

Gersh, E. Sutton, University of Pennsylvania. Centromere of chromosome 3 in *D. melanogaster* located to right of *ri*.

Females of constitution  $w^e/w^e$ ; Dp (1; 3) 264-58a/*ri p^p* were mated with  $w^e/Y$ ; *ri p^p/ri p^p* males. The Dp is a piece of X including the *w* locus, and its insertion is known to be in 3L between *in* and the centromere. It

causes a white-mottled ( $w^m$ ) phenotype.  $w^e p^p$  eyes are directly distinguishable from  $w^e$ , and  $w^e w^m p^p$  flies can be distinguished from  $w^e w^m$ , usually directly, always by progeny-testing.

If the order of the 3 heterozygous markers were *ri* Dp  $p^p$ , the above cross would yield  $w^e$ ; +++ and  $w^e$ ; *ri w^m p^p* flies only as rare double crossovers (expected frequency < 1/10,000), while  $w^e$ ;  $p^p$  and  $w^e$ ; *ri w^m* flies would appear as a result of single exchange in region 1. If the order were Dp *ri p^p*, the reverse results would be obtained.

In a total of 1262 progeny, the following phenotypes were found in addition to the parental types:

$w^e$ ; $w^m p^p$ , 3	$w^e$ ; <i>ri w^m</i> , 6	$w^e$ 17
$w^e$ ; <i>ri</i> , 4	$w^e$ ; $p^p$ , 6	

All of the 6  $w^e$ ; *ri w^m* flies had some wild-type pigmentation on an eosin background, and were clearly not  $p^p$ . Four of the 6  $w^e$ ;  $p^p$  flies were obtained as virgins and progeny-tested by mating with  $w^e$ ; *ri p^p*: 3 proved to be genetically  $w^e$ ;  $w^m p^p$  (offspring had peach mottling on a  $w^e$ ;  $p^p$  background); the fourth gave no mottled offspring and was, therefore, genuinely  $w^e$ ;  $p^p$ . Six of the  $w^e$  flies were obtained as virgins and similarly progeny-tested: all of them produced mottled offspring and were, therefore, non-crossovers.

Thus, only two pairs of complementary crossover types were identified, and these were of the kinds expected as single crossovers if the order of markers were *ri* Dp  $p^p$ . We can, therefore, assume that *ri* is to the left of the Dp, and knowing that the centromere is to the right of the Dp, we can assert that it is also to be right of *ri*.

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B. Leigh, State University, Leiden, The Netherlands. An unusual mosaic.

One day old  $X^{C2}$ , *y B/sc<sup>8</sup>*·Y males were irradiated and mature sperm were sampled by mating them to *y sc<sup>8</sup>* In49 *sc<sup>8</sup>*; *bw*; *st p^p* females. Exceptional  $F_1$ , *y* ♂♂ were tested

for fertility by backcrossing them to females from the maternal stock. In one fertile cross the  $F_2$  consisted of 45  $y^+$  ♂♂, 21 *y* ♀♀, and 23  $y^+$  ♀♀. On further testing it was found that the non-yellow females carried the  $y^+$  marker on chromosome IV and the  $F_2$  males could be divided into two classes, those which carried a  $y^+$  marker on the Y chromosome and another  $y^+$  on chromosome IV and those which only carried  $y^+$  on the Y chromosome.

To explain the presence of two  $y^+$  markers in the gonads of the phenotypically *y* exceptional male, it has been assumed that a chromatid exchange occurred in the male pronucleus. This resulted in the transfer of  $y^+$  from one of the Y chromatids to one of the chromatids of chromosome IV. At the first mitotic division one daughter nucleus received the unexchanged *sc<sup>8</sup>*·Y chromatid and the exchanged IV,  $y^+$  chromatid. The other daughter nucleus received the exchanged non- $y^+$  Y chromatid and the unaltered IV chromatid. The first daughter nucleus later developed into the germ cell line and possibly a portion of the endoderm tissue, while the latter daughter nucleus developed into the entire hypoderm.

Thus, the mosaic  $F_1$  male provided evidence for the occurrence of radiation induced chromatid exchange and also indicated that differences arising at the first cleavage division do not necessarily lead to the formation of phenotypically half and half mosaics.