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Influence of Anti-inflammatory Drugs on the Rheological Properties of Synovial Fluid and Its Components WENDY E. KRAUSE, North Carolina State University, REBECCA R. KLOSSNER, North Carolina State University, JING LIANG, North Carolina State University, RALPH H. COLBY, The Pennsylvania State University — The polyelectrolyte hyaluronic acid (HA, hyaluronan), its interactions with anti-inflammatory drugs and other biopolymers, and its role in synovial fluid are being studied. We are investigating the rheological properties of sodium hyaluronate (NaHA) solutions and an experimental model of synovial fluid (comprised of NaHA, and the plasma proteins albumin and γ-globulins). Steady shear measurements on bovine synovial fluid, the synovial fluid model, and plasma protein solutions indicate that the fluids are rheopectic (stress increases with time under steady shear). In addition, the influence of anti-inflammatory agents on these solutions is being explored. Initial results indicate that D-penicillamine and hydroxychloroquine (HCQ) affect the rheology of the synovial fluid model and its components. While HCQ has no effect on the viscosity of NaHA solutions, it inhibits/suppresses the observed rheopexy of the synovial fluid model and plasma protein solutions. In contrast, D-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 phosphate buffered saline) by *ca.* 40% after 44 days. The potential implications of these results will be discussed.

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