TABLE 1

Protein, RNA and DNA and related parameters in exponentially growing E. coli B/r, *as a function of the doubling time of the culture*

Parameter	Symbol	Units	τ 100 min	60	40	30	24
			μ 0·6	1·0	1·5	2·0	2·5 doubl/hr
Protein/mass[a]	P/M	10^{17} aa/OD_{460}	6·5	5.8	5.2	5.1	5.0
RNA/mass[a]	R/M	10^{16} nucleot./OD_{460}	4·3	4·9	5·7	6·6	7·8
DNA/mass[a]	G/M	10^{8} genomes/OD_{460}	18·3	12·7	9·5	7·9	7·6
Cell number/mass[a]	N_c/M	10^{8} cells/OD_{460}	11·6	7·4	3·8	2·2	1·9
Origins/genome[a]	O/G	dimensionless	1·25	1·35	1·45	1·52	1·63
Protein/genome[b]	P/G	10^{8} aa-residues	3·6	4·6	5·5	6·5	6·6
RNA/genome[b]	R/G	10^{7} nucleot. residues	2·4	3·9	6·0	8·4	10·3
Mass/cell[c]	$\bar{M}$	OD_{460}-units/10^{9} cells	0·8	1·35	2·6	4·6	5·3
Protein/cell[d]	$\bar{P}$	10^{8} aa-residues	5·6	7·8	13·7	23·2	26·3
		$\mu g/10^{9}$ cells	101	140	246	417	474
RNA/cell[d]	$\bar{R}$	10^{7} nucleot. residues	3·7	6·6	15·0	30·0	41·1
		$\mu g/10^{9}$ cells	20	36	81	162	222
DNA/cell[d]	$\bar{G}$	genome equivalents	1·6	1·7	2·5	3·6	4·0
		$\mu g/10^{9}$ cells	6·3	6·9	10·0	14·4	16·0
Sum $\bar{P}+\bar{R}+\bar{G}$	$\bar{m}$	**$\mu g/10^{9}$ cells**	**127**	**184**	**337**	**594**	**711**
$(\bar{P}+\bar{R}+\bar{G})/\bar{M}$	$\bar{m}/\bar{M}$	**$\mu g/OD_{460}$-unit**	**148**	**136**	**128**	**131**	**135**
Peptide chain[e] elongation	c_p	**aa/s per chain**	**12**	**16**	**18**	**21**	**22**
Protein/origin[f]	P_0	**10^{8} aa-residues**	**2·8**	**3·4**	**3·8**	**4·3**	**4·0**
C-period[g]	C	**min**	**67**	**55**	**46**	**39**	**37**
D-period[h]	D	**min**	**31**	**18**	**28**	**35**	**28**

[a] Observed parameters, averages based on graphs in which parameters were plotted as a function of growth rate; DNA/OD_{460} and RNA/OD_{460} from Churchward *et al.*, 1981*a*; $cells/OD_{460}$ from Shepherd, Churchward & Bremer, 1981; origins/genome from Churchward *et al.*, 1981.

[b] $P/G = (P/M)/(G/M)$; $R/G = (R/M)/(G/M)$; $P_O = P/O = (P/G)/(O/G)$.

[c] $\bar{M} = 1/(N_c/M)$.

[d] $\bar{P} = (P/M)/(N_c/M)$; $\bar{R} = (R/M)/(N_c/M)$; $\bar{G} = (G/M)/(N_c/M)$; for conversion into μg, the following molecular weights were used: average amino acid residue, 108 (composition of *E. coli* protein from Spahr, 1962); average RNA nucleotide, 324 (composition of *E. coli* stable RNA from Nierlich, 1972); *E. coli* genome, $3{\cdot}9\times10^{6}$ base pairs (Bachman & Brooks Low, 1980), 618 dal/base pair, i.e. $2{\cdot}41\times10^{9}$ dal/genome.

[e] $c_p = 81(P/M)/(R/M)\tau$, equation (7a).

[f] $P_0 = P/O = (P/G)/(O/G)$.

[g] C-period calculated from O/G and τ, using $O/G = [(C/\tau)\ln 2]/(1-2^{-C/\tau})$, equation (11).

[h] D-period calculated from O/G, τ and $\bar{G}$, using $D = \{(\tau/\ln 2)\ln[\bar{G}\,.\,O/G]\} - C$, equation (1). The fluctuations in D seen here with increasing doubling time are not significant; see text.