Table 1

Female Parent	Radiation Dose (rads)	Expected No. of progeny	Exceptional Progeny		Nondisjunction	Chromosome loss
			Matro	Patro		
lt stw^3/b pr cn	0	86,000	2	26	4	24
lt stw^3/b pr cn	3500	72,000	17	153	34	136
lt stw^3/SM1	0	84,000	12	26	24	14
lt stw^3/SM1	1000	63,000	208	230	416	22
lt stw^3/SM1	3500	40,000	120	325	240	205

homozygotes for chromosome 2, and 2) structural heterozygotes involving the multiple-break inversion, SM1, Cy. Comparing the results recorded on lines 1 and 3 of the table, we note little difference in the frequency of exceptional progeny from either class of untreated females. The primary contrast is in the ratio of matro/patro progeny. The exceptional progeny produced by structurally homozygous females appear to arise mainly as a function of chromosome loss. In comparing the relative frequencies of exceptional progeny recovered from the different genotypic classes following radiation (from a Co^{60} source at a rate of 65 rads/sec.) we find two quite contrasting results. First, assuming the method of estimating progeny number is reliable, the frequency of induced exceptional meiotic events is considerably greater in structurally heterozygous females than in homozygous females (compare lines 2 and 5 in the Table). The second contrast concerns chromosome loss. Although treated structural homozygotes produce increased numbers of exceptional gametes, we find (as noted on line 2) that most of the progeny are patroclinous. This clearly indicates that chromosome loss is responsible for the majority of the exceptional gametes. The structural heterozygotes, on the other hand, produced more nondisjunctional gametes, although chromosomal loss is significant at 3500 rads. At the lower radiation dose of 1000 rads, all the progeny appear to be products of nondisdunction (i.e., the matro/patro is approximately equal to one). It is also of interest to note that in all but the last experiment (line 5 of the table) the matro/patro ratio remained relatively constant. At 3500 rads (line 5), the matro/patro ratio was quite low in brood 1, indicating high chromosome loss, whereas by brood 5 the ratio increased to approximate unity. We should also note that, since the assortment of the compound-2 chromosomes used in this study approaches randomness in males, the frequency of disomic-2 and nullosomic-2 eggs should be approximately four times the frequency of exceptional progeny.

Mosna, G. and S. Dolfini. University of Milan, Italy. New continuous cell lines of Drosophila melanogaster. Morphological characteristics and karyotypes.

Several continuous cell lines of Drosophila melanogaster have been recently established (Kakpakov et al. 1969; Echalier and Ohanessian 1970; Schneider 1971). We report now on the successful growth of three additional cell lines deriving from embryonic tissues of Drosophila. Two hundred cultures were started from embryos of the wild stock Varese 12-15 hours old, following the technique devised by Echalier and Ohanessian (1970) and using the same D 225 medium. The development of the cultures was similar to that described by Echalier and Ohanessian (1970). The only three cultures, after 8, 10 and 6 months respectively, a new wave of cell multiplication gave rise, by subsequent subcultures, to the three cell lines, called GM_1, GM_2 and GM_3 (Genetics, Milan). Nearly all cells are roundish, only a few are spindle-shaped; the degree of homogeneity in the three lines varies according to the percentage of polyploid cells present in each line.

Karyotypic analysis provided characteristics for distinguishing each line. The preliminary cytological observations are in fact the following:

GM_1 line (16th and 17th passage): A high percentage of cells (75%) are marked by a normal X and a centric heteropycnotic fragment, 10% are XO and the rest are tetraploid. Nearly all cells have only one IV chromosome, the major autosomes being normal (Fig. 1a). Quinacrine staining showed in the short fragment two sections of bright fluorescence, which correspond to the two sections of the normal Y chromosome proximal to the centromere (Zuffardi et al. 1971).

GM_2 line (17th and 21st passage): a peculiar marker has been found in this line. 50% of these cells are XO and have two IV chromosomes; moreover, one chromosome of the II pair is missing and two "new" telocentric chromosomes are present resulting probably from a misdivision of the centromere of the original metacentric autosome (Fig. 1b). The other cells show tetraploidy or higher ploidy degrees; the characteristic telocentric chromosomes are always present (Fig. 1 .)

