PROJECT REVIEW

"Expanding the testing capability of immunopurification assisted analytical methods for peptides > 2kDa by means of mass spectrometry"

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A variety of prohibited peptide hormones potentially enhancing athletic performance is still lacking sufficient detection methods in accredited anti-doping laboratories. This is mainly due to a yet missing adequate analytical methodology, which is crucial for detection of these very efficient (and therefore low-dosed) therapeutics and drug candidates in biological fluids (urine / blood).

Examples for new peptide-based compounds, which are explicitly mentioned on the Prohibited List, are Corticorelin (CRH) and Mechano Growth Factors (MGFs). Other peptidic compounds (e.g. Thymosin beta-4) share the same status, but are not named on the list so far although their misuse has been reported. They all are available as approved drugs (CRH) or at least subject of different clinical trials (Thymosin beta-4, MGF with different analogues).
Essential requirement for the mass spectrometric detection is the appropriate extraction of the target peptides from biological matrices to meet the required limits of detection in the low pg/mL range. This will be achieved by applying the established coated magnetic beads technology (which has been successfully applied to other peptide hormones such as insulin analogues, CJC-1295, Tesamorelin, Geref, Synacthen, etc.) with respective antibodies. The identification of isolated and enriched analytes will be realized after liquid chromatographic separation by means of high resolution mass spectrometry. Due to the unknown metabolic fate of the peptides after administration to humans, in-vitro experiments are planned, which will help to characterize amino acid sequences serving as additional analytical targets in routine doping controls. The method will be validated and the implementation into existing screening procedures (if possible) for peptides will be realized.