

Para-coumaric acid loaded chitosan nanoparticles: Its neuroprotective effects against the neuroblastoma cell line

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Para-coumaric acid is a natural phenolic compound and found in a variety of edible plants and possess pharmacological activities. However, the clinical use of para-coumaric acid is limited due to its hydrophobic properties, instability and limited permeability through the blood-brain barrier. The development of nanoparticulate delivery systems can solve some of these limitations. The

aim of the present study was to evaluate the possibility to improve the neuroprotective effects of para-coumaric acid by its encapsulation in chitosan nanoparticles. The methodology includes the formulation of chitosan nanoparticles containing para-coumaric acid (CN-PCA) by the simple ionic cross-linking method. Formulated CN-PCA was subjected to characterization such as SEM and zeta potential analysis. Stability study, *in-vitro* drug release study of formulated CN-PCA, was performed. *In-vitro* neuroprotective activity of formulated CN-PCA was studied against neuroblastoma cell line (SH-SY5Y) using MTT assay. The results indicated that F1, F2, and F3 of CN-PCA were prepared. Based on SEM and Zeta potential analysis, this study indicated that F2 formulation having better particle size 120-326nm

with higher surface area and sufficiently stable. Stability study showed that F2 formulation was stable and *in-vitro* drug release study indicated that percentage release of F2 was comparatively higher than F1 and F3 due to a better particle size with higher surface area. The F2 formulation of CN-PCA nanoparticles showed a neuroprotective effect in a dose-dependent manner against neuroblastoma cell line (SH-SY5Y) using MTT assay. In conclusion, CN-PCA nanoparticles formulation improved its neuroprotective activity *in-vitro*.

Biography

Dineshkumar B has completed his Ph.D. at the age of 31 years from Indian Institute of Technology (IIT), Kharagpur, West Bengal, India. He is a Professor, Dept. of Pharmaceutics, St. James College of Pharmaceutical Sciences, Chalakudy, Kerala, India. He has published more than 30 papers in reputed journals and has been serving as a reviewer of several pharmacy journals.

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