Table 1. Amount of Various Proteins in E. coli NC3 in Different Media

Protein Number[a]	Protein Identification[b]	Regulation Group[c]	Weight Fraction of Total Protein in Glucose Medium ($\alpha' \times 10^3$)	Number of Molecules per Genome in Glucose Medium[d]	Level in Each Medium Relative to the Level in Glucose Medium[e]			
					Acetate (k = 0.38)	Glycerol (k = 0.77)	Rich-Met (k = 1.50)	Rich (k = 1.98)
A13.0	L7	Ic	2.93	9,920	0.87	0.99	1.11	–
B13.0	L12	Ic	4.57	15,470	0.24	0.75	1.66	–
B14.6		Ic	0.68	2,050	0.77	1.04	1.05	–
B21.8		Ic	0.90	1,820	0.61	0.86	–	1.60
B26.3		IIa	4.83	8,080	0.87	1.13	–	0.35
B40.7	α	Ic	3.66	3,960	0.76	0.96	1.02	1.44
B46.7		Ia	5.64	5,310	1.15	1.19	0.72	0.94
B50.3		Ic	6.15	5,380	0.57	0.90	1.14	1.57
B56.5	A	Ic	13.5	10,510	0.94	1.00	1.18	1.22
B58.3		IIa	3.11	2,350	0.33	1.30	0.46	–
B61.0		Ic	1.25	900	0.59	0.67	1.20	–
B65.0	S1	Ic	15.1	10,220	0.58	0.84	1.33	1.74
B66.0		Ic	9.33	6,220	0.67	0.89	–	1.51
B82.5		Ia	0.28	150	2.88	1.95	1.14	–
B83.0		Ia	0.95	500	2.45	2.21	1.00	–
B88.0		Ia	1.45	720	1.11	1.00	0.91	–
B89.0		Ib	0.95	470	1.05	0.87	1.05	–
C14.8	S6	Ic	0.95	2,820	0.58	0.84	1.65	–
C15.3		Ic	1.24	3,570	0.57	0.94	1.28	–
C15.4		Ib	1.89	5,400	0.91	1.00	1.03	–
C27.0		IIa	1.93	3,140	0.93	1.07	–	0.39
C30.7	EF-T_s[f]	Ic	1.31	1,880	0.69	0.85	1.16	1.62
C31.6			3.49	4,860				
C34.3		Ib	2.63	3,370	1.04	1.06	–	0.91
C39.3		Ia	1.12	1,250	1.42	1.17	0.52	–
C40.3		Ib	5.50	6,000	0.92	1.14	0.87	0.94
C44.0		IIa	2.81	2,810	0.62	0.71	–	0.81
C44.6		IIa	4.41	4,350	0.61	0.80	2.03	0.91
C48.7		IIb	1.44	1,300	39.0	0.83	1.39	–
C55.0		Ic	1.38	1,100	0.45	0.80	1.67	–
C56.0		IIa	0.64	500	0.53	0.83	0.87	–
C58.5		IIa	0.47	350	0.63	0.90	0.95	–
C60.7		Ic	1.39	1,010	0.47	0.89	1.67	–
C61.0		Ic	1.88	1,360	0.63	0.89	1.47	–
C62.5		Ic	1.80	1,270	0.69	0.94	1.04	–
C62.7		Ic	2.57	1,800	0.63	0.73	2.09	–
C70.0		Ic	0.96	600	0.61	0.75	2.23	–
C78.0		Ic	3.07	1,730	0.79	1.01	1.29	–
C137		IIa	2.78	890	0.59	0.91	0.74	0.37
D15.2		Ic	1.01	2,920	0.53	0.78	1.50	–
D31.5		IIb	0.97	1,360	1.17	1.07	–	1.40
D32.5		IIa	1.39	1,880	0.77	0.92	–	0.89
D40.7		Ia	4.55	4,920	5.90	1.94	–	0.23
D44.5		IIa	6.94	6,860	0.56	1.35	0.48	–
D58.5	LysS	Ic	1.07	800	0.58	0.77	–	1.38
D74.0		Ic	3.28	1,950	0.51	0.68	–	1.52
D84.0	EF-G	Ic	16.6	8,700	0.60	0.88	1.43	1.70
D87.5		Ib	0.13	60	0.92	1.07	1.07	–
D94.0	PheS, β	Ic	2.05	960	0.54	0.94	1.12	1.10
D99.0		Ia	2.85	1,270	6.45	1.80	0.64	0.37
D100	LeuS	Ic	1.18	520	0.61	0.93	1.38	–
D102		Ia	0.81	350	5.10	1.61	0.78	–
D157	β	Ic	5.02	1,410	0.78	0.91	1.43	1.48
E25.4		IIa	1.02	1,770	0.68	0.45	–	0.10
E38.5		IIa	7.90	9,030	0.83	0.73	0.21	0.08
E39.8		Ia	1.68	1,860	8.72	2.90	0.53	–
E42.0	EF-Tu	Ic	55.5	58,140	0.71	0.97	–	1.53
E43.8		IIa	3.17	3,180	0.80	0.93	0.63	–
E58.0	ArgS	Ic	0.82	620	0.57	0.84	1.28	1.67
E77.5	GlyS	Ic	1.65	940	0.84	1.07	1.24	1.66
E79.0		IIb	1.58	880	1.28	1.25	1.66	2.97

