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Local nano-mechanical properties in cancer metastasis LYNDON BASTATAS, Physics, Texas Tech University, RAUL MARTINEZ-ZAGUILAN, SOUAD SENNOUNE, Cell Physiology and Molecular Biophysics, Texas Tech University Health Sciences, SOYEUN PARK[1], Physics, Texas Tech University — We investigated whether the local nano-mechanical properties of cells can represent metastatic potential using the Atomic Force Microscope. As models, we used the lowly (LNCaP) and highly (CL1) metastatic prostate cancer cells. By varying the applied forces, we determined the heterogeneity in the local elastic properties of cells in the vertical direction. We also obtained the 2D array of the force-distance curves over the entire region of cells to investigate the lateral heterogeneity of local elastic moduli. By analyzing the force-distance curves using the Hertz and the advanced models, we delineated the 2D maps of elastic moduli and adhesiveness of cells. We found that the CL1 is more heterogeneous in the local elastic moduli compared to LNCaP. We also found that the CL1 adheres much better on the substrates than the LNCaP. The enhanced adhesion generates the tensional force and thus results in higher elastic moduli. We conclude that there is an optimal range of elastic moduli to make cells actively elicit the directional movements, leading to the enhance metastasis. We will discuss our results correlated with our intercellular calcium transit.

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