

Impact of DBS sampling site (fingertip vs. upper arm) on the concentrations of ephedrine

Jakob Mørkeberg, Sara A. Solheim (Anti Doping Denmark), **Nikolai B. Nordsborg** (University of Copenhagen, Denmark), **Andreas Thomas, Mario Thevis** (German Sport University Cologne, Germany)

Project overview

The minimally invasive dried blood spot (DBS) technique has the potential to improve the time- and-cost efficiency compared to traditional matrices in doping control. The potential impact of the sampling site e.g. finger vs. arm on the concentration of target analytes needs to be established. Indeed, the possible impact of the sampling site may be of particular relevance for the DBS analysis of threshold substances prohibited in-competition, such as stimulants (e.g. ephedrine), which requires accurate quantification of the circulating concentrations at the time of competition. Thus, agreement between concentrations from different sampling sites as well as the parallel comparison of DBS vs plasma concentrations of ephedrine are needed.

In this study, eight healthy male volunteers will receive a single oral administration of 20 mg ('low dosage') and 60 mg ('high dosage') in a randomized crossover design with one week between the interventions. Parallel DBS samples from the fingertip and upper arm will be collected at 0 (pre-administration control sample), 1, 2, 4, 6 and 8 hours post-administration. From the DBS samples the ephedrine concentration will be determined. Additionally, venous blood samples will be collected through a peripheral venous catheter on the same time points to compare the DBS concentrations of ephedrine with those in plasma.

Therefore, the present project aims to:

- 1) Determine whether there are differences in the concentration of ephedrine in samples collected from the finger vs. the upper arm
- 2) Examine potential differences in DBS vs. plasma concentrations of ephedrine.