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E. COLI MAP

Location of Purine Genes on the Physical Map of *Escherichia coli*

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To locate the purine genes on the physical map of *Escherichia coli* (Table 1), strains mutant in purine pathway genes were obtained from B. Bachmann and made sensitive to bacteriophage λ by P1 transduction to Mal$^+$ where necessary. Genetic map positions were used to identify, for each gene, a group of phages among which one or more might be expected to carry complementing DNA. Samples of these phages were obtained from Y. Kohara, amplified by growth on the *recD* strain NM621 (6), and used in spot recombination-complementation tests both alone and in coinfections with wild-type λ. One or more phages giving a positive spot test were identified for each of the 11 mutants, and the physical limits within which the gene must be located were derived.

Restriction and/or sequence information was available for three of the genes, *purE* (2), *purF* (5), and *purM* (4), and was used to define physical gene locations further. The *purF* and *purM* restriction information from Tso et al. (5) and Smith and Daum (4), respectively, was in agreement with the information on the physical map, but the *Bgl*II restriction data for *purE* did not correspond. No attempt was made to compare the extensive restriction information for the DNA surrounding *purE* with the physical map.

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TABLE 1. Physical location of genes for purine metabolism

Gene	Genetic map location (min)[a]	Physical map location[b]	Phage(s)[c]		Mutant strain and source[d]	Additional comments (reference)[e]
			Tested	Positive on test[f]		
purA	95.0	4472–4487	651–656	652	PC0698	
purB	25.2	1203–1212	239–243	239, 240	JK268	
purC	53.3	2609–2615	421–426	423, 424	PC0111	
purD	90.3	3496–3500	530–532	531, 532	AB468	
purE	12.2	557–567	156–163	157	PC0135	559-567, probably near 565 (2)
purF	50.0	2438–2447	401–406	406	AB352	2441–2447, probably between 2442 and 2444 (5)
purM (*G*)	53.5	2615–2628	421–426	425, 426	PC0631	2619–2624, probably between 2622 and 2623 (4)
purH	90.3	3496–3500	530–532	531, 532	PC0132	
purL (*I*)	55.2	2696–2704	431–434	433, 434	PA3306	

[a] From reference 1.
[b] From complementation results; locations are in kilobase pairs as assigned in reference 3.
[c] Numbers (unpublished) refer to the "Miniset" available from Y. Kohara. The reference numbers of tested phages as used by Kohara et al. (3) are as follows (in Miniset numeric order, positives in boldface): *purA*, 3H6, **3A1**, 6G4, 1G10, 7E9, 5B5; *purB*, 7F9, **20E6**, 3E11, 4D1, 2A3; *purC*, 4E10, 7A8, **4C11**, **5A8**, 10H6, 5A11; *purD* and *purH*, 6G9, **3C5**, **9B9**; *purE*, 9E5, **6E7**, 2C4, 8F11, 23E10, 12A1, 2F5, 21A9S; *purF*, 9F11, 4C8, E9B9, 9C2, **9D2**; *purG*, phage tested as for *purC*, **10H6** and **5A11** are positive; *purI*, 6F10, 8E12, **6H2**, **7G4**.
[d] CGSC strain, obtained from B. Bachmann.
[e] Refinements based on restriction information, positions are in kilobase coordinates from reference 3.
[f] Direct selection for Pur$^+$ in phage spot tests.