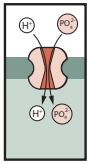
(A)

phosphorus transport



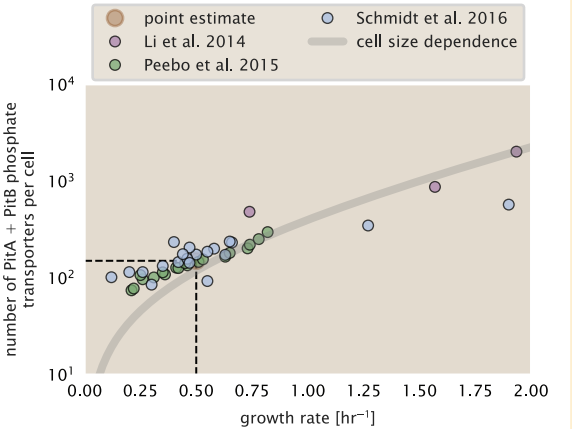
$m_{phosphorus} \approx 0.03 \times m_{dry} \approx 10\,fg$ BNID: 100653

$N_{phosphorus} \approx m_{phosphorus} \times \frac{1\ P}{30\ Da} \times \frac{6 \times 10^8\ Da}{1\ fg} \approx 2 \times 10^8\ P$

atomic weight

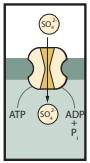
$r_{transport} \approx \frac{300\ phosphate\ /\ s}{transporter}$

$N_{transporters} \approx \frac{2 \times 10^8\ P}{cell} \times \frac{1\ phosphate}{1\ P} \times \frac{1\ s}{300\ phosphate} \times \frac{1\ cell}{5000\ s} \approx 150\ transporters$



(B)

sulfur transport



$m_{sulfur} \approx 0.01 \times m_{dry} \approx 3\,fg$ BNID: 109665

$N_{sulfur} \approx m_{sulfur} \times \frac{1\ S}{32\ Da} \times \frac{6 \times 10^8\ Da}{1\ fg} \approx 5 \times 10^7\ S$

atomic weight

$r_{transport} \approx \frac{10\ sulfate\ /\ s}{transporter}$ BNID: 109035

$N_{transporters} \approx \frac{5 \times 10^7\ S}{cell} \times \frac{1\ sulfate}{1\ S} \times \frac{1\ s}{10\ sulfate} \times \frac{1\ cell}{5000\ s} \approx 1000\ transporters$