SMALL CELLS: CURVATURE - DRIVEN LYSIS

A FREE BILAYER EDGE COSTS ENERGY

WHAT IS THE MAXIMUM SIZE OF A DISK-SHAPED MEMBRANE?

$E_{DISK} = 2\pi R_D \lambda$ $\qquad$ $E_{SPHERE} = 8\pi\kappa_b$ + gaussian term

SPHERE PREFERRED IF

$$E_{DISK} > E_{SPHERE}$$

$$\rightarrow \quad R_D > 4\kappa_b / \lambda \qquad (1)$$

MODEL FOR MEMBRANE BENDING AT A HOLE

$$\lambda = \pi\kappa_b / 2d \qquad (2)$$

(1) + (2) GIVES

$$R_D > (8/\pi)\, d$$

THUS, CLOSED SHELLS ARE PREFERRED OVER FREE BOUNDARIES FOR $R_{DISK} > 10$ nm