

Public/Lay Abstract

Breast cancer arises from cells that line the glands and ducts of the breast. When a patient's disease is confined to the breast, a patient's prognosis for long-term survival is excellent. However, when cancer spreads (metastasizes) from the breast to the bone, survival rates decline by 70%. Breast cancer bone metastasis is incurable and painful. The bone pain associated with breast cancer bone metastasis has been linked to a decreased quality of life and shorter survival. One of the reasons that it is difficult to treat breast cancer bone metastasis is that bone metastatic breast cancer cells induce bone loss which creates more space for breast cancer to grow in the bone. Unfortunately, current treatments for bone metastases, such as blocking bone loss mediated by bone metastatic breast cancer, provide only temporary, symptomatic relief.

The goal of this proposal is to target the area of bone loss, using targeted radioactive therapies that destroy the bone metastasis but are not harmful to normal tissue, thus reducing the risk of harmful side effects. To accomplish this, we will use our innovative mouse models that enable us to measure cancer bone pain, tumor growth, and nerve distraction – all in the same animal. Our studies will shed light on bone metastases from a new and untested perspective, by using radioactive therapies linked with agents targeting the area of bone loss. If successful, this work may provide a clinically feasible treatment strategy for breast cancer patients afflicted with bone metastases within the next decade that would improve their overall survival.