Department of
Biomedical Engineering
UNIVERSITY OF WISCONSIN-MADISON

Fall 2017 Seminar Series

Mechanically Complex Tumor Microenvironments Drive Disease Progression and Resistance to Therapy

About the Speaker

Paolo Provenzano
Assistant Professor of Biomedical Engineering, University of Minnesota

Dr. Provenzano received his B.S in Mechanical Engineering from the University of Wisconsin in 1998. Following M.S. and Ph.D. degrees in Biomedical Engineering focused on cell and tissue mechanics and tissue engineering at the University of Wisconsin, Paolo joined the laboratory of Dr. Patricia Keely as postdoctoral fellow to rigorously study cell and molecular cancer cell biology. During this time Dr. Provenzano was awarded a postdoctoral grant from the DOD and became a CDMRP Breast Cancer Research Program postdoctoral fellow. Under the co-mentorship of Dr. John White at the Laboratory for Optical and Computational Instrumentation (LOCI), Paolo's research expanded heavily into nonlinear optical imaging platforms and computational analysis of emission signals. Following his postdoctoral fellowship, Dr. Provenzano became a research associate at the Fred Hutchinson Cancer Research Center in Seattle, WA working with Dr. Sunil Hingorani's group to study pancreatic cancer. His work in breast and pancreatic cancer has been highlighted in numerous television, web and print media forums including the Journal of National Cancer Institute, Nature Medicine, Science and Cancer Cell. Dr. Provenzano is now a member of the faculty in Biomedical Engineering and the Masonic Cancer Center at the University of Minnesota where he directs the Laboratory for Engineering in Oncology.

Epithelial cancers, or carcinomas, behave like a complex "organ" system and are comprised of multiple cell populations and structural and signaling components such as the stromal extracellular matrix (ECM). In this complex microenvironment, cells encounter a multitude of coordinated, simultaneously active, stimuli that are biochemical, structural, and mechanical in nature. The presence of these elements is neither random nor uniform across the tumor. Rather, these elements and the dynamic interactions among them evolve coordinately during tumor progression, conspiring to promote and sustain the carcinoma. As such, here, recent findings elucidating the physical and molecular mechanisms governing the response to mechanical and architectural microenvironmental cues that promote metastasis and resistance to therapeutic intervention will be discussed.

Monday, December 4, 2017
12 - 1 PM in Tong Auditorium (1003 Engineering Centers)