Arsenic trioxide is one of the most common metallic pollutants entering the food chain both by human actvites and nature. Its introduct on to living organism and accumula t on is known to manifest several metabolic and hormonal disorders; however its role in protein misfolding and aggrega t on followed by neurodegenera t ve disorders is not fully elucidated. In the present study by employing several biophysical techniques, we reveal the aggrega t on mechanism of Hen Egg White Lysozyme (HEWL) in presence of Arsenic Trioxide (As2O3) at physiological condi t on and characterized the aggregates. Our ThT fuorescence and sca t ering data shows that As2O3 promote the in vitro aggrega t on of HEWL in concentra t on dependent manner. Early phase of aggrega t on was observed to be induced by exposure of hydrophobic surfaces which later reorganized to promote further self-associa t on leading to ? sheet structure which was evident by CD spectroscopy. Presence of lower ordered oligomers a f er two days and higher ordered oligomers along with amorphous aggregates, as evident by AFM a f er wee η ering