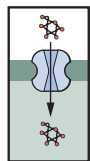


(A)

generic carbon transport

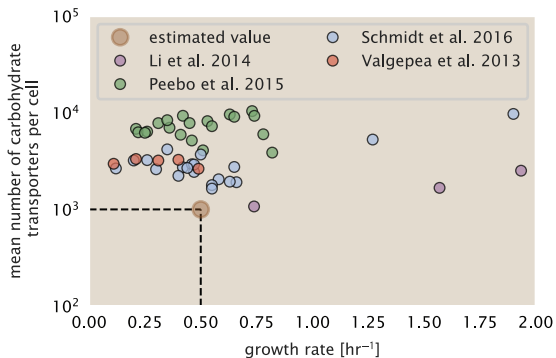


$$m_{\text{carbon}} \approx \frac{m_{\text{dry}}}{2} \approx 0.15 \text{ pg} \quad \text{BNID: 100649}$$

$$r_{\text{transport}} \approx \frac{200 \text{ sugars / sec}}{\text{transporter}} \quad \text{BNID: 103693}$$

$$N_{\text{carbon}} \approx m_{\text{carbon}} \times \frac{1 \text{ carbon}}{12 \text{ Da}} \times \frac{6 \times 10^{11} \text{ Da}}{1 \text{ pg}} \approx 10^{10} \text{ C}$$

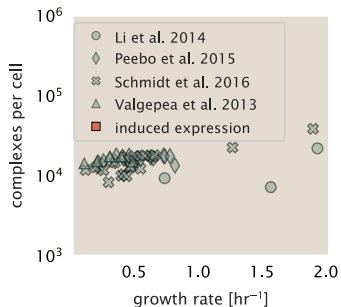
$$N_{\text{transporters}} \approx \frac{10^{10} \text{ C}}{\text{cell}} \times \frac{1 \text{ sugar}}{6 \text{ C}} \times \frac{1 \text{ sec}}{200 \text{ sugars}} \times \frac{1 \text{ cell}}{6000 \text{ s}} \approx 1000 \text{ transporters}$$



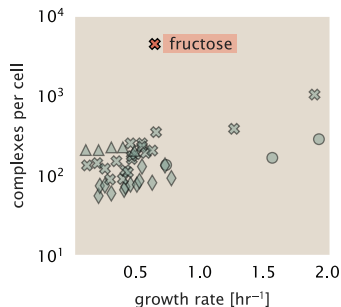
(B)

specific carbon transport

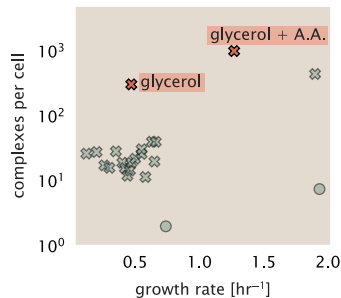
glucose transporters (PTS + ManXYZ)



fructose transporter (FruAB)



glycerol facilitator (GlpF)



xylose transporters (XylE + XylFGH)

