

Abstract Submitted
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***In vitro* approach to the mechanics of lipid membrane area regulation: vesicle absorption and tube formation** MARGARITA STAYKOVA, DOUGLAS HOLMES, CLARKE READ, HOWARD A. STONE — We have designed an experimental approach that allows us to study the response of supported lipid bilayers to cycles of biaxial expansion and compression. We observed that the bilayer effectively adjusts its area during dilatational or compressive strains in order to reduce its tension. For example, if there is a sufficient lipid reservoir in the form of attached vesicles, then a lipid bilayer may accommodate strains tens of times larger than the critical strain for rupture by expanding its area. Additionally, upon compression the bilayer reduces its area by expelling lipid tubes out of its plane. These observations offer new insights into how cells regulate their surface area in response to various mechanical stimuli, i.e. during physiological volume changes, locomotion, cyclic expansion and compression of the uro- and the alveolar- epithelium, etc.

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