

Development of aptamer conjugated nanoliposomal flavonoid: A novel therapeutic approach to treat hepatocellular carcinoma

Moumita Dhara

Jadavpur University, India

Hepatocellular carcinoma (HCC) is one of the major causes of cancer related death globally. Successful treatment of liver cancer remains a formidable challenge in modern drug development due to sub-therapeutic permeation of conventional chemotherapeutics to the proper site of action along with its toxic side effects. Ligand conjugated nanoliposomes are an emerging formulation in the treatment of cancer. Flavonoids are abundantly present in fruits and vegetable are believed to carry preventive and therapeutic potential against cancer. Here we have optimized the aptamer conjugated nanoliposomes which is encapsulated with a bio-flavonoid and we studied its preferential uptake and efficacy on liver cancer. Various physicochemical and biopharmaceutical characterization studies such as drug-excipients interaction, surface morphology, energy dispersive X-ray analysis, zeta potential, *in vitro* drug release and cytotoxicity along with cellular uptake were conducted. Drug loaded nanoliposomes (D-NL) and aptamer conjugated drug loaded nanoliposomes (D-NL-A) showed 3.51±0.26% and 3.23±0.05% drug loading values, respectively. Average diameters (z-average) of the nanoliposomes were within 100 nm; it was also showed negative zeta potentials along with smooth surface and intact lamellarity. Predominant uptake of both the types of nanoliposomes was visualized. *In vivo* pharmacokinetic and biodistribution study in swiss albino rats showed that the drug availability significantly increased in carcinogenic liver upon (D-NL-A) treatment in comparison with free drug and (D-NL). Ligand conjugated nanoliposomal drug delivery substantially controlled the severity of hepatocellular carcinoma and could be a future hope for lingering the survival in hepatic cancer patients.

Biography

Moumita Dhara has four years of research expertise in development of novel drug delivery system with its physical and molecular pharmacological characterization of different nanoformulations upon cancer therapy. Additionally had a previous five years of pharmaceutical industrial experience in product development and regulatory field. Completed Masters in Pharmacology and presently pursuing PhD in Pharmacy in Jadavpur University, Kolkata, India.

moumitadhara@yahoo.com