Frequently-Asked Questions: Toxicology

What does the toxicology section do?

The function of the toxicology section is to analyze biological, food/feed, water, and environmental samples to detect the presence of toxic compounds and/or toxins to identify poisons responsible for animal illness or death. The section also provides therapeutic drug monitoring services—a key component of individualized medicine. Ultimately, this knowledge is used to save animals’ lives, protect public health, and assist clinicians in treating animals. This well-equipped laboratory uses a wide variety of techniques, including thin layer chromatography (TLC), high performance liquid chromatography (HPLC), gas chromatography (GC), gas chromatography/mass spectrometry (GC/MS and GC/MS/MS), cold vapor atomic absorption (AA), inductively coupled plasma emission spectrometry (ICP/AES), inductively coupled plasma mass spectrometry (ICP/MS), high performance liquid chromatography mass spectrometry (LC/MS/MS), and capillary zone electrophoresis (CZE).

How do I contact the toxicology section?

During regular business hours, please call 517-353-1683. For consultation about clinical signs and treatment, ask to speak with Dr. Wilson Rumbeiha, our toxicologist. If your question is about analytical methods and procedures ask to speak to Dr. Andreas Lehner, our analytical chemist. For animal health emergencies outside of normal operating hours, call 517-353-5275 for an automated answering system.

What tests do you perform to detect poisons or drugs?

DCPAH’s state-of-the-art toxicology section is equipped to test for an infinite range of toxic substances and drugs. For instance, we offer tests for rodenticides, insecticides, avicides, fungicides, mycotoxins and plant toxins, trace minerals, heavy metals, veterinary and human pharmaceuticals, and industrial pollutants. We also offer tests for the identification of poisonous plants and mushrooms. For our research customers, we offer specialized research sample analysis. We continuously add new tests. Please consult the Available Tests section on the DCPAH CD or website for a comprehensive list of toxicants we test for.

What is tested for in your GC/MS screen?

The GC/MS “screen” is one of our most popular and versatile tests. Technically, molecules of chemicals and compounds are fragmented during analysis. Each chemical/compound has a rather unique fragmentation pattern and is compared to a library that has patterns of >100,000 chemicals. Chemicals in the library include pesticides, pharmaceuticals, industrial chemicals, herbicides, natural toxins, and products used around the home. It is not practical for us to provide a comprehensive list of all chemicals we detect using this technology. Thus we suggest that you list for us potential candidate toxicants. This way we can tell you if the GC/MS analysis is the right test for your application. If not, we will suggest for you a more suitable analytical procedure. As a guide, a list (Chemicals/Compounds Identified by the GC/MS Screen) of the compounds most commonly detected by the GC/MS procedure...
at DCPAH is provided on the DCPAH CD or website. Please do not hesitate to contact the lab at 517-353-1683 if you have any questions about this or other tests.

**What is the ideal sample to diagnose copper toxicosis in dogs?**

We recommend needle biopsy samples in live patients as blood is not a suitable sample for diagnosis of copper toxicosis in dogs. We need a minimum of 10 mg dry weight (50 mg wet weight) of liver for this test. Biopsy samples should be submitted in plastic vials. In deceased dogs, please send us 50 g of liver. The same approach is recommended for diagnosis of iron storage disease in all species.

**What samples do you use for toxicology analysis?**

We have versatile capabilities. That means we can test a wide variety of matrices/specimens. We analyze source materials like water, food, bait, fence posts, animal bedding, nuts, coins, river-bed sediments, etc. If you suspect it as a source of poisoning, we can test it. We can also analyze tissue samples from poisoned animals including liver, kidney, brain, adipose tissue (fat), and hair; and biological fluids including serum, plasma, whole blood, urine, bile, cerebral spinal fluid, and seminal plasma. Among other factors, the choice of sample depends on the poison in question, length of time post-exposure, and whether the animal is alive or dead. A veterinarian usually can decide on the appropriate sample(s) alone or in consultation with a clinical toxicologist. When calling the toxicology section, please be prepared to share information about the animal’s medical history, clinical signs, living environment, etc. so we can help you determine appropriate samples for testing.

**How do I submit samples for testing?**

Proper sample submission is critical to a successful toxicological analysis. Improper sample submission can jeopardize the process and cause erroneous results. The components of proper sample submission are: 1) choice of appropriate test sample; 2) ideal sample size; 3) appropriate packaging; 4) ideal shipping conditions; and 5) paper work complete with history, clinical signs, clinical chemistry, feed labels, necropsy reports, or any other pertinent information.

Please submit fresh or frozen tissue samples. Whole blood should be kept refrigerated. Please strictly follow the guidelines for sample volume/size and shipping conditions specified in the Available Tests section on the DCPAH CD or website. Some poisons are volatile at room temperature, while others are metabolized and lost if not packaged properly.

**What is a consultative work up?**

The toxicology laboratory normally runs routine samples of clinical or diagnostic nature. However, because of our expertise and the sophisticated equipment at our disposal, we can serve clients that need help with unusual cases. This may include analysis of samples for a rare poison, chemical, or drug not routinely performed in the lab and not listed in the Available Tests section of the DCPAH CD or website. In such cases, we will work with you to develop the test method and to validate that method. We charge an hourly rate to develop and validate the assay. This process can take between 5 hours and 1 week, depending on the complexity of the case. Please call the lab at 517-353-1683 to inquire about a consultative workup, hourly rates, or to determine if we can assist you with a custom assay.