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Stress Modulus of Cancer Cells[1] KEITH BONIN, MARTIN GUTHOLD, XINYI GUO, JUSTIN SIGLEY, Wake Forest University — Our main goal is to study the different physical and mechanical properties of cells as they advance through different stages of neoplastic transformation from normal to the metastatic state. Since recent reports indicate there is significant ambiguity about how these properties change for different cancer cells, we plan to measure these properties for a single line of cells, and to determine whether the changes vary for different cellular components: i.e. whether the change in physical properties is due to a change in the cytoskeleton, the cell membrane, the cytoplasm, or a combination of these elements. Here we expect to present data on the stress modulus of cancer cells at different stages: normal, mortal cancerous, immortal cancerous, and tumorigenic. The cells are Weinberg cell line Human Mammary Epithelial (HME) cells. Atomic force microscope (AFM) probes with different diameters are used to push on the cell membrane to measure the local, regional and global cell stress modulus. Preliminary results on normal HME cells suggests a stress modulus of 1.5 ± 0.8 kPa when pushing with 7 μm spherical probes. We anticipate reporting an improved value for the modulus as well as results for some of the Weinberg cancer cells.

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Keith Bonin
Wake Forest University

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