



# Inhibitory effect of copper nanoparticles on rosin modified surfactant induced aggregation of lysozyme.

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## Abstract:

Protein aggregation is associated with many serious diseases including Parkinson's and Alzheimer's. Protein aggregation is a primary problem related with the health of industrial workers who work with the surfactants, metal ions, and cosolvents. We have synthesized rosin-based surfactants, i.e., quaternary amines of rosin diethylaminoethyl esters (QRMAE), which is an ester of rosin acid with polyethylene glycol monomethyl ether. Here, we report the thermal aggregation of lysozyme induced by QRMAE at 65°C and pH 7.4 for a given time period in which amorphous aggregates are formed and confirm that copper-nanoparticles have the ability to inhibit QRMAE-induced aggregation compared with zinc and silver-nanoparticles. Aggregation experiments was evaluated using several spectroscopic methods and dye binding assay, such as turbidity, Rayleigh light scattering, 1-anilino-8-naphthalene sulfonate (ANS), Thioflavin T (Th T), congo red (CR) and circular dichroism (CD), that was further supported by scanning electron microscopy (SEM) and SEM with EDX. The therapeutic use of nanoparticles and the fact that rosin possesses excellent film-forming properties, and that its derivatives have pharmaceuticals application such as micro encapsulation, coating and film forming, it's matrix materials are used for sustained and controlled release tablets, renders importance and application to the present study. Copyright © 2015 Elsevier B.V. All rights reserved.

## Published In:

International Journal of Biological Macromolecules , 78 , 379-388