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Preparation and characterization of efavirenz loaded liposome

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Antiretroviral therapy remains the common and effective means of managing the human immune deficiency virus/acquired immune deficiency syndrome (HIV/AIDS). But its application is being hampered by several factors including poor bioavailability of most of the anti-retroviral drugs (ARVs), which results in several side effects as well as an alarming emergence of drug resistant strains. In recent developments, the use of drug delivery systems (DDS) has shown great potential for improving the pharmacological profiles of ARVs. The liposome being the most clinically successful DDS, and yet frequently explored for ARVs delivery, we have aimed at exploring efficient encapsulation of efavirenz (EFV), which is one of the potent (ARVs) using different mass ratios of crude soybean lecithin and cholesterol. The EFV-loaded liposomes (EFL) were prepared using thin film hydration method, and evaluated for particle size, zeta potential (ZP) using the dynamic scattering equipment (DLS), encapsulation efficiency (EE%), morphology and drug release studies was carried using transmission electron microscopy (TEM) and high performance liquid chromatography (HPLC) respectively. Differential scanning calorimetry (DSC), X-ray diffraction (XRD), energy dispersive spectroscopy (EDS) and Fourier transform infrared (IR) were used for comprehensive physicochemical characterization of EFL. The encapsulation of efavirenz using soybean lecithin demonstrated high encapsulation efficiency with well acceptable particle size within the nano range for antiretroviral drug delivery. The release profile showed diffused and prolonged release from the liposome when compared with the pure drug. This thereby, suggests use of soybean lecithin which is cheap and readily available for drug encapsulation for potential and effective drug delivery to minimize side effects and increase bioavailability and solubility of the drugs.

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