PROJECT REVIEW

"Precursor ion scanning for the detection of new steroid markers. Routine application for the open screening of anabolic steroids and evaluation of population factors in the detectability of these markers"

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This project aims at four goals:

A. Interpretation and evaluation of precursor ion scanning chromatograms (urine profile recognition)

In the field of anti-doping control, chromatograms from target steroid-analysis are generally evaluated and interpreted visually by the analyst which is trained for this purpose.

A similar approach will be adopted for evaluating the precursor scanning chromatograms. To get acquainted with the chromatograms, around 50 blank samples will be analysed. In a second step precursor ion scan chromatograms obtained from controlled administration studies (e.g. methyltestosterone, methanedienone,…) and from adverse analytical findings from routine target screening will also be investigated to get acquainted with positive samples. The applicability of instrument software for this purpose will be evaluated.

B. Application to real samples

Urine-samples will be analysed. These samples will include all out of competition samples and both out of competition samples and in competition samples

C. Study of the influence of different population factors in the detectability of different markers for several anabolic steroids

A single dose of the previously studied steroids (stanozolol and methyltestosterone) will be administered to six volunteers belonging to different population groups. Urine will be collected for three weeks and a method including all feasible markers will be applied. The best marker(s) will be selected based on the results obtained. This procedure will also be followed if promising new markers are found in the re-evaluated steroids.

D. Re-evaluation of the metabolism of additional steroids by LC-MS/MS looking for alternative markers for the detection of steroid misuse

Three or four additional steroids will be re-evaluated via the analysis by LC-MS. These steroids will be selected based on the availability of excretion studies in both laboratories.

Appropriate precursor scan and/or neutral loss scan methods will be applied for each steroid depending on their structure. Feasible metabolites will be characterized by MS techniques. The metabolic nature of these metabolites will be determined, if necessary, by the analysis of chimeric mouse urine after the drug administration. A full excretion study will be analyzed in order to determine the long term metabolites.