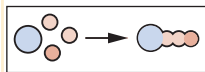


DNA SYNTHESIS

(A)

dNTP synthesis

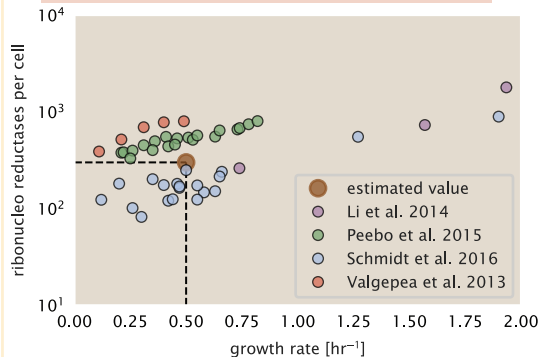


$$r_{\text{ribonucleo-reductase}} \approx \frac{10 \text{ dNTP / sec}}{\text{ribonucleo reductase}}$$

Ge et al. 2003

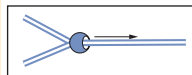
$$L_{\text{genome}} \approx 5 \times 10^6 \text{ base pairs} \quad \text{BNID:100269} \quad N_{\text{dNTPs}} \approx 2L_{\text{genome}} \approx 10^7 \text{ dNTPs}$$

$$N_{\text{ribonucleo reductases}} \approx \frac{10^7 \text{ dNTPs}}{1 \text{ cell}} \times \frac{1 \text{ sec}}{10 \text{ dNTPs}} \times \frac{1 \text{ cell}}{6000 \text{ sec}} \approx 300 \text{ ribonucleo reductases}$$



(B)

replication



$$r_{\text{replication}} \approx \frac{600 \text{ base pairs / sec}}{\text{DNA polymerase}} \quad \text{BNID:1109251}$$

$$L_{\text{genome}} \approx 5 \times 10^6 \text{ base pairs} \quad \text{BNID:100269}$$

$$N_{\text{DNA polymerase}} \approx \frac{5 \times 10^6 \text{ base pairs}}{1 \text{ cell}} \times \frac{1 \text{ sec}}{600 \text{ base pairs}} \times \frac{1 \text{ cell}}{6000 \text{ sec}} \approx 3 \text{ DNA polymerases}$$

