

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

1- and 2-particle Microrheology of Hyaluronic Acid AUSTIN SAGAN, SARAH KEARNS, DAVID ROSS, MOUMITA DAS, GEORGE THURSTON, SCOTT FRANKLIN, Rochester Inst of Tech — Hyaluronic acid (also called HA or Hyaluronan) is a high molecular weight polysaccharide ubiquitous in the extracellular matrix of soft tissue such as cartilage, skin, the eye's vitreous gel and synovial fluid. It has been shown to play an important role in mechanotransduction, cell migration and proliferation, and in tissue morphodynamics. We present a confocal microrheology study of hyaluronic acid of varying concentrations. The mean squared displacement (MSD) of sub-micron colloidal tracer particles is tracked in two dimensions and shows a transition from diffusive motion at low concentrations to small-time trapping by the protein network as the concentration increases. Correlations between particle motion can be used to determine an effective mean-squared displacement which deviates from the single-particle MSD as the fluid becomes less homogeneous. The real and effective mean-squared displacements are used to probe the local and space-averaged frequency dependent rheological properties of the fluid as the concentration changes.

Austin Sagan
Rochester Inst of Tech

Date submitted: 13 Nov 2014

Electronic form version 1.4