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Production of biological nanoparticles from bovine serum albumin as controlled release carrier for curcumin delivery

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Abstract

This study described a curcumin (CUR) loaded bovine serum albumin nanoparticles (BSA@CUR NPs), which could solubilize the poorly water-soluble drug and increase the therapeutic efficacy of the drug. BSA@CUR NPs were synthesized by a simple coacervation procedure. The resultant BSA@CUR NPs showed a spherical shape, with a diameter of 92.59 ± 16.75 nm (mean \pm SD) nm and a ζ -potential of -9.19 mV. The *in vitro* drug release study of CUR showed a sustained and controlled release pattern. Cellular toxicity of BSA NPs was also investigated on HFF2 cell lines. Additionally, a hemolysis test of as prepared NPs were performed for investigation of hemocompatibility. Hemolysis assay and cytotoxicity study results on HFF-2 cell line show that as prepared BSA NPs are biocompatible. The *in vitro* anticancer activity of the BSA@CUR NPs were performed by MTT assay on MCF-7 cancer cells. These results suggest that BSA@CUR NPs are a new drug delivery system for cancer therapy.

Keywords: Albumin, BSA, Drug delivery, Controlled release, Curcumin, Protein

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