An in Vivo Comparison of Susceptibility of Pancreatic and Breast Xenograft Models to Targeted Osmotic Lysis

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Introduction
Breast cancer is the most common cancer among women in the United States. It is diagnosed in 12 percent of women and may also affect men in rare cases. Pancreatic cancer has the highest mortality rate of all major cancers. The majority of patients are diagnosed at an advanced stage, contributing to this high observed mortality rate. Current treatments for both cancers include chemotherapy, radiation and surgery, all of which have many adverse effects. Previous studies from our lab used a novel technique that selectively lysed breast cancer cells in vitro. The proposed project uses this new technique called Targeted Osmotic Lysis (TOL). TOL kills cancer cells without affecting non-cancerous cells, thereby reducing adverse effects. Many types of cancers express more voltage-gated sodium channels (VGSCs) than normal tissue. TOL treatment stimulates these VGSCs while concurrently blocking sodium pumps pharmacologically. This process overloads the cancer cells with sodium, leading to the subsequent flow of water into the cells, causing them to burst (lyse). Normal cells do not lyse because they have fewer VGSCs. Because breast cancer and pancreatic cancer cells both overexpress VGSCs, we hypothesize, based on our previous experiments, that TOL will be similarly efficacious treating in vivo models of both pancreatic and breast cancers.

Targeted Osmotic Lysis

Methods and Material

Methods for in vivo experiment
- Culture the Cells
- Harvest the Cells
- Inject Mice with Cancer
- Weight mice and measure tumors
- Inject drug, and vehicle
- Stimulate mice with Coaxial Ring Device
- Sacrifice the Mice
- Expose all organs and tumor to the fixative
- Send to the Pathologist

Materials
- T25 Flask
- T75 Flask
- Needles
- Calipers

Coaxial Ring Device

Experimental Design

Results

Conclusion

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