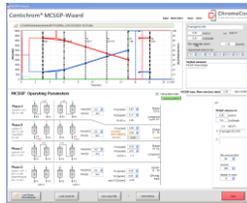
- Develop single-step purification for a synthetic polypeptide (20-30 amino acids, feed purity ca. 60%) using reversed-phase chromatography (C18)
- Improve COG (yield, productivity, solvent consumption) and purity by using MCSGP instead of conventional batch chromatography
- Batch reference process was already developed



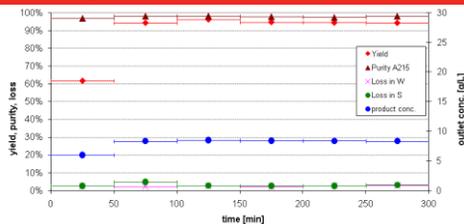
Chromatogram of batch chromatography showing concentrations and purities

## MCSGP process development

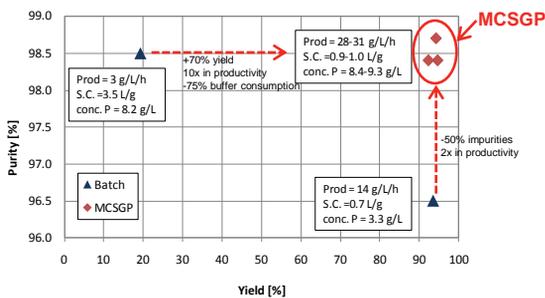
1. In MCSGP, the same stationary phase and eluent as in batch chromatography was used, but instead of a single column with 25cm bed height, two columns with each 5 (or 10) cm bed height were employed
2. Using the interactive Contichrom® software wizard, the batch process was automatically converted to the MCSGP process
3. Operation of MCSGP
4. Optional: Process optimization by fine-tuning of process parameters



## Experimental results MCSGP



Transient concentration profiles of Contichrom® outlets over time showing fast steady state and purity always in spec

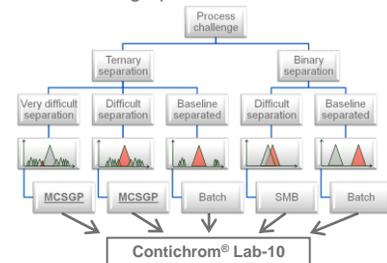


Summary of experimental results, comparing MCSGP and batch performance

## Introduction to Contichrom® & MCSGP

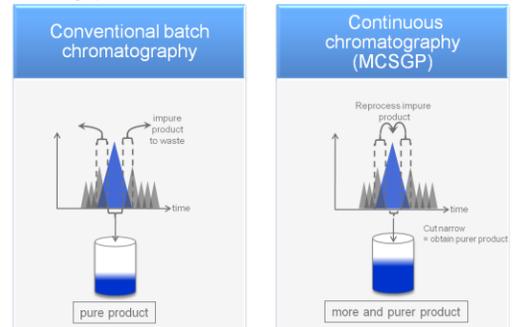
**Contichrom® Lab-10** is

- a preparative 2-column liquid chromatography system
- designed for discovery, process development and scale-up
- offering flexibility for all process choices (batch, SMB, MCSGP, multi-column) using a single equipment and control software
- All standard resin and column formats (e.g. RP, IEX, MM, SEC) can be used from low-high pressure with full solvent compatibility



The **MCSGP process** principle

- uses twin columns instead of one
- whereby the impure side fractions containing product are recycled internally extracting all product
- thereby in average increasing both yield and purity by 50% at a 10-fold throughput increase and 70% buffer reduction



Schematic principle of MCSGP. Find detailed animations at [www.chromacon.ch](http://www.chromacon.ch) in the download section

## Conclusions

With Contichrom® Lab-10 and the MCSGP process principle

- yield can be increased by 75% simultaneous with 10x increase in productivity and 75% reduction of buffer requirement
- purity can be increased by 50% simultaneous with 2x increase in productivity
- Contichrom® Lab-10/ Prep-100 could produce up to 40g/400g of purified product per day, although having only the foot-print of an HPLC

### References:

- [www.chromacon.ch](http://www.chromacon.ch)
- L. Aumann, M. Morbidelli, A continuous multicolumn countercurrent solvent gradient purification (MCSGP) process, *Biotechnology and Bioengineering*, 98 (5), pp. 1043-1055, Dec 2007