Investigation and optimization of mixed-mode chromatography for the analysis of pharmaceutical analytes dissolved in neat or high content of organic solvent (30 p)

Background
At AstraZeneca a robot allowing automatic sample preparation has been developed and is also hyphenated to a chromatographic separation system for analysis. Methanol is used as dissolving medium creating a mismatch to the generally employed reversed phase systems. After initial tests, using a combination of fundamentally different retention mechanisms of the separation column, results showed great potential for its use. The separation column is packed with particles enabling hydrophobic as well as ion exchange interactions, usually called mixed-mode, and by a proper choice of chromatographic conditions the sample incompatibility can be overcome.

Project plan
The objective of this thesis plan is to investigate chromatographic parameters available, e.g.

- Mobile phase composition and gradient elution settings (ionic strength, composition, pH, slope etc.)
- Type of separation medium
- Separation selectivity and analyte detectability, including injection volume
- Robustness
- Analysis time for high sample throughput

After screening of these and other parameters, an optimization aiming for a general procedure and fitting the automatic sample preparation system would be a great step forward. Finally, an application of a drug product would prove the case.

Project overview
The project plan is roughly divided into:

- Installation, introduction and LC basic literature studies
- Screening of chromatographic parameters + relevant literature
- Optimization and application
- Compilation of thesis and eventual complements
- Presentation in person or digital at AstraZeneca, Mölndal

Supervisors at AstraZeneca:
Ass. Prof. Morgan Stefansson
morgan.stefansson@astrazeneca.com
0703-758213

Senior Scientist Anna Granfors
Anna.granfors@astrazeneca.com
0722-282999