



Engineering the Metastatic Niche

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Metastasis is the single greatest driver of cancer related mortalities regardless of the tumor's tissue of origin. A defining hallmark of metastasis is the ability for tumor cells to modulate the microenvironment to facilitate invasion and colonization. These microenvironmental changes within pre-metastatic tissues play a key role in determining the invading cell's fate. In this talk I will describe my lab's efforts toward understanding the how the matrix composition and mechanical forces present within the metastatic microenvironment govern cell colonization and metastatic outgrowth. More specifically, we use a combination of tissue engineering approaches and mouse models to interrogate how cells use extracellular vesicles to alter the pre-metastatic niche and have identified transglutaminase-2 (TG2) as a potential target against metastasis. Additionally, I will discuss the development of 3D culture platform that allows for biomimetic stretching that mimics the physiological forces present within the lung niche, and how changes in the mechanical microenvironment influence the cell growth cycle and dormancy, creating potential novel therapeutic avenues.



ABOUT the SPEAKER

Luis Solorio, PhD is the director of the Tumor Microenvironment & Therapeutics Lab (TMET) at Purdue University, which focuses on applying principles of tissue engineering, medical imaging, and drug delivery for the development of modular 3D tissue-engineered constructs that can be used to evaluate the cancer cell response to microenvironmental cues. He joined the faculty at Purdue University in 2016 as an Assistant Professor in the Weldon School of Biomedical Engineering. He is a U.S. Army veteran who proudly served for five years immediately after graduating high school. Dr. Solorio has been trained in both engineering and chemistry, obtaining a BS in Biomedical Engineering and Chemistry from Saint Louis University in St. Louis in 2006. Dr. Solorio received his MS degree in Biomedical Engineering from Rensselaer Polytechnic Institute in 2007 working with Dr. Jan Stegemann exploring methods of growth factor delivery to drive differentiation of mesenchymal stem cells. Dr. Solorio then received his PhD in Biomedical Engineering from Case Western Reserve University in 2012 with Dr. Agata Exner focusing on the use of medical imaging to guide the design and development of controlled release platforms.

Monday, September 26 at noon
1003 Engineering Centers (Tong Auditorium)