Metabolomic Applications in Veterinary Medicine.

Phillip Whitfield

Proteomics and Functional Genomics Research Group, Faculty of Veterinary Science, University of Liverpool, Liverpool, United Kingdom

Of all classes of biological molecules, metabolites are the most conserved across species, and report directly on the metabolic and physiological status of the subject. Metabolomics can therefore provide a coherent view of the response of biological systems to a variety of genetic and environmental influences. Furthermore, readily accessible metabolites raise the possibility of identifying surrogate biomarkers of specific disease states. This information could have significant diagnostic applications, particularly if such markers can be used to direct treatments. Metabolomics is now beginning to make a significant impact on the landscape of veterinary research. We are employing mass spectrometry-based metabolomic strategies to investigate metabolic regulation and dysfunction in animals. In an exemplar project, liquid chromatography-mass spectrometry was used to characterise the metabolic disturbances associated with canine liver disease. The analyses not only distinguished control and affected cohorts of dogs but also discriminated animals with congenital and acquired forms of hepatic disease. This approach demonstrates the potential of metabolomics to improve diagnostic capabilities and provide greater insights into the pathogenesis of disease states throughout veterinary medicine.