



(B) model I: membrane protein allocation is held constant

$$\frac{\phi_{peri}}{\phi_{mem}} = \frac{12}{\pi(3\alpha - 1)} \frac{m_{peri}}{\rho_{prot} \phi_{mem}^* w^3}$$

constant per-cell periplasmic protein mass

constant average aspect ratio

constant allocation toward membrane proteins

model II: membrane protein density is held constant

$$\frac{\phi_{peri}}{\phi_{mem}} = \frac{m_{peri}}{2\alpha\pi\rho_{mem}^* w^2}$$

constant allocation toward membrane proteins