MAR14-2013-000589

Abstract for an Invited Paper
for the MAR14 Meeting of
the American Physical Society

Cancer Cell Migration in 3D

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Two-dimensional (2D) *in vitro* culture systems have for a number of years provided a controlled and versatile environment for mechanistic studies of cell adhesion, polarization, and migration, three interrelated cell functions critical to cancer metastasis. However, the organization and functions of focal adhesion proteins, protrusion machinery, and microtubule-based polarization in cells embedded in physiologically more relevant 3D extracellular matrices is qualitatively different from their organization and functions on conventional 2D planar substrates. This talk will describe the implications of the dependence of focal adhesion protein-based cell migration on micro-environmental dimensionality (1D vs. 2D vs.. 3D), how cell micromechanics plays a critical role in promoting local cell invasion, and associated validation in mouse models. We will discuss the implications of this work in cancer metastasis.