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Cell Membrane Softening in Cancer Cells SEBASTIAN SCHMIDT, CHRIS HNDEL, JOSEF KS, Leipzig University — Biomechanical properties are useful characteristics and regulators of the cell's state. Current research connects mechanical properties of the cytoskeleton to many cellular processes but does not investigate the biomechanics of the plasma membrane. We evaluated thermal fluctuations of giant plasma membrane vesicles, directly derived from the plasma membranes of primary breast and cervical cells and observed a lowered rigidity in the plasma membrane of malignant cells compared to non-malignant cells. To investigate the specific role of membrane rigidity changes, we treated two cell lines with the Acetyl-CoA carboxylase inhibitor Soraphen A. It changed the lipidome of cells and drastically increased membrane stiffness by up regulating short chained membrane lipids. These altered cells had a decreased motility in Boyden chamber assays. Our results indicate that the thermal fluctuations of the membrane, which are much smaller than the fluctuations driven by the cytoskeleton, can be modulated by the cell and have an impact on adhesion and motility.

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