Drug Safety and Early Toxicology Services
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IDEXX BioAnalytics offers a range of bioanalysis services to detect early adverse effects resulting from drug administration. Some of our tests are proprietary, GLP and can be run on multiple animal species (mouse, rat, cat, dog, pig, NHPs, etc.) to detect early cardiac, renal or liver toxicity issues. Additionally, GLP histopathology services run by our recognised experts complement the extensive range of our toxicity biomarkers.

Furthermore, a range of haematology, biochemistry and analytical chemistry tests are also available.

### Cardiotoxicity

**Nt-proBNP**: The N-terminal prohormone of brain natriuretic peptide (Nt-proBNP) increases even when no signs of heart failure are present, which shows its high sensitivity to predict cardiotoxicity after treatment. As heart disease progresses, the chambers become more stretched and BNP is released in greater quantities. Cardiopet® proBNP quantitatively tracks the injury progression.

**Ultrasensitive Cardiac Troponin I (cTn I)** is a sensitive and specific marker of myocardial injury. The troponin concentration can be thought of as a quantitative measure of the degree of injury sustained by the heart. cTn I is becoming the serum biomarker of choice for monitoring potential drug-induced myocardial injury in both clinical and preclinical studies. IDEXX BioAnalytics offers us-cTn I, the ultrasensitive method for cardiac Troponin I detection.

### Liver Toxicity

Early Drug-Induced Liver Injury (DILI) detection is vital for drug development.

Alanine and Aspartate Aminotransferases (ALT and AST) are general indicators of hepatocellular injury.

**Alkaline Phosphatase (ALP)**, **Aspartate Aminotransferase (AST/GPT)**, **Bile Acids**, **Total Bilirubin**, **Total Protein** are important markers of liver injury.

**Lactate Dehydrogenase (LDH)** and **Cholinesterase** are all useful tools to detect liver dysfunction.

**Glutamate Dehydrogenase (GLDH)**, **Gamma Glutamyltransferase (GGT)**, **Urobilinogen** are general indicators of hepatocellular injury.

**Bilirubin** is often part of a cholestatic DILI pattern.

**Total Cholesteryl**, **Cholesterol**, **Gamma Glutamyl Transferase (GGT)** are general indicators of hepatocellular injury.

### Kidney Toxicity

Although many forms of Drug Induced Kidney Injury (DIKI) do not produce symptoms until late during drug administration, there are indeed warning signs, such as Blood Urea Nitrogen (BUN) and Creatinine levels falling outside the normal range.

**Symmetric Dimethyl Arginine (SDMA)** is a new and potentially useful tool to assess glomerular filtration rate (GFR) and detect changes to kidney function much earlier than with creatinine and BUN alone. In addition, both creatinine and BUN are affected by protein catabolism (e.g. muscle wasting, high-protein diet), which is not the case with SDMA. SDMA is excreted from the kidneys; therefore, as kidney function or GFR decreases, SDMA increases.

Other parameters measured to assess renal function are: the (lowered) glomerular filtration rate (GFR), Potassium (K), Protein (total), Sodium (Na), Chloride (Cl) and other analytes. Routine haematology analysis is also recommended.

* In bold: IDEXX BioAnalytics tests and services available