multiple origins of replication skew gene dosage in favor of additional ribosomes (A) 150 (C)  $\langle \# \text{ ori} \rangle = 2^{t_{cyc}} \times \lambda / \ln(2$ t<sub>cyc</sub> [min] 100 growth rate [hr-1] 50 0.0 \_ ori 0.5 1.0 1.5 2.0 ter growth rate [hr-1] (B) 140000 (D) 120000 ribosomes per cell 0 100000 0 80000 ori 60000 0 ribosomal 40000 protein 20000 loci

ter

growth rate [hr-1]

0

2

6

estimated (# ori)

8

10