

RELATIONSHIP BETWEEN LIPID-BILAYER ORGANIZATION AND LATERAL LIPID-LIGAND DISTRIBUTION INVESTIGATED BY ATOMIC FORCE MICROSCOPY

Thomas Kaasgaard, Ole G. Mouritsen, Kent Jorgensen: technical university of denmark, Dept. of Chemistry, Build 206, Lyngby, 2800 Denmark

Atomic force microscopy (AFM) using a ligand-receptor (biotin-avidin) bioamplification technique has been used to investigate the lateral organization of different lipid bilayer mixtures, e.g. dipalmitoylphosphocholine-diarachidoylphosphocholine DC₁₆PC-DC₂₀PC binary lipid bilayers. The mica supported phospholipid bilayers incorporated with a low amount of biotin-labeled DC₁₆PE lipids (0.7 mol%) were prepared using Langmuir-Blodgett techniques. The lipid bilayers were scanned in contact mode before and after addition of avidin. The AFM images revealed the lateral structure of the low-temperature gel-gel phase coexistence region. Addition of avidin further accentuated the small-scale bilayer structure due to a strong binding of avidin to biotin-labeled lipids which are most likely accumulating in DC₁₆PC enriched lipid domains. Furthermore, the avidin-biotin binding assay demonstrated a pre-ferential distribution of biotin-labeled lipids in lipid bilayer defect regions.