World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:12, No:09, 2018

Towards the Inhibition Mechanism of Lysozyme Fibrillation by Hydrogen Sulfide

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Abstract : Amyloid fibrils are stable aggregates of misfolded protein associated with many neurodegenerative disorders. It has been shown that hydrogen sulfide (H2S), inhibits the fibrillation of lysozyme through the formation of trisulfide (S-S-S) bonds. However, the overall mechanism remains elusive. Here, the concentration dependence of H2S effect was investigated using Atomic force microscopy (AFM), non-resonance Raman spectroscopy, Deep-UV Raman spectroscopy and circular dichroism (CD). It was found that small spherical aggregates with trisulfide bonds and a unique secondary structure were formed instead of amyloid fibrils when adding concentrations of 25 mM and 50 mM of H2S. This could indicate that H2S might serve as a protecting agent for the protein. However, further characterization of these aggregates and their trisulfide bonds is needed to fully unravel the function H2S has on protein fibrillation.

Keywords : amyloid fibrils, hydrogen sulfide, protein folding, raman spectroscopy
Conference Title : ICHSBM 2018 : International Conference on Hydrogen Sulfide in Biology and Medicine
Conference Location : Tokyo, Japan
Conference Dates : September 10-11, 2018