INFLUENCE OF LIPOSOME SURFACE PROPERTIES ON LIPOSOME-ERYTHROCYTES INTERACTIONS

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Lipid aggregates are used as carriers for macromolecules, toxic drugs and DNA in gene therapy [Torchilin, V.P. Nat. Rev. Drug Discov. 4 (2005) 145]. In order to fulfill its functions, aggregates should possess some specific properties that ensure efficient delivery of their cargo to the desired location. One of such property is aggregate stability in blood necessary for their accumulating in the targeted tissue. Several factors may affect this stability: enzymatic activity, response of immunological system and nonspecific lipid exchange between liposome aggregates and surrounding cells. Because blood cells consist mainly of erythrocytes, their interactions with liposomes should be carefully analyzed. A stopped-flow method was used to evaluate the lipid exchange between liposomes and erythrocytes. Liposomes containing toxic cationic lipid mixed with different lipids were examined. The extend of lipid exchange was measured in terms of the toxicity of cationic lipid (DOTAP), evaluated by changes in the plasma membrane mechanical properties. Several mixtures of different lipids were investigated, including PC, PE, SM and cholesterol. It has been shown that when liposomes were formed from DOTAP/SM mixtures their stability was superior to that with other lipid compositions [Wojewodza, J. et al. Chem. Phys. Lipids in press].

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