

Targeting to prostate cancer cells by using ligand conjugated polymeric nanoparticles as drug carrier

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Presently wide-ranging research has been carried out to develop nano drug carriers, to overcome the lack of specificity of conventional chemotherapeutic agents for the treatment of prostate cancer, the second most common cancer in men. The aim of the current study is to develop and characterize PLGA nanoparticles (NPs) containing an anticancer agent, tagged with a suitable ligand for targeted delivery of the drug. Nanoparticles were prepared by a multiple emulsion solvent evaporation method. Drug-excipients interaction, surface morphology, zeta potential and size distribution, cellular uptake were carried out using Fourier transform infrared spectroscopy (FTIR), Field emission scanning electron microscopy (FESEM), Zeta sizer Nano ZS90, particle size analyzer and confocal microscopy respectively. No chemical interaction was observed between the drug and the selected excipients. NPs had a smooth surface, and a nanosize range (250–380 nm) with a negative surface charge. Drug loadings of the prepared particles were 1.5%±0.02% weight/weight (w/w), 2.68%±0.5% w/w, 4.09%±0.2% w/w, 8.50%±0.58% w/w for NP1–NP4, respectively. A sustained drug release pattern was observed from the nanoparticles and they were internalized well in the PC3, LnCap, cancer cells on a concentration dependent manner. Drug loaded nanoparticles were found to be more cytotoxic than the free drug and the cellular internalization was observed in PC3, LnCap cancer cells *in vitro*. Further the prepared nanoparticles will be conjugated with suitable ligand for the site-specific targeting to the prostate cancer cells *in vivo*. Thus, the formulation might be suitable for the effective treatment of prostate cancer.

Biography

Ashique Al Hoque is a research fellow and pursuing his Ph.D in Department of Pharmaceutical Technology, Jadavpur University, India. He has completed his master's degree in Medicinal Chemistry from Aliah University, India. He has very good knowledge of Medicinal Chemistry, QSAR, Pharmacology, Pharmacognosy, Biotechnology, Biochemistry, Pharmacokinetics, Pharmacodynamics, Toxicology etc. Currently he is working on a project entitled "Development and characterization of ligand conjugated biodegradable polymeric nanoparticles system for targeted prostate cancer therapy: *in vitro* and *in vivo* study".

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