atids similar to those observed in XO males. Two deviations from the XO phenotype have been observed. Lambrush loop structures which are not obvious in XO primary spermatocytes can be seen in those carrying the deficiency. Furthermore, in electron micrographs of cross sections through the primary spermatocytes both crystals and the nuclear structures shown by Meyer et al. (1961) and Tates (1971) to be present in wild type (XY) spermatocytes are seen. The second deviation from the XO phenotype is that counts of spermatid tails in cross sections of cysts close to the middle of the testis indicate a mean number of tails per bundle of 34.5, considerably higher than the 31 reported in XO males by Kiefer (1973). Additionally, many of the axonemes and mitochondrial derivatives exhibit cross sections like those seen in XO males.

Preliminary observations of small deficiencies totaling virtually all of the Y chromosome except for the proximal regions around the kinetochore suggest that only the small region noted above leads to crystals, aberrant nebenkerne and micronuclei. Males carrying some of the other small deficiencies do not have normal ultrastructure in their spermatocytes or spermatids but the extent of such aberrations is not known.

At present work is under way to further characterize the Y chromosome deficiencies both genetically and cytologically (Kennison) and to study their effects on germ line development using both light and electron microscopy (Hardy).


Hawley, R.S. University of Washington, Seattle, Washington. Radiation-induced nondisjunction in females homozygous for In(1)sc8.

In(1)sc8, y w+/In(1)sc8, f y cv females were exposed to 3000 R, using a Co60 source, and then mated to YS In(1)EN-YL, v f B / O males. The progeny, resulting from eggs laid from 24-72 hours after irradiation, consisted of 1546 B females, 438 B+ males, 72 f v B males, 11 B+ females, 2 w B+ females, 1 y B+ female, and 1 v B+ female. The frequencies of B males (.22), which result from nullo-X ova, and B+ females (.005), which result from diplo-X ova, are identical to published values obtained following similar treatment of wild-type females (Hawley 1975). The recovery of 4 females homozygous for recessive markers confirms the observation of Savontaus (1975) that radiation-induced nondisjunction is not restricted to Eo tetrads.

In a second experiment, In(1)sc8, y w+/In(1)sc8, f v cv females treated with 3000 R were mated to YS In(1)EN-YL, v f B / O; C(4)RM, ci eyR females and 27 v f B males and 6 B+ females were selected from among the progeny. By crossing the v f B males to C(1)RM, y f / Y; ci eyR / ci eyR females, 7 (24%) were shown to have resulted from eggs which were also diplo-4. Of the 6 B+ females, 4 (66%) were homozygous for ci eyR. Following similar treatment of wild-type females, 13% of the nullo-X exceptions were also diplo-4 and 38% of the diplo-X exceptions were also nullo-4 (Hawley 1975). The recovery of 4 females homozygous for recessive markers confirms the observation of Savontaus (1975) that radiation-induced nondisjunction is not restricted to Eo tetrads.

These data suggest that the associations between the X and 4th chromosomes that dictate the frequency and manner of radiation-induced nondisjunction are not influenced by the location of the pericentric heterochromatin.


Hazeldrigg, T. and T.C. Kaufman, Indiana University, Bloomington, Indiana. Newly induced mutations of doublesex.

Previous work (Duncan and Kaufman) has shown that the homeotic gene doublesex (dsx) is located in region 84p of the polytene chromosome map. Both a recessive allele (which yields an intersexual phenotype in males and females) and a dominant allele (which transforms only females into intersexes) are known to be associated with this locus. In the present work, an EMS mutagenizing (Lewis and Bacher) screen has been performed to uncover new alleles of dsx, and also recessive lethals located in this region of the chromosome. The screen utilized a deficiency, dsxR, recovered as a revertant of dsxR.