

“The P-Glycoprotein (MDR-1) Gene”

DID YOU KNOW?

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Herding breed dogs such as Collies, Border Collies, and Old English Sheepdogs are at risk for a genetic defect leading to increased sensitivity and potential toxicity to many common drugs. It has been known for many years that the Collie and associated breeds are sensitive to ivermectin medications. Recently, the gene and mechanism causing this sensitivity have been identified.

The gene, MDR-1, which may be missing or only partially expressed in these dogs, encodes for a membrane protein called P-glycoprotein. This protein is responsible for binding to many commonly used drugs, including the ivermectins. A lack of the gene may lead to life-threatening, toxic levels of drugs when they are prescribed at the recommended dosages considered safe for other dogs. Reduced dosages are recommended for patients having the genetic defect. It is, therefore, important to know which patients are affected. A partial list of these drugs is included in table below. As you can see, these include pain medications, antibiotics, chemotherapy medications and steroids.

Identifying this genetic defect in your patients as part of their general health profile is suggested. More medications will probably be added to the list as research continues. Testing involves a simple mucosal cheek swab which may submitted to the address below.

Veterinary Clinical Pharmacology Lab
College of Veterinary Medicine
Washington State University
www.vetmed.wsu.edu/vcpl; Ph: 509-335-3745

Cost: \$70/dog; \$60/ea for 5 or more samples (as of 10/09). Call for cheek swab kits. No refrigeration is required. Ship regular mail. Samples received by Tues. afternoon have results available by Fri. afternoon.

Anticancer Agents: Doxyrubincin, Vincristine, Vinblastine, Actinomycin-D	Steroid Hormones: Aldosterone, Cortisol, Dexamethasone, Methylprednisolone
Opioids: Loperamide, Morphine, Butorphanol	Antimicrobials: Erythromycin, Ketoconazole, Itraconazole, Tetracycline, Doxycycline
Immunosuppressants: Cyclosporine	Cardiac Drugs: Digoxin, Diltiazam, Verapamil
Miscellaneous: Ivermectin, amitriptyline, acepromazine, odansetron	

Reference: Mealey KL. Adverse Drug Reactions in Herding-Breed Dogs: The Role of P-Glycoprotein. *Compend Contin Educ Pract Vet.*28:23-33, 2006.

If we can help you with your cases don't hesitate to call 24/7!!

Next Edition:
“Salmon Poisoning”