

عنوان مقاله:

Synthesis and Characterization of an Amphiphilic Block Sunflower Oilbased Polyol and Preparation of their Nanocarrier as a Potential Delivery System: Raloxifene-Hydrochloride as a Model

محل انتشار:

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خلاصه مقاله:

Presently, modern pharmaceuticals, are almost exclusively derived from the arduous refining of petroleum that is inherently unsustainable. In order to address this issue, using biobased materials for chemical synthesis, particularly in drug delivery systems is noticeable. Biodegradable and biocompatible hyperbranched polyol was synthesized via a facile method through the ring-opening and thiol-ene click reactions in room temperature. Due to the bio-based content of the polyol backbone, the synthesized polyol represented both excellent biodegradability and low cytotoxicity. Raloxifene HCl was used as a hydrophobic model drug in order to confirm the excellent potential of polyol as a carrier in drug delivery system. The polyol showed amphiphilic character and could prepare a nanoparticulate sustained delivery system of raloxifene hydrochloride, the drug with poor bioavailability, in an aqueous solution. Raloxifene HCl could readily encapsulate in the lipophilic core of polyol whose branched hydroxyls was put in surface (external part) of prepared micelles. The size of nanoparticles was 94 ± 0.43 nm in diameter and had entrapment efficiency of $93 \pm 0.5\%$. The nanoparticles were evaluated for in vitro release and exhibited a sustained release profile ($17 \pm 1.52\%$ after 4 weeks). The MTS assay showed low toxicity in MG-63 cells line HumanOsteoblast. Based on its good biodegradability and low cytotoxicity, polyol provides an opportunity to design excellent drug delivery systems

کلمات کلیدی:

Bio-based, Polyol, Raloxifene HCl, Nanoparticles, Sustained release, MTS assay

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