

Application of a Connexin 43 (Cx43) Targeted Agent for the Treatment of Metastatic Breast Cancer

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Project Summary

Breast cancer is the most common type of cancer among women in the United States. Disease progression leads to breast cancer metastasis, spread of the cancer cells from the place of origin to form new tumors in other places in the body. Common sites for metastatic breast cancer to spread include the bone, lung, and liver. As of today, while there are several treatment options, metastatic breast cancer remains incurable. Therefore, it is of the utmost importance to identify and test novel drugs that can be provided to patients to treat and cure metastatic breast cancer.

My laboratory has partnered with a clinically-oriented biotech company called FirstString Research Inc. that has developed an agent called ACT1, which stands for "α-connexin carboxyl-terminal" peptide. ACT1 targets a protein called Connexin 43, which is found in high levels in breast cancer metastases, suggesting that this protein plays a role in the development and maintenance of metastatic breast cancer. The normal function of Connexin 43 is to permit communication between cells. Interestingly, although Connexin 43 is present in high levels in metastatic breast cancer cells, it does not function properly and the cell-to-cell communication that is normally propagated by Connexin 43 is lost. This observation suggests that cell-to-cell communication is important for normal cell function and loss of this normal function supports breast cancer metastasis. The ACT1 drug works by restoring Connexin 43's normal function and thus restoring the cell-to-cell communication that is lost.

Project Goals

The goal of our research project is to determine if combined targeting of Connexin 43 with currently approved cancer treatments in the MDA MB 231 metastatic breast cancer model is effective for treating metastatic breast cancer.