



Department of
Biomedical Engineering
UNIVERSITY OF WISCONSIN-MADISON

Spring 2018 Seminar Series



The Collagen-Dense Tumor Microenvironment Drives Inflammatory Signaling and Tumor Progression

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High breast density is linked to an increased risk of breast cancer, and correlates with changes in collagen organization. In a transgenic mouse model of collagen-dense mammary tumors there is accelerated mammary tumor formation and progression, increased recruitment of macrophages and neutrophils, and an overall increase in inflammatory cytokine signaling.

However, the mechanisms by which collagen-dense tumors enhance inflammation and tumor progression remain poorly understood. The use of multiple approaches to target inflammation in the collagen-dense tumor microenvironment have identified an important role for both neutrophils and signaling through Cyclooxygenase-2 (Cox-2), a key enzyme in prostaglandin metabolism. In separate studies the depletion of neutrophils and inhibition of Cox-2 signaling significantly impacted tumor growth and metastasis in collagen-dense tumors and had little effect on WT tumors. These findings demonstrate a clear role for Cox-2 induced inflammation and neutrophils to modulate tumor progression within collagen-dense microenvironments, and suggest that inhibition of COX-2 may be an effective therapeutic target for women with dense breast cancer.

Suzanne Ponik completed her graduate work, studying the mechanisms of mechanotransduction in osteoblasts, in the lab of Dr. Fredrick Pavalko at Indiana University/Purdue University in Indianapolis, IN. In 2005, she joined the laboratory of Dr. Patricia Keely and spent the next 12 years as a post-doc and Scientist. In the Keely lab, Suzanne investigated the cellular mechanisms of breast cancer progression altered in response to collagen matrix density, including regulatory mechanisms for cellular contractility and collagen organization. Currently, Suzanne is a Senior Scientist in the Department of Cell and Regenerative Biology where she continues her interest in understanding the influence of the collagen-dense tumor microenvironment to drive inflammation and breast cancer progression.



Monday, January 29, 2018
12 PM in Tong Auditorium (1003 Engineering Centers)