Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Quantitative particle exclusion assays of the pericellular coat reveal changing mesh size PATRICK CHANG, LOUIS MCLANE, NOLAN KRAMER, JENNIFER E. CURTIS, Georgia Institute of Technology — We present a quantitative assay of the pericellular coat, a tethered polymer matrix that decorates the surface of numerous cell types. In these assays, we look at how passivated microspheres of varying diameter penetrate the cell coat. Distinct spatial distributions correspond to different particle sizes. These measurements confirm that the cell coat (on the chondrocyte RCJ-P cell line) has a spatially varying mesh size, in agreement with our independent assays performed with optical force probe microscopy. The data indicate that particles with diameters of 500 nm or greater do not penetrate the inner layer of the matrix, while particles smaller than 500 nm reach different regions, with the smallest reaching the cell surface. In an ongoing effort, we are developing a model for the observed statistical distribution of the beads. These experiments show that accessibility of the cell surface is strongly mediated by the presence of the cell coat, and they have important implications regarding the transport of molecules to the cell surface, protection from bacterial infection, drug delivery, as well as the way the cell interacts and adheres to the surrounding extracellular matrix.

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Date submitted: 14 Dec 2012 Electronic form version 1.4