The Genetic Basis of Histiocytic Sarcoma: Present and future applications for the breeders and veterinary and human medicine
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The summary detailing the best use of the Antagene Histiocytic Sarcoma Risk Test is as follows:

- It is a help for selection and mating based on knowledge
- It is only one criteria among many that can be used to select mates
- To maintain diversity in the breed, do NOT overuse any dogs
- To maintain diversity, use the B and C results as well
- Select away from C slowly over the generations as we increase the numbers of A and B results

Drs. André and Hédan at the University of Rennes in France used hundreds of dogs provided by a great many of the French breeders for their research into Histiocytic sarcoma (HS). They found that each generation only about 5% of the males were used, and of these fewer than 1% produced more than 50% of the next generation.

In humans, there are only about one to five cases of HS reported each year, making Bernese a much better model for a study of methods to treat the disease. The presentation of the disease is the same in humans and canines. Both the BMD and Rottweilers typically have the disseminated form of the disease, while the localized form is typically seen in the Flat Coated Retrievers. A question posed by the researchers: are the localized and disseminated forms the same disease but at different stages, or is it two different types of disease?

The researchers have found 9 markers on 5 chromosomes that are linked to HS in Berners. One marker on chromosome 5 is associated with lymphoma, one on 20 is associated with mast cell, one on 14 is only found in unaffected dogs and would seem to be protective against cancer. Numerous risk alleles are needed in order for a dog to get HS. These markers are used for the Antagene HS Risk Test, which is not diagnostic, but is a prediction of HS risk. Having updates on the date and cause of death for the tested dogs is critically important, and a necropsy helps to verify that data. If people are unable to pay for a necropsy, tumors in formalin can be sent to Dr. Hédan's lab for analysis.

There is still work to be done. Why are 14% of A's affected? Why are 11% of C's unaffected? There may be other markers on other chromosomes, and as they are found the test will be refined. Other factors play a role, sex hormones, or treatment of inflammation for example. But as we breed slowly away from the C's, we should see an increase in lifespan, and a decrease in cancer. Providing them with data from tested dogs will help to improve the test and the breed as well.

The HS Index Mate Selection (HSIMS) tool has been well used, with more than 45,000 dogs and more than 50,000 simulations per year. He stressed that we need to KEEP DIVERSITY, and don't remove C results from the gene pool, and don't overuse A results.

Some of the current research is being used to detect cancer cells with specific mutations in the blood plasma, with the intention of identifying the disease sooner, in order to improve eventual treatment outcomes. There are clinical trials starting soon to determine the effectiveness of using Trametinib which has been very effective at slowing or stopping the growth of the tumor in the laboratory. If a liquid biopsy can allow detection of the cancer from two to fourteen months prior to seeing any symptoms, then treatment that slows or stops the growth of the tumors becomes even more effective.