

Posters

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Membrane mimetic bolaamphiphiles and the role of the nature of lipid chains

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Natural bolaamphiphiles, called Archaeolipids, are the constituents of membranes in Archaeobacteria, extremophile organisms that can survive in harsh environments. Extreme conditions (for humans) can be found in Arctic and Antarctic, in geysers and volcanoes, in areas of high salinity or acidity, as well as in regions of high pressure. Archaeolipids can be isolated from natural resources, usually in form of mixtures of lipids. We undertook the synthesis of a series of bolaamphiphiles in our laboratory in order to investigate the role of the nature of the hydrocarbon chain on the formation of supramolecular structures mimicking membranes. The bolaamphiphile molecules synthesized have two polar heads of natural origin: one based on sugar moiety and the other based on glycine betaine. The main chain length between two polar heads has been varied for 12, 22 and 32 methylene units. Another variation was to introduce a diacetylenic unit into the main chain in order to investigate its influence on the formation of supramolecular structures *via* the π - π stacking. Using the small and wide-angle X-ray diffraction, we could elucidate the thickness of the formed membrane layer, as well as the type of the lamellar structure formed by one type of bolaamphiphiles. The determined structures are lamellar fluid, L_{α} , lamellar crystalline, L_c , lamellar tilted, $L_{\beta'}$ and lamellar isotropic, L. We also observed an important stability of lamellar structures upon thermal cycling up to 70 °C.