Table 1. Protein-synthesizing activity of Drosophila ribosomes in a cell-free system.*

Time of incubation (min)	Incorporation (cpm/mg RNA)	
	- poly U	+ poly U
1.5	1250	1250
3	2900	3100
6	5600	5800
20	15080	15660
Ribosomes from rat liver (min)		
20	16160	17180

* 100 μg poly U were added where indicated.

Data obtained show that although ribosomal RNA within Drosophila ribosomes are fragmented these ribosomes not only remain structurally intact but also display sufficient activity in the cell-free system for protein synthesis. Addition of poly U to these ribosomes leads only to a small increase of phenilalanine incorporation suggesting that endogenous templates were present in the ribosomes. This result confirms previous data on the functional activity of ribosomes from animal and bacterial cells which are treated with exogenous ribonucleases (5,6). However, in the case of Drosophila ribosomes, we have dealt for the first time with biological activity of ribosomes containing ribosomal RNA whose structural integrity was damaged by endogenous ribonucleases. It is important to note that results reported above were the same for ribosomes isolated from Drosophila melanogaster at various developmental stages as well as for ribosomes from cultured embryonic diploid cells.

References: (1) Schuppe, N.G., T.V. Syrota 1974, Dokl. Akad. Nauk SSSR 217(5):1210-1213; (2) Wettstein, F.O. et al. 1963, Nature 197:430-435; (3) Kakpakov, V.T. et al. 1969, Genetika 5:67-75; (4) Ilan, J. 1968, J. Biol. Chem. 243:5859-5866; (5) Grove, B.K. and T.C. Johnson 1973, Biochem. Biophys. Res. Comm. 55:45-51; (6) Kuechler, E. et. al. 1972, Biochim. Biophys. Acta. 277:615-627.

Smith, C.M., J.N. Thompson, jr., and R.C. Woodruff. University of Oklahoma, Norman, and Bowling Green State University, Bowling Green, Ohio. An attempt to transmit male recombination activity by non-genetic means.

A number of recent studies have suggested that male recombination (MR) and its correlated mutator activity in Drosophila melanogaster may be due to an infective factor (Woodruff and Thompson, 1977; Thompson and Woodruff, 1978). The most direct evidence comes from successful transmission of MR activity by injecting homogenates of an MR strain (OK1) into a control strain (Canton S) that does not show male recombination (Sochacka and Woodruff, 1976). Attempts to transmit MR activity by feeding have given interesting, but ambiguous, results (Hellack et al., 1978). We have repeated the feeding experiments in order to test the efficiency of this hypothetical method of social transfer over a longer period of time.

We established two sets of population cages. The control cages (#1 and #2) were made from styrofoam ice chests and contained Canton-S (a non-MR strain). Each chest had spaces for 6 food tubes in which yeasted Carolina potato-based instant food was introduced into the cages. Two tubes were replaced each week. The experimental cages (Treated #1 and #2) were identical to the controls, except that 1 ml of a concentrated whole-fly homogenate of the MR strain OK1 was added to each food tube. The cages were kept in an incubator at 25°C.

The results are summarized in Table 1. A total of 23,379 progeny were scored from the four cages over a period of 27 weeks of treatment. Seven recombinants were found in the treated cages, but three were found in the control cages. Thus, although some male recombination activity may have been induced, the presence of MR activity in the control cages does not allow us to interpret these results. Indeed, MR activity in control feeding experiments has been the primary source of ambiguity in similar experiments (Slatko and Hiraizumi, unpublished; Hellack et al., 1978). Even the most generous interpretation of these data, however, shows that social transfer through flies dying on the food is not likely to be a significant ecological factor in MR transmission.

Table 1. Summaries of male recombinants in MR assays of treated and control population cages. (All MR assays were carried out by the methods outlined in Woodruff and Thompson, 1977. Total progeny assayed are shown in each column with the number of recombinants in parentheses.)

Week of Sample	Treated Cage #1	Treated Cage #2	Control Cage #1	Control Cage #2
0	1405 (1)	1187 (0)	968 (0)	1911 (0)
8	1173 (0)	1172 (0)	912 (0)	961 (0)
15	954 (3)	1377 (0)	1308 (0)	808 (0)
22	1970 (0)	1954 (0)	--	1503 (0)
27	1148 (1)	925 (2)	667 (3)	1076 (0)
Total	6650 (5)	6615 (2)	3855 (3)	6259 (0)

References: Hellack, J.J., J.N. Thompson, jr., R.C. Woodruff and B.N. Hisey 1978, Experientia 34: 447; Sochacka, J.H.M. and R.C. Woodruff 1976, Nature 262: 287-289; Thompson, J.N., jr., and R.C. Woodruff 1978, Nature: in press; Woodruff, R.C. and J.N. Thompson, jr., 1977, Heredity 38: 291-307. This work was supported by DHEW-NIEHS grant ES01439-03.

Stein, S.P. and E.A. Carlson. State Univ. of New York, Stony Brook. Mosaicism of eye color induced in mature sperm of D. melanogaster.

Males of bw^+;st or bw;st^+ genotype were fed EMS (ethyl methane sulfonate) using an 0.0125M concentration for 24 hours. The procedure for preparation of the mutagen was that of Lewis and Bacher (DIS 43:193). These males were mated with virgin bw;st females. F_1 progeny were examined for eye color mutations reflecting alterations of the bw^+ or st^+ alleles. These appeared in five different patterns whose frequencies are presented in Table 1. The frequency of induced eye color mutation was 0.28% for bw^+ to bw (31/10,928) and 0.13% for st^+ to st (9/6739). Of the 40 mutants obtained, 27 were isolated amorphs (white sectors or eyes) and 13 were hypomorphs (lemon-orange sectors or eyes). One of the 27 amorphs, however, turned lemon-orange about a week after being detected.

Table 1. Patterns of eye color mosaicism

Phenotype	Series I $bw^+ \downarrow bw$	Series I $st^+ \downarrow st$	Series II $bw^+ \downarrow bw$	Total
both eyes full mutant	2	0	4	6
one eye full mutant, one eye normal	2	0	9	11
one eye full mutant, one eye sectored	1	0	2	3
both eyes sectored	1	5	2	8
one eye sectored, one eye normal	7	4	1	12

Each of the 40 eye color mutants was mated to bw;st flies to test for gonadal transmissibility of the induced mutant.

There were 29 mutants which produced 100 or more F_2 progeny. Of these 8 were transmitted mutations, 4 involving a gonadal complete composition and 4 involving a gonadal mosaic composition. The classification of a gonadal mosaic was based on the presence of 80% or more of mutant (white or lemon) gametes. The transmissibility, 28% is similar to that found for dumpy mutations induced by EMS.

The pattern of mosaicism varied, with one eye sectors and one eye full mutants being the most common forms. The use of the bw^+;st or bw;st^+ permitted white or very light eye color sectors to be detected readily. No salt-and-pepper distribution of white and scarlet (or brown) ommatidia were found.