

Bankhead-Coley Cancer Research Program

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*Environmental & Occupational Health
Florida International University*

*2009 Program
New Investigator (3-year project)*

Project Title: Metastases and Promotion of Aggressive Angiogenic Phenotype in Breast Cancer

Project Summary: Breast cancer progression is dependent on robust formation of blood vessels, a process called angiogenesis. The more blood vessels that are produced, the faster a breast tumor grows and spreads throughout the body. Our research targets the ability of breast cancer cells to attract a new blood supply that will ultimately exacerbate breast tumor growth and invasiveness. We have provided evidence for a paracrine signaling mechanism by which high reactive oxygen species (ROS) production by environmental estrogen-exposed, metastatic breast cancer cells stimulate an aggressive angiogenic phenotype. More specifically, we hypothesize that ROS from metastatic breast cancer cells exposed to environmental estrogens mediate an aggressive angiogenic phenotype in neighboring endothelial cells by Pyk2 signaling. The findings from this grant will contribute to a more profound understanding of how estrogenic environmental chemicals mediate breast tumor angiogenesis. This, in turn, will lead to biomarkers for identifying individuals susceptible to estrogen-induced neovascularization and ultimately improve public health. In summary, the findings of this study will: (i) provide a novel paradigm for understanding the molecular mechanism by which environmental estrogenic chemical exposure increases the risk of an aggressive angiogenic phenotype in breast cancer; and (ii) lead to the discovery of novel drug therapies or biomarkers.