

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Role of mismatch in mechanical properties in cancer cell migration¹ JULIAN BUTCHER, MOUMITA DAS, Rochester Institute of Technology, Rochester, NY — Recent experiments suggest that the mechanical stiffness of cells and their interaction with their surroundings undergo remarkable changes during tumor progression [1,2]. An intriguing experimental result in this area suggests that the mismatch in the elasticity and adhesive properties between cancer cells and cells that have not yet transformed may lead to enhanced cancer cell motility in a binary cell population [2]. Motivated by this, we study the mechanical response and dynamics of a binary system of active and deformable particles using Langevin Dynamics simulations. We characterize their motility by studying particle trajectories, mean square displacements and correlation functions. Our study may provide an understanding of the interplay of mechanical and statistical mechanical properties underlying the enhanced motility of cancer cells during metastasis [2].

[1] S. Suresh, Biomechanics and biophysics of cancer cells, *Acta Biomaterialia* 3, 413 (2007).

[2] M. H. Lee, P. H. Wu, J. R. Staunton, R. Ros, G. D. Longmore, and D. Wirtz, Mismatch in Mechanical and Adhesive Properties Induces Pulsating Cancer Cell Migration in Epithelial Monolayer 102, 2731 (2012).

¹This work was partially supported by a D-RIG grant from the College of Science at Rochester Institute of Technology.

Moumita Das
Rochester Institute of Technology, Rochester, NY

Date submitted: 22 Oct 2013

Electronic form version 1.4