

Dogs help retrieve information about cancer

Argyri Mathioudaki

The domestic dog, apart from being man's best friend, is also a very useful model for genetic studies. Its population and genome structure provide researchers with an alternative way to identify genetic components that predispose for diseases.

Canine Mast Cell Tumors is a very common type of skin cancer in dogs. From all the breeds, these tumors appear more often to golden retrievers probably because they have inherited the same genetic risk factors. To identify these risk factors a genetic comparison of healthy and sick golden retrievers was previously performed. Differences were observed in the areas of the dog genome that code certain enzymes which are responsible for degrading hyaluronan, the main molecule in the area around the cells, from very long molecules to shorter fragments.

Big hyaluronan and small hyaluronan molecules have different functions. In general, hyaluronan can provide moisture, mechanical support and control of the environment where the cells live and interact, divide and migrate. This surrounding area is also very important in tumors. Many human cancers were found to be rich in hyaluronan molecules and the way tumor cells and their environments interact might favor tumor cell growth, invasiveness, cell death, immune evasion and metastatic ability. Reasonably, the genes that synthesize and degrade hyaluronan are of great importance because they regulate how much and what type of hyaluronan molecules can be found around the cells.

In this study, we wanted to see how these genes are expressed among the different healthy dog tissues but our results are not enough to retrieve a pattern of expression. To identify variation among different individuals we tested skin from 20 different dogs and we saw that maybe the skin of golden retrievers might have increased levels of two certain hyaluronan degrading enzymes. Additionally, we observed that canine mast cell tumor samples might have higher levels of all the hyaluronan degrading enzymes. Even though, our results are preliminary and more samples are needed, one thing is for sure: hyaluronan plays an important role in dog cancer.