

Bankhead-Coley Cancer Research Program

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Bridge
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Project Title: MicroRNAs in Lobular Involution and Breast Cancer

Project Summary: About 2 million women are diagnosed with benign breast disease (BBD) each year in the United States. Although these women are at significantly increased risk for developing breast cancer, the connections between BBD and breast cancer progression have been largely understudied. Failure to undergo normal, age-related breast involution is a significant factor in progression from BBD to breast cancer. All of the increased risk among women with BBD is associated with individuals who have failed to undergo a process known as lobular involution (LI). However, it is very difficult to quantify LI status using conventional pathological techniques. What is needed are molecular markers that can be used to quantify the LI status in women with BBD. Our objective is to identify small RNAs (microRNAs) that can be used to this end. We will initially use high throughput small RNA sequencing technology to identify and count all of the microRNAs in cells from involuted and non-involuted breasts. We will determine if there are microRNAs that are differentially expressed in such cells and tissues. We will determine if any of these microRNAs are functionally linked to the more cancer-like properties of cells from non-involuted breast tissues. In this manner we will identify microRNAs that can be used as quantitative markers of LI status and which may be mechanistically linked to breast cancer risk in BBD patients.