

Location of ser-4 near arg-2 on linkage group IV

Dow Woodward isolated ser-4 (DW110), initially designated P110, by UV irradiation of ST 74 A. The mutant was first described by Urey (1966 Ph. D. Thesis, Caltech) and further characterized by Maxwell (1970 Ph. D. Thesis, Caltech) who tentatively mapped the locus near centromere on linkage group IV. The results reported here place ser-4 0.7 centimorgans to the right of arg-2 on IVR.

pyr-1, arg-2 A (FGSC 394) was crossed with ser-4, cot-1 a on solid Westergaard-Mitchell medium supplemented with 1 mg/ml yeast extract and 2% sucrose. Random ascospores were isolated onto small slants of appropriately supplemented Vogel's medium containing 2% sucrose (Horowitz complete medium did not improve the recovery of the ser-4, cot-1 parental type progeny).

TABLE 1

Linkage data obtained from random ascospore isolates from the cross pyr-1, arg-2 X ser-4, cot-1

zygote and percent recombination	genotype	Parental types	Recombinations			Total and percent germination	Marker isolation numbers
			Region 1	Region 2	Region 3		
<u>pyr-1</u>	<u>at-g-2</u> +	+	252	1	0	36	H263, 33442
+ (2.2)	+ (0)	<u>ser-4</u> <u>cot-1</u> (14.8)	128	9	0	32	DW110, C102(t)
						458 70-82%	

Because the results shown in Table 1 did not indicate whether ser-4 was located proximal or distal to arg-2, prototrophic recombinants were selected from random spores plated onto Vogel's minimal medium supplemented with 1.5% sorbose and 0.5% sucrose. Ten prototrophic colonies were isolated from 2880 spores germinated at 25°C. All ten prototrophs were cot⁺, suggesting that ser-4 lies distal to arg-2, and that prototrophs arise from a single crossover between these two loci. The map distance between arg-2 and ser-4 based on the frequency of prototrophs is estimated to be $10/2880 \times 2 \times 100 = 0.7$ centimorgans.
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