A PhD position in metabolomics is available at LABERCA (Oniris, France) and LCH (Laboratoire des Courses Hippiques). The CIFRE funded project, will be starting in September 2019.

PROPOSAL TITLE
Animal doping: toward the practical implementation of metabolomics based strategies

ABSTRACT
Within the particular context of controlling the misuse of growth promoters in animals (both sport and livestock species), an alternative to targeted approaches has emerged within the last past 10 years; it consists in the characterization of physiological perturbations induced upon exposure of the animal to prohibited substances and practices to highlight suitable biomarkers addressing safety and/or regulatory issues. Metabolomics in particular has been investigated in the hope of identifying such biomarkers, and some studies have from that time forward demonstrated the efficiency of the strategy [1-17]. Steps toward official or commercial implementation of corresponding (screening) tools are however still to be taken [18]. Besides the need to harmonise and establish accepted protocols to be applied to such methods, scientists are still facing the question of biomarkers universality and transferability.

In the present context, biomarker’s universality is closely related to its specificity and its ability to be considered as generic toward, for instance, animal species, route of exposure, chemical analogues, chemical mixtures, biological matrix considered ..., while biomarkers’ transferability refers to the capacity of, first, highlighting them and then monitoring them on different instruments, different technologies and in different laboratories. The present research project has been elaborated on the basis of these different findings and needs.

Previous research projects conducted by both teams, each of them individually focusing on a particular anabolic compound (belonging to steroids, β-agonists, growth hormone, SARMs...), in different biological matrices (urine, blood, faeces, liver) and for a given animal species (equine, cattle, porcine), enabled establishing robust metabolomics models for the detection of the misuses considered; test challenges were sometimes successfully conducted and certain marker metabolites identified. These isolated, albeit promising, works do not, however, allow for consideration at this stage of the generalization of established models or their robust application in a control context. It is therefore necessary on the one hand to study more finely the areas of application of these preliminary metabolomics models, define their scopes, conduct the validation of the selected models and to ensure their implementation on the different analytical platforms (LC-Q-Exactive, LC-Q-TOF, LC-QqQ).

COORDINATION /SUPERVISION:
Gaud DERVILLY-PINEL, Ph.D (LABERCA) / Zied KAABIA, Ph.D (LCH)

QUALIFICATIONS
We are looking for a highly motivated, enthusiastic team player and result-driven scientist with:
• Strong chemical background with a Master’s in chemistry, Analytical Chemistry or equivalent
• A significant level of technical knowledge and experience in Mass Spectrometry including its applications in Chemistry and/or Metabolomics
• An excellent academic record (MSc) in analytical chemistry
• Intermediate to strong statistical skills
• Good collaboration and communication skills (written and oral English)
• Structured and analytical working approach

APPLICATION
Please submit your application no later than 23rd June 2019.
Applications must be submitted as one pdf file containing all materials to be given consideration. The file must include:
• A letter motivating the application (cover letter)
• Curriculum vitae
• 1 or 2 letters of support
• MSc records

Candidates may apply prior to obtaining their MSc level, but cannot begin before having received it.

For further information please contact the project coordinators,

-------------------------------------------


Headed by Prof LE BIZEC, LABERCA’s general domain of activity is the chemical food safety, in a global risk assessment perspective: generation and interpretation of exposure and body burden data, study of the transfer and metabolism of investigated chemicals from their sources to the consumers through the food chain. From an analytical point of view, the two main areas of competence of the laboratory are the treatment of complex biological samples for isolating the studied substances present at (ultra-trace) level, and the hyphenated measurement of these compounds by various mass spectrometric coupling techniques. Besides these targeted approaches, the laboratory has been developing over the last 10 years an expertise in untargeted approaches (metabolomics) to reveal biomarkers of chemical exposure. The analytical platform is considered as one of the most complete at the national and European level (> 15 last generation MS instruments). All these activities (assays and research) are conducted under management quality system combining accreditation (ISO17025) and certification (ISO9001:2008).
Headed by Dr BAILLY-CHOURIBERRY, Laboratoire des Courses Hippiques (LCH) is the official laboratory in France for the horseracing and equestrian drug testing. LCH started with horse testing in the beginning of 1972 with the tireless continuous development of analytical methods correlated to the survey of new technologies in the field of mass spectrometry and chromatography. Since 2003, LCH is based at Verrières-le-Buisson (91) and analyses annually around 30 000 samples from France and around 8 000 from other countries mainly both from blood and urine. The laboratory is accredited ISO17025 for horses and jockeys (800 samples/year). LCH is one of the five IFHA reference laboratories for horseracing and one of the four FEI reference laboratories for equine sports, leading LCH to be in the top three of the International laboratories for horse testing. LCH is one of the laboratories at the forefront of the detection of new prohibited substances with 50 mass spectrometers, a dedicated research and development unit and published around 40 peer reviewed articles since the past ten years.

References within both laboratories in relation to the topic


