

BAKER INSTITUTE *for* ANIMAL HEALTH

Dedicated to the study of veterinary infectious diseases, immunology, genetics, and reproduction.

Canine Research Update

It has been a very busy year here at the Baker Institute! We study several diseases that afflict dogs (amongst other animals) and have been closely monitoring the ongoing influenza outbreak in canines (you may not have heard much of it here in the North East, but it has been a major issue in the Midwest, South, and West Coast). We've also been studying dog allergies, which unfortunately I am sure is something many of us are familiar with. Above everything else, we of course have continued our diligent research on canine cancers. At the moment, our two most active dog cancer programs are on canine hemangiosarcoma and canine breast cancer. We do not have any clinical trials to announce yet, and it may be quite a few years before we get there. What we are doing though, is identifying and exploring what we still do not know about these cancers. It is the lack of knowledge of how these cancers work that prevents us, and everybody else, from making any major inroads against them.

Some of you may have recently heard of checkpoint inhibitors such as Keytruda and Opdivo. These products are a major breakthrough in human cancer therapy, but they did not come easily. They are the results of 25 years of work in which researchers first worked to understand the human immune response to cancer and how it is regulated. Only when all this background research had produced the information required could the actual anticancer drugs be developed. As you can imagine, an investment of several billion dollars was required to reach the clinical trial phase. Although we do not have billions of dollars to work on canine cancer, we are working harder and harder every day to understand canine hemangiosarcoma and breast cancers, so that we too can then apply the newly acquired information to develop treatments that we cannot yet even dream of.

Drs. Charles Danko and Scott Coonrod are leading a team that is using the most modern tools to understand how hemangiosarcomas form and grow. Without getting into any detail, they are essentially taking molecular snapshots of the cancer cells to understand what drives them to keep on replicating (and producing disease). The tools that they have been using to study this dog cancer for a couple of years have started to be used to study human cancers, too! You may be interested in knowing that Charles, working together with many others, invented and is further developing these tools.

Dr. Gerlinde Van de Walle is exploring why stem cells from canine mammary glands continue to divide when their DNA is damaged, thus passing on the mutations to the new breast cells, which in turn become cancer cells. In an innovative approach, she compares dog stem cells with those from horses, which stop dividing when they have their DNA damaged (horses do not often experience breast cancer). Gerlinde's approach is to identify what is different between the canine and horse breast stem cells, and then pinpoint the genes and proteins that make horses resistant to cancer, or dogs susceptible to it. She is strongly convinced that once we can identify such genes, we can begin to conceptualize how to make drugs that target them.

Our work is relentless, and we do make continuous progress. However, these are long processes that require long (and hard) work, of many, many years. If canine cancers were easy to tackle, we would of course already have good treatments for them! We will never give up in our quest, and any and all support we may gather along the way will make the journey faster. We, and all dogs, thank you all very much for any and all support you may be able to provide us.