

Thomas A¹, Walpurgis K¹, Krug O¹, Schänzer W², Thevis M¹

Screening for small peptides in urine by means of nano-UPLC-MS/MS in doping controls

Center for Preventive Doping Research / Institute of Biochemistry, German Sport University Cologne, Cologne, Germany¹;
Institute of Biochemistry, German Sport University Cologne, Cologne, Germany²

Abstract

The need for simple, fast and sensitive procedures is an urgent task in modern doping control analysis. Thus, a simple screening assay including 12 prohibited peptides (< 1.5 kDa) that are purified from urine using weak cation exchange with subsequent determination by means of nanoUHPLC separation coupled to high resolution tandem mass spectrometry was developed. These peptides comprise Gonadorelin (LH-RH), Desmopressin, TB-500 and 9 Growth Hormone Releasing Peptides (GHRP-1, -2, -4, -5, -6, Hexarelin, Alexamorelin, Ipamorelin and a GHRP-2 metabolite); however, the procedure is expandable to further target analytes. Respective metabolites are covered as far as their metabolism is already known.

The method was validated with a focus on qualitative result interpretation considering the parameters specificity, linearity (0 to 500 pg/mL), recovery (45 to 95 %), precision (< 20% at 100 pg/mL), limits of detection (2-10 pg/mL), robustness and ion suppression. The proof-of-principle was shown by analysing excretion study urine samples for LHRH, Desmopressin and GHRP-2.

Thomas A, Walpurgis K, Krug O, Schänzer W, Thevis M. (2012) Determination of prohibited, small peptides in urine for sports drug testing by means of nano-liquid chromatography/benchtop quadrupole orbitrap tandem-mass spectrometry. *J Chromatogr A*, **1259**, 251-7.