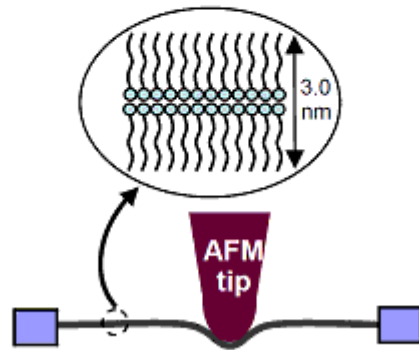
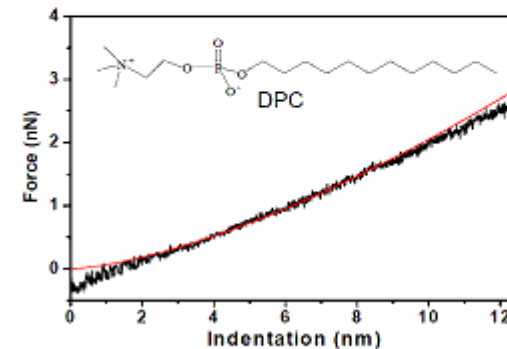


Nanomechanical Property of DFFs

Nanomechanical properties of free-standing reversed surfactant bilayers, dried foam films (DFFs), were examined via AFM by fitting local force-indentation curves with Hertzian Model. The Young's moduli of the bilayers were in a range of 10-30 MPa, showing unexpectedly-high stiffness of DFFs. The elastic moduli of DFFs are close to those of rubber and are one-tenth to one-hundredth of those of elastic polymers such as polyethylene, but much stiffer than fluid-like biomembranes. As reported previously, DFFs were very stable for the vacuum deposition of inorganic materials. The free-standing films of about 3 nm in thickness can support thick inorganic layer of 100 nm or more. The elastic moduli of DFFs demonstrated here are quite high as well as their thermal stability. This work will contribute to the understanding of molecularly thin organic films suspended in air.



Schematic of AFM measurements on DFFs



Force-indentation curve (black line) and its curve fitting by using Hertzian model (red line) of DPC film