Conformational Control by Membrane of Biliverdin Dimethyl Ester Incorporated into Liposomes, Fluorescence and Membrane-Induced Circular Dichroism

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Biliverdin dimethyl ester (BVE) has been incorporated into liposomes. Fluorescence of BVE was strongly enhanced in the membranes over that in ethanolic solution(1), which can be attributed to a decrease in the rate of radiationless relaxation processes in the highly ordered molecular environment of the membranes. When the incubation of BVE was carried out at room temperature without external perturbation, a long-wavelength emission (λ^{em}_{max} > 700 nm), attributed to helically coiled conformations (s), predominated initially in all cases. It persisted in the gel-type liposomes composed of dimiristoyl,dipalmitoyl, and distearoyl lecithine, but changed on standing in the more fluid liquid-crystalline liposomes formed from dioleoyl and egg yolk lecithine to a shorter-wavelength emission (λ^{em}_{max} = 660 nm), attributed to stretched conformation (s). The same irreversible change could also be effected by heating to > 55 °C by sonication of the BVE-containing liposomes, and when these liposomes were prepared by cosonication of BVE and lipid.

The incorporation of helically coiled BVE into the liquid-crystalline liposomes and their conformational stretching with time could also be followed by circular dichroism induced by liposomes of optically active phospholipids.