Williamson, D.L. and R.P. Kernaghan. State University of New York at Stony Brook, New York. Virus-like particles in Schneider's Drosophila cell lines.

Virus-like particles have been reported to be present in several adult tissues of D. melanogaster, see, e.g., Filshie, et al. (1967), Kernaghan et al. (1964), Philpott et al. (1969), and Rae and Green (1967). In addition, Akai et al. (1967), observed virus-like particles in cell lines derived from in vivo cultures and Wehman and Brager (1971) report similar particles to be present in in vitro cultures of wing imaginal discs. We are reporting the presence of similar virus-like particles in sublines of Schneider's Drosophila cell lines 1, 2, and 3.

Cells from each line were fixed in 2% glutaraldehyde in M/15 phosphate buffer (pH 7.2) and centrifuged at 1,000 XG. The pellets were washed in phosphate buffer, post-fixed in 2% aqueous osmium tetroxide containing 1% sucrose, en bloc stained in 2% aqueous uranyl acetate, dehydrated in acetone and embedded in epon. Sections were stained with lead citrate for 15 seconds. Figure 1 is a cell belonging to line 2 in which the virus-like particles are clearly

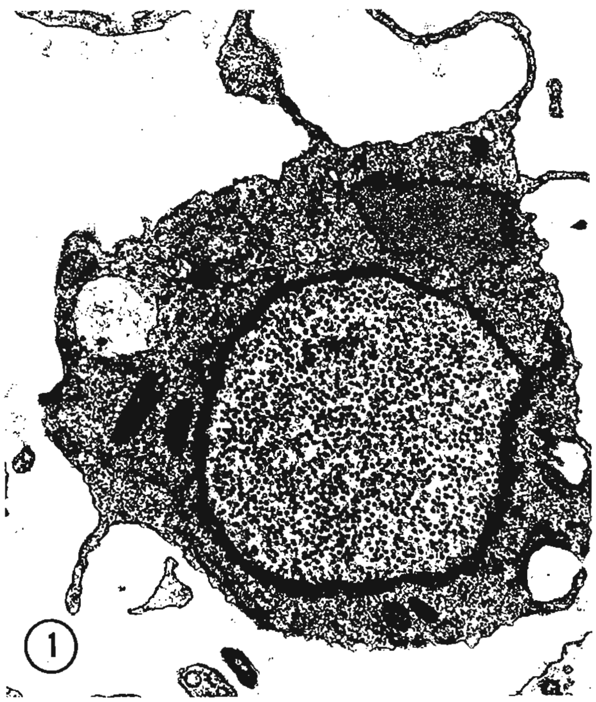

Fig. 1. Cell from Schneider's Drosophila cell line 2 showing virus-like particles in the nucleus. 21,000 X

Fig. 2. Cell from Schneider's Drosophila cell line 2 showing virus-like particles in both nucleus and cytoplasm. 25.000 X

visible in the nucleus of the cell. These virus-like particles are also observed in the cytoplasm of each of the three cell lines as shown in Figure 2 in which particles can be seen in both the nucleus and cytoplasm of the cell. The particles are spherical in shape with a diameter of ≅ 43 nm. Particles are observed in most sections of cells, though the number seen varies from single particles to large aggregates. The cell lines grow vigorously in spite of the presence of the particles, and the nature of the relationship of the particles to the cell remains unknown.

This note is intended to bring to the attention of those working with Schneider's Drosophila cell lines that the presence of these particles may confound any studies being carried out on the nucleic acids of these cell lines. Supported by NIH Grant AI-10950 to DLW and NIH Grant AI-09945 to RPK. We are grateful to Dr. Imogene Schneider for supplying us with the cell lines.

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Kernaghan, R.P., M.A. Bonneville and G.D. Pappas 1964 Genetics 50:262; Philpott, D.E., J. Weibal, H. Altan and J. Miquel 1969 J. Invert. Path. 14:31-38; Rae, P.M.M. and M.M. Green 1967 Virol. 34:187-189; Wehman, H.J. and M. Brager 1971 J. Invert. Path. 18:127-180.

Narda, R.D. and R.K. Gupta. Punjab Agricultural University, Ludhiana, India. Mutation studies in D. melanogaster.

Role of protein synthesis in the induction of chromosomal aberrations was studied in the larvae of Oregon-K stock of D. melanogaster. Protein synthesis was inhibited by chloramphenicol (CPL) or streptomycin (ST), chromosomal aberrations were induced by ethylmethane sulphonate (EMS), methylmethane sulphonate (MMS), and hydrazine sulphate (HZ). For treatment with mutagen and/or the inhibitor, the larval period was divided into two halves. Chromosomes were examined for aberrations in fully grown third instar larvae.

EMS induced higher frequency of inversions when applied in the second larval half, whereas, MMS and HZ did so when applied in the first larval half. A few deletions were also induced by EMS and MMS and one translocation was induced by HZ (Table 1).

Regarding the effect of inhibition of protein synthesis on inversion frequency, excluding one case there was an overall increase in all treatments. This indicates that protein synthesis is involved in induction of chromosomal aberrations.

Further EMS, MMS and HZ induced maximum frequency of inversions (46.81%, 30.77% and 41.82% respectively) in 3L chromosome. In X-chromosome HZ induced higher frequency of inversions (13.62%) as compared to EMS (6.37%) and MMS (5.12%) and HZ induced not even a single inversion in the 2L chromosome in any of the treatments. The observed number of inversions induced by different mutagens in different chromosomal arms is non-random. Possibility that the number of aberrations induced on a chromosome depends upon its length is thus ruled out.

Table 1. Effect of protein inhibitors on the frequency of induced by EMS, MMS and HZ

Treatment	No. of larvae studied	No. of inversions scored	Frequency of inversions
NIL	95	0	0.0%
0 + EMS	86	10	11.6%
CPL + EMS	107	13	12.1%
ST + EMS	90	5	4.3%
*EMS + 0	85	7	8.2%
EMS + CPL	71	7	9.8%
EMS + ST	76	7	9.2%
0 + MMS	70	8	11.4%
CPL + MMS	81	13	16.0%
ST + MMS	75	18	24.0%
**MMS + 0	104	14	14.2%
MMS + ST	96	38	39.5%
MMS + ST	90	29	32.2%
***0 + HZ	90	12	13.3%
CPL + HZ	70	19	27.1%
ST + HZ	70	11	15.7%
HZ + 0	79	16	13.3%
HZ + CPL	75	30	40.0%
HZ + ST	75	25	33.3%

* 3 deletions were also induced
** 5 deletions were also induced
*** 1 translocation was also induced

It was also revealed by the study of breakage-union points that EMS acts specifically at proximal end of 3L chromosome, MMS does so at the distal end of 2R and proximal end of 3R and HZ in the central one third 3L chromosome.

It is concluded that the type of spectrum of mutations induced by various mutagens is different and mode of action of each mutagen is specific in itself.