

“Androgens and contraceptive steroids interaction with ABP”

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Project Overview:

Our research program encompasses projects designed to investigate how the use of drugs (emergency pills and androgens) and genetic variation interfere with the Athletes Biological Passport (ABP). ABP is essential to detect doping with anabolic agents, especially with the decreasing doses evidently used by some athletes. However, there are many factors that may contribute to the inter-individual variability in steroid profiles, i.e. drug use, diseases, genetic variation etc. Preliminary results indicate that the use of an emergency pill influences the steroid profile and confounds the test interpretation. We will therefore investigate how the use of emergency pills affects the excretion of steroids in females. We and others have shown that UGT2B17 genetic polymorphism has a large impact on testosterone doping test. We will continue to evaluate the use of genetic testing of UGT2B17 as well as other polymorphisms in sport samples. Finally we will study how androgens affects the haematological module.

It is of great importance that the athletes ABP will be able to compensate for all possible variability in longitudinal steroid profiles. More knowledge is therefore needed about how drug use and genetic variation may affect the ABP and hence outcome of doping tests

Results and Conclusions:

Study 1: We show that DNA extracted from urine samples is not good enough for individual genetic testing in anti-doping work. We showed that UGT2B17 ins/ins men exert higher T/E than ins/ins females and that some del/del athletes (particularly men in power sports) had T/E >0.4. The CYP17A1, and UGT2B7 SNPs investigated could not explain the large inter-individual variation in urinary concentration of epitestosterone.

Study 2: We have shown that the ABP ratios varies randomly throughout the menstrual cycle, epitestosterone being the only metabolite that are significantly altered. The administration of an EC decreased the urinary concentrations of epitestosterone 24 hours after the intake, and it is possible that a use of EC could result in atypical finding in the ABP.

Study 3: We conclude that testosterone but not nandrolone mediates significant effects on the hematocrit profile and gene expression of the EPO gene in blood. Moreover, testosterone increases the serum levels of the future ABP biomarker P-III-NP. It may be of importance to know how the different modules interact for the interpretation of the ABP results. We will

continue to study these biomarkers in relation to each other, both at baseline and after the administration of different doping agents.