

Liposomal nanodelivery system targeting epha2 receptor for sensitizing prostate cancer to enhance the efficiency of chemotherapy

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Abstract

Liposomal nanodelivery targeting EphA2 receptor for sensitizing prostate cancer to enhance the efficiency of chemotherapy: The quality of life in cancer chemotherapy decreases due to adverse effects associated with chemotherapeutic drugs caused by non-specific action, immunogenicity, and reduced drug penetration. In the current study, we have fabricated Lithocholic acid tryptophan conjugate (LCAT) based liposomal nanodelivery system targeting cancer specifically through EphA2 receptors which shows an interesting feature that these receptors are highly expressed in cancer tissues, but not in normal tissues. We have encapsulated the anticancer drug niclosamide in this delivery system that has shown an average particle size of 207.8 ± 1.91 nm, a poly dispersity index of 0.384 ± 0.02 , with an average Zeta potential -29.13 ± 0.7 mV and its encapsulation efficiency was $73.82 \pm 1.61\%$. Niclosamide loaded LCAT formulations (LCAT-NIC-NPS) has shown significant cytotoxicity in EphA2 highly expressed cells (PC 3) but not in EphA2 low expressed (H4) cells. *In vitro* cellular uptake studies of coumarin-6 loaded LCAT formulation by flowcytometry and confocal microscopy have shown a significant increase in uptake by PC-3 cells compared to H4 cells which indicates that this delivery system is acting through EphA2 receptor. *In vivo* antitumor efficacy data in PC-3 xenograft reveals that LCAT-NIC-NPS has shown a significant suppression of tumor growth with a 4-fold reduction in the tumor weight and tumor volume compared to disease control. Western blotting and histopathology data reveal that it is acting via EphA2 receptors and has no toxicity on vital organs.

Biography:

Jannu Arun Kumar has completed his B pharmacy at the age of 23 years from Sahasra Institute of Pharmaceutical Sciences Warangal, and MS from National Institute of Pharmaceutical Education and Research, Hyderabad and currently pursuing his Ph.D. final year from National Institute of Pharmaceutical Education and Research, Guwahati.

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