RESEARCH PROPOSAL

Development of highly sensitive and robust analytical method for detection, isolation and confirmation of drugs of abuse in race Horses / camels.

Introduction

In forensic Anti doping analysis it has become increasingly important to identify and confirm the doping agents to avoid legal arguments and challenges to the analytical findings. The major challenge in anti doping analysis is the difficulty in the efficient extraction and low level detection in matrices/body fluids such as urine /blood. The influx of clandestine drugs coming to the market everyday pauses great challenge to the analysis in terms of detection capability and identification as it requires efficient method development for extraction and analysis.

Doping is the illegitimate use of banned substances by athletes to improve performance during sports and in training, The two major reasons that doping is made illegal are the potential harmful effects on athletes and the depth of corruption it can bring to the sports field So, any athlete in veterinary sport adopting any of these substances or methods, during sports will result in disqualification and further legal proceedings.

This research would mainly focus on a novel drug / designer drug which has never been Reported in racing, aims to compare the various extraction procedures(Solid phase or Liquid liquid extraction) and to develop an efficient extraction procedure from the matrices urine and plasma , the metabolite study can be conducted in by administering the drug in horses / camels which are available at the laboratory for that purpose, invitro experiment using homogenized liver cells may also be conducted in the laboratory .

  This research would primarily be focused to develop and optimize highly sensitive LCMS method for identifying and confirming the drug using the High resolution accurate mass LCMS MS Systems in the laboratory

Project Overview

Aim

- To develop highly sensitive and robust analytical method for detection and confirmation of drug under study which is not reported in race horses yet.

- Method development involves highly sensitive LCMS Instrument method for analysis with the lowest LOD, and optimizing various extraction protocols for maximum drug recovery from urine and blood.

- Study Pharmacokinetics, metabolism and excretion of Drug under study after single / multiple administration

Number of Animals :
 4-6 Horses, these animals are held in controlled environment and fed regularly with hay and grains, have free access to water and are exercised regularly.

Sample collection.
Under the supervision of a veterinary surgeon, Blood samples will be collected on a regular interval after the drug administration.
Urine collection collected as animal disposes as morning and evening samples
after the administration.

Storage of samples
All blood samples are centrifuged, plasma separated, stored at -20'c until being processed, while urine samples are stored at -20'c immediately after collection ,which are then thawed as required for the experiment

In vitro / in vivo metabolomics:
Administration study will be based on Ethics approval from the scientific board at central veterinary research laboratory and availability of animals (Horses / camels),
Invitro studies will be carried out on homogenised liver cells available in the laboratory

Instrumentation:
Samples are thawed, pH adjusted, Extracted by LLE /SPE techniques and analyzed by Thermo orbitrap LCMS / waters Xevo QTOF LCMS

Pharmacokinetics / Excretion profile
Study the Absorption, Distribution, and Excretion parameters ,Cmax , Tmax ,t1/2 ,CL and elimination rate .
All samples (blood and urine) will be analyzed until the drug and metabolites are cleared from the system as confirmed by analysis.