

Abstract Submitted
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Neutron scattering and phase separation of Gamma-B crystallin vs. pH, ionic strength and protein concentration¹ GEORGE THURSTON, K. MICHAEL MARTINI, Rochester Institute of Technology, KENNETH DESMOND, Emory University, ELIAS PUTZIG, ZACHARY DELL, DAWN CARTER, DAWN HOLLENBECK, NICHOLAS DEXTER, ANDREAS LANGNER, DAVID ROSS, ANTHONY HARKIN, EDWARD NELSON, Rochester Institute of Technology, MALIN ZACKRISSON-OSKOLKOVA, Lund University, ANNA STRADNER, NICOLAS DORSAZ, Adolphe Merkle Institute, GIUSEPPE FOFFI, EPFL, PETER SCHURTENBERGER, Adolphe Merkle Institute — We study the pH, ionic strength and concentration dependence of liquid-liquid phase separation and neutron scattering of the eye lens protein Gamma-B crystallin. At pH 7, lowering ionic strength raises the cloud points. Neutron scattering indicates anisotropic protein interactions, in agreement with prior information. At lower pH phase separation disappears, and protein repulsions increase at low ionic strength. We seek to evaluate the roles of (i) patterned charge regulation, (ii) biasing of relative protein orientation due to local charge patches, and (iii) screened net protein charge for these phenomena. We apply a grand-canonical partition function model for charge regulation and other interactions, as input to Monte Carlo and neutron scattering computations.

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