Patent Search

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Abstract:

Abstract: The high therapeutic performance nano formulation of Thymoquinone (TQ) has been developed for Liver aliments. Pure Thymoquinone (TQ) has poor solub toxicity at higher concentration. As a consequence, the therapeutic performance of TQ was limited in the drug targeting or drug delivery application. To overcome the this drug, nanocarrier was developed to release the Thymoquinone (TQ) at the site-specific delivery in the Liver. The nanocarrier based drug targeting to the liver for t of Thymoquinone (TQ) was developed. The process consists of synthesis of NIPAAM (N-isopropylacrylamide) nanoparticles followed by coating with PAG (p-aminophe D-galactopyranoside). Thymoquinone (TQ) was added for the encapsulation of this compound in the hydrophobic core of the nanoparticles called nano formulation a Nanothymoquinone (NTQ). Keywords: Thymoquinone (TQ), Nanothymoquinone (NTQ), Nanocarrier, Nanoparticle, Liver, PAG and NIPAAM coating

Complete Specification

Description:Nano-Thymoquinone (TQ) as High-Performance Drug Targeting Vehicle for Liver

INVENTION DISCLOSURE FORM

Thymoquinone (TQ) is one of the most active constituents of Nigella sativa (N. sativa), widely being used as a hepato-protective agent. However, toxicity and poor w solubility at higher dosages limit its use as a therapeutic agent. The idea behind the present study is to design a nanocarrier that exploits the benefit of the antioxid property of TQ without causing any toxicity. For this purpose, PAG (p-aminophenyl-1-thio-b-D-galactopyranoside) coated NIPAAM (N-isopropylacrylamide) nanoparti were synthesized followed by encapsulation of TQ (Nanothymoquinone, NTQ) in their hydrophobic core. PAG is a ligand that directly interacts with asialoglycoprotei receptors (ASGP-R) present on the surface of hepatocytes and delivers the drug directly to the liver. NTQs were found to have a size of ~90 to 108 nm and were characterized using DLS and TEM. The drug was given in two modes: one as NTQ (3 groups: 0.125 µgkg-1 body weight (NTQL), 1.25 µgkg-1 body weight (NTQM) and µgkg-1 body weight (NTQH) µgkg-1, intraperitoneal (i.p.)), and the other as TQ (12.5 mgkg-1 body weight, i.p.).

EXPERIMENTAL PROCEDURE

In the present study, we have evaluated the preventive efficacy of TQ and NTQ against CCl4- induced hepato-toxicity (free radical generation). CCl4 administration is known model for the production of chemical hepatic injury, causing an increase in lipid peroxidation and reduction in the activities of the anti-oxidant enzymes such Glutathione peroxidase (GPX) and Catalase.

Animals were divided into six groups, each having 6 animals and they have received the treatment as follows: Group I (N): Normal (saline for 7 days i.p.), Group II (D treated (CCl4 on 3rd and 4th day, 1.2 ml/kg , subcutaneous (s.c.)) + diet/water, Group III (NTQL): nanothymoquinone low dose (0.125 µgkg-1 body weight, i.p.) + CCl4

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