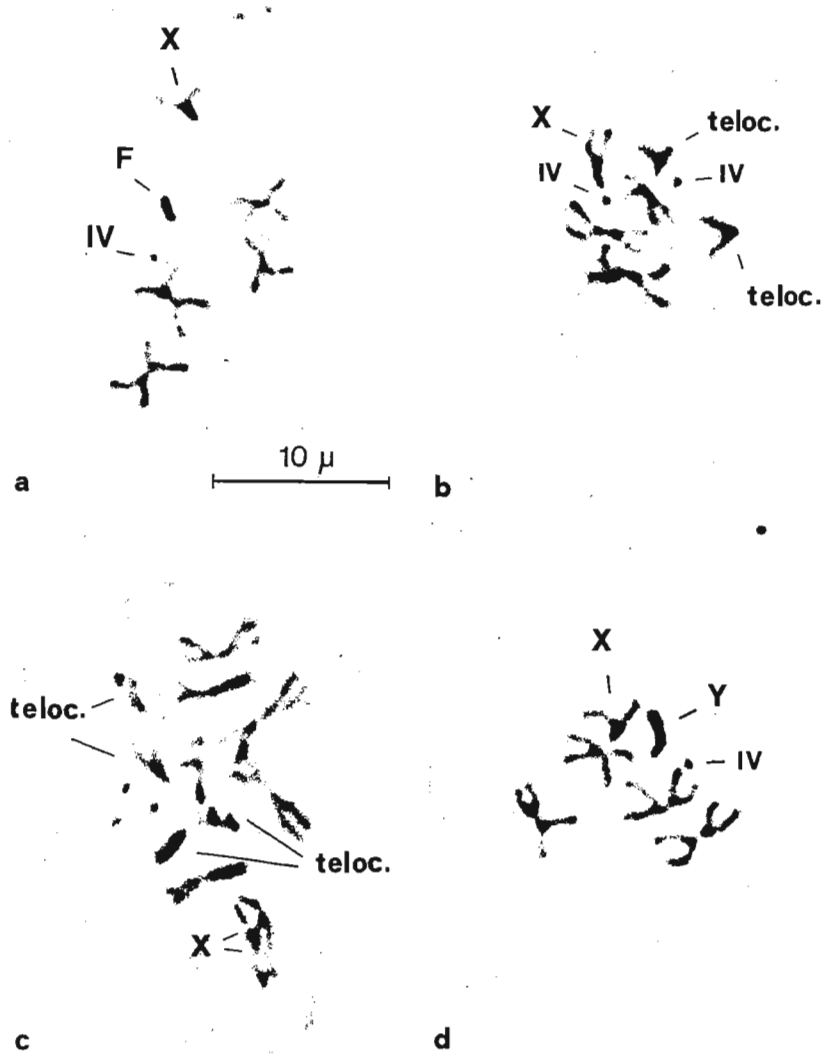

Fig. 1. Karyotypes of the different cell lines. a GM_1 line: X + fragment cell having one IV chromosome (F fragment); b GM_2 line: XO cell having two "new" telocentric chromosomes and two IV chromosomes; c GM_2 line: tetraploid cell; d GM_3 line: XY cell having one IV chromosome.

GM_3 line (9th, 10th and 12th passage): a high percentage of these cells (70%) are XY and have normal large autosomes. Only one IV chromosome is present (Fig. 1d). Many cells exhibit tetraploidy, octoploidy or higher ploidy degrees (30%).

No differences between different passages have been found in each line.

These findings emphasize the importance of these Drosophila cell lines: the easily recognizable chromosomal markers allow one to distinguish the different lines, making them useful for several research purposes. We are willing to send our cell lines to anybody interested.

References: Echalier, G. and A. Ohanessian 1970, In Vitro 6:162-172; Kakpakov, V.T., V.A. Gvozdev, T.P. Platova and L.G. Polukarova 1969 Genetika (USSR) 5:67-75; Schneider, I. 1971 DIS 46:111; Zuffardi, O., L. Tiepolo, S. Dolfini, C. Barigozzi and M. Fraccaro 1971 Chromosoma (Berl.) 34:274-280.