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**Nanoparticles induce raft formation in phospholipid liposomes**

BO WANG, LIANGFANG ZHANG, STEVE GRANICK, University of Illinois at Urbana-Champaign — Motivated by general interests in endocytosis, virus transfection and utilization of nanoparticles as cargo for drug delivery, this study focuses on the binding of nanoparticles to model lipid bilayers and the interactions between them. Exploring not only on the ensemble level, with the help of calorimetry, but also on the single-molecule level using fluorescence probes and single-molecule detection, we conclude the following. First, adsorbates capture and slave dynamically the lipids underneath, which results in lipid packing fluctuations, thereby producing rafts in the bilayers. Second, competition between neighboring particles causes further recomposition of heterogeneous lipid distribution. Bearing this insight in mind, we expect coupled motions of lipid and nanoparticles to occur, and confirm this with direct measurements. Going further, collective responses of lipid molecules cast light on the crucial role of support membranes in determining how membrane-based sensors respond to an external stimulus.

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