

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Developing a Procedure for the Characterization of Mechanical Properties of Collagen Gels¹ CHRISTOPHER CHAMBERS, Northern Arizona University, HEATHER LOVELADY, GARRETT MATTHEWS, University of South Florida — The characterization of bulk mechanical properties of type I collagen gels is critical to understanding the role of collagen in the extracellular matrix (ECM), and developing biocompatible devices for use in the human body. Understanding the mechanical properties of the gel state of collagen can lead to the ability to adjust these properties for multiple uses. Here, we examined the Young's modulus of the synthesized gels. This project used a microrheological approach to discover these properties. Gels were first formed using a known process and magnetic microspheres were embedded in the gel prior to formation. An optical microscope was fitted with a magnetic chamber used to drive the embedded beads in two modes, an oscillatory motion and a pulse motion. Tracking software was modified and used to analyze the motion of the beads recorded with a CCD camera on the microscope. These techniques should be sufficient to obtain a reliable value for the Young's modulus of collagen gels, as well as other similar materials.

¹This work was supported by NSF REU program (award No DMR-1004873).

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Date submitted: 28 Nov 2010

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