

Table I
Morphological and Physical Characteristics and Macromolecular Composition of *E. coli* B/r H Cells Cultured at Three Different Growth Rates^a

Parameter	Symbol	Unit	Culture			Remarks
			Alanine	Glucose	Tryptone	
Doubling time	T_D	min	150	44	21	
Cell length	\bar{L}	μm	2.5(0.23)	3.0(0.22)	3.8(0.25)	Value in brackets indicates coefficient of variation
Cell diameter	$2\bar{R}$	μm	0.5(0.10)	0.7(0.08)	1.0(0.08)	
Cell volume	\bar{V}_T	μm^3	0.46	1.06	2.72	$\bar{V} = \pi R^2(\bar{L} - 2\bar{R}/3)$
Wet density	ρ	g/ml	1.078	1.081	1.085	From Percoll gradients
Cell mass	\bar{M}	$\text{g} \times 10^{-12}$	0.49	1.15	2.96	From $\bar{M} = \rho\bar{V}$
Cell surface	\bar{A}	μm^2	3.9	6.6	11.9	$\bar{A} = 2\pi\bar{R}\bar{L}$
Envelope volume	\bar{V}_E	μm^3	0.09	0.14	0.27	See text
Nucleoid volume	\bar{V}_N	μm^3	0.08	(0.14)	(0.30)	See text
Genome equivalents	\bar{G}	—	1.2	2.1	4.6	See text
DNA per cell	—	$\text{g} \times 10^{-12}$	0.005	0.009	0.019	
Stable RNA per cell	\bar{R}_s	$\text{g} \times 10^{-12}$	0.016	0.062	0.302	From Churchward <i>et al.</i> (1982a)
Protein per cell	\bar{P}	$\text{g} \times 10^{-12}$	0.086	0.208	0.500	From Churchward <i>et al.</i> (1982a)
Cytoplasmic volume	\bar{V}_C	μm^3	0.28	0.76	2.10	$\bar{V}_C = \bar{V}_T - (\bar{V}_E + \bar{V}_N)$
Number of ribosomes	N_r	—	5,000	20,000	97,000	From Churchward <i>et al.</i> (1982a)
Total ribosome volume	\bar{V}_R	μm^3	0.04	0.16	0.79	Assuming ribosome to be a sphere with 25 nm diameter
Average free distance between two ribosomes	—	nm	22	17	10	See text

^aAll parameters refer to the average cell in the population.