



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP150148

Project Title:
Identifying Drivers of Lung Metastasis in Triple Negative Breast Cancer

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas M.D. Anderson Cancer Center

Lay Summary:

The process by which breast cancer cells leave the breast and begin to grow and divide in other organs is called metastasis. For reasons that are currently not understood, patients with triple negative breast cancer (TNBC) are prone to develop lung metastases. There are few options for breast cancer patients once tumor cells gain the capacity to leave the breast and take up residence in foreign organs. The major objective of the proposed research is to determine how TNBC cells acquire the capacity to metastasize and grow in the lung. This will be accomplished using a model whereby primary breast cancer cells, obtained directly from patients with TNBC, are grown in mouse mammary glands that have been "humanized" with normal human breast cells. This model allows all stages of breast cancer metastasis to be studied. We demonstrated that TNBC grows in these "humanized" mammary glands and metastasizes to several organs, including lung. We will determine how gene expression profiles of tumor cells that leave the breast and metastasize to lung differ from gene expression profiles of tumor cells that remain in the mammary gland. The contribution made by these differences to promoting lung metastasis will be determined using a variety of assays in mice. Validated metastasis drivers will then be interrogated in matched primary and metastatic tumors using human breast cancer archival tissue as well as fresh tumor tissue obtained prospectively. A subset of the validated hits will be studied in greater detail to define how they function in the metastatic process. The knowledge gained by studying how breast cancer cells acquire the capacity to leave the environment of the breast and take up residence in foreign organs is expected to stimulate the development of novel therapeutic strategies for preventing and/or treating metastasis and for identifying novel prognostic markers for breast cancer metastasis.