*Elastic moduli of membranes. Excerpt from Derek Marsh’s ‘Handbook of lipid bilayers’*

Isothermal area extension modulus:

where *A* – area, ** = two-dimensional tension (mN/m)

*KA* is measured in mN/m

Dioleyl (C18) PC at 20oC 209-265 mN/m

Dioleyl (C18) PC + Cholesterol (1:1) at 22oC 600-685 mN/m

The bacterial inner membrane is not soft, so the second estimate seems adequate.

We relate 2D extension modulus to the bulk modulus:

If we divide it by the membrane thickness, we get the bulk elastic modulus

If the 2D elastic area extension modulus is 600 mN/m, we divide it by 5 nm and get the bulk elastic modulus E = 120 MPa, (it is 12x what Sai used in FEP simulations)

If area extension modulus is 300 mN/m, we get E = 60 MPa.