Murray, N. E. Linkage information for cysteine and methionine mutants.

cys-9 (T156). cys-9 is located between cr (crisp) and thi-1 (thiamine-1) in linkage group IR (see Table 1).

cys-10 (39816). The tentative location of this locus (Murray 1965 Genetics 52: 801) as the most distal marker in the left arm of linkage group IV is supported by information from other workers.

cys-11 (NM86). A cluster of cysteine mutants is located in the cys-5 region between leu-3 and mating type. The evidence is consistent with the region comprising two loci, cys-5 and cys-11. The mutants NM44 and R83R1-1-271 gave very low recombination frequencies when crossed to cys-5 (35001). The recombinants from the latter cross were scored for flanking markers and all four flanking marker combinations were represented. When a fourth nutant (NM86) was crossed to cys-5 (35001) the recombination frequency was much higher and there war no or little "negative interference". Complementation tests showed that NM86 is physiologically different from the heterocaryon compatible cys-5 (NM44) strain, and more specifically Leinweber (personal communication) has shown that while NM86 lacks ATP-sulfurylase, the cys-5 alleles tested (35001 and NM44) lack PAPS-reductase. It is proposed that NM86 is an allele at locus cys-11. The combination of flanking markers found for cysteine independent recombinants from a cross of cys-5 by cys-11 indicate the order mating type, cys-11, cyr-5, leu-3. Adequate genetic information is lacking far a cross of cys (85518) by cys-5, but cys (85518) gave a very low recombination frequency (1 in 200,000) when crossed to cys-11 (NM86).

cys-12 (NM268). cys-12 is an additional cysteine locus in linkage group I distal to ad-9 and close to al (0 recombinants among 76 isolates) (see Table 1).

me-6 (35809) and mac (65108). These mutants OR closely linked. Methionine independent recombinants hove been isolated from crosses of me-6 by mac and classified with respect to the flanking markers thi-1 ond ad-9 (odenine-9). The order indicated is thi-l, mac, me-6, ad-9, but it is probable that mac and me-6 is allelic.

me-7 and me-9. Methionine independent recombinants have been isolated from crosses of me-7 (NM73) by me-9 (NM43t) and classified with respect to flanking markers (thiamine-3 and white collar). The methionine loci are very cl-linked in the order thi-3, me-7, me-9, wc.

Table 1. Linkage data on random segregants from crosses involving cys-9 or cys-12.

Zygote genotype and % recombination	Parental combinations	Recombination: Singles region 1	Recombination: Singles region 2	Recombination: Doubles regions 1 and 2	Total and % germination	Marker isolation numbers
+ thi-1 ad-9	34	7	10	0	93	T156
cys-9 + +	33	5	4	0	(93%)	56501
12.9 15.1						Y 154M37
+ cyr-9 +	26	2	20	0	88	8122
cr + os-1	23	1	16	0	(63%)	T156
3.4 40.9						B135
+ + cys-12	48	8	8	0	120	56501
thi-1 ad-9 +	44	5	6	1	(83%)	Y 154M37
11.7 12.5						NM268

(The top number in each p-air represents the class that has the + allele of the leftmost marker).

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