

Structure and Dynamics of Glycophorin-A Containing Dimyristoyllecithin Vesicles

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Glycophorin-A has been incorporated into dimyristoyllecithin (DML) vesicles in the concentration range of 0.1 % to 5 %. A separation into a rigid and a fluid protein-containing phase at 19   C could be determined by freeze-etching electron-microscopy. For a lipid:protein ratio of 3500:1 the translational diffusion coefficient of fluorescein-labelled glycophorin was obtained by fluorescence recovery after photobleaching. The diffusion coefficient increased by about two magnitudes of order from $5 \times 10^{-11} \text{ cm}^2/\text{sec}$ below 15   C to $1 - 2 \times 10^{-8} \text{ cm}^2/\text{sec}$ above 15   C.

The temperature dependence of the order parameter of 3 % spin-labelled lecithin in DML showed the occurrence of an additional phase-transition at about 14   C for glycophorin-concentrations below 1 %.

The diffusion coefficient of the lipid was measured by eximer formation of 1-palmitoyl-2-pyrendecanoyllecithin. It increased by about 20 % from 0 to 0.75 % glycophorin. On the basis of the experimental results a model for the structure of the lipid-protein-complex is proposed.