



Temperature dependent rapid annealing effect induces amorphous aggregation of human serum albumin.

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Abstract:

This study represents an analysis of the thermal aggregation of human serum albumin (HSA) induced by novel rosin modified compounds. The aggregation process causes conformational alterations in the secondary and tertiary structures of the proteins. The conversion of globular protein to amorphous aggregates was carried out by spectroscopic, calorimetric and microscopic techniques to investigate the factors that are responsible for the structural, conformational and morphological alteration in the protein. Our outcome results show that the aggregation of HSA was dependent on the hydrophobicity, charge and temperature, because the formation of amorphous aggregates occurs in the presence of a novel cationic rosin compound, quaternary amine of rosin diethylaminoethyl ester (QRMAE), at 40°C and pH 7.4 (at 25°C on similar pH value, there was no evidence of aggregate formation). In addition, the parent compound of QRMAE i.e.; abietic acid, and other derivatives such as nonionic rosin compounds [(RMPEG-750) and (RMA-MPEG-750)] do not shows the aggregating property. This work provides precise and necessary information that aid in the understanding the effects of rosin derivative compounds on HSA. This study also restrains important information for athletes, health providers, pharmaceutical companies, industries, and soft drink-processing companies.

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