

**PROPERTIES OF DOTAP-CONTAINING LIPOSOMES –
FLUORESCENCE STUDIES**

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Positively charged lipids are commonly used for transfection in genetic studies and in the treatment of both genetic and acquired diseases. The structure and properties of complexes of nucleic acids and mixtures of cationic and neutral lipids have been extensively investigated. No fully satisfactory description, however, of the interactions between the compounds of such lipoplexes has been published yet. In this work the structure and properties of cationic liposomal membrane composed of positively charged DOTAP and the zwitterionic DOPC or DOPE, as helper lipids, were studied by various fluorescence methods. The solvent relaxation technique, based on time-resolved emission spectra (TRES) reconstruction, was employed to evaluate the data collected for four different fluorescence probes with their locations spanning the headgroup region. Three naphthalene dyes (Patman, Laurdan and Prodan) and 2-(9-anthroyloxy)stearic acid (2-AS) were used. The localization of these dyes was verified by TRES width profiles examination and by parallax quenching experiments. To probe the hydrophobic interior of the membrane, diphenylhexatriene (DPH) and its trimethylammonium- derivative (TMA-DPH) were used. Both steady state and time resolved anisotropy measurements were performed for these dyes. The results indicate that the addition of DOTAP makes the bilayer less rigid. Moreover the headgroup part of the membrane becomes also significantly more hydrated.