عنوان مقاله:

Preparation of chelidonine highly loaded poly(lactide-co-glycolide)-based nanoparticles using a single emulsion method : Cytotoxic effect on MDA-MB-۲۳۱ cell line

محل انتشار:

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خلاصه مقاله:

Introduction: Chelidonine, a bio-active component of Chelidonium majus, has been investigated for its anti-proliferative effects on various cancer cell lines with multidrug resistance (MDR). Although the results are auspicious, its poor water solubility and low bioavailability are the main limitations for clinical applications. This study aimed to develop poly(lactic-co-glycolic acid) (PLGA) nanoparticles loaded with chelidonine, in order to enhance its bioavailability for oral administration and improve the therapeutic index. Methods: Herein, we encapsulated chelidonine in PLGA nanoparticles using a single emulsion solvent evaporation method. Nanoparticles were characterized in terms of size, surface charge and morphology, encapsulation efficiency, drug loading, and in vitro drug release profile. The anti-cancer efficacy of chelidonine-loaded nanoparticles and free chelidonine was evaluated in MDA-MB-۲۳۱ breast cancer cells. Results: The physicochemical characteristics showed spherical particles in nanometer size range (۲۶۳ ± ۱۹.۶ nm), with negative surface charge (−۲۰.۶۷ ± ۲.۴۸ mv), high encapsulation efficiency (۷۶.۵۳ ± ۳.۶۱%), and drug loading (۲۲.۴۷ ± ۰.۰۹%), as well as drug release amount of ۶۰.۲۷±۵.۶۸% up to ۱۰ days. Furthermore, chelidonine-loaded nanoformulations were found to improve anti-cancer potential, compared with unentrapped chelidonine. Conclusion: This in vitro study showed that the encapsulation of chelidonine, as a potent herbal drug, in a polymeric matrix enhances its bioavailability. This offers an efficient vehicle for targeted drug delivery in cancer treatment.

کلمات کلیدی:

لینک ثابت مقاله در پایگاه سیویلیکا: