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AFM Bio-Mechanical Investigation of the Taxol Treatment of Breast Cancer Cells DYLAN SMITH, DIPIKA PATEL, FERNANDO MONJARAZ, SOYEUN PARK, Texas Tech University — Cancerous cells are known to be softer and easier to deform than normal cells. Changes in mechanical properties originate from the alteration of the actin cytoskeleton. The mechanism of cancer treatment using Taxol is related to the stabilization of microtubules. It has been shown that Taxol binds to polymerized tublin, stabilizes it against disassembly, and consequently inhibits cell division. An accurate quantitative study still lacks to relate the microtubule stabilizing effect with the cellular mechanical properties. We utilized our AFM to study changes in elastic properties of treated breast cancer cells. The AFM has several advantages for precise force measurements on a localized region with nanometer lateral dimension. In previous AFM studies, measurable contributions from the underlying hard substrate have been an obstacle to accurately determine the properties on thin samples. We modified our AFM tip to obtain the exact deformation profile as well as reducing the high stresses produced. We have probed depth profiles of mechanical properties of the taxol-treated and untreated cells by varying the indentation depth of the AFM-nanoindenting experiments.

Fernando Monjaraz
Texas Tech University

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