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Ergosterol and Stigmasterol Interact with Phosphatidylcholine Lipid Bilayers Less Favorably Than Cholesterol SERKAN BALYIMEZ, JUYANG HUANG, Texas Tech University — The maximum solubility of sterol in a lipid bilayer is the highest mole fraction of sterol that can be incorporated into a lipid bilayer before sterol precipitates from the bilayer to form crystals. A higher maximum solubility indicates more favorable interactions between the sterol and lipid bilayer. In this study, the maximum solubilities of ergosterol and stigmasterol in DOPC and DSPC lipid bilayers were measured using light scattering and further confirmed using optical microscopy. We found that correlation function of scattering intensities from two independent detectors can be used to sensitively determine the solubility limits of sterols. The validity of our new technique was confirmed by measuring the solubility limit of cholesterol in DOPC and DPPC lipid bilayers. We found that the maximum solubilities of ergosterol and stigmasterol are higher in PC lipid bilayers with saturated chains (DSPC) than that in PC bilayers with unsaturated chains (DOPC). Compared with cholesterol, ergosterol and stigmasterol both have much lower solubility limits in PC lipid bilayers. Our results suggest that minor differences in sterol structure could result in large differences in sterol-PC interactions.

Serkan Balyimez
Texas Tech University

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