JPUR
JOURNAL OF PURDUE UNDERGRADUATE RESEARCH

ENGINEERING

Characterization and Comparison of Cancer Stem Cells in Human and Canine Glioma Cell Lines

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Gliomas are among the most common and malignant forms of primary brain tumors that occur naturally in humans. They represent about 33% of brain tumors and 80% of malignant brain tumors. Gliomas also spontaneously arise in specific breeds in the canine family. Canine gliomas are histologically similar to human glioma and have similar presentation and response to treatment in the clinic. A comparison of canine and human gliomas could prove to be invaluable, because the accepted rodent model has limitations when testing therapies and identifying targets. Our goal is to obtain global protein expression and metabolic profiles of different classification and grades of human and canine glioma, in order to identify and compare the tumor survival strategies in both systems. Toward this end, we harvested and cultured cells from a naturally occurring grade-3 oligodendroglioma tumor that was isolated from a canine patient at the Purdue University Veterinary Teaching Hospital. Similar to cells from human glioma, these cells formed neurospheres when cultured in serum free media in the presence of FGF and EGF. The cells were also sensitive to plating density and oxygen concentrations.

This work was supported by the National Institutes of Health, National Cancer Institute R25CA128770 Cancer Prevention Internship Program administered by the Oncological Sciences Center and the Discovery Learning Research Center at Purdue University. This work was also supported by Showalter Research Foundation and a College of Technology Seed Grant.

Research advisors Jenna Rickus and Kari Clase write, "Thomas learned more than just laboratory techniques from his research experience as an undergraduate. He had the opportunity to critically evaluate protocols when experiments did not work as expected, and he also presented his project multiple times, including a poster presentation at a national meeting."

Clements, T. (2012). Characterization and comparison of cancer stem cells in human and canine glioma cell lines. *Journal of Purdue Undergraduate Research,* 2, 82. doi:10.5703/1288284314689