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Replicon properties of Drosophila genome. I. DNA fibre autoradiography of salivary gland cells held at the mid-part of S-phase.

^{3}H-TdR autoradiograms prepared from Drosophila polytene tissue reveal a heterogeneity in the cell population with respect to their replication cycle (Plaut et al. 1966; Mulder et al. 1968; Rodman 1968; Lakhotia & Mukherjee 1970; Kalisch & Haegle 1973; Chatterjee & Mukherjee

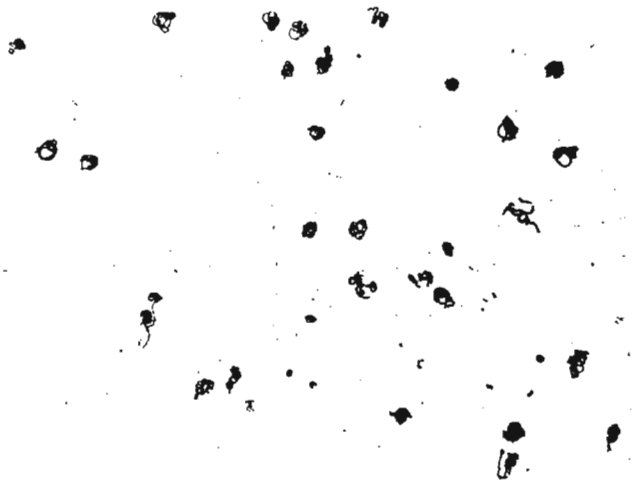

Fig. 1a. ^{3}H-TdR autoradiogram showing the accumulation of nuclei at the mid-part of S-phase.

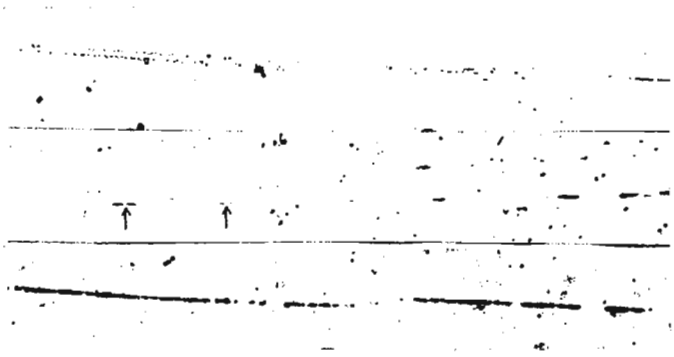

Fig. 1b. Different sizes/types of labelled segments obtained from the DNA fibre autoradiograms of polytene cells synchronized at the mid-part of S-phase. Arrows show the origins of post-pulse.

1975; Mukherjee et al. 1980). Studies on some molecular aspects of replication viz., initiation of replicons, their size, rate of fork movement, termination, etc., in a cell population demanded a synchronous (at least partial) population of cells, to avoid misinterpretations and laborious toil.

We, therefore, employed FdUrd block, cold thymidine release technique (Achary et al. 1981) and obtained more than 60% nuclei synchronized at the mid-part of the S-phase (Fig. 1a). DNA fibre autoradiography was done to study the said properties of Drosophila larval salivary gland polytene nuclear DNA synchronized at the mid-part of the S-phase.

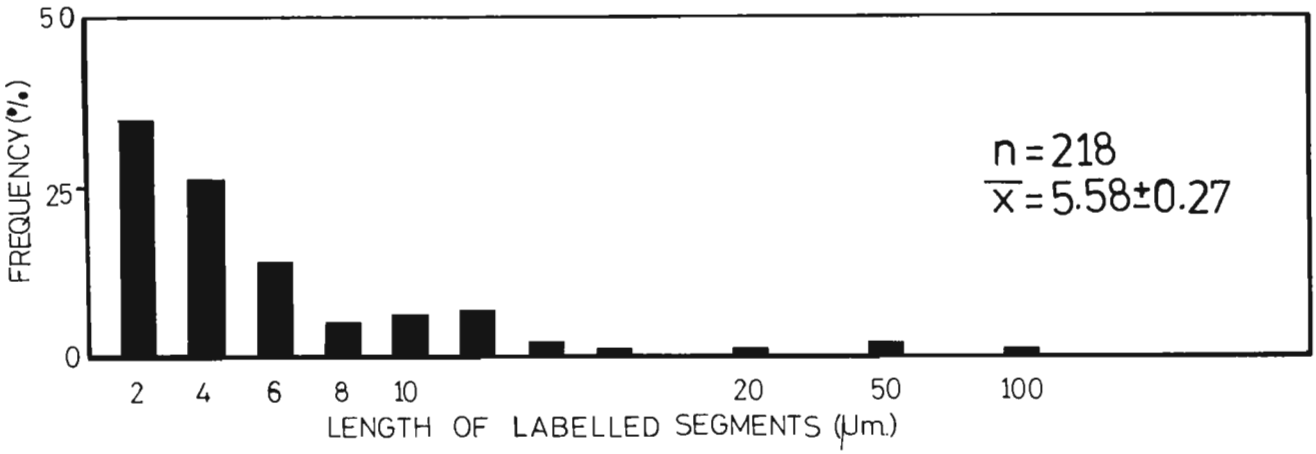

Fig. 2. Histogram showing the frequency distribution of different size labelled segments of DNA held at the mid-part of S-phase.

Basically the methodology of DNA fibre autoradiography involves lytic buffer (modified after Laughlin & Taylor 1979). The lysate is gently drawn over the slide, air dried and the processed for autoradiography.

Fig. 1b shows different types of labelled segments observed in these DNA fibre autoradiographic studies on the polytene nuclei synchronized at the mid-part of S-phase revealed a predominance of short labelled segments ranging from 2-6 µm with a mean of 5.58±0.27 µm (histogram). The finding suggests that the majority of the replicons are in the process of initiation rather termination in which case (latter) longer labelled segments would have been observed in good number. Works in our laboratory are in progress to substantiate our proposal.

References: Plaut, W. et al. 1966, J.Mol.Biol. 16:85-93; Mulder, M.P. et al. 1968, Genetica 39:385-428; Rodman, T.C. 1968, Chromosoma 23:271-287; Lakhotia, S.C. & A.S. Mukherjee 1970, J.Cell Biol. 47:18-33; Kalisch, W.E. & K.Haegele 1973, Chromosoma 44:265-283; Chatterjee, A.S.Mukherjee et al. 1980, In Development and Neurobiology of Drosophila (Ed: A.Hollaender), Plenum Press, N.Y., pp. 57-83; Achary, P.M.R. et al. 1981, Chromosoma 82:505-514.

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A new allele (H^r) at the Hairless locus of Drosophila melanogaster.

A mutant which produces suppression of a large number of macro and microchaetae has arisen spontaneously in a line selected for low dorsocentral and scutellar bristle number. This mutant is recessive and was found to map near ebony locus. An allelism test indicated that it is a new allele of the Hairless series (location III - 69.5). This allele was named Hairless-recessive and the H^r symbol is proposed to it.

Flies homozygous for H^r have almost all the bristles and hairs substituted with double or triple abnormal sockets (a and b). In wing, L IV and L V veins do not reach the margin (c).