

Department of Pathology

Research in Progress Seminar
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“Identification of Functionally Significant Changes in Transition from Preinvasive to Invasive Phenotype in Breast Cancer”

Acquisition of invasiveness through the basement membrane extracellular matrix (ECM) is a defining criterion in breast malignancy. Signaling from ECM maintains cell and tissue structure and normal functions. We discovered that ECM signaling via beta 1 integrin regulates DNA double-strand break repair in breast epithelial cell lines and primary mouse mammary epithelial cells. We use these cell model systems to study the cytoplasmic signaling, nuclear mechanisms, and relevance of this regulation to in vivo repair using mouse models to study the ECM-to-DNA repair pathways. Reciprocally, we developed a breast cell model of pre-invasive to invasive transition and found that some genome stability genes acquire a function in invasion through ECM as cells become malignant. Collaborative projects are in progress to discover the pathways as well as the potential utility of some of these "moonlighting" genes as predictive markers for breast pre-cancer progression.