

Abstract Submitted  
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**Influence of D-Penicillamine on the Viscosity of Hyaluronic Acid Solutions** JING LIANG, North Carolina State University, WENDY E. KRAUSE, North Carolina State University, RALPH H. COLBY, The Pennsylvania State University — Polyelectrolyte hyaluronic acid (HA, hyaluronan) is an important component in synovial fluid. Its presence results in highly viscoelastic solutions with excellent lubricating and shock-absorbing properties. In comparison to healthy synovial fluid, diseased fluid has a reduced viscosity. In osteoarthritis this reduction in viscosity results from a decline in both the molecular weight and concentration of hyaluronic acid HA. Initial results indicate that D-penicillamine affects the rheology of bovine synovial fluid, a model synovial fluid solution, and its components, including HA. In order to understand how D-penicillamine modifies the viscosity of these solutions, the rheological properties of sodium hyaluronate (NaHA) in phosphate-buffered saline (PBS) with D-penicillamine were studied as function of time, D-penicillamine concentration (0 – 0.01 M), and storage conditions. Penicillamine has a complex, time dependent effect on the viscosity of NaHA solutions—reducing the zero shear rate viscosity of a 3 mg/mL NaHA in PBS by *ca.* 40% after 44 days.

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