MEMBRANE FLUCTUATIONS AND ENTROPIC REPULSION

y

$h(x,y)$

x

HEIGHT FLUCTUATIONS

$$2\ C_{MEAN} = - (\partial^2/\partial x^2 + \partial^2/\partial y^2)\ h(x,y)$$

$+$

$$\text{BENDING ENERGY} = 2\kappa_{BEND}\ \ C_{MEAN}^2\ dA$$

GIVES

$$\text{PERSISTENCE LENGTH} \sim$$
$$[mol.\ length]\ \exp(4\ \kappa_{BEND}\ /\ 3k_B T) \qquad \text{(HUGE)}$$

AND

$$<h^2> /\ A\ \sim\ k_B T\ /\ \kappa_{BEND}$$

THERMAL FLUCTUATIONS IN HEIGHT LEAD TO ENTROPIC REPULSION