c-RNA and DNA from Schistocerca and Aedes was extremely low. Within the genus Drosophila, the comparisons have been applied to the sibling species melanogaster and simulans and the more distantly related funebris. The level of hybridization between either melanogaster and simulans c-RNA and funebris DNA was only about 10% of the level found in the homologous combinations. For the sibling species, the heterologous combinations led to levels of hybridization which were only about half those found in the homologous combinations.

The high level of discrimination which can be attained by this method favors a search for intra-specific differences and this is in progress. Preliminary tests indicate that the rapidly renaturing fraction of Drosophila DNA is exclusively involved in the hybridization with RNA under our conditions. Hence this approach offers an effective way of studying the properties and rates of divergence of the highly reiterated sequences generally. Comparisons between closely related species are of particular interest, to see how far the evidence from hybridization compares with more conventional taxonomic criteria and with estimates of affinity based on salivary banding. Experiments to this end are in progress. A preliminary report of the work has been published (Biochem. Journ 1968, 108 J. 30p) and a fuller account is in press.

Portin, P. University of Turku, Finland.
The meiotic loss of the extra Y-chromosome in relation to its preferential segregation in D. melanogaster XXY-females.

It is known from R. F. Grell's (1962) experiments that the extra Y-chromosome can segregate preferentially only from non-crossing over chromosomes. This led Grell to construct a meiotic model with two pairing events. This model is known as the "distributive pairing"-hypothesis.

In the present study the meiotic behavior of the extra Y-chromosome was examined in four different translocation/inversion-systems involving T(2;3)Xa and various combinations of the Curly and Payne inversions. The distal ends of the autosomes, which were potential pairing partners with the Y-chromosome, were marked with recessive genes in order to measure crossing-over.

It was found, as could be expected, that preferential segregation of Y and an autosome can be observed only in those cases where there is no crossing-over in the autosome in question. However it was also found that the Y-chromosome is lost to a certain degree in the non crossing-over cases but in the crossing over cases there is no meiotic loss. This last finding is in contradiction to the distributive pairing hypothesis, because it should be expected in the terms of this hypothesis that the Y-chromosome has fewer if any partners for distribution in the crossing-over situation and thus its meiotic loss should increase.

However, the evidence is not in contradiction to Novitski's (1964) alternative hypothesis to distributive pairing.

References: Grell, R. F., 1962: Proc. Natl. Acad. Sci. 48, 165-172. Novitski, E., 1964: Genetics 50, 1449-1451.

Kuroda, Y. National Institute of Genetics, Misima, Japan.
Characteristic aggregation pattern of dissociated imaginal disc cells of Drosophila melanogaster larvae in rotation culture.

To elucidate at a cellular level under strictly defined conditions the mechanism by which cells of identical genetic constituents show various phenotypic expressions in various organs and tissues, dissociated cells from various imaginal discs of D. melanogaster were tested for their ability to form characteristic histogenetic aggregates in rotation culture.

Eye-antennal discs and wing discs were dissected as described in earlier papers (Kuroda and Yamaguchi, 1; Kuroda and Tamura, 2) from mature third-instar larvae (96 hours after hatching at 25°C) grown under sterile conditions. They were incubated in calcium- and magnesium-free salt solution for 15 minutes, then in 1% trypsin solution for 15 minutes, and were dispersed in the culture medium into single cells by flushing the dissected material through the tip of a fine pipette. After some improvements and simplifications of the culture medium had been made, it was found that medium K-10 (3), a chemically defined medium, was better than

other initial media.

One hundred eye-antennal discs isolated from Oregon-R larvae yielded about 4 x 10^5 single cells, whereas one hundred wing discs from the same strain produced about 4.5 x 10^5 cells. One hundred eye-antennal discs from Bar larvae yielded about 3 x 10^5 cells by the same procedure.

When single cell suspensions each containing 10^5 cells in 0.3 ml medium were introduced into tightly covered micro-beakers, rotated on a gyratory shaker for 24 hours at 100 rpm at 28°C, tissue-like cell aggregates were reconstituted in the center of the micro-beakers. Cell aggregates obtained from eye-antennal disc cells of the Oregon-R strain had an average diameter of 0.6 mm, whereas eye-antennal disc cells from the Bar strain formed smaller and looser aggregates of an average diameter of 0.4 mm. In the staining preparations of the aggregates ommatidium-forming cells formed some cell clusters, which were separated and sorted out from those of antenna-forming cells.

Wing disc cells from the Oregon-R strain formed after 24 hours of rotation aggregates of 0.5 mm in diameter which showed a characteristic structure different from that of eye-antennal disc cells. The differences in histogenesis and organogenesis of different imaginal discs are now further studied.

1. Kuroda, Y. and K. Yamaguchi, 1956, Japan. J. Genet., 31: 98.
2. Kuroda, Y. and S. Tamura, 1956, Med. J. Osaka Univ., 7: 137.
3. Kuroda, Y., 1968, Proc. XII Internatl. Congr. Genet., Vol. II: 100.

Mohamed, Aly H. and Patricia A. Kemner. University of Missouri-Kansas City, Kansas City, Missouri. Cytogenetic effects of hydrogen fluoride on D. melanogaster.

Wild type (Oregon-R) D. melanogaster males were subjected to hydrogen fluoride gas and crossed to untreated Oregon-R virgin females and to tester virgin females of the genotype Pm dp b/Cy sp^2; Sb/D CxF. Salivary gland chromosomes smears of the F_1 larvae from the first cross indicated the presence of chromosomal aberrations such as duplications, deficiencies and inversions. The second cross has been used to determine the induction of subvital, semi-lethal and lethal mutations on the second chromosome.

Abrahamson, S., W. C. Kiriazis and E. M. Sabol. Dept. of Zoology, University of Wisconsin, Madison, Wisconsin. A Storage Effect of Ethyl Methane Sulfonate (EMS) on the Induction of Translocations in Drosophila Sperm.

Experiments were performed to determine the effect of EMS, a monofunctional alkylating chemical, on the induction of translocations, including mosaic translocations, in fresh mature sperm and stored mature sperm.

Oregon-R males aged for 5-6 days were fed a 0.0125 M solution of EMS for 24 hours (following procedures of Lewis and Bacher). These males were mated to bw/bw;e/e ♀♀ for 24 hours and then discarded. The females were allowed to lay eggs for 2 more days, and then transferred to non-yeasted media. After 10 more days the females were transferred back to yeasted media and allowed to lay for 3 days. Progeny obtained from the first three days of egg laying were products of fresh mature sperm; progeny recovered from the last brood were products of stored mature sperm. The F_1 males containing the treated chromosomes (wild-type males) were mated singly to bw/bw;e/e ♀♀. The F_2 cultures were screened for translocations. Six to ten wild-type males from each normal F_2 culture, those not exhibiting translocations, were further tested for mosaic translocations by single pair matings with bw/bw;e/e ♀♀.

One Y-2 translocation was recovered from 271 fertile cultures from fresh mature sperm. Although only 20 vials were fertile in the stored mature sperm test, three 2-3 translocations were recovered, giving a translocation frequency of 0.15. This is a remarkable increase over the translocation frequency of 0.004 obtained in the fresh mature sperm test.

No mosaic translocations were recovered after testing 6-10 males from each of 110 F_2 normal cultures from fresh sperm nor from the 17 aged sperm cultures. However, two other kinds of mosaics were observed in the stored sperm test. Among the progeny of the 6 males from F_2 normal culture #7 two of these vials showed that bw/bw ♂♂&♀♀, bw/bw;e/e ♂♂&♀♀, and +/+ ♀♀ all