Several Shepherd breeds are sensitive to some drugs. The administration of those drugs, even in normal doses (the one usually recommended in dogs), can lead to neurotoxicity in dogs with genetic mutation in the MDR1 gene.

**What is multidrug sensitivity MDR1?**

Multidrug Sensitivity MDR1

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What are the breeds concerned?

Principal breeds presenting a risk

(Frequency in French population)
- Rough Collie: 86%
- Australian Shepherd: 54%
- Shetland sheepdog: 52%
- White Swiss Shepherd: 26%
- Border Collie: 3%

Other breeds presenting a risk:
- Old English Sheepdog, Australian Cattle dog, Whippet, German Shepherd

What are the risks of intoxication?

Molecules to use with caution

The main risky molecules for which a drug sensitivity has been described in dogs, are:

- Ivermectin,
- Selamectin,
- Moxidectin,
- Loperamide,
- Emodepside,
- Milbemycin,
- Acepromazine,
- Butorphanol,
- Vincristine,
- Vinblastine,
- doxorubicin,
- Digoxin.

Clinical symptoms:

After administration of a risky drug, the dog that has the MDR1 mutation (see table below) presents a depressant syndrome with the following clinical signs: ataxia, prostration, paresis, hypersalivation, mydriasis, amaurosis, tremors, convulsions that can lead to coma and death by respiratory depression.

The risk of intoxication based on the MDR1 genetic status

<table>
<thead>
<tr>
<th>Genetic Status</th>
<th>Mutation</th>
<th>Explanations</th>
<th>Intoxication risk linked to MDR1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Homozygous</td>
<td>MDR1 (+/+)</td>
<td>Two normal alleles of the MDR1 gene</td>
<td>No risk</td>
</tr>
</tbody>
</table>
| Heterozygous     | MDR1 (+/-)| One normal and one mutated allele of the MDR1 gene | Average risk
|                  |          | The severity of the intoxication depends on the molecule, on the dose, on the breed and age. | NB: It is strongly advised to take as much care with heterozygous dogs than with homozygous mutated dogs. |
| Mutated Homozygous| MDR1 (-/-)| Two mutated alleles of the MDR1 gene | Strong risk
|                  |          | The severity of the intoxication depends on the molecule, on the dose, on the breed and age. | |

**Multidrug sensitivity MDR1: Why shall we test?**

The MDR1 DNA test allows the screening of Multidrug sensitivity on risky breeds.

- **A preventive screening:** Determining if a puppy presents or not this multidrug sensitivity allows to adapt the prescription with an alternate treatment without danger for the animal’s health.
- **Confirm a diagnosis:** After administration of a drug using suspected molecule, the dog shows symptoms of neurological intoxication. The veterinarian confirms the diagnosis with a MDR1 test.
- **Advice for reproduction** The veterinarian advises the breeder to screen the Dam or Sire and adapt its matings to avoid the birth of mutated homozygous puppies. In order to avoid the reduction of the genetic pool in the breeds, heterozygous dogs should not be excluded from reproduction.

**A DNA test easy to perform – Test MDR1**

1. **Using the ANTAGENE DNA sampling kit**
   - Perform a cheek swab sample (see instructions included in the kit)
   - Autenthicate the sample
2. **Send via Postmail**
   - The sample
   - The filled, and authenticated sampling certificate
   - The copy of the paiement
3. **You shall receive within 5 to 10 days the result by email** (the dog owner gets a copy)