

PUBLIC ABSTRACT

Women living with stage IV metastatic breast cancer have few palliative treatment options that often target the bone microenvironment and not cancer cells themselves. Thus, it is essential to develop new cancer-targeted treatments for patients with bone metastases. While most breast cancer bone metastasis research is done using cell lines representative of the triple-negative breast cancer population, most patients with bone metastases retain estrogen receptor-positive status. We have developed estrogen receptor-expressing cell lines from the triple-negative cell lines known to spread to the bone. By pairing these new estrogen receptor-positive cells with well-studied triple-negative cell lines, we will be able to uncover how to best treat and monitor women with stage IV metastatic breast cancer with either the triple-negative or estrogen receptor-positive subtypes.

This project aims to test the efficacy of single or combined antiestrogen (tamoxifen and Faslodex) and the tyrosine kinase inhibitor DCC-2618 treatment in the early and late stages of bone metastatic breast cancer. Using newly-developed estrogen receptor-positive and triple-negative breast cancer cell lines known to spread to the bone, we will employ animal models to test treatment regimens to slow bone metastatic growth. Using different injection techniques, we will examine both newly developed and well-established breast cancer bone metastases. We will also study the tumors and plasma of mice bearing cancers to uncover biomarkers of treatment response and metastatic growth and spread. These biomarkers can then be used to track treatment response in women with bone metastatic breast cancer.

Through this project, we hope to impact women with either triple-negative or estrogen receptor-positive stage IV bone metastatic cancer, uncovering new molecular targets, developing new treatment regimens, and identifying biomarkers of prognosis and treatment response. Upon successful completion of the proposed studies, we would initiate a phase I clinical trial. As both treatments proposed are approved for human use and are in clinical trials, the transition to a phase I clinical trial in patients could be accomplished quickly, allowing for immediate benefit to women with stage IV bone metastatic breast cancer.