

Mechanistic insight of Shear induced Aggregation of Proteins and the Effect of Transition Metal ions – SERB



Dr. Lalit Pandey-Department of Biosciences and Bioengineering

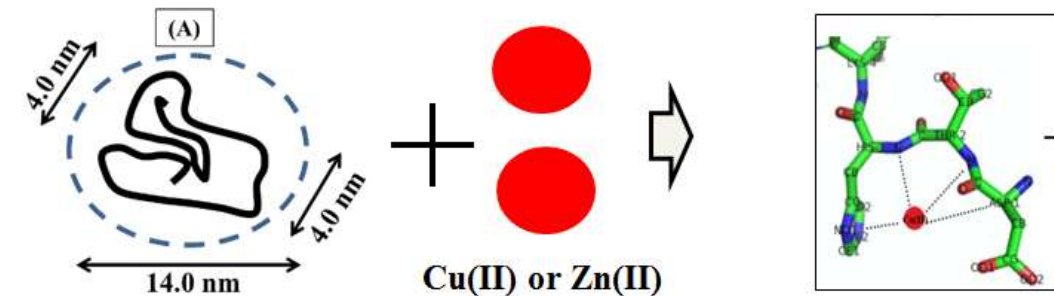
Aim: To investigate (a) effect of shear on the rheological properties of protein solutions of different molecular weights and concentrations and (b) effect of transition metal ions

❖ Achievements

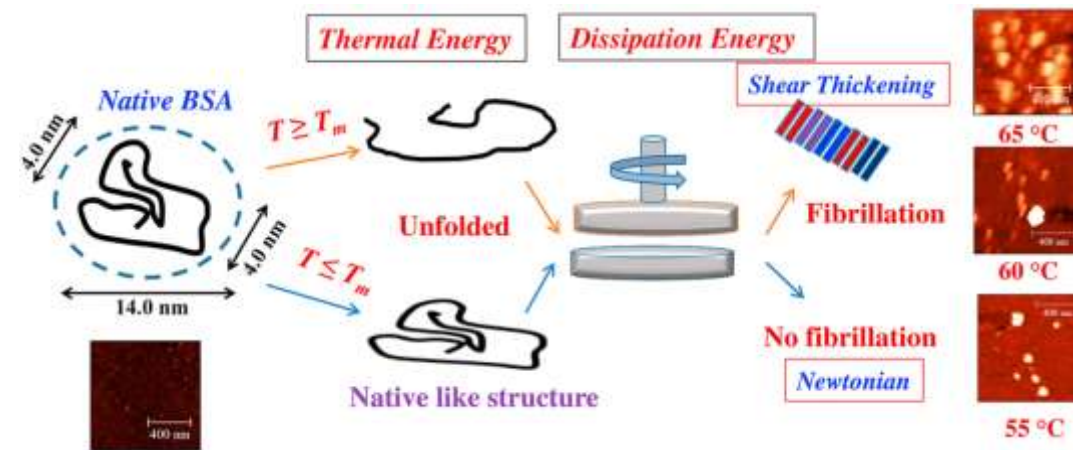
- Stoichiometric ratio dependent dual behavior of protein fibrillation is observed in the presence of transition metal ions
- We proposed a model to explain this effect in which metal ions follow the different binding pattern in different ratios and subsequently alter the intra or intermolecular interactions
- The interplay of viscosity, a fluid property, with the aggregation process and its corresponding change in the secondary structures of the peptide
- Rates of aggregation of protein was enhanced by a few folds for the thermomechanical process
- Protein solution exhibited a shear thickening behaviour during the aggregation

❖ Highlights

- Mechanistic insights of the effect of the thermomechanical process on unfolding and fibrillation of proteins



Coordination between transition metal ions and protein molecule



Thermomechanical process induces unfolding and fibrillation of bovine serum albumin