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**Potential efficacy of nano-curcumin against nicotine toxicated mammalian proteins**

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Curcumin is a well-known anti-inflammatory and antioxidant agent that significantly reduces the nicotine-induced toxicity both at cellular and genetic levels. However, the poor aqueous solubility of curcumin makes it less bio-available that hinders the more possible remediation of curcumin against nicotinic abuse in the target cells. An attempt was made to synthesize nano-curcumin (20-50 nm) that would be more soluble in water with enhanced bioavailability. The prepared nanoparticles of curcumin (Cur-NPs) were characterized by Ultraviolet-Visible (UV-Vis) spectroscopy, Field Emission Scanning Electron Microscopy (FESEM), X-Ray Diffraction (XRD) and Zetasizer techniques. Investigations were performed on the structural modifications of nicotine-triggered two important mammalian proteins ( $\alpha$ -lactalbumin:  $\alpha$ -LA and Cytochrome-c: Cyt-c) via the interaction of concentration dependent curcumin nanoparticles. It was observed that nicotine significantly affected the structural conformation and optical properties of  $\alpha$ -LA and Cyt-c proteins by modifying their structural integrity. Cur-NPs significantly regained the structural integrity of those nicotine-treated proteins as revealed by the results from UV-Visible absorption, intrinsic fluorescence emission and Circular Dichroism (CD) studies. The Isothermal Titration Calorimetric (ITC) investigation demonstrated that Cur-NPs prevented the nicotine molecules for binding in the active site of those proteins. This was due to the greater binding affinity of curcumin towards  $\alpha$ -lactalbumin (-4.87 KCal/mol) and Cytochrome c (-7.64 KCal/mol) proteins in comparisons to nicotine (-4.24 KCal/mol; ~ -5.26 KCal/mol respectively) as observed in molecular docking studies. This study clearly demonstrated that curcumin in its nano particulate form acted as an efficient ameliorative against nicotine-induced toxicity at cellular levels.

**Biography**

K Chattopadhyay has completed her PhD in Physiology from University of Calcutta in 2002. She did her Post-doctoral studies in the Department of Chemical Technology of Calcutta University and worked as a Women Scientist (WOS-A) in the same department. Presently she is working as a Women Scientist (WOS-B) in DST project in the Department of Chemistry of Jadavpur University, India. She is also engaged as a Guest Faculty in the Department of Food Processing and Nutrition, IEST, Shibpur. She has published many papers in reputed international journals. Her field of interest is pharmacology, food & nutrition and natural antioxidants.

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