World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:9, No:12, 2015

Chrysin-Loaded PLGA-PEG Nanoparticles Designed for Enhanced Inhibitory Effect on the Breast Cancer Cell Line

Authors : Faraz Zarghami, Elham Anari, Nosratollah Zarghami, Yones Pilehvar-Soltanahmadi, Abolfazl Akbarzadeh, Sepideh Jalilzadeh-Tabrizi

Abstract : The development of nanotherapy has presented a new method of drug delivery targeted directly to the neoplasmic tissues, to maximize the action with fewer dose requirements. In the past two decades, poly(lactic-co-glycolic acid) (PLGA) has frequently been investigated by many researchers and is a popular polymeric candidate, due to its biocompatibility and biodegradability, exhibition of a wide range of erosion times, tunable mechanical properties, and most notably, because it is a FDA-approved polymer. Chrysin is a natural flavonoid which has been reported to have some significant biological effects on the processes of chemical defense, nitrogen fixation, inflammation, and oxidation. However, the low solubility in water decreases its bioavailability and consequently disrupts the biomedical benefits. Being loaded with PLGA-PEG increases chrysin solubility and drug tolerance, and decreases the discordant effects of the drug. The well-structured chrysin efficiently accumulates in the breast cancer cell line (T47D). In the present study, the structure and chrysin loading were delineated using proton nuclear magnetic resonance (HNMR), Fourier-transform infrared spectroscopy (FT-IR), and scanning electron microscopy (SEM), and the in vitro cytotoxicity of pure and nanochrysin was studied by the MTT assay. Next, the RNA was exploited and the cytotoxic effects of chrysin were studied by real-time PCR. In conclusion, the nanochrysin therapy developed is a novel method that could increase cytotoxicity to cancer cells without damaging the normal cells, and would be promising in breast cancer therapy.

Keywords : MTT assay, chrysin, flavonoids, nanotherapy
Conference Title : ICNB 2015 : International Conference on Nanotechnology and Biotechnology
Conference Location : Melbourne, Australia
Conference Dates : December 13-14, 2015