Félix, R. and Rosario Rodríguez. Programa de Genética y Radiobiología, Comisión Nacional de Energía Nuclear. Mexico City, Mexico. Effect of actinomycin D on the number of offspring produced by D. melanogaster females.

Virgin females of the genotype y cv v f car/y which had eclosed 12 to 24 hours previously, were injected with solutions of actinomycin D. The use of this stock makes the detection of non disjunction and X-loss fairly easy when crossed to a tester male stock with attached XY chromosomes with the markers yellow and Bar. This preliminary experiment was divided into three groups: Group I, females not treated, but otherwise handled in the same way as the treated flies; Group II, females injected with a solution of actinomycin D at a concentration of 0.010 mg/ml; and Group III, females injected with a solution of actinomycin D at a concentration of 0.100 mg/ml.

The actinomycin D solution was prepared half an hour before the injection dissolving this substance in a drop of 95 per cent ethanol, and diluting in a physiological 0.7N NaCl solution to the concentration desired. A saline solution was used instead of distilled water in order to avoid the problem of induced sterility and possible cell selection by osmotic shock.

The procedure followed for the injection and for the calibration of the micro-syringe has been outlined elsewhere (Félix, 1964 and 1968). A "Santotube Q" needle was attached to a micro-syringe which was actioned by a tubing from an air-compressor machine. Amounts estimated as 0.60 microliter were injected into the flies between the fifth and the sixth abdominal tergite.

The flies used throughout the experiment were reared in the agar-cornmeal medium regularly employed at the laboratory. The cultures were kept at 25°C±1 before and after the treatment.

The injected females were placed in mass cultures with an excess of males and a day later they were transferred to vials. In each vial a female was mated to two or three males having attached XY chromssomes.

Seven broods were obtained after transferring the P flies every two days. The F_1 flies arising from eggs laid in each vial were scored 17 days after oviposition. The results are summarized in Table I and Fig. 1.

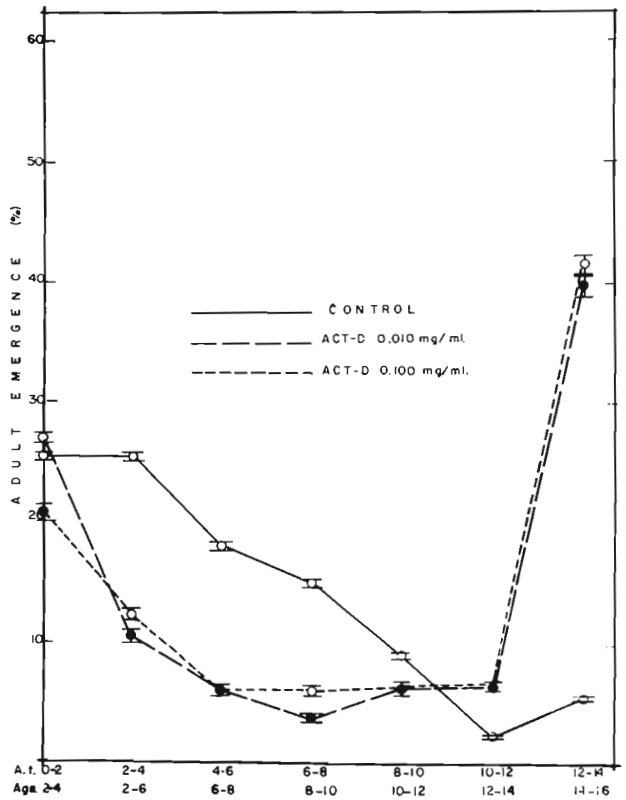

Fig. 1. Percent of productivity in consecutive two-day broods from control and injected females (d.a.t. = days after treatment).

TABLE I

Effect of actinomycin D on the productivity of offspring by y cv v f car/y females.

