

Abstract Submitted
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Fast X-ray Photon Correlation Spectroscopy measurements from the diffusion of concentrated Alpha Crystallin suspensions¹ VIDANAGE NUWAN KARUNARATNE, JANA DEBARTOLO, JUSTIN BERRY, LAURENCE LURIO, Northern Illinois University, GEORGE THURSTON, Rochester Institute of Technology, SURESH NARAYANAN, ALEC SANDY, JOHN WEIZORICK, Advanced Photon Source — Alpha Crystallin constitute up to half of the total protein found in the mammalian eye lens. It has chaperone like behavior and may play a key role in maintaining lens transparency by preventing condensation of other lens proteins. We report here Fast X-ray Photon Correlation Spectroscopy (XPCS) measurements of protein diffusion within concentrated suspensions of Alpha Crystallin. Bovine calf eye lens cortices were homogenized, centrifuged and ultra-filtered to obtain concentrated Alpha Crystallin suspensions. Diffusion of proteins within these suspensions was measured as a function of temperature. The overall observed diffusion rates imply that the proteins exist in a glassy or gel phase, even at concentrations where equivalent hard sphere system would still be liquid. We interpret these results within the context of strongly interacting proteins, with protein-protein interactions possibly mediated by subunit exchange among Alpha Crystallin oligomers.

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Vidanage Nuwan Karunaratne
Northern Illinois University

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