

Bankhead-Coley Cancer Research Program

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*Cancer Biology
Mayo Clinic*

*2010 Program
Research Project Grant
(5-year project)*

Project Title: Protein Kinase D – A Marker and Target for Invasive Breast Cancer

Project Summary: A difficulty in breast cancer therapy is that clinically used compounds that mainly target proliferating cells are not very effective in targeting invading cells to prevent recurrence. There is a need to identify key-proteins affecting tumor cell invasion that can serve as new drug targets. Another issue is the lack of molecular markers that allow prediction of metastatic breast cancer or recurrence. In this project, we are investigating if a protein named PKD1 is a molecular switch that acts as a suppressor of breast tumor cell invasion. We will test if this can be utilized to predict the potential for metastasis or recurrence of tumors and to develop new avenues for therapeutic intervention. Our goals are to understand how PKD1 is inactivated in highly-invasive breast cancer cells and if this inactivation can serve as a predictive marker for the potential of tumors to metastasize; to understand the mechanism this protein utilizes to mediate its anti-invasive functions; and to test a reactivation strategy for PKD1 as a therapeutic approach. Successful completion of this project will identify new prognostic markers for metastatic breast cancer and tumor recurrence. A second outcome is that we will re-activate a silenced tumor suppressor, which is a novel and innovative strategy, and once tested in our orthotopic animal model will allow a relatively quick adaption for a clinical application in Phase I trials.