and 61^{e} lines varied according to the culture medium used, and on the banana medium I use, no dor females emerge as adults in the FM_3 line. Lucchesi, Hildreth and I (in preparation) have also found that fertility and testicular development in dor ♂♂ are greatly influenced in expression by a variety of factors, including the standard media used for stock rearing. Moreover, Lucchesi and I find that identical dor stocks exchanged between our labs where different standard media are used, show very different characteristics of emergence and survival rate, fertility, and fecundity within one to two generations.

It therefore seems probable that the differences observed in the patterns of damage in dor embryos at different times and in different laboratories are related to a complex of factors, including fertility of both sexes, fecundity, egg quality, viability, and mating behavior. Many of the developmental differences are probably immediately related to the qualities of the egg in which development is taking place. This points to the necessity in developmental studies in female sterility mutants of clearly defining and carefully controlling the conditions under which studies are carried out or repeated.

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Chen, P. S. and P. Baumann. Zoologisches Institut der Universität, Zurich, Switzerland. Protein synthesis during aging of D. melanogaster.

A kinetic study of the utilization and incorporation into proteins of ^{14}C-labelled lysine, α-alanine and glycine in 3- and 50-day-old adult males of D. melanogaster has been carried out. Since the pool size of free amino acids differs between young and old flies, we used the equations of Hearon as published by Dinamarca and Levenbook (1966) for the calculation of the rates of turnover (K_a) and incorporation into proteins (Kp). Adult flies of the wild type (Sevelen) were raised on standard medium at 25°C. At the desired age about 0.03 µl of the uniformly ^{14}C-labelled amino acid with a concentration of 0.7-1.0 mc/mM was injected into each fly. Amino acid and protein samples were taken at 0, 30, 60, 90 and 120 minutes after injection. Owing to the small size, four animals had to be used for each sample. The flies were homogenized and the proteins precipitated by adding 300 µl of 0.3 n hot perchloric acid (PCA). Subsequent to centrifugation, the protein precipitate was washed three times with PCA, two times with ether-ethanol (1:3), and then dissolved in 300 µl of concentrated formic acid. About 10% of the protein solution was used for determining total radioactivity, 60% for assaying total protein by the biuret reaction, and 30% for acid hydrolysis (6 n HCl for 12 h at 110°C). The injected amino acid in the protein hydrolysate was first separated by high-voltage paper electrophoresis (8% formic acid, pH 2.0, 2500 V, 100 min.), eluted from the paper with 60% methanol, and then plated out for counting.

The free amino acids in the supernatant solution of the PCA extract were also analyzed. After neutralization with KOH and centrifugation, the solution was evaporated to dryness and the residue was taken into a small volume of 80% ethanol. The latter was then divided into two parts. Subsequent to individual electrophoretic separation, one part was used for estimating the radioactivity in free pool, and the other part for assaying pool concentration using the cadmium-ninhydrin-reagent.

Our data obtained by the above procedures showed that for all three amino acids both the

Table 1.

Incorporation of lysine, glycine and alanine into proteins

Age of adult males	Incorporation rate (µM/h/mg protein)x10^{-3}					
	Lysine		Glycine		Alanine	
	n	M ± S.E.	n	M ± S.E.	n	M ± S.E.
3 days	22	2.508±0.228	24	8.176±0.202	24	6.640±0.378
50 days	23	0.923±0.090	23	3.422±0.107	24	2.579±0.082
$\frac{\text{50d males}}{\text{3d males}}$ x 100		36.9		41.8		38.9

References: Dinamarca, M. L. and L. Levenbook, 1966, Arch. Biochem. Biophys., 117: 110-119; Clarke, J. M. and J. M. Smith, 1966, Nature, 209: 627-629.

rates of turnover and incorporation into proteins in 3- as well as 50-day-old flies remain constant within at least two hours after injection. The same results have been reported by Dinamarca and Levenbook (1966) for the blowfly Phormia regina. Of particular interest is our finding that the incorporation rates per mg protein in older adult males amount to only 36.9 to 41.8% of those in the younger ones (see Tab. 1). This is in contrast to the previous report of Clarke and Smith (1966) who found that for D. subobscura the incorporation of ^{14}C-leucine into protein in 60-day-old male flies is about two times higher than in individuals aged 20 days. The difference is obviously due to the fact in our kinetic analysis the pool size was included in the calculation of the incorporation rate, whereas Clarke and Smith determined only the total radioactivity in protein. Similar experiments on protein synthesis in various lethal mutants are now in progress.

Cohen, A., Shamay, E. and Goldschmidt, E.
Laboratory of Genetics, Hebrew University, Jerusalem, Israel. Effect of induced recombination on homozygous viability.

A simple scheme of crosses enabled us to compare the viability of recombinant chromosomes with that of wild type as well as marked nonrecombinant chromosomes, in the third generation after irradiation.

Males of D. melanogaster heterozygous for the recessive markers b cn bw and for their wild type alleles received an X-ray dose of 2,000 r (dose rate 430 r/minute in Exp. A. and 290 r/minute in Exp. B). The males were mated individually to two females homozygous for the three recessive markers and for the dominant marker J (Jammed). Each male was supplied with two fresh females per day for 15 days. A sharp decrease in fertility amd fecundity on the seventh day after irradiation indicates the success of the brood pattern plan. The large majority of recombinants appeared in the broods of days 8 - 15.

Recombinant and non-recombinant males heterozygous for J were mated individually to Cy/Pm females in vials. Males and females of the R_2 generation carrying the Cy chromosome and an irradiated recombinant or non-recombinant chromosome were mated in vials. The percentage of non-Cy flies appearing in the R_3 generation was scored as an estimate of the homozygous viability of the irradiated chromosomes. The frequency of lethals and semi-lethals among recombinant and non-recombinant chromosomes was much lower than observed by Bateman (1968) in a similar experiment after irradiation with only 1,000 r. The difference in the frequency of lethals between recombinant and non-recombinant chromosomes was not significant. The results of the viability tests pooled for days 8 - 10 and for days 11 - 15 of each experiment appear in the following table.

Table 1

Viability	Days 8 - 10 CO	Days 8 - 10 NCO +	Days 8 - 10 NCO mut.	Days 11 - 15 CO	Days 11 - 15 NCO +	Days 11 - 15 NCO mut.	Total CO	Total NCO	Chi Square (1 d.f.) leth. + semi-leth. vs. others
Expt. A.									
0 - 3.3%	6	-	2	2	2	-	8	4	
3.4 - 16.7	-	-	-	-	-	-	-	-	2.507
16.8 - 26.7	3	3	4	1	1	1	4	9	
26.8 +	18	23	13	23	10	17	41	63	
Expt. B.									
0 - 3.3%	5	3	1	1	1	-	6	4	
3.4 - 16.7	-	1	1	-	-	1	-	3	0.478
16.8 - 26.7	4	7	3	4	9	3	8	22	
26.8 +	47	49	56	40	32	35	87	172	

Cross-over and non-crossover chromosomes grouped by viability classes.