Table 1—*Continued*

Protein Number[a]	Protein Identification[b]	Regulation Group[c]	Weight Fraction of Total Protein in Glucose Medium ($\alpha' \times 10^3$)	Number of Molecules per Genome in Glucose Medium[d]	Level in Each Medium Relative to the Level in Glucose Medium[e]			
					Acetate (k = 0.38)	Glycerol (k = 0.77)	Rich-Met (k = 1.50)	Rich (k = 1.98)
E106	ValS	Ic	1.39	580	0.58	0.82	1.32	1.52
E133		IIa	4.52	1,500	0.72	0.88	0.33	0.19
E140		IIa	2.70	850	0.80	0.89	0.21	0.41
F14.3		Ia	2.34	7,200	1.34	1.26	0.88	–
F14.7		Ia	3.13	9,370	1.24	1.23	1.01	–
F24.5		Ib	20.5	36,820	1.03	0.90	–	0.79
F28.7		Ic	1.19	1,820	0.45	0.93	–	1.03
F28.8		IIa	3.54	5,410	0.59	0.74	0.40	0.35
F29.7		Ic	1.19	1,760	0.63	0.98	1.07	–
F30.2		Ic	2.68	3,900	0.72	0.92	1.05	1.50
F32.3		Ia	2.53	3,450	3.96	2.01	0.38	0.19
F32.5		IIa	5.56	7,530	0.47	0.92	0.88	0.37
F36.9		Ib	0.69	820	0.84	0.98	–	0.93
F37.8		Ib	0.61	710	0.85	0.98	–	0.85
F38.0		IIa	9.49	10,990	0.56	0.77	–	0.31
F39.9		IIa	2.02	2,230	1.15	1.50	–	0.31
F41.8		Ic	1.40	1,470	0.64	0.80	–	1.29
F48.1	GluS, β	Ic	0.96	880	0.85	1.00	–	1.57
F50.3		Ia	1.73	1,510	4.32	2.02	0.88	0.14
F54.0		Ic	0.62	500	0.83	0.92	1.28	–
F54.4		IIa	3.50	2,830	0.77	0.87	0.15	0.17
F55.3		Ia	0.29	230	44.3	1.58	0.58	–
F56.0		Ia	1.21	950	5.53	3.30	1.07	–
F56.2		Ic	2.36	1,850	0.55	0.74	–	2.13
F58.5		Ic	1.36	1,020	0.78	0.96	1.02	–
F60.3		Ia	1.10	800	5.86	1.95	0.54	0.21
F63.4		Ic	0.40	280	1.03	1.05	–	1.40
F63.8		Ia	1.82	1,260	1.27	1.09	1.12	0.98
F64.5		IIa	3.16	2,160	0.88	1.00	1.29	0.92
F66.0		Ic	1.75	1,170	0.46	0.81	–	1.13
F82.5		Ia	0.48	260	3.63	2.42	0.76	0.39
F84.0		IIa	4.39	2,300	0.42	0.79	0.35	0.18
F84.1		Ia	0.88	460	1.27	1.05	0.79	0.83
F88.0		IIa	56.7	28,350	0.36	0.75	0.48	0.02
F99.0		Ic	8.54	3,800	0.62	0.80	2.34	2.87
F107	IleS	Ic	2.45	1,010	0.71	0.85	1.19	1.14
F178		Ib	0.99	240	1.06	0.94	1.02	–
G25.3		Ib	1.76	3,060	1.00	1.03	–	1.14
G27.2		Ia	0.89	1,440	12.78	7.50	0.70	–
G30.5		Ib	0.99	1,430	1.16	1.10	–	1.15
G31.6		IIb	0.25	350	2.05	0.80	–	1.23
G32.8		IIa	5.36	7,190	1.14	0.95	1.23	0.14
G36.0	PheS, α	Ic	1.07	1,310	0.53	0.87	–	1.05
G38.7		Ib	0.56	640	0.78	0.88	–	0.74
G40.3		IIa	1.64	1,790	0.56	0.72	–	0.36
G41.2		Ib	1.90	2,030	0.81	1.12	0.67	1.09
G41.3		Ic	1.09	1,160	0.77	1.04	–	5.04
G41.4		IIa	2.07	2,200	0.51	0.77	–	0.20
G42.0		Ic	1.83	1,920	0.80	0.94	–	1.88
G42.5		Ia	1.53	1,580	1.26	0.92	0.24	0.05
G43.2		IIa	6.75	6,880	0.41	0.55	0.47	0.15
G43.5		IIa	1.24	1,250	0.75	1.71	–	0.63
G43.8		IIa	7.97	8,010	0.80	0.60	0.66	0.25
G49.2		IIa	4.41	3,940	0.71	1.21	0.14	0.08
G50.5		IIb	4.60	4,010	1.96	1.24	1.37	1.41
G51.0		Ia	6.90	5,950	1.22	1.26	0.77	0.87
G51.1		IIa	0.64	550	1.09	1.26	–	0.39
G54.0		Ia	3.28	2,670	2.00	1.47	–	0.27
G54.6		Ia	0.65	520	3.75	2.12	–	0.30
G54.7		Ic	2.29	1,840	0.35	0.76	1.26	1.58
G57.0		Ia	0.55	420	1.49	1.70	1.00	0.99
G61.0	GlnS	Ic	1.14	820	0.70	0.99	–	1.31
G62.8		Ia	0.50	350	1.20	0.96	–	0.76

