Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Characterization of Hyaluronan-Protein Microstructures and Polymer Solutions J.E. CURTIS, School of Physics, Georgia Tech, L. MCLANE, M. BEDOYA, R. BEATTY, A. KRAMER, H. BOEHM, Max Planck Institute for Metals Research, Stuttgart, Germany, J. SCRIMGEOUR — Evidence is mounting that mechanical and topographical features of biomaterials can be as critical for cellular behavior as chemical properties. A case in point is hyaluronan (HA), a large polysaccharide with unique mechanical and hydrodynamic properties, found in many tissues and bodily fluids. Thanks to a large variety of accessible conformations and aggregation states, this remarkable polymer can impart on its biological environment a diverse range of structural and viscoelastic properties with far-reaching consequences for cell physiology (migration, inflammation, cancer). Supramolecular assembly of HA is typically mediated by HA-binding proteins. These specialized molecules are known to assist the formation of organized structures, such as cross-linked bundles, gels, or the all-important pericellular coat, a polymer network anchored to many cell surfaces. Precisely how the material properties of HA-rich matrices and aggregates are modified by the associated proteins, however, is largely a matter of speculation. We will present new insights concerning the cell coat and HA-protein solutions characterized using passive microrheology, fluorescence recovery after photobleaching (FRAP), and optical force probe microscopy.

J. Curtis
Georgia Institute of Technology

Date submitted: 03 Dec 2009 Electronic form version 1.4