

# Ultra-high performance liquid chromatography-tandem quadrupole mass spectrometry for high-sensitivity profile analysis of blood pressure modulators angiotensin peptides

<sup>1</sup> MOE Key Laboratory for Standardization of Chinese Medicines and SATCM Key Laboratory for New Resources and Quality Evaluation of Chinese Medicines, Institute of Chinese Materia Medica, Shanghai University of Traditional Chinese Medicine, Shanghai, China, 201210 <sup>2</sup> Waters Corporation, Shanghai, China, 201206

### Introduction

- Angiotensin peptides play a significant role in the modulations of vasoconstriction and blood pressure. As an essential modulator of renin-angiotensin system, the dynamic changes in angiotensin peptides correlates with hypertension and metabolic syndrome. The rapid and accurate quantification of angiotensins are important to understand the underlying biochemistry of multiple physiological and disease states.
- Circulating levels of angiotensins in blood are typically at low concentrations (<500 pmol/L), which makes the analysis particularly challenging.
- Here we present a sensitive and specific assay for simultaneous quantification of eight angiotensins in BSA matrix that uses Oasis MCX µElution plates and the Xevo TQ-S for automatic MRM for the characterization of these peptides.

#### **Results**

- The seven angiotensin peptides were well separated and eluted within 3 min with an optimized elution gradient of 0.2% formic acid/acetonitrile at a flow rate of 0.3 mL/min.
- The recovery for all the angiotensin peptides was above 50% with a relative standard deviation under 8%.
- The calibration working curve was created by spiking different concentrations of angiotensin standards into 8% BSA, and all peptides produced a linear response over the entire calibration range of 0.25-1000 ng/mL with R<sup>2</sup> values above 0.99 and mean dev below 10% in 1/x<sup>2</sup> weighting.
- The lower limits of quantification (LLOQ) were below 0.25 ng/mL for all angiotensin peptides.

#### Meng Qi<sup>1</sup>, Hui Wang<sup>2</sup>, Jie Wang<sup>1</sup>, Li Yang<sup>1</sup>, Zhengtao Wang<sup>1</sup>

## In vivo transformation pattern and MRM parameters of test angiotensin peptides



#### Apply protocol of angiotensin peptide profiling via specific sample extraction and chromatographic separation technique



#### Conclusions

The UPLC-MS/MS assay provided reliable angiotensins quantification in complex matrix, which could be applied into clinical angiotensin profile research.

#### Acknowledgments

Supported by the National S&T Major Special Project (2012ZX09103201-045), and the Natural Science Foundation of China (81222053 and 81403070). **Ref**[1] A
[6(1):
[2] S *Prote* 

Fast and effective optimization of MRM methods for multiply charged parents

otide	MRM transitions (m/z)
tensin l	325.12>463.97
ensin II	349.60>371.26
ensin III	466.40>669.46
ensin IV	388.36>513.38
ensin 1-9	395.36>647.49
ensin 1-7	450.34>647.43
ensin 1-5	333.15>534.25

#### References

[1] Ali Q, Wu Y, Nag S, Hussain T. *Anal Methods. 2014*; 6(1): 215-222.

[2] Schulz A, Jankowski J, Zidek W, Jankowski V. *Clin Proteomics. 2014*;11(1): 37-45.