

Perkins, D. D. Multiple interchange stocks for linkage detection.

The following strains, each containing three reciprocal translocations, have been synthesized for the purpose of assigning new mutants to linkage groups with a minimum of labor:

T(I;II)al-l; T(IV;V)2355, cot; T(III;VI)I, ylo A (Designated alcoy A)
(Fungal Genetics Stock Center # 997)

T(I;II)al-l; T(IV;V)2355, cot; T(III;VI)I, ylo a (Designated alcoy a)
(Fungal Genetics Stock Center # 998)

In each translocation a readily scored "visible" marker either is present at the interchange point (al-l) or has been inserted close to it (cot and ylo), so that linkage to either of the two groups involved in the translocation can be detected by linkage to the visible marker. albino-l (al-l, 4637T) marks IR and IIR (near peach); colonial-temperature sensitive (cot, C102) marks IVR and VR (near histidine-l); yellow (ylo, Y30539y) marks VII and IIIR (near velvet).

Procedure: Use alcoy as protoperithelial parent on 2% agar slants of minimal synthetic crossing medium in 15 cm tubes. Incubate 6 or 7 days at 25° before fertilizing with the mutant to be mapped. Isolate 100 black spores to minimal agar slants in 75 mm tubes. (If the unmapped mutant is an auxotroph, isolate 200 to minimal and score only among the prototrophs.) Isolate not earlier than one week (25°) after spores are shot. Heatshock and incubate 2 to 3 days at 34°. Sort out cot⁺ progeny, which have grown up at 34°. Move remaining tubes (not grown up at 34°) to 25°, to allow growth of cot⁻. Score albino, yellow, and the unmapped mutant at 6 days growth. ylo is scorable only among al⁺ progeny.

The following format is useful for tabulating numbers (P = parental, R = recombinant):

		unmapped mutant		
		+	-	
cot	+	(R)	(P)	
	-	(P)	(R)	(Tests for linkage in IV or V.)

		(R)	(P)	
al	+	(R)	(P)	
	-	(P)	(R)	(Tests for linkage in I or II.)

		(R)	(P)	
ylo	+	(R)	(P)	
	-	(P)	(R)	(Tests for linkage in III or VI.)

If linkage to one of the three markers is apparent, follow up either with crosses to markers in the individual groups concerned, or with other marked multiple-translocation testers whose interchanges straddle the groups interchanged in alcoy. If no linkage is apparent to any of the alcoy markers, the unmapped mutant is presumably in VII (or possibly at the extreme left of I, III, IV or V).

In crosses between alcoy and strains with normal chromosome sequence, about one-eighth of shot ascospores are black. Presence of the three translocations has been confirmed both genetically (by the author) and cytologically at prophase I (by E. G. Barry). Of 44 previously unmapped mutants tested with alcoy, linkage to one or another of the alcoy markers has been shown by 34. - - - Department of Biological Sciences, Stanford University, Stanford, California.