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Fomulation of rhodamin B-containing catanionic vesicles: a new class of pharmaceutical vesicles

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Background and Aims: Catanionic vesicles (CAVs) can be formed from cationic and anionic surfactant aqueous mixtures, in which the counter-ions are present and have high potential in drug delivery applications. In this research the preparation and characterization of model compound, rhodamin B-, containing vesicles have been evaluated.
Methods: Equimolar percents of cetyltrimethylammonium bromide (CTAB) and sodium lauryl sulfate (SLS) in deionized water were turned to a milky suspension which was filtered to achieve catanionic amphiphiles. Rhodamine B CAVs were prepared by film hydration method at 60°C. Vesicular diameters were measured by Malvern Particle Size Analyzer. Encapsulation efficiency (EE) of rhodamin was calculated by fluorescence spectroscopy. The release profiles of rhodamin from different formulations were studied by using Franz diffusion cells.
Results: Multi-lamellar vesicles (MLVs) were formed in the presence of 30, 40 or 50% mole percent of cholesterol. Rhodamin B was encapsulated in vesicles more than 60% which the EE was increased as cholesterol content was augmented. The release data were best fitted with diffusion-based models such as Baker and Lonsdale ones. The formulations were stable at least for 6 months stored in 4-8°C.
Conclusions: Catanionic vesicles have good stability, low cost, high encapsulation efficiencies for small water-soluble molecules and diffusion-based mechanism for release of entrapped molecules. All the presented characteristics make this type of vesicular systems as good candidates for drug, gene and vaccine delivery.

Keywords: Release; Rhodamin B; Catanionic vesicles