Cell Migration in Confined Microenvironments: Stiffness matters

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Cell locomotion is a fundamental process underlying diverse (patho)physiological phenomena, including cancer metastasis. Much of what we know about the mechanisms of cell migration stems primarily from *in vitro* studies using unconfined, two-dimensional (2D) substrates. However, these 2D assays fail to recapitulate the confining tracks encountered *in vivo*. Importantly, migration mechanisms through confining microenvironments are not predicted by 2D migration assays. Thus, engineered *in vitro* models have been developed to delineate the mechanisms of cell motility through confining spaces. This presentation will discuss the plasticity of cancer cell migration mechanisms, and how cells sense and adapt to different physical microenvironments using either stiff polydimethylsiloxane- or compliant polyacrylamide- based microchannels as *in vitro* models. Uncovering the complexity of cell locomotion in physiologically relevant microenvironments could enable the development of therapeutic interventions aiming to halt metastatic spread.