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Permalink

<https://escholarship.org/uc/item/6j04d71f>

Journal

BIOPHYSICAL JOURNAL, 64(2)

ISSN

0006-3495

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Publication Date

1993-02-01

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Peer reviewed

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Effect of cholesterol on phospholipid phase domains as detected by Laurdan generalized polarization.

37th Annual Meeting of the Biophysical Society, Washington, DC, February 1993.

Biophys J. 1993; 64(2 Pt 2): A72, M-Pos284.

Abstract

Spectroscopic properties of 2-dimethylamino-6-lauroylnaphthalene (Laurdan) have been used to detect phospholipid gel and liquid-crystalline phase domains coexistence in liposomes where phase segregation is known to occur. In vesicles composed of equimolar DLPC and DPPC at 20C, Laurdan Generalized Polarization (GP) values show a characteristic behavior as a function of wavelength. GP values increase with the increase of excitation wavelength and decrease with the increase of emission wavelength. In pure gel phase, GP values do not show any relevant dependence on wavelength while in pure liquid-crystalline phase the behavior of GP values is opposite than that observed in the presence of domain segregation. The addition of 30 mol% cholesterol to the equimolar mixture of phospholipids renders the excitation and emission GP spectra similar to those obtained in pure liquid-crystalline phospholipids but with higher absolute values.