



Detection of 230-234delATAG mutation in the MDR1 gene causing ivermectin (Ivomec) hypersensitivity in dogs by fragmentation analysis of PCR product

### Customer

Pavla Kubesová  
Újezd nad Zbečnem 104  
270 24 Zbečno, okr. Rakovník  
Czech Republic

### Details of animal

Sample: 10-15706  
Animal: NAUGHTY BUT NICE Gasko Prim  
Breed: Border Collie  
Reg. number: 2296  
Microchip: 203098100230197  
Year of birth: 15.09.2007  
Sex: female  
Date received: 22.06.2010  
Sample type: blood

Result: Mutation was not detected (N/N)

### Explanation

Mutation nt230(del4) in exon 4 of canine MDR1 gene was tested. This mutation causes a frame shift and formation of a stop codon during P-glycoprotein synthesis. P-glycoprotein, an ATP-dependent transporter of various substrates, is contained in cells lining the blood vessels in the brain. In P-glycoprotein defective animals, administering of ivermectin or similar drug can lead to elevated levels of drug in the CNS, resulting in potentially lethal neurotoxic reaction. These drugs include, but are not limited to: Acepromazine, Butorphanol, Doramectin, Doxorubicin, Ivermectin, Loperamide, Milbemycin, Moxidectin, Selamectin, Vinblastine, Vincristine.

MDR1 related drug hypersensitivity is inherited as an autosomal recessive trait. That means the disease affects dogs with P/P genotype only. The dogs with N/P genotype are considered carriers of the disease (heterozygotes). Multiple drug hypersensitivity based on MDR1 gene mutation was proved in following breeds: Rough Collie, Smooth Collie, Shetland Sheepdog, Australian Sheepdog, Wäller, Bobtail, Border Collie, White Swiss Shepherd Dog.

Method: SOP04, accredited method

Sensitivity (probability of correct identification of the defective form of the gene in heterozygous or mutated homozygous) is higher than 99%. Specificity (probability of correct identification of the normal form of the gene in a normal homozygous or heterozygous) is higher than 99%.

Report date: 25.06.2010

Responsible person: Mgr. Markéta Dajbychová, Veterinary Laboratory Manager