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2D Fluidization of Nanomaterials by Biomimetic Membranes
KATHLEEN KELLY, MARTIN FORSTNER[1], Physics Department, Syracuse University, Syracuse, NY, 13244 — The last decade has seen much progress in the synthesis and manufacturing of a large variety of nanometer sized particles of different materials, geometries and properties. If they can be assembled into larger structures, these manmade nano-objects are posed to be the "atoms" and "molecules" of new materials. In order to facilitate their dynamic rearrangements we have developed a method that uses material specific binding peptides to anchor nano-objects to lipids in supported bilayers (SLB). In this study we use single walled carbon nanotubes (CNT) with a mean length of 1 micrometer as model of a potential nano-building block. By fluorescently labeling CNTs we are able to use video-microscopy to investigate the dynamic behavior of membrane anchored CNTs. We show that the 2D fluidity of the lipid membrane can be successfully templated on the CNTs and that they stay laterally mobile while being confined to a plane. Furthermore, the dependence of CNT mobility on specific binding stoichiometries is discussed.

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