Designing a Novel Technique to Determine Patient Suitability for Brain Cancer Clinical Trials

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Glioblastoma (GBM) and Diffuse Intrinsic Pontine Glioma (DIPG) are the most lethal form of brain cancer in adults and children respectively. There are clinical trials aimed at trying to kill these tumors. Some clinical trials are using viruses that target brain tumors and destroy them. While there are some reports of success of viral therapy, not all tumors respond equally to this type of therapy. The focus of this project was to screen adult GBM and pediatric DIPG cell lines to see if they express an antiviral protein, interferon inducible transmembrane protein-1 (IFITM-1). Additional studies were performed to see if IFITM-1 proteins can be shed from tumor cells in culture and then test if shed IFITM-1 can be detected in the serum of cancer patients. The hypothesis of this study is that brain tumors that express IFITM-1 will be more resistant to viral therapy than tumors that do not express this protein. If we can detect this protein circulating in the blood of cancer patients, it might mean that they may not respond well to viral therapy. The results from my studies found IFITM-1 expressed in 5 of 6 GBM cell lines studied and 5 out of 7 DIPG cell lines studied. This is the first study to demonstrate the presence of IFITM-1 in shed microparticles from tumor cell lines, which could lead to future studies looking at these proteins in the blood of cancer patients to predict if they will be good candidates for viral therapy.

Awards Won: