

Supramolecular solvents for simplifying sample preparation in the detection of small peptides in DBS (DBS)



Resumen:

The use of dried blood spot (DBS) samples in doping analysis is becoming a promising matrix because of their great operational advantages (e.g. minimally invasive, cost-efficient, analyte-stabilizing, possibility of increasing testing frequencies, etc.). Doping testing of small peptides (SPs) is mostly performed in urine but complementary information can be obtained in a cost-effective way using DBS samples. However, many issues still need to be addressed before considering it reliable for routine use. Major issues are the demand for simpler and faster sample processing, the need for higher SP recoveries and lower detection limits. This project aims to develop an efficient and high throughput analytical platform for reliable testing and confirmation of SPs in DBS samples. The approach will be based on the combination of the capability of supramolecular solvents (SUPRASs) to integrate efficient compound extraction and sample clean-up with the power of liquid chromatography-mass spectrometry (LC-QTOF and LC-QQQ) for SP detection. The analytical platform will be applied to the detection of 58 peptidic drugs and metabolites, most of them routinely analysed by the WADA accredited laboratory of the Health Institute Carlos III (ISCIII, Madrid) in urine. They will include growth hormone releasing peptides and secretagogues, growth hormone fragments, antidiuretic hormones, gonadorelin releasing peptides and growth factor modulators). As a proof of concept, the SUPRAS-based method will be applied to the analysis of DBS samples obtained from the subcutaneous administration of a single dose of peptidic drugs to two intervention groups, each consisting of 10 elite athletes.

Objetivos:

1. Development and optimization of the SUPRAS-based sample preparation.
2. Validation of the proposed SUPRAS-LC-MS/MS method according to WADA guidelines.
3. Detection of SP in DBS samples obtained from controlled administration studies.
4. Transfer of the developed SUPRAS-LC-MS/MS method to WADA accredited labs.

Presupuesto: 101,767.00

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Enlace: <https://www.wada-ama.org/en/resources/scientific-research/supramolecular-solvents-simplifying-sample-preparation-detection>

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