

Abstract Submitted
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Cancer cell elasticity response to the mechanics of microenvironment JINGQIANG LI, RAYMOND FANG, KEVIN JIANG, Rice University, IAN LIAN, Lamar University, CHING-HWA KIANG, Rice University, RICE UNIVERSITY TEAM, LAMAR UNIVERSITY TEAM — Cells can sense and respond to the mechanical properties of their microenvironment. In particular, the rigidity of the cell's microenvironment is regarded as a physical parameter of interest given its regulation of various cellular processes, including proliferation, differentiation and migration. Currently, in vitro cancer studies primarily performed by monolayer culture grown on the rigid polystyrene surfaces, but in vivo cancer cells interact with much softer tissue. Here, we utilize a new soft substrate cell culture platform to mimic tissues with various stiffness within the physiological range (0.2–100 kPa). We apply atomic force microscopy (AFM) to probe the elastic behaviors of three different cancer cell lines so as to emulate the essential features in the in vivo microenvironment. We observed that the substrate stiffness has a significant effect on the cell morphology and elasticity. The results of our study could have important implications regarding to the physics of cancer metastasis.

Jingqiang Li
Rice University

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