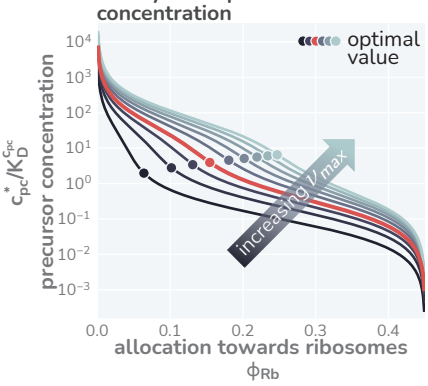
(A)

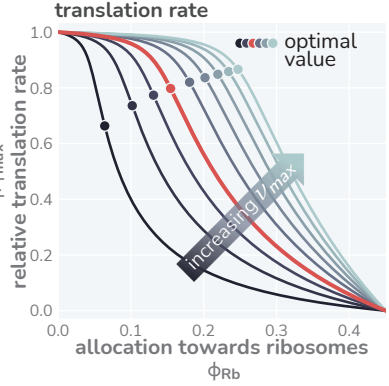


analytical solution

maximum metabolic output $N = \nu_{max}(1 - \phi_{Rb} - \phi_O)$

$$c_{pc}^* = \frac{N}{\lambda} - 1$$

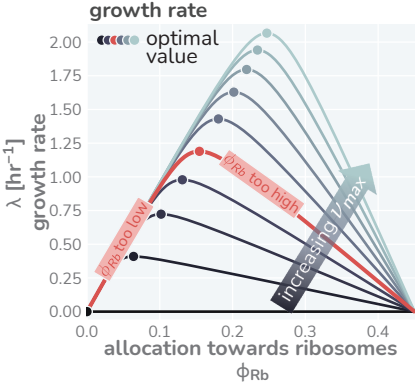
(B)



analytical solution

$$\gamma(c_{pc}^*) = \gamma_{max}\left(1 + \frac{K_M^{c_{pc}}\lambda}{N - \lambda}\right)^{-1}$$

(C)



analytical solution

maximum translational output $\Gamma = \gamma_{max}\phi_{Rb}$

$$\lambda = \frac{N + \Gamma - \sqrt{(N + \Gamma)^2 - 4N\Gamma(1 - K_M^{c_{pc}})}}{2(1 - K_M^{c_{pc}})}$$

(D)

scenario I: constant allocation

$$\phi_{Rb}^{(I)} = \text{Constant}$$

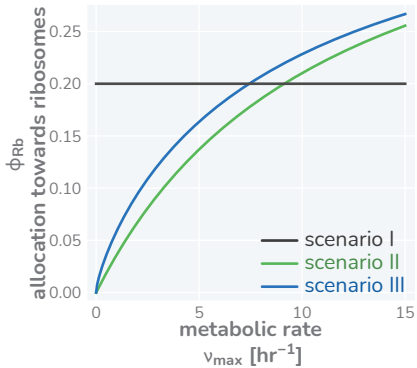
scenario II: constant translation rate

$$\phi_{Rb}^{(II)} = \frac{\nu_{max}(1 - \phi_O)(c_{pc}^* + K_M^{c_{pc}^*})}{\nu_{max}(c_{pc}^* + K_M^{c_{pc}^*}) + \gamma_{max}c_{pc}^*(c_{pc}^* + 1)}$$

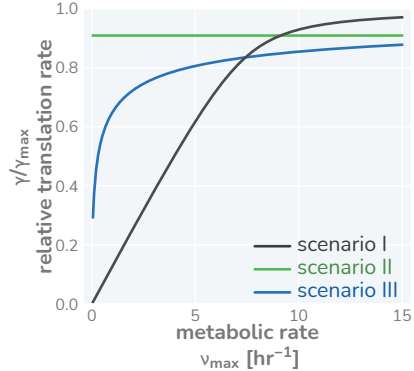
scenario III: optimal allocation

$$\phi_{Rb}^{(III)} = \frac{(1 - \phi_O)\left(\gamma_{max}\nu_{max}(1 - 2K_M^{c_{pc}}) + \nu_{max}^2 + \sqrt{K_M^{c_{pc}}\gamma_{max}\nu_{max}}(\gamma_{max} - \nu_{max})\right)}{(\gamma_{max} + \nu_{max})^2 - 4K_M^{c_{pc}}\gamma_{max}\nu_{max}}$$

(E)



(F)



(G)