

# (A) envelope growth law

average cell  
surface-to-  
volume ratio

$$\frac{S_A}{V} = \frac{\text{membrane protein allocation} \cdot \text{density ratio}}{2 \left[ 1 + \beta \phi_{Rb} - \phi_{mem} - \phi_{peri} \right]} \sim \frac{1}{w}$$

membrane protein allocation  $\phi_{mem}$  density ratio  $\kappa$

ribosomal protein allocation  $\phi_{Rb}$

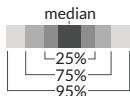
periplasmic protein allocation  $\phi_{peri}$

average cell width  $w$

## (B)

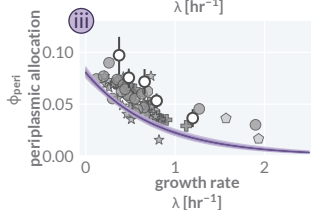
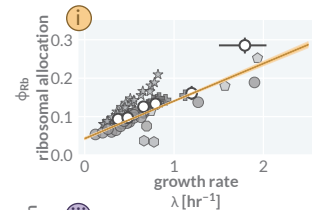
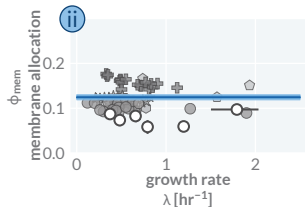
fit parameter  
credible regions

data sources

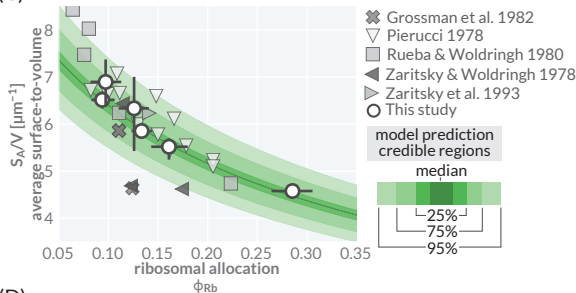


data sources

- Caglar et al. 2017
- Li et al. 2014
- Mori et al. 2021
- Peebo et al. 2015
- Schmidt et al. 2016
- Soufi et al. 2015



## (C)



## (D)

