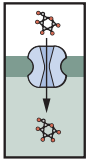
(A)

generic carbon transport



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

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

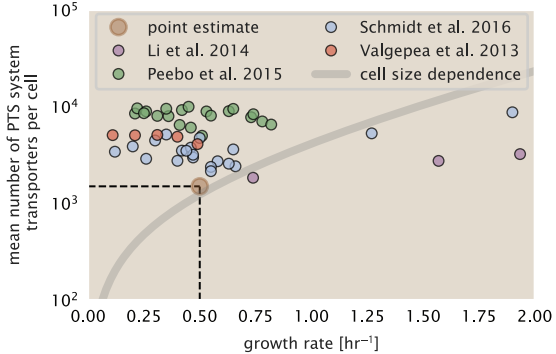
atomic weight

$N_{carbon} \approx \frac{0.15\ pg}{1\ cell} \times \frac{1\ carbon}{12\ Da} \times \frac{6 \times 10^{11}\ Da}{1\ pg}$

$\approx 10^{10}$ carbon atoms

$N_{transporters} \approx \frac{10^{10}\ C}{cell} \times \frac{1\ sugar}{6\ C} \times \frac{1\ sec}{200\ sugars} \times \frac{1\ cell}{5000\ s}$

≈ 1500 transporters



(B)

specific carbon transport