Parameters for a cell membrane:

- $\eta = 10^{+3}\,\eta_{WATER} \cdot [\text{membrane thickness}] =$

$= 10^{3}$ mPa·s 10 nm

$= 10^{3}\, 10^{-3}\, \frac{kg}{m\,s^2}\, 10 \cdot 10^{-8}\, m$

$= 10^{-8}\, \frac{kg}{s} = 10^{-2}\, Pa\,\mu m \cdot s, \qquad (2)$

- $\sigma = 10^{-6}$ N/m =

$= .1$ Pa μm,

- the typical velocity to which one may pull a protein in a membrane is

$v \sim 10\, \frac{\mu m}{s}$,

• $K = 10 k_B T = 10 \cdot 10^{-23} \frac{Kg m^2}{s^2 K} \cdot 300 K \approx$

$\approx 10^{1-23+2} \frac{Kg m^2}{s^2},$

$= 3 \cdot 10^{-20} \frac{Kg m^2}{s^2} =$

$= 3 \cdot 10^{-20} N \cdot m = 3 \cdot 10^{-20+6} m^2 Pa \mu m$

$= 3 \cdot 10^{-20+6+2 \cdot 6} Pa \mu m^3,$

$= 3 \cdot 10^{-2} Pa \mu m^3, \leftarrow k_B T$

• $\rho_m \approx \frac{10^3 Dalton}{nm^2} = 10^{3-27+18} \frac{Kg}{m^2}$?

$= 10^{-6} \frac{Kg}{m^2} = 10^{-6} \frac{Kg m}{s^2} \frac{N}{m^3} =$

$= 10^{-6} \frac{Pa}{m} s^2 =$

$= 1 \cdot \frac{Pa}{\mu m} s^2,$

• $\tau \approx 0.01 \mu m$