

# The Influence of Liposomal Preparation on the Interaction between $\alpha$ -Lactalbumin ( $\alpha$ -LA) and Dimyristoylphosphatidylcholine (DMPC)

F.H. Van Cauwelaert, I. Hanssens and W. Herreman

Interdisciplinary Research Center, K.U. Leuven campus Kortrijk  
B-8500 Kortrijk, Belgium

Recently Sherphof et al. (1) and Morrisett et al. (2) have shown that multilamellar vesicles are less susceptible to lipoprotein attack than are unilamellar vesicles. We studied therefore the influence of the liposomal preparation on the interaction between  $\alpha$ -LA and DMPC. Microcalorimetric and fluorescence data of this system have been obtained earlier (3). We did the following observations when measuring the enthalpy of binding  $\Delta H$  between  $\alpha$ -LA and DMPC: 1) when 4 ml  $\alpha$ -LA (0,5 mg/ml) interacted with 2 ml sonicated DMPC-vesicles (4,5 mg/ml),  $\Delta H$  as a function of sonication time reached a maximum negative value after 10 min sonication. 2) With sonicated unilamellar vesicles  $\Delta H$  f(T) reached a maximum negative value around 23°C-24°C, the transition temperature of DMPC. Above and under 23°C,  $\Delta H$  was less negative. 3) With multilamellar liposomes  $\Delta H$  is negative above 23°C, but less than with unilamellar vesicles. However, at 23°C and below  $\Delta H$  is positive (endothermic binding process). Fluorescence spectra obtained in the same experimental conditions, show a decrease of the  $\alpha$ -LA tryptophan fluorescence intensity when mixed with DMPC below 23°C. This quenching of the fluorescence is probably the result of a molecule contraction during the initial phase of penetration of  $\alpha$ -LA in the multilayered liposome. At and above 24°C, however, an increase in fluorescence intensity is observed which is smaller than with vesicles, suggesting a similar but less effective behavior as with vesicles.

1. Sherphof, G., Morselt, H., Regts, J. and Wilschut, J.L. (1979) *Biochim. Biophys. Acta*, 556, 196 - 207.
2. Morrisett, J.D., Pownall, H.J. and Gotto, A.M. (1977) *Biochim. Biophys. Acta*, 486, 36 - 46.
3. Hanssens, I., Houthuys, C., Herreman, W. and Van Cauwelaert, F. (1980) *Biochim. Biophys. Acta* in press.