FAIMS Pro Interface Coupled to Triple Quadrupole Mass Spectrometer for Quantification of Peptides in Complex Matrices

Michael Volný, Claudia P. B. Martins, Michael W. Belford, Mary L. Blackburn, Thermo Fisher Scientific, San Jose, CA, United States

ABSTRACT
Phenomena: The Thermo Scientific™ FAIMS Pro™ Interface provides the selectivity and remote ion (or enigmatic peptide quantification) in complex matrices and for lower abundances of peptides.

Methods: Thermo Scientific™ TSQ Altis™, Triple Quadrupole Mass Spectrometer

Results: Results show compatibility of the FAIMS Pro interface with Thermo Scientific™ TSQ Altis™ Triple Quadrupole Mass Spectrometer and the applicability of this coupling for improvement of selective peptide quantification sensitivity.

INTRODUCTION
The high mobility electron adverse influence on selectivity based on differential gas phase stability. The Compensation Voltage (CV) setting determines which peaks are transferred to the mass spectrometer for detection. In a low CV setting, the FAIMS Pro™ delivers increased performance for ion-source experiments. The increased selectivity and sensitivity enabled by FAIMS Pro™ is illustrated here for biologically significant N-terminal peptides, which are disruptively enriched in cell line contaminations. The use of targeted peptide quantification is typically exercised by LC/MS using high sensitivities to overcome background matrix interference. FAIMS Pro™ Interface offers an orthogonal approach that separates selectivity and reduces the background interference and improves cells levels.

MATERIALS AND METHODS
A Thermo Scientific™ TSQ Altis™ instrument coupled with a Thermo Scientific™ FAIMS Pro™ system was utilized for all experiments. Peptide standards and real-time were utilized from Thermo Fisher Scientific and Belford. The FAIMS Pro™ provides advantages to the mass spectrometer with a change can be implemented with Thermo Scientific TSQ series.

RESULTS

FAIMS Pro software implementation

No instrument configuration necessary. FAIMS Pro™ software implementation is the same as the software that supports the Thermo Scientific™ TSQ Altis™ System. In addition, the FAIMS settings are maintained across the entire operation.

The CV Optimizer is available in Tune

Optimization is available in Tune. The value of the CV can be set in the FAIMS Pro™ method for each injection.

The FAIMS Pro™ interface improves the 1/10 part per million (ppm) accuracy from Thermo Scientific’s Pierce™ LC/MS System Suitability Test (SST) while improving the relative standard deviations (RSDs) of 10 fold.

CONCLUSIONS
FAIMS Pro™ Interface coupled to Thermo Scientific™ TSQ Altis™ Triple Quadrupole Mass Spectrometer provides performance of selective quantification due to reduced noise and excellent interference rejection.

REFERENCES
1. FAIMS Pro software implementation

TRADEMARKS/LICENSES
© 2010 Thermo Fisher Scientific. All rights reserved. The Thermo Scientific™ Pierce™ System Suitability Test is protected by patents issued in the US and other countries. Thermo Scientific™ Pierce™ System Suitability Test is a trademark of Thermo Fisher Scientific Inc.

ACKNOWLEDGEMENTS
Thermo Fisher Scientific and Michael Belford kindly provided access to internal data with this work.