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Structural modification of unilamellar and multilamellar vesicles in the presence of vitamin D[1] A. DEVARAJAN, Y. A. RAOUF, S. RASHID, Khalifa University, Abu Dhabi, UAE, R. L. LAW, Imperial College, London, UK, V. STOJANOFF, BNL-NSLS-II, A. F. ISAKOVIC, D. L. GATER, Khalifa University, Abu Dhabi, UAE — Chronic vitamin D deficiency is increasingly associated with a range of health conditions, such as cardiovascular disease, diabetes and certain cancers. Our report contributes to a mechanistic understanding of these associations. Vitamin D is a lipophilic compound that is synthesized in the skin by the action of UV light on 7-dehydrocholesterol and obtained from dietary sources. We look at how vitamin D could be extracted from either skin membranes or therapeutic liposomes and transported through the body by its associated proteins. A variety of physical techniques (FTIR, DLS, UV-Vis spectroscopy, NMR, XRD) are brought to investigate: (a) the behavior of vitamin D in model membranes, and (b) the effect of vitamin D-associated proteins on membrane structure. Our results include: (1) vitamin D can be incorporated into DOPC membranes up to 40mol% with only minor changes in the dynamics of the lipid acyl chains; (2) liposomes containing larger quantities of vitamin D may have reduced stability over time; (3) the vitamin D binding protein and the vitamin D receptor do associate with and alter the behavior of model membranes, including systems that do not contain vitamin D.

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