

PROJECT REVIEW

"Simplifying and expanding the screening for peptides < 2 kDa by means of liquid chromatography mass spectrometry"

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The number of samples and target analytes is constantly increasing, necessitating all analytical methods to be optimized with regards to speed and costs effectiveness to follow the challenges of the modern anti-doping fight. Low molecular mass peptidic drugs (< 2kDa) have become more and more prominent on the Internet and in black markets, and their misuse in elite sport has been proven in the past.

The analysis of these new compounds is possible and methods are installed in the accredited anti-doping laboratories worldwide. Unfortunately, these methods are largely designed to cover small peptidic drugs only in exclusive categories or after dedicated sample preparation as shown for instance for growth hormone releasing peptides, gonadorelins, desmopressin, TB-500, AOD-9604 and ARA-290. This is mainly due to the required sensitivity of these methods that enables the detection of the drugs in very low concentrations (sub-ng/mL). Within this study, a generic sample preparation strategy (dilute and inject) which is valid for several classes of compounds (diuretics, stimulants, anabolic agents etc.), will be evaluated for the detection of low molecular mass peptide hormones in urine even in the sub-ng/mL-levels. Therefore, several types of mass spectrometers and liquid chromatography methodologies will be assessed to find the best option for the aimed combination. This will enable a comprehensive multi-target screening within one analysis.