

Friday, December 3rd, 2021

3:00 PM

HBSB Room 280

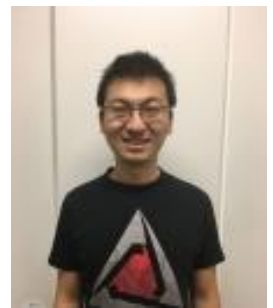
Defense presented online via Teams

Hongqiu Zhnag

PhD Dissertation Defense

Dr. Kirill Larin, Faculty Advisor

**“Biomechanical Characterization of Crystalline Lens
by Optical Coherence Elastography”**



Abstract

This dissertation reports on the application of optical coherence tomography (OCT) based elastography technique to assess the biomechanical properties of crystalline lens tissue noninvasively quantitatively. This work is summarized in four sections: 1) Assessing the Effects of Storage Medium on the Biomechanical Properties of Porcine Lens with Optical Coherence Elastography; 2) Optical Coherence Elastography of Cold Cataract in Porcine Lens; 3) The Mechanical Properties of Oxidative Cataract and the Potential Medical Treatment Measured by Optical Coherence Elastography; 4) Age-Related Changes in Rabbit Lens Viscoelasticity by Surface Wave Dispersion Analysis. These methods and applications are demonstrated with experiments on both tissue-mimicking phantoms (gelatin and agar) and lens (porcine and rabbit) ex vivo and in situ under different conditions (medium preservation, cold cataract, oxidative cataract, aging). This dissertation represents the frontier and emerging research area of noninvasive optical coherence elastography. It is expected to contribute to the field of quantitative biomechanical assessment with research and clinical-based applications.

Teams link [here](#)