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BSA can form Micelle in Aqueous Solution

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Abstract

Protein aggregation is pathogenic and plays significant role in causing neurodegenerative diseases in biological system. Although the evolution of different types of protein aggregation mediated diseases are well-known, the origin and molecular mechanism of these aggregates remain unclear. In the present investigation, self-assembling characteristics of BSA is discussed by evaluating its critical micelle concentration (cmc) and aggregation number using surface tension and various spectroscopic techniques. The cmc of BSA is estimated to be 0.65-0.69 μM in solution. Steady state and time resolved fluorescence methods are employed to determine the aggregation number of the BSA micelles, which is found to be ~ 44. The accessibility of the fluorophore to the CPC quencher in the BSA micelle is assessed using Lehrer's plot. Furthermore, the morphology and size of the aggregates are studied using HRTEM, Scanning Electron Microscopy, Confocal microscopy and Dynamic light scattering methods. The present study helps in understanding the physicochemical properties of BSA protein aggregation and also provides the mechanistic details of the phenomenon.

Keywords: Aggregation, BSA, Lifetime, Micelle, Microscopy, Size