

GENETIC TESTING IN CATS



I've written quite a bit in Best Friends Bulletins about genetic testing in dogs, but not a lot in cats. Cats can have genetic defects that lead to disease just as dogs do. Some of them are even the same or similar to gene mutations in dogs. One of these is a gene called MDR1. MDR1 is a common gene variant in herding breeds, such as Australian shepherds, border collies and old English sheepdogs.

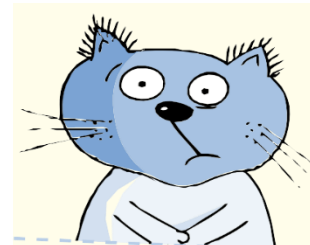


The MDR1 variation in dogs causes the blood-brain barrier to be leaky, thus enabling some medications to affect the brain that wouldn't cause a problem in a normal dog. Doses of these drugs that are safe for a normal dog may not be safe for a dog with MDR1. This issue with medication will be worse if the dog has two copies of the gene, one from each parent, than if it only inherited one copy from one parent.

Picture from Freepik.com

One of the medications dogs can have trouble with if they are MDR1 positive is Ivermectin, the heartworm preventive in Heartgard™ and many generic heartworm preventives. Well, it turns out cats with MDR1 can be sensitive to some forms of heartworm prevention also.

According to information released from the veterinary school at Washington State University, up to 4% of all cats, approximately 4 million in the U.S. alone, have either one or two mutated copies of the MDR1 gene. This can make common medications, including those used for parasite control, potentially lethal, even when used at recommended dosages.



Dr. Katrina Mealey is the veterinarian who initially discovered the MDR1 mutation and invented the first test to detect the condition. Mealey and her team have already identified some medications, including products containing eprinomectin and ivermectin, that can put cats with the MDR1 mutation at increased risk of adverse reactions, but they suspect additional drugs might be causing adverse reactions in cats with the MDR1 mutation, too. Cats with the mutation may experience lethargy, ataxia, muscle tremors, disorientation, blindness, muscle weakness, and death when treated with the drugs.

The MDR1 mutation is more common in non-purebred cats, with the exception of Maine coons, which appear to have a higher representation than any other pure breed. Mealey recommends all cats be tested for the mutation to avoid preventable adverse reactions to medications.

WSU offers both canine and feline MDR1 genotyping for a fee but they are currently collecting cheek swab samples from cats for MDR1 genotyping at no cost to owners. She is specifically looking for cats that may have experienced a neurological adverse reaction to NexGard COMBO™ (eprinomectin), Centragard™ (eprinomectin), Profender™ (emodepside), Revolution™ (selamectin) or Cisapride (compounded formulation). They have sent us three kits we can submit for testing at no charge. **If your cat has had neurological symptoms after receiving one of these preventives and you'd like to participate in the study, give us a call.**

Dr. Mealy says "If we can determine a drug is causing adverse reactions in cats with the MDR1 mutation, we can recommend that an appropriate warning be included on applicable product labels."

We had started prescribing Nexgard Combo for cats, which contains eprinomectin, but we've backed away from that, temporarily at least, until we know more. It seems that the neurologic issues from eprinomectin are much worse than anything we've seen with Ivermectin or selemectin. MDR1-positive cats given Nexgard combo

If your cat has already been given Nexgard Combo with no problems, it should be perfectly safe to continue on it.

had a pretty high fatality rate in the first small study that was released. Since this information came out very recently and there hadn't been an MDR1 test for cats, we haven't been testing for it. We have no idea which 4% of our feline patients have this gene, so we don't feel safe newly prescribing Nexgard Combo. (If your cat has already been given Nexgard Combo

with no problems, it should be perfectly safe to continue on it. If it were going to cause a problem, you should have seen it with the first dose. For 96% of cats, it will be perfectly safe. We have continued our clinic cats on Nexgard Combo.)

Previous to using it, we recommended Revolution™ or Revolt™, containing selemectin, to prevent heartworms, fleas, ticks and roundworms. If the kitten or cat also had intestinal parasites, we would use Profender™ in addition to the selemectin. Nexgard combo is nice because it killed intestinal parasites, as well as being the preventive medication. It's less expensive to only have to give one product instead of two. However, at the moment we think it's safer to pay the extra money to use both medications, rather than risking eprinomectin if we don't know a cat's MDR1 status.

Several brands of DNA tests for cats test for over 150 genetic defects in cats. Oravet and Embark are brands we've used quite a bit. We've mostly been genotyping purebred cats for specific diseases they are at risk for, such as cardiomyopathy in ragdoll cats and polycystic kidney disease, PKD, in Persians. We hope the MDR1 test eventually is included in these kits so we can test for many diseases in a single swab. Since average domestic shorthair and longhair cats are at risk for the MDR1 abnormality, we will be recommending MDR1 testing for all cats in 2025.

One of the DNA test companies, Base Paws (BasePaws.com) has DNA test kits using oral swabs that include the cat's genotype but also bacterial DNA markers to evaluate the different bacteria in the mouth. They give you a risk evaluation for periodontal disease and for tooth resorption along with DNA testing of the cat itself. This kit gives you the advantage of knowing if your cat needs more frequent dental cleanings and dental radiographs. They can even tell you the approximate age of a rescued cat based on the level of deterioration in the genes - DNA slowly degrades with age, which can be measured.

ASK US BEFORE PURCHASING A DNA TEST KIT FOR ANY PET ONLINE. SOME OF THOSE KITS ARE INACCURATE TO THE POINT OF BEING USELESS. DNA TESTING IS DIFFICULT AND REQUIRES A VERY GOOD LABORATORY.

DNA testing is a great idea for both dogs and cats. The more you know about your cat's health, the more proactive you can be to keep them healthy and happy.