FACC-29 gathers authenticated canine cancer cell lines for research and drug development

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Much of what we know about cancer and many modern medicines that treat it grow from experiments on cancer cells. However, it is notoriously difficult to maintain the integrity of cell lines - due to contamination or simple mistakes such as mislabeling, later generations of a cell line may bear no resemblance to the original sample, potentially invalidating results of research performed on mistaken cells. For this reason, the National Cancer Institute maintains a library of 60 authenticated human cancer cell lines for the purposes of research, called the NCI-60.

Members of the University of Colorado Cancer Center from the Flint Animal Cancer Center (FACC) at Colorado State University report at the American Association for Cancer Research (AACR) Annual Meeting 2015 the assembly of a panel of validated canine cancer cell lines named the FACC-29, analogous to the NCI-60. In addition to validating these cells, the group has determined the sensitivity of these cell lines to a variety of chemotherapeutic agents currently in use and proposed for use in the treatment of canine cancers.

"We learned this in the 70s when investigators found that HeLa cells had contaminated many established cell lines and we have to relearn it every so often: you have to authenticate your cells. Without authentication, you don't really know what you're working with. Now researchers working on canine cancer have an authenticated resource similar to what's available for human cancers," says Daniel L. Gustafson, PhD, CU

Cancer Center investigator and director for basic research at the Flint Animal Cancer Center.

Specifically, the FACC-29 includes 29 cell lines of canine origin, including 10 osteosarcomas, 5 melanomas, 2 mammary carcinomas, 1 hemangiosarcoma, 2 bladder carcinomas, 4 lymphoma/leukemias, 1 mast cell tumor, 2 histiocytic sarcomas, 1 thyroid carcinoma and 1 soft-tissue sarcoma.

"We've caught a few cases already in which researchers were experimenting on cells that turned out not to be what they thought. One group thought they had canine lymphoma cells and it turned out they were human cells," Gustafson says.

In addition to allowing examination of the biology of these diseases, the FACC-29 will help researchers test new targeted cancer treatments and other therapeutics against authenticated cell lines, predicting which cancers will and will not respond. Gustafson also points out that many developers of human cancer therapeutics must first prove drugs' effectiveness in animals.

"This new library has direct relevance to treating canine cancer, but it also has indirect relevance to treating human cancer," Gustafson says.

The FACC-29 library depends on microsatellite "signatures" that can be used to identify short segments of a cell's genetic sequence, in this case developed by the laboratory of study co-author, Dawn L. Duval, PhD, also working at the FACC. By matching the microsatellite signature in a population of cells to those of known cells in the FACC-29, a researcher can validate the identity of the cells used in research.

"The Flint Animal Cancer Center offers cutting-edge compassionate treatment for companion animals. We hope that housing this research

resource will ultimately help us give dogs and their owners better lives," Gustafson says.

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