Mechanically Complex Tumor Microenvironments Drive Disease Progression and Resistance to Therapy

About the Speaker

Paolo Provenzano
Assistant Professor of Biomedical Engineering, University of Minnesota

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.