

Table S4. Transcription related parameters for 2 doub/h, 37°C. Transcription related parameters as defined in [1], obtained here for 2 doub/h. Values in bold were estimated. See S1.2 for further explanations.

Genetic parameter	Units	P1 ^a	P2 ^a	constitutive ^a	repressable ^a	pause ^a
$D_i = V_{cell}(2 \text{ doub/h}) \cdot d_i$	average copies per cell	27 ^b	27 ^b	40.4 ^c	408.4 ^d	161.8 ^e
V_i^{max}	ini/min	110 ^f	110 ^f	33 ^g	1.5 ^h	3.3 ⁱ
c_i	nuc/sec	85 ^j	85 ^j	52 ^j	52 ^j	0.89 ^d
$K_{m,i}$	molec/cell	1240 ^l	2531 ^k	405 ^k	405 ^k	405 ^k
L_i	base pairs	6000 ^m	6000 ^m	2000 ^m	1000 ^m	1000 ^m

^a Promoter classes as defined by [1].

^b The average number of copies of the m n operon per cell, $D_{mn}(\mu)$, is given by Eq. S7: $D_{mn}(\mu) = \sum_{j=1}^7 2^{m(C(1-n_j^{(m)})+D)}$, where $m_j^{(m)}$ are the m n operon map locations given in Table S1.

^c According to [1], $[P_{constitutive}] = 1.5[P_m]$, in order to fit to (1) transcription of all r-proteins and (2) mRNA synthesis rate. This is consistent with the length of the r-protein gene class given in Table S1: the total DNA per chromosome associated with this gene class is roughly $40.4/(27/7 = \text{gene dosage per gene}) \cdot (2000 \text{ bp}) = 20,948 = \text{total length of constitutive class coding genes}$, compared with $L_{r-protein} = 21252$ (Table S1).

^d Estimated value - see S1.2.

^e According to [1], based on known fractions of intermittently inactive RNAP in the cell $[P_{pause}] = 6[P_m]$.

^f Estimated in [8]. Assumed to be growth rate independent [1].

^g As measured for the spc ribosomal promoter, which is a representative promoter for this class (see [1]).

^h As measured for β -lactamase promoter, which is taken to be a representative promoter for this class (see [1]).

ⁱ Maximum initiation rate was set to be ten fold lower than the V^{max} for the constitutive gene class, assuming pause genes are blocked 90% of the time [1].

^j See table 3 in [3].

^k Constitutive promoter binding affinities scale according to cell volume with respect to their values at 2.5 doub/h and are taken from [1]. Volumes are given in Table S2.

^l Taken from table 5 of [21]: $K_{p1}:K_{p2}$ at (2.14 doub/h) = 0.49:1, i.e. $1240 = 0.49 \cdot 2531$.

^m See tables 1 and 2 in [1].