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The Study of Lipid-Based Nanodis as a Novel Carrier for Hydrophobic Cargo YING LIU[1], MU-PING NIEH[2], Chemical, Materials and Biomolecular Engineering, University of Connecticut, HYUNSOOK JANG, Polymer Science, University of Connecitcut, YIKE HUANG, YONG WANG, Chemical, Materials and Biomolecular Engineering, University of Connecticut
— Monodispersed nanodiscs can be self-assembled in an aqueous mixture of 1,2-dipalmitoyl-sn-glycero- 3-phosphocholine (DPPC), 1,2-dihexanoyl-sn-glycero-3-phosphocholine (DHPC) and 1,2-dipalmitoyl-sn-glycero-3-phospho- (1'-rac-glycerol) (sodium salt)(DPPG) and 1,2-distearoyl-sn-glycero- 3-phosphoethanolamine-N-[methoxy(polyethylene glycol)-2000] (ammonium salt) (PEGylated DSPE). The stability of discs and the effect of polyethylene glycol (PEG), including molecular chain length and concentration, on the disc morphology are characterized by dynamic light scattering, negative staining transmission electron microscopy and small angle neutron scattering. Fluorescent Spectroscopy is used to study the loading capacity of a hydrophobic dye, Nile red entrapped in the nanodiscs. The exchanging of Nile red between discs will be correlated with the release of hydrophobic molecule. In-vitro studies indicate that the non-specific binding of these Nile-red loaded nanodiscs to the CCRF-CEM cells is greatly reduced upon the addition of PEGylated DSPE. The system has a potential application of delivering hydrophobic molecules. The incorporation of targeting molecules with the nanodiscs is also investigated.

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