

Abstract Submitted
for the OSS13 Meeting of
The American Physical Society

Mechanical properties of cancer cells: A possible biomarker for stemness AMENEH MOHAMMADALIPOUR, FABIAN BENENCIA, MONICA BURDICK, DAVID TEES, Ohio University — There is evidence that mechanical properties and deformability can be used as a biomarker to distinguish between healthy and cancerous cells. In this study, micropipette aspiration was used to investigate deformability differences between two breast cancer cell lines: BT-20 and Hs578T. Hs578T breast cancer cells have been reported to have a stem-like phenotype, whereas BT-20 cells are more recognized as being non-stem-like. Cancer cells were aspirated one-by-one at controlled pressures into small glass micropipettes with radius R_p while the length of the aspirated section of the cell inside the micropipette L was measured. We found that stem-like cancer cells are softer than non-stem-like cells with no significant differences between the mechanical properties of their cytoplasmic and nuclear regions, which allows them to deform more easily while undergoing extravasation and intravasation processes during metastasis. Our hypothesis is that the stem-like or non-stem-like phenotype of cancer cells is correlated with differences in mechanical properties. If these differences are significant enough, mechanical properties could be used as a biomarker for stemness of cells, which could eventually lead to a new diagnostic method in cancer research.

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Date submitted: 27 Feb 2013

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