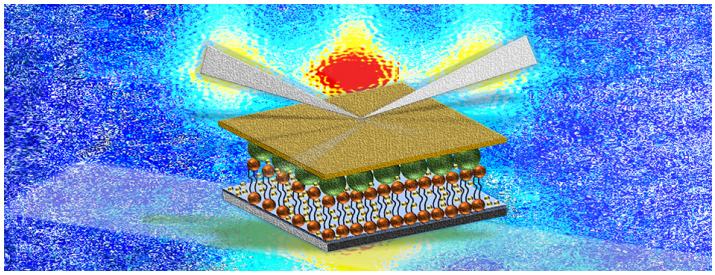

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Tuning the functionality of model lipid membrane with novel polymeric systems: a neutron scattering study

Mittwoch, 9. Oktober 2024 18:16 (7 Minuten)

The addition of synthetic polymers to lipid membranes has emerged as an effective route to modulate their properties and support them in performing biological functions [1]. The presence of polymers in the bilayer can alter the ordering and flip-flop activity of lipids, thus facilitating membrane permeation. In special cases, the addition of selected polymers results in membrane fracturing and the formation of peculiar structures (nanodiscs) that find useful applications for membrane proteins (MPs) handling in solution [2]. Despite the considerable fundamental and applicative interest, the molecular interactions between synthetic polymers and biological interfaces are yet not fully understood, and a rationale is lacking in the design of polymer structures aimed at supporting specific membrane tasks.
In this work, we investigate model lipid membranes as platform for the insertion of a novel class of polymers (alternating amphiphilic polymers or AAPs [3]) featuring unique characteristics and combining high chemical malleability with bio-compatibility, which make them a promising tool to investigate polymer-membrane interactions and optimize membrane activities. The structural modifications induced by the polymers have been investigated by experimental techniques including small-angle neutron scattering (SANS) and neutron reflectometry.

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