

## ROLE OF CHOLESTEROL IN MODIFYING THE PHYSICAL AND STABILITY PROPERTIES OF LIPOSOMES AND IN VITRO RELEASE OF VITAMIN B12

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### Abstract

*Cholesterol has garnered significant attention in research due to its role in both the structure and the fluidity/rigidity of phospholipid membranes. This property makes it an essential component in liposome formulation. Finding the right ratio of phospholipid-to-cholesterol is important for making a liposome formulation that is stable and works well. This study involved the investigation of various mass ratios between phospholipid and cholesterol. The resulting formulations were characterized in terms of mean particle size, size distribution, and  $\zeta$  potential. It was observed that as the cholesterol content increased, the mean particle size also increased, with the stability of the suspensions improving up to a certain point, after which stability decreased. The optimal phospholipid-to-cholesterol ratio of 5:1 was identified and chosen for subsequent studies on the encapsulation of vitamin B12. The vitamin was successfully encapsulated in the liposomes (37%), and the controlled release of vitamin B12 under gastrointestinal conditions was demonstrated using the liposomes as a carrier.*

**Keywords:** *cholesterol; liposome; phospholipid; vitamin B12; controlled release.*