Protein conformation, dynamics and aggregation: From test tubes to human diseases

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While protein conformational disorder and aggregation have serious implications in a number of neurodegenerative diseases, these processes are difficult to study. This is because; they often share common conformational landscapes, which are inherently heterogeneous, consisting of multiple pathways and intermediates of varying toxicities. Our lab has been developing and using sensitive fluorescence methods-both at ensemble and single molecule resolution-and complementing these using traditional biochemical assays, to address the heterogeneity and toxicity of a number of neurodegenerative disorders, including Parkinson's Disease (PD) and ALS. In this talk, we will discuss conformational fluctuations of Superoxide Dismutase (SOD1) and their implications in the early events of their aggregation, with specific reference to protein phase separation.