

(54) Title of the invention : Hepatoprotective Role of Silymarin Solid Lipid Nanoparticles via Inhibition of NF- κ B-Mediated Inflammation in Acetaminophen-Induced Liver Injury

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(57) Abstract :

[050] The present invention relates to a novel nanotechnology-based hepatoprotective formulation comprising silymarin-loaded solid lipid nanoparticles (SLNs) designed to enhance therapeutic efficacy against acetaminophen-induced liver injury. The formulation improves the solubility, stability, and bioavailability of silymarin through encapsulation within a biocompatible lipid matrix, enabling controlled and sustained drug release. The developed nanoparticles facilitate targeted delivery to hepatic tissues and enhance cellular uptake, thereby increasing the therapeutic concentration of the active compound at the site of action. The mechanism of action involves inhibition of nuclear factor kappa B (NF- κ B)-mediated inflammatory pathways, leading to a reduction in pro-inflammatory cytokines and attenuation of oxidative stress. The formulation demonstrates significant hepatoprotective effects, including reduction in liver enzyme levels and improvement in histopathological conditions. The invention offers a promising, safe, and scalable approach for the treatment of drug-induced liver injury and other inflammatory liver disorders.

Accompanied Drawing [FIGS. 1-2]

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