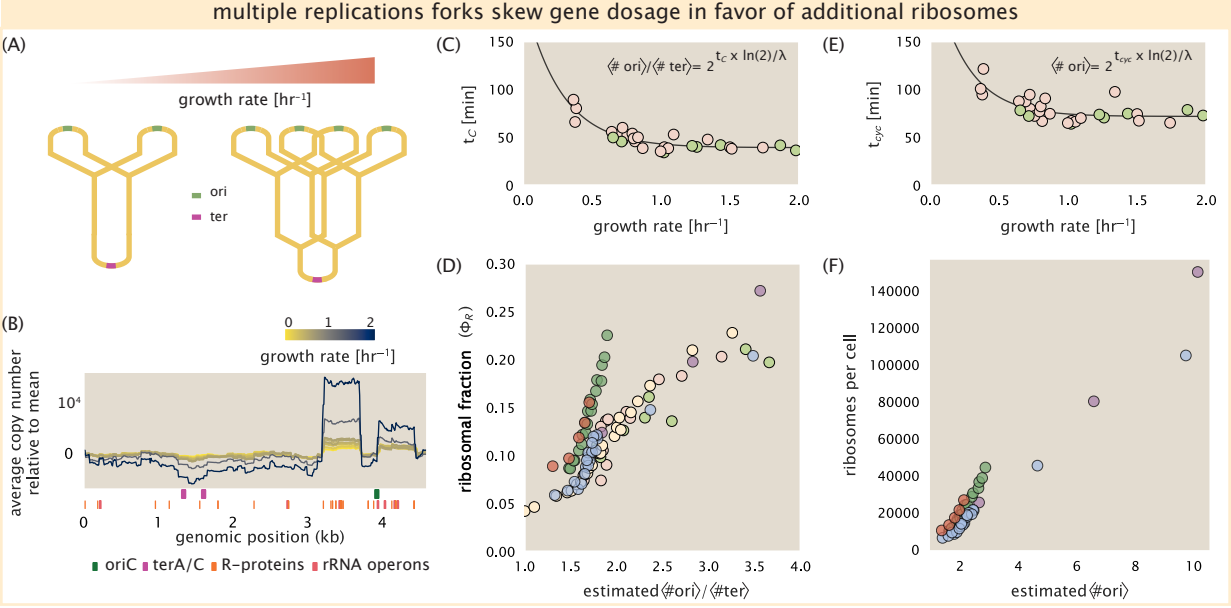
multiple replications forks skew gene dosage in favor of additional ribosomes
(A)
growth rate [hr⁻¹]
ori
ter
(B)
0 1 2
growth rate [hr⁻¹]
average copy number relative to mean
10⁴
0
0 1 2 3 4
genomic position (kb)
oriC terA/C R-proteins rRNA operons
(C)
⟨# ori⟩/⟨# ter⟩= 2 t_C x ln(2)/λ
t_C [min]
growth rate [hr⁻¹]
(D)
ribosomal fraction (Φ_R)
estimated ⟨#ori⟩/⟨#ter⟩
(E)
⟨# ori⟩= 2 t_cyc x ln(2)/λ
t_cyc [min]
growth rate [hr⁻¹]
(F)
ribosomes per cell
estimated ⟨#ori⟩
regulation of ribosomes supports maximal growth under nutrient limitation
(G)
Li et al. 2014
Peebo et al. 2015
Schmidt et al. 2016
Valgepea et al. 2013
Si et al. 2017
Dai et al. 2016
(H)
λ translation-limited
(r_t=17.1aa/s)
growth rate [hr⁻¹]
active ribosomal fraction (Φ_R · f_a)