

Abstract Submitted  
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**The detection of cancer in living tissue with single-cell precision and the development of a system for targeted drug delivery to cancer** ADAM FIELDS, Jericho High School, SEAN PI, North High School, ALEX RAMEK, HAFTR High School, TAYLOR BERNHEIM, University of Pennsylvania, JESSICA FIELDS, Princeton University, NADINE PERNODET, MIRIAM RAFAILOVICH, SUNY Stony Brook — The development of innovations in the field of cancer diagnostics is imperative to improve the early identification of malignant cells within the human body. Two novel techniques are presented for the detection of cancer cells in living tissue. First, shear modulation force microscopy (SMFM) was employed to measure cell mechanics of normal and cancer cells in separate and mixed tissue cultures. We found that the moduli of normal keratinocytes were twice as high as the moduli of SCC cancerous keratinocytes, and that the cancer cells were unambiguously identifiable from a mixture of both kinds of cells. Second, confocal microscopy and the BIAcore 2000 were used to demonstrate the preferential adhesion of glass micro-beads impregnated with fluorescent dye to the membranes of cancer cells as compared to those of normal cells. In addition to their use as a cancer detection system, these hollow and porous beads present a model system for targeted drug delivery in the treatment of cancer.

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