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## Cancer cell specific-penetrating peptide modified liposome for targeted delivery of anticancer agent to hepatocellular carcinoma

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**Statement of the Problem:** Nowadays liver cancer has become the second leading cause of cancer related death globally. Systemic therapy with chemotherapeutic agents has severe toxicity to normal cells and the application is limited in pre-clinical study. Researchers have reported that liposomal drug delivery system working as a carrier by encapsulating chemotherapeutic agents into its hydrophobic or hydrophilic parts can enhance the bioavailability and solubility of drugs, facilitate the tumor-specific targeting treatment purpose with surface modification, and further reduce the drug toxicity to normal tissues. However, these delivery systems have not been adopted in clinics. The purpose of this study is to develop cancer-cell specific penetrating peptide modified liposomal delivery system with CTD encapsulated for targeted hepatocellular carcinoma treatment.

**Methodology & Results:** The cancer cell-specific penetrating peptide (CCP) modified-liposome prepared in the present study had a particle size around 120 nm and a narrow polydispersity index. It had an enhanced cytotoxicity on HepG2 cells compared to the control, free drug and unmodified liposome by MTT assay. In addition, a provoked apoptosis was induced by this liposome as well. The cellular uptake results of HepG2 and normal Miha cells further confirmed the higher ability of the CCP-modified liposomes to penetrate cancer cells. A higher efficiency of delivery by CCP-modified liposomes as compared to unmodified liposomes was evident by evaluation of the HepG2 tumor 3D spheroids penetration and inhibition experiments as well as the *in vivo* study. In conclusion, our CCP-modified liposomes improve the anticancer potency of drugs for hepatocellular carcinoma.

### Biography

Xue Zhang has her expertise in liposomal drug delivery systems in improving chemotherapeutic drug properties and for targeted cancer treatment. She has developed a cancer cell-specific liposomal carrier by modifying liposomal surface with a cancer cell-specific penetrating peptide. And also she evaluated the therapeutic efficacy and effectiveness of this carrier *in vitro* (2D and 3D cells) and *in vivo* hepatocellular carcinoma model.

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