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DEVELOPMENT OF FOLATE CONJUGATED SOLID LIPID NANOPARTICLE OF PACLITAXEL FOR SELECTIVE TARGETING OF FOLATE RECEPTOR OVER EXPRESSED LUNG SQUAMOUS CARCINOMA CELL

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Cancer is a leading cause of death worldwide and 1.59 million deaths due to the lung cancer till 2016 as stated by World Health Organization. Indian Council of Medical Research (ICMR) stated that India is likely to have over 17.3 lakhs new cases of cancer and over 8.8 lakhs deaths till 2020 with cancers of breast, lung and cervix. Currently more than 10 lakhs new patients are confirmed to have cancer on biopsy every year in India and our citizens are facing a tremendous increase in the projected incidence of various cancers. The overall survival rate in last five years has around 17% with the presented chemotherapy, so emphasizing the need for more effective and novel therapeutic strategies. The objective of this study is to develop folate conjugated paclitaxel (PTX) encapsulated solid lipid nanoparticle (FSLNs) for the lung squamous carcinoma cells targeting. It may improve targeting propensity as well as enhance bio-distribution and pharmacokinetic properties of drugs. Solvent evaporation exploiting hot homogenization method was employed for the preparation of FSLNs. FSLNs has characterized for particle size, polydispersity index, zeta potential, entrapment efficiency and drug loading capacity. The FSLNs had shown particle size 231.11±2.3nm by TEM. FSLNs have shown improved entrapment efficiency and drug loading capacity. The hemolytic study stated that FSLNs have reduced blood toxicity in comparison to PTX-SLNs and paclitaxel drug solution (PS). The cell uptake study has shown higher accumulation of FSLNs in lung squamous carcinoma cell. Ex-vivo study has confirmed the reduce GI50 of FSLNs in comparison to paclitaxel solution (PS) evaluated by SRB assay. A momentous improvement of drug concentration was found in the carcinogenic squamous cells through FSLNs. The results concluded that the FSLNs are safe, stable and potentially promising drug delivery system for lung targeting.