

# Organisation of Xanthophyll-Lipid Membranes Studied by Means of Specific Pigment Antisera, Spectrophotometry and Monomolecular Layer Technique Lutein versus Zeaxanthin

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The structure of the xanthophyll pigments lutein and zeaxanthin differs in the position of one double bond and refers to one of the ionon rings. Specific antibodies to zeaxanthin were used to analyse the localisation and orientation of these two xanthophyll pigments in lipid membranes formed with egg yolk lecithin. Bimolecular and monomolecular layers were used. Antibody-antigen interaction was demonstrated and analysed by the bathochromic shift of the absorption spectra of both pigments and by the increase of light-scattering of the pigmented liposome suspension. It appeared that the extent of the spectral effects accompanying the interaction of the antiserum to zeaxanthin, injected to the liposome suspension which was pigmented with either zeaxanthin or lutein, was different in spite of their similar molecular structures. The results are interpreted in terms of a localisation and distribution of lutein, in the hydrophobic phase of liposomes within two essentially different pigment pools, one oriented horizontally and the other vertically with respect to the membrane plane. This interpretation is supported by the analysis of isotherms of the compression of monomolecular layers of lutein and zeaxanthin formed at the air-water interface and of mixed xanthophyll-lipid monolayers as well as by analysis of the penetration of antibody proteins dissolved in the subphase into the mixed xanthophyll-lipid films.