

(54) Title of the invention : A Method of Preparation of Transferrin Surface-Modified Hesperetin-loaded PLGA Nanoparticles

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(57) Abstract :

The present invention relates to eco-friendly Hesperetin-loaded PLGA nanoparticles and their surface is modified by Transferrin (TF) which is a serum protein that has been widely studied as a cancer-targeting agent and is highly expressed on the surface of malignant cells. Further, in vitro anti-cancer study of PLGA-HSP-TF NPs in triple-negative breast carcinoma cell line (MDA-MB-231) were also carried out. PLGA-HSP-TF NPs have a strong cytotoxic ability against MDA-MB-231 cells compared to HSP. The nanoparticles were also able to produce excessive intracellular ROS generation which caused oxidative damage. As a result, mitochondrial membrane potential was depolarized which may favour the apoptotic mediated cell death. On the other hand, PLGA-HSP-TF NPs also stimulated the chromatin condensation and DNA damage as well as it has arrested the cell cycle at G0/G1 phase. In vivo anticancer study of PLGA-HSP-TF NPs was investigated in EAC cells. The study revealed that the nanoparticles significantly increased the life span of EAC cell-bearing mice. Besides that, PLGA-HSP-TF NPs also restored the hematological parameters and no significant histopathological changes were observed in the kidney and liver of mice.

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