Development of a PGSF modified curcumin loaded micelle delivery system

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Abstract: In this study, we developed curcumin (Cur) loaded micelles (Cur-PGSF). The targeting material, poly (glycerol-succinate) oligoesters (PGSF), was synthesized by one-pot synthesis grafted with fatty alkyl chains leading to amphiphilic structures. We developed a micelle system with a newly synthesized PGSF polymer, which shows lower CMC of 0.0081 mg/ml. The Cur loaded micelles were prepared by thin film hydration method with PGSF (Cur-PGSF) as carrier. A central composite design (CCD) was used to optimize the formulation, and the optimized Cur-PGSF was prepared with the weight ratio in the range of 2% to 5% Cur in PGSF. The average size of the mix micelles, the encapsulation efficiency and drug-loading were report. The poorly water-soluble curcumin was effectively encapsulated in Cur-PGSF micelles with the drug loading amount and entrapment efficiency reaching 2.22% and 99.24%, respectively. The result demonstrated that PGSF modified Cur micelles had good re-dispersibility and storage stability at 4 °C for 6 weeks.

Keywords: Biodegradable polymers; Drug formulation; Nanomedicine; Curcumin