

DRIED URINE SWABS AS A TOOL FOR MONITORING METABOLITE EXCRETION BY UPLC-MSMS

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We tested a large set (n=181) of dried urine samples spotted on regular cosmetic cotton swabs for quantitative UPLC-MSMS analysis of various metabolites. The agreement of measurements between conventional 24h urines and dried urine spots made from them in situ was evaluated by Passing-Bablok regression and Bland-Altman analysis after creatinine correction. There was full agreement in qualitative results making dried urine spots a simple method for urine sample collection, suitable for metabolomics profiling and for screening of compliance in clinical trials. The dried urine samples were stable for at least 9 months. This allows samples to be stored at room temperature and analysed later, thereby making logistics much easier in human studies. Quantitative analysis exposed certain limitations of dried urine spots. Results were underestimated in the range from 11-23% in case of tartaric acid, indoxyl sulfate, pyroglutamyl proline and DHEAS. However, full agreement was found in case of the alcohol intake related metabolites, ethyl sulfate and ethyl glucuronide. Partial overestimation ranging from 10-20% was observed in case of cresol sulfate. As a secondary objective, we examined variance of individual total daily creatinine excretion, which was found to be maximally 16%. This finding suggests that the individual creatinine correction factor calculated as an average individual value factor could be used in long-term clinical trials for correction of measurements in dried urine spots, provided that muscle mass is unchanged and the level of analytical offset is acceptable for the research purpose.

BIOGRAPHY

Rastislav Monošík has been a post-doc at the University of Copenhagen since 2015. He received his master's degree in food engineering and PhD in food biosensors from Slovak University of Technology. He was awarded FAPESP fellowship in 2013 to work at the University of São Paulo on microfluidic devices. His current focus as Marie-Curie fellow is on developing an objective tool for assessment of recent dietary intakes using multiplex UPLC-MSMS analysis of validated food intake biomarkers and improving the tool by a novel sampling technique (dried urine spots) and addition of promising food biomarkers following their validation.

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