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Preparation of Urea-containing stable plurilamellar Liposomes and studying the effect of Cholesterol on their encapsulation efficiency and release rate

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Abstract:

Liposomes have attracted much attention as a novel drug delivery system for controlled and/or targeted release of drugs. In reverse-phase evaporation, which is a well-known method of preparation for LUVs and SPLVs, the phospholipid concentration affects the preparation process, as well as characteristics of the resulting liposomes. Drug release rate from liposomes depends on permeability of the liposomal membranes. Cholesterol (CH) is quite often included in liposomal membranes to reduce their permeability to water-soluble molecules. In this study, the required concentration of the phospholipid Ovotin® 160 (O160) for the preparation of urea-containing stable plurilamellar vesicles, and the effect of different percentages of cholesterol on the encapsulation parameters and release rate of urea as a water-soluble model drug were investigated. The results show that there is a critical concentration of the phospholipid, under which the capability for the formation of a stable emulsion (in the emulsification part of the preparation process) sharply decreases. The release rate and encapsulation parameters increased when the molar ratio of cholesterol to O160 was 5% and decreased with the ratios of 50% and 100%. Therefore, in preparation of the optimum samples a balance between the encapsulation parameters as well as the release pattern should be considered carefully.

Keywords:

Liposome ، SPLV ، Release rate ، Encapsulation efficiency ، Urea

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