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Synergy of Membrane Curvature-Stabilization and Electrostatic Interaction leads to Formation of Block Liposomes by Colossal Charged Lipids ALEXANDRA ZIDOVSKA, KAI K. EWERT, CYRUS R. SAFINYA, Materials, Physics, and Molecular, Cellular and Developmental Biology Departments, University of California, Santa Barbara, JOEL QUISPE, BRIDGET CARRAGHER, CLINTON S. POTTER, National Resource for Automated Molecular Microscopy, The Scripps Research Institute, La Jolla — Recently, we have reported block liposomes (BLs), a new vesicle phase formed in mixtures of MVLBG2, DOPC and water (A. Zidovska et al., *Submitted*, 2007), where MVLBG2 is a newly synthesized highly charged (16+) lipid (K. Ewert et al., *JACS,* 2006) with giant dendrimer-like headgroup. BLs are liposomes consisting of distinctly shaped nanoscale spheres, pears, tubes, or rods connected into blocks. In this work we investigate the contribution of spontaneous curvature and membrane charge density to the formation of BLs. By comparing with a system of matching membrane charge density but zero spontaneous curvature and by screening the charge of MVLBG2 but keeping the curvature constant, we were able to identify both, spontaneous curvature and membrane charge, as critical parameters for BLs-formation. The effect of salt and pH on the shape evolution of the BLs was also carefully studied. Funding provided by DOE DE-FG-02-06ER46314, NIH GM-59288, NSF DMR-0503347.

Alexandra Zidovska
Materials, Physics, and Molecular, Cellular and
Developmental Biology Departments, University of California, Santa Barbara

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