Supporting Information

Nanomechanical Characterization of Single Phospholipid Bilayer in Ripple Phase with PF-QNM AFM

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Bilayer deposition on mica

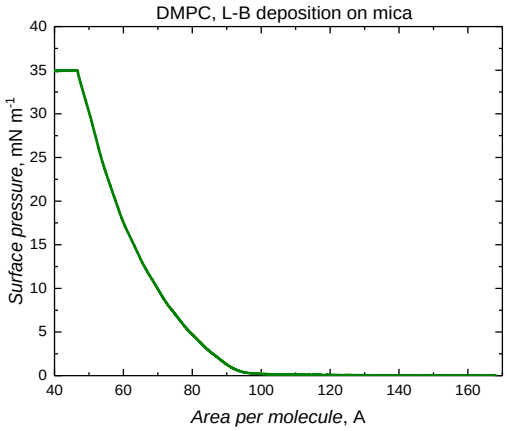
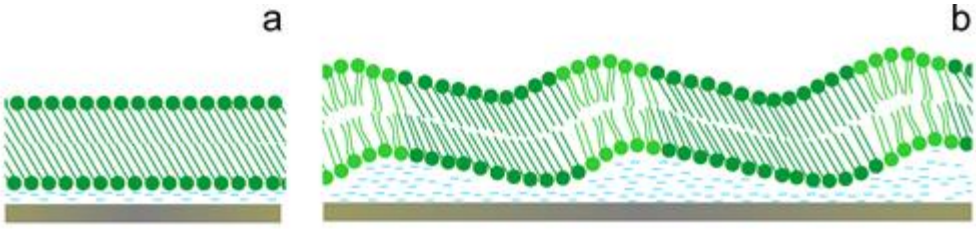


Figure S1. Surface pressure/area isotherm of DMPC spread on aqueous subphase at 21°C. The compression was stopped at 35mN m^{-1} and for this surface pressure monolayers were transferred onto the mica substrate first by LB and then LS technique.



Scheme S1. Phospholipid bilayer structure in (a) gel phase and (b) ripple phase, deposited on solid substrate. Changes in observed thickness result from rearrangement of the phospholipids and presence of corrugations.

The substrate effect correction.

The substrate effect correction takes into account the influence of a rigid substrate on the apparent stiffens of the DMPC single bilayer. The thickness of the bilayer was determined based on the topography AFM image shown in Figure S2a. The correction was performed for

the sample bonded to the substrate. All calculations were performed with the use of AtomicJ software[1].

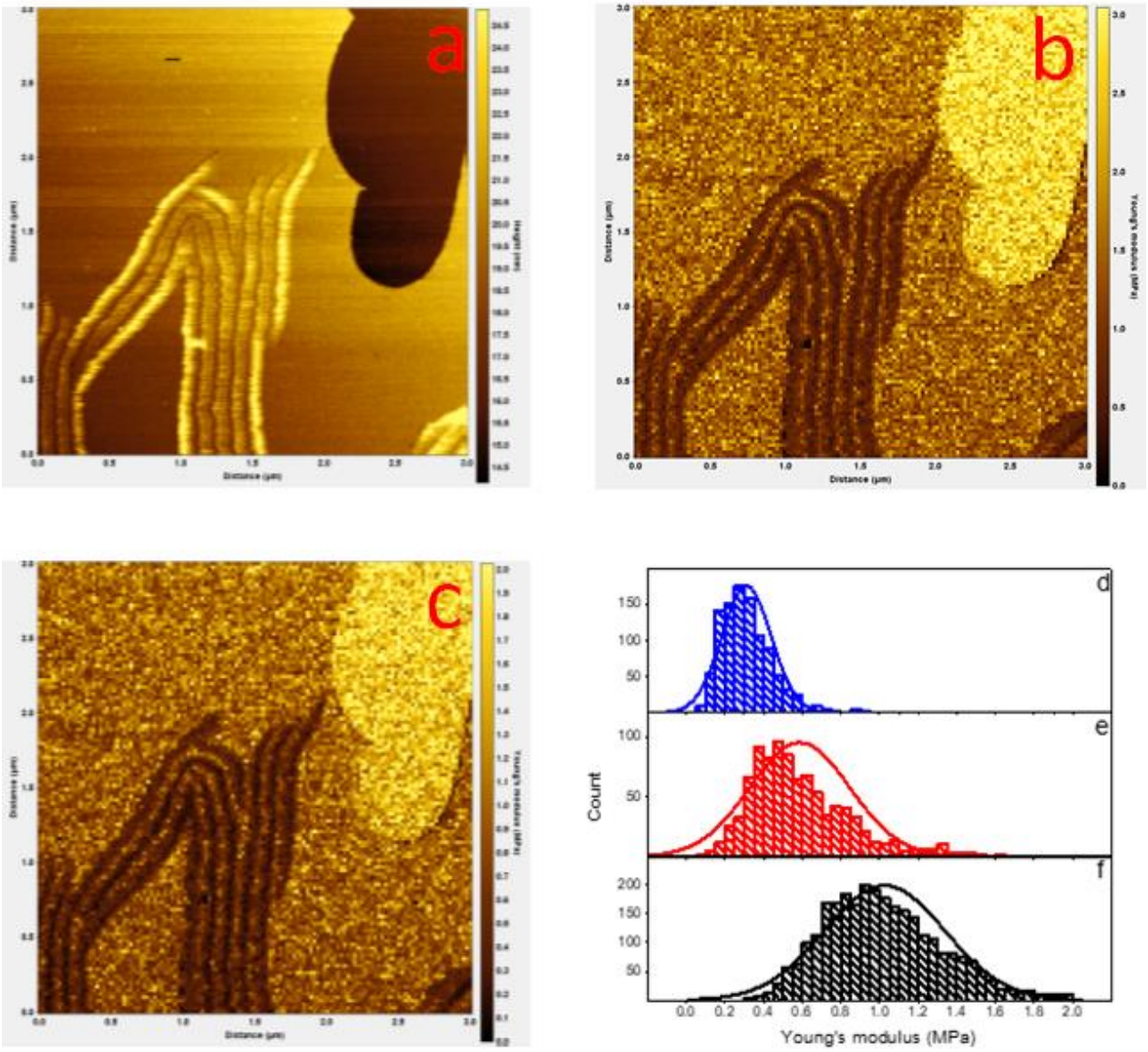


Figure S2. (a) The AFM topography image and (b, c) Young's modulus map of the DMPC single bilayer deposited on mica determined (b) without and (c) with solid substrate correction. (d, e, f) Young's modulus histograms, corresponding to the Young's modulus map shown in panel c, calculated for (d) top and (e) bottom part of the ripples as well as (f) smooth bilayer.

References

1. Hermanowicz, P., et al., *AtomicJ: An open source software for analysis of force curves.* Review of Scientific Instruments, 2014. **85**(6).