Abstract Submitted
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DLS microrheology at the onset of weak elasticity during thermal denaturation of BSA ULF NOBBMANN, CARLOS A. REGA, HANNA JANKEVICS, SAMIUL AMIN, Malvern Instruments, Grovewood Rd, Malvern, WR14 1XZ, UK — The ability to precisely detect the onset of protein aggregation to draw insights into microstructural characteristics plays a critical role in a variety of biotechnological applications such as therapeutic protein stability.[1] Rheological techniques are very sensitive to evolution of an aggregating network but have been limited in biotechnology, due to large sample volume and moderately high viscosity requirements in traditional mechanical rheometry. Dynamic Light Scattering (DLS) overcomes these limitations as experiments can be carried out on very dilute samples and small volumes. We present a method based on optical microrheology[2] to study the onset of bovine serum albumin (BSA) aggregation to develop an understanding of the evolving network structure. The exponent of the tracer mean squared displacement power law fit and the elastic modulus G' emerge as two key parameters. The impact of probe chemistry and probe size on the extracted microrheological response is discussed.

[1]A Saluja et al., "Ultrasonic rheology of a monoclonal antibody (IgG_2) solution: implication for physical stability of proteins in high concentration formulations" J. of Pharm. Sci. (2007) 96, 3181-3195.
[2]D Weihs et al., "Bio-microrheology: a frontier in microrheology" Biophys. J. (2006) 91, 4296-4305.

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