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Hydrogels of solid lipid nanoparticles of curcumin

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Solid lipid nanoparticles of curcumin (C-SLNs) were prepared using stearic acid as lipid carrier by nano precipitation technique and characterized for their physio-chemical properties. SLNs were incorporated in hydro gels prepared from Carbopol®934 and the effect of method of incorporation of SLNs on the hydrogel properties was studied by Texture Analyzer. For the purpose of study, three types of hydro gels were prepared, i) Blank hydro gels B1, B2 and B3 containing respectively 0.5, 1.0 and 2.0 % w/v carpobol; ii) In-situ hydro gels Y1, Y2 and Y3 by adding carbopol (0.5, 1.0 and 2.0 % w/v) to fixed volume of C-SLNs suspension and; iii) Enriched hydro gels by mixing C-SLNs and blank carbopol (1% w/v) hydrogel in the ratios 1:1 (D1) and 1:2 (D2). C-SLNs exhibited a mean particle size of 527.6 nm, poly dispersity of 0.383 and 82.73% entrapment efficiency. In-situ hydro gels exhibited a concentration (carbopol) dependent increase in firmness, consistency, cohesiveness and viscosity, however, presence of C-SLNs significantly decreased ($p<0.05$) these values in comparison to blank hydro gels. Similar observations were made in enriched hydro gels. Also, a significant difference ($p<0.05$) in hydrogel properties was observed between in-situ and enriched hydro gels. It indicates that SLNs have an effect on the swelling properties of Carbopol. Occlusive properties of in-situ hydrogels were better than enriched and blank hydro gels. In-situ hydro gels also exhibited uniform and extended release of curcumin, along with higher permeation characteristics. Better formulation characteristics of in-situ hydro gels might be because of homogenous deposition and gelling of carbopol around curcumin nanoparticles.

Biography

Ruchi Chawla is an Assistant Professor at Department of Pharmaceutics, Indian Institute of Technology (Banaras Hindu University), Varanasi. She has 6 years of teaching and research experience. Her areas of research are anti-microbial chemotherapy, nanotechnology and herbal drug delivery. She has a strong academic background and has published papers in reputed journals. She is also serving as an Editorial Board Member.

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