

PROJECT REVIEW

“Terbutaline doping control using enantioselective urine assays”

Dr. G. Jacobson, Dr Morten Hostrup (University of Tasmania, Australia)
(University of Copenhagen)

Beta2-agonists are among the most commonly used drugs by athletes, which is related to the high prevalence of asthma and exercise induced bronchoconstriction (EIB) in this population. This project will determine analytical urine thresholds for a beta2-agonist asthma drugs, terbutaline.

Urinary thresholds and decision limits are a way to avoid excessive use of beta2-agonist asthma drugs by athletes and to lessen the burden associated with therapeutic use exemption (TUE) applications. One of the most common beta2-agonists, terbutaline, is widely used in Europe but is currently prohibited unless a TUE has been granted. Terbutaline is responsible for over three quarters of AAFs associated with beta2-agonists in doping control. The project will develop a urine threshold for terbutaline to discriminate between normal therapeutic use via inhalation, high dose (supratherapeutic) inhalation and oral ingestion of terbutaline.

Terbutaline is a chiral compound administered as 50:50 mixtures of two enantiomers (stereoisomers) which are molecules with non-superimposable mirror images (analogous to right and left hands). Differences in the way the body excretes enantiomers of the same drug can be used to improve discriminatory capability of urine doping detection methods – this requires the use of advanced stereoselective UPLC-MS/MS assays to distinguish between enantiomers which will be used in this project.