

**The thickness of phospholipid bilayer in unilamellar liposomes: small-angle neutron scattering using contrast variation**

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The thickness of the lipid bilayer in extruded unilamellar liposomes prepared from the diC<sub>n:1</sub>PC (n=14-22) homologues was studied at 30°C using the contrast variation technique in the SANS. Different contrasts between the scattering density of bilayer and solvent were reached by varying H<sub>2</sub>O/D<sub>2</sub>O ratio of water solvent. The experimental data were evaluated using the small-angle form of Kratky-Porod approximation  $\ln[I(q)q^2]$  vs.  $q^2$  of the SANS intensity  $I(q)$  in the appropriate range of scattering vector values  $q$  to obtain the bilayer radius of gyration  $R_g$  at several contrasts. The thickness parameter was then evaluated from  $R_g$  extrapolated to the infinite contrast without making any assumptions about bilayer structure [1]. We compared these results also with results from evaluation based on fitting whole scattering curves at different contrasts simultaneously, employing very realistic model of phospholipid bilayer developed recently [2]. The dependence of the thickness parameter  $d_g \cong \sqrt{12}R_g$  on the number of n of acyl chain carbons was found to be linear with the slope  $1.8 \pm 0.2$  Å per one acyl carbon. This slope can be used in bilayer-protein interaction studies. The project was supported by the European Commission through the Access to Research Infrastructures Action of the Improving Human Potential Programme (contract HPRI-CT-1999-00032).

[1.] J. Penczer, XII International Conference on SAS, Venice 2002.

[2.] N. Kučerka, J. Nagle and P. Balgavý, Phys Rev E (in preparation).