Scozzari, R., G. Trippa, C. Santolamazza, L. Ulizzi, C. Barberio and G. Modiano.
Istituto di Genetica, Università di Roma, Italia. Enzyme activity in three phosphoglucomutase phenotypes of D. melanogaster.

Natural populations of Drosophila melanogaster present a polymorphism for phosphoglucomutase (PGM) with at least two common electrophoretic alleles: Pgm^A and Pgm^B (Trippa et al., Biochem. Genetics 4, 1970, in press).

The mean PGM activities of the three PGM electrophoretic phenotypes (PGM A, PGM AB and PGM B) have been measured in order to estimate the mean PGM activities associated with the two PGM alleles.

A sample of 295 females from a natural Italian population, collected near Rome, has been examined for PGM electrophoretic phenotype and PGM activity. The PGM electrophoretic phenotypes were determined according to Trippa et al. (1970). The PGM activity has been expressed as micromoles of glucose-6-phosphate (G6P) produced per hour at 37°C per mg of nucleic acids of the single-fly homogenate.

The mean PGM activities were found to be not significantly different in the three PGM electrophoretic phenotypes. This finding shows that the activities depending upon the two PGM alleles (Pgm^A and Pgm^B) are the same, at least in the conditions of the present assay.

In order to get a better estimate of the mean PGM activity the data obtained for the three phenotypes have been pooled together, the mean activity in the whole sample being 77.59±1.17.

Lieb, E. Universität München, Germany. Recombination in gynandromorphs of Drosophila melanogaster.

In 1912 Morgan found that Drosophila melanogaster males, unlike females, do not show genetic recombination. The basis for this difference between the sexes in Drosophila and some other organisms is still unknown. It could be due to factors which are present in the germ-cells themselves. It also seems possible that dissimilarities in the somatic cells of males and females could influence recombination in germ-cells. In order to investigate this latter possibility the rate of recombination in gynanders was registered.

Gynanders heterozygous for the second chromosome markers al, b, and c were selected from the offspring of R(1)2, $In(1)w^{vC}/In(1)dl\text{-}49$, y w lz^s ♀♀ and XY^LY^S, w spl cv f; al b c ♂♂. After loss of the unstable ring-X the XY^LY^S testes are able to produce motile spermatozoa. Six "female" gynanders, i.e. with ovaries and female genitalia, were backcrossed to al b c ♂♂; seven "male" gynanders were backcrossed to al b c ♀♀. In each of the 13 gynanders both gonads were of identical type, i.e. both ovaries or both testes. The mosaic character of the flies was visible in their heads and thoraxes; in some cases in an otherwise female abdomen one dorsal half was male, or vice versa. As a control al b c heterozygous ♀♀ were backcrossed to al b c ♂♂.

The recombination rate in the six female gynanders was the same as in the controls (within the limits of a statistical test for homogeneity; $p = 0.18$). No recombinants were found among the 3853 offspring of six of the male gynanders. Among the 1189 offspring of the seventh male gynander six recombinants (0.5%) were found: 5 al b^+ c^+ and one of the complementary type al^+ b c. This cluster of recombinants can well be explained by a single premeiotic exchange. Under this assumption the overall recombination rate is ca. 0.1%, which is of the same order of magnitude as the spontaneous frequencies of recombinants found for males (e.g. Cooper 1944).

In my experiments only the influence of somatic (i.e. other than gonadal) tissues of the opposite sex on recombination in the gonads of male (or female) gynanders could be studied. No such influence was found. Gynanders with both an ovary and a testis have been found (Sturtevant 1929, Dobzhansky 1931, Tokunaga 1961) and may even be fertile. They are, however, very rare and there were no gynanders of this kind among the 54 whose gonads I investigated. The influence of gonads of one sex on recombination in gonads of the opposite sex has been studied in transplantation experiments by Gloor and Hadorn (1959; D.I.S. 33). They implanted testes in female larvae; the results were not fully conclusive. The corresponding test for males has not been made.