Measurements of lateral motion of Glycophorin A reconstituted in liposomes of Dimyristoylphosphatidylcholine.

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Lateral mobility of fluorescence-labelled protein Glycophorin A incorporated in large (20-50µm Ø) pancilamellar liposomes was determined by fluorescence recovery after photobleaching method (FRAP) in the concentration range of 0,05 m mol to 5 m mol protein/mol DMPC over a temperature interval from + 2°C to + 30°C. For characterizing the state of mobility the relative mobile fraction R of protein and the coefficient of lateral diffusion $D_p^{\perp}$ of the mobile fraction was determined. In each case "cooling" and "heating" curves are derived. The most important observations are the following:

1) The temperature-dependence of $D_p^{\perp}$ and R is not the same during heating and cooling the liposomes.

2) At all concentrations the lipid main-transition (chain melting) is not accompanied with transitions in the values of $D_p^{\perp}$ or R. On the other side, pretransition of lipids clearly is the determining factor for variations in $D_p^{\perp}$ and R at concentrations $\leq$ 1 m mole protein/mole lipid.

3) The examined range of concentrations is divided in three intervals of C:

   0 - 0,8 m mole / 0,8 - 4 m mole / > 4 m mole protein

   related to one mole of lipid.
   Furthermore there are at least two well-distinguished concentrations: 0,3 m mole and 0,8 m mole protein / mole lipid.

   The complex behaviour of $D_p^{\perp}$ and R is explained by long-ranging lipid-mediated protein-protein-interaction and in terms of different protein aggregation states as a consequence of this interaction.

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