Co-delivery of docetaxel and curcumin prodrug via dual-targeted nanoparticles with synergistic antitumor activity against prostate cancer.


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Abstract

PURPOSE: Combination therapy is increasingly used as a primary cancer treatment regimen. In this report, we designed EGFR peptide decorated nanoparticles (NPs) to co-deliver docetaxel (DTX) and pH sensitive curcumin (CUR) prodrug for the treatment of prostate cancer.

RESULTS: EGFR peptide (GE11) targeted, pH sensitive, DTX and CUR prodrug NPs (GE11-DTX-CUR NPs) had an average diameter of 167nm and a zeta potential of -37.5mV. The particle size of the NPs was adequately maintained in serum and a sustained drug release pattern was observed. Improved inhibition of cancer cell and tumor tissue growth was shown in the GE11-DTX-CUR NPs group compared to the other groups.

CONCLUSION: It can be summarized that DTX and CUR prodrug could be delivered into tumor cells simultaneously by the GE 11 targeting and the EPR effect of NPs. The resulting GE11-DTX-CUR NPs is a promising system for the synergistic antitumor treatment of prostate cancer.

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KEYWORDS: Dual-targeted nanoparticles; EGFR-mediated endocytosis; Prostate cancer; Synergistic combination therapy; Targeted delivery system


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