Table 1—*Continued*

Protein Number[a]	Protein Identification[b]	Regulation Group[c]	Weight Fraction of Total Protein in Glucose Medium ($\alpha' \times 10^3$)	Number of Molecules per Genome in Glucose Medium[d]	Level in Each Medium Relative to the Level in Glucose Medium[e]			
					Acetate (k = 0.38)	Glycerol (k = 0.77)	Rich-Met (k = 1.50)	Rich (k = 1.98)
G63.0		Ic	0.64	450	0.65	0.96	–	1.35
G65.0	ThrS	Ic	0.86	580	0.72	0.85	–	1.67
G70.0		Ic	0.71	450	0.56	1.31	–	1.26
G71.5		Ib	0.55	340	0.73	1.00	–	0.90
G72.5		Ia	0.27	160	0.96	0.83	–	0.65
G74.0		Ia	3.25	1,930	2.54	1.72	–	0.72
G76.0		Ia	0.17	100	9.05	1.30	0.85	–
G78.0		Ic	0.85	480	0.58	0.98	–	1.03
G93.0		Ia	2.18	1,030	1.52	1.33	0.95	0.74
G97.0		Ia	1.99	900	4.45	1.06	0.86	0.30
G117		Ic	1.75	660	0.78	0.92	1.07	–
G127		Ib	0.25	90	0.83	0.88	0.93	–
H35.0		IIa	2.98	3,750	0.55	0.80	–	0.30
H47.4		Ia	1.12	1,040	4.37	1.68	–	0.07
H52.7		Ic	1.69	1,410	0.35	0.60	1.84	2.41
H54.6		Ia	0.65	520	4.07	2.35	0.67	0.82

[a] Proteins are numbered as described in the Appendix. Letter prefixes refer to the position of the protein in the axis parallel to the isoelectric focusing dimension (A–H; acid to base). Numbers refer to the apparent molecular weight of the protein as determined by the distance moved in the SDS electrophoresis dimension (56.5; molecular weight 56,500).

[b] Abbreviations used: (S) aminoacyl tRNA synthetase; (α) 39,000 molecular weight subunit of RNA polymerase; (β) 155,000 molecular weight subunit of RNA polymerase; (L7, L12, S1, S6) ribosomal polypeptides; (EF-Ts, EF-G, EF-Tu) elongation factors; (A) A protein (Subramanian et al., 1976).

[c] The proteins have been grouped according to the way in which their relative levels change in cells grown in different media. As the growth rates increase, the relative levels of Ia proteins decrease, Ib proteins do not change, Ic proteins increase, IIa have a maximum and IIb have a minimum.

[d] The number of polypeptide molecules per genome equivalent DNA for cells growing in glucose-minimal medium was calculated as follows: $\frac{\alpha'}{MW} \times 110$ daltons per amino acid $\times$ 4 $\times$ 10^9 amino acids per genome. To calculate the number of molecules per genome for growth in the two rich media, multiply the above product by the relative level of the protein. Since the amino acids per genome are different at generation times greater than 40 min, 2.3×10^9 and 3.5×10^9 must be substituted for acetate and glycerol media, respectively.

[e] Proteins for which a value is shown for glucose-rich medium lacking methionine (Rich-Met) and not for glucose-rich medium (Rich) are those which were measured only in the experiments using ^3H and ^{35}S. Proteins for which a value is shown for Rich and not for Rich-Met were measured only in the experiments using ^3H and ^{14}C. Where a value is shown for both of these media, the same protein was measured by each method, and in these cases, the values for acetate- and glycerol-minimal media are averages of the results in the two sets of experiments.

[f] Elongation factor Ts forms a double spot, C30.7 and C31.6. Separate α' values were measured in glucose medium, but the relative levels in different media were measured on the combined spots.