

THE EFFECT OF ALKYLRESORCINOLS ON BILAYER PHASE TRANSITION

MARIA STASIUK^{1*}, MICHAŁ KUŹDŹAŁ¹, ANDRZEJ HENDRICH²
and ARKADIUSZ KOZUBEK¹

¹Department of Lipids and Liposomes, Institute of Biochemistry and Molecular Biology, University of Wrocław, Przybyszewskiego 63/77, 51-148 Wrocław, Poland, ²Department of Biophysics, Wrocław Medical University, Chałubińskiego 10, 50-368 Wrocław, Poland

Resorcinolic lipids, the natural amphiphilic long-chain homologues of orcinol (1,3-dihydroksy-5-methylbenzene) were demonstrated in numerous plants, microbial and fungal organisms [Kozubek, A. and Tyman, J.H.P. **Chem. Rev.** 99 (1999) 1]. They exhibit strong amphiphilic character with the values of octanol/water partition coefficient ($\log P_{o/w}$) over 7.4 [Kozubek, A. **Acta Biochim. Polon.** 42 (1995) 247] and show high affinity for lipid bilayer as well as for biological membranes. The incorporation of homologues into liposomal and biological membranes induces the increase of their permeability for small nonelectrolytes and cations [Kozubek, A. and Demel, R.A. **Biochim. Biophys. Acta** 603 (1980) 220]. This increase of the permeability of membranes may result in formation within the bilayer of the non-bilayer structures, such as reversed micelles or hexagonal phase (H_{II}) [Kozubek, A. and Demel, R.A. **Biochim. Biophys. Acta** 642 (1981) 242] and often results in the haemolysis of the cells. The effect of alkylresorcinol homologues on phase transition was studied by differential scanning calorimetry (DSC). Liposomes composed of various types of alkylresorcinols and DPPC (dipalmitoylphosphatidylcholine) or DSPC (distearoylphosphatidylcholine) were prepared by varying the amount of alkylresorcinols. The effect of alkylresorcinol on the phase transition temperature of liposomal membrane from gel to liquid crystalline state and phase separation of membrane constituents depends both on alkyl chain length of alkylresorcinol and its membrane concentration.

*E-mail: stasiuk@ibmb.uni.wroc.pl