Alonso, C. University of Nijmegen, The Netherlands. In situ hybridization of RNA synthesized in larval salivary glands of D. hydei under in vitro conditions.

The hybridization (RNA-DNA) experiments reported here were designed to test a) the capacity for RNA synthesis in isolated salivary glands of Drosophila maintained for three days in a medium described by Poels et al. (1972); b) the possibility that RNA produced by certain puffs is transcribed from repetitive sequences.

Autoradiographs of pulse labeled glands at three days after the onset of incubation revealed a pattern of uridine incorporation into the chromosomes and nucleolus which was essentially the same as seen after in vivo incorporation (Poels et al., 1972). Puff 97A, a puff which becomes active in all cells after explantation of the glands was heavily labeled.

RNA was extracted for hybridization from 70 glands after three days incubation with 50 uCi/150 ul ^{3}H-5T-uridine (spec. act. 27 Ci/mM). The RNA which had a specific activity of 1.1 x 10^{6} dpm/ug, revealed after electrophoresis on SDS-polyacrylamid gels various molecular weight fractions, the major fractions being located at the 28S, 18S and 4-5S positions of the gels. Hybridization experiments were performed with the total RNA extract according to the method of Pardue et al. (1970). Salivary gland squashes were incubated for 16 hrs with the RNA and exposed for 65 days. The autoradiographs consistently revealed labeling of the nucleolus (Fig. 1) and variable labeling of other chromosome areas. Puffed regions, including the puff 97A, did not show consistent labeling.

Fig. 1. Autoradiograph of a salivary gland nucleolus and a part of a chromosome after in situ hybridization of total in vitro synthesized RNA. Exposure time 65 days.

References: Poels, C.L.M., C. Alonso and S.B. de Boer 1972 DIS 48 (this issue); Pardue M.L., S.A. Gerbi, R.A. Eckhardt and J.B. Gall 1970 Chromosoma 29:268-290.

Gavin, J.A. and D.G. Holm. University of British Columbia, Vancouver, Canada. Gamma ray induced nondisjunction of chromosome 2 in females.

Estimating the relative frequency of autosomal nondisjunction (or autosome loss) has been made possible through the construction of compound autosomes (Rasmussen, DIS 34:53). We find, for example, that disomic-2 and nullosomic-2 sperm are regular and frequent products of compound-2 males. Therefore, when these males are crossed with females bearing standard chromosomes, the resultant, but infrequent, progeny are products of exceptional meiotic events during oogenesis. The frequency of nondisjunction increases considerably, however, when crossing-over, in more than one pair of homologous chromosomes, is suppressed by either structural rearrangements or genetic means, or when females are exposed to ionizing radiation. The results of a preliminary study on radiation induced chromosome 2 nondisjunction (and chromosome 2 loss) during oogenesis are recorded in Table 1.

In each of the five tests, the treated (or control) females, whose genotypes are described in Table 1, were divided into groups of 25 and placed in half-pint creamers with 25 C(2L)P, b;C(2R)P, px males. The crosses were carried through five successive broods of three days duration for a total of 15 days. To estimate the overall reproductive potential of the females in each test, a number of bottles involved matings of 25 treated (or untreated) females to males bearing standard second chromosomes. The expected number of progeny listed in Table 1 is an estimate of the total expected progeny if compound males had been replaced by standard males. This value serves as a relative denominator for comparing nondisjunctional frequencies.

Two basically different genetic types of females are being considered: 1) structural