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Lipid-based vesicular nanodrug carriers encapsulating a plant-derived anticancer agent showed successful blood-brain barrier permeation and retention in rats: A strategy for the effective treatment of glioma

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Effective management of brain related ailments continues to be the challenging area in neuroscience research. Lipid based nanosize carriers owing to their structural uniqueness possess the ability to cross blood-brain barrier (BBB); the major hurdle for the successful transport of therapeutic agents into brain. The present study aimed for the development of a phospholipid based nanosize carrier encapsulating a plant derived therapeutic agent and investigation of its BBB crossing potential *in vivo*. The optimized formulation had a size range between 20-50 nm with smooth surface morphology. The formulation showed a narrow size distribution pattern with nearly 8% drug loading capacity. Cryo-transmission electron microscopy study revealed stable formation without any perforation on the outer surface. A sustained drug release profile was observed for the experimental formulation up to 24 hours study period. Pharmacokinetic and biodistribution data showed an enhanced residence time of the experimental nanocarrier in brain as compared to the free drug. Gamma scintigraphy studies clearly evidenced an efficient permeation of the nanocarriers through the BBB, as compared to the free drug. Further investigations are warranted to establish its future use in clinical practice.

Biography

Bhabani Sankar Satapathy has 6 years of experience in drug delivery research. He has worked as a Senior Research Fellow in the Dept. of Pharm. Tech., Jadavpur University, India under DST/Inspire fellowship, Govt. of India. His basic research area includes novel approaches like nanoparticles, nanosclae liposomes for targeted drug delivery in the treatment of various cancers like breast and liver. Currently, his research focuses on the brain targeted nanodrug delivery systems for treatment of brain cancer.

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