Days after treatment	0 - 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14	Total	Sex ratio males/females
				Control					
By females	1,191	1,184	821	743	334	101	280	4,654	
y males	1,283	1,286	943	702	426	115	243	4,998	
Total	2,474	2,470	1,764	1,445	760	216	523	9,652	
Percent	25.64±0.44	25.60±0.44	18.28±0.39	14.97±0.36	7.87±0.27	2.23±0.15	5.41±0.23		1.07
				Actinomycin D (0.010 mg/ml)					
By females	340	122	78	51	79	84	492	1,246	
y males	370	159	85	49	84	83	558	1,388	
Total	710	281	163	100	163	167	1,050	2,634	
Percent	26.96±0.86	10.67±0.60	6.18±0.47	3.79±0.37	6.18±0.47	6.35±0.47	39.87±0.95		1.11
				Actinomycin D (0.100 mg/ml)					
By females	366	215	109	100	90	107	668	1,655	
y males	378	220	110	115	134	131	820	1,908	
Total	744	435	219	215	224	238	1,488	3,563	
Percent	20.89±0.68	12.21±0.55	6.14±0.40	6.03±0.40	6.28±0.41	6.68±0.42	41.77±0.83		1.15

The data from the experiment indicate that the percent of productivity (Fig. 1) obtained through the 0-2 day brood is similar in the three groups, but a decline starts in the treated groups in the second brood. A parallel decrease in productivity persist throughout the next two broods. If this reduction is due to the lowered fecundity or fertility or both, it is not known. The productivity after 12-14 days shows a striking increase above the control values in the two injected groups.

The Chi^2 test gives no significant difference at a 0.05 level among the data from the two concentrations of actinomycin D (x^2_{10-100}= 3.02311, x^2_{100-10}= 2.89570). The 0-12 days after treatment broods show a significant difference among the control and both treated groups (X^2_{0-10}= 33.06639, x^2_{0-100}= 30.44042); hence the two concentrations of actinomycin D proved to have the same effect on productivity.

A regression study was done plotting the productivity of both injected groups against each other.

The equation derived from the rectilineal graph: $y = 0.1685+1.0118x$ ($r=0.9786$) shows that the group to which the lower concentration was injected is 1.0118 times more productive than the second (0.100 mg/ml) injected group; however, this difference is not significant at a 0.05 level.

These results would indicate that actinomycin D is effectively absorbed by the cells inducing a physiological effect more noticeable in the 2-4 and in the 12-14 day brood. The sex ratio was not significantly altered after the injection of actinomycin D.

References; Félix, R. and V. M. Salceda. 1964, D.I.S. 39:135. Félix, R. and Rosario Rodríguez. 1967, D.I.S. 43:180.

Schalet, A. University of Connecticut Storrs, Conn. Three Y suppressed phenotypes associated with X chromosomes carrying $In(1)B^{M1}$.

Except for the brief mention of a bobbed allele (Muller and Schalet, DIS 31:144) the phenotypes described below apparently have not been previously reported as being associated with chromosomes carrying B^{M1}. A number of B^{M1} chromosomes, some of which carried no other known rearrangements, have been examined genetically and all of them show the following characteristics:

bobbed - In stocks homozygous for B^{M1}: the bb allele usually produces a normal phenotype, but upon outcrossing to produce B^{M1}/O males or females heterozygous for B^{M1} and a strong bb allele, the typical bb phenotype appears.

pod foot - In stocks homozygous for B^{M1}: females and B^{M1}/Y males have normal terminal tarsi. Upon outcrossing to produce B^{M1}/O, $B^{M1}/Dp(1:f)18$, B^{M1}/y^+Y^L or $B^{M1}/sc.Y^L$ males, terminal tarsus is swollen in one or more legs of many flies. Appearance of mutant phenotype seems to be temperature dependent. For $B^{M1}/Dp(1:f)18$ males, at 25 degrees - 51/181 (28%) show a swollen taraus, and at 18 degrees - 91/122 (75%) show a swollen tarsus. At both temperatures and for all of the above genotypes the swelling is less severe than for pdf/Y or pdf/O males. For B^{M1}/pdf females, only a small number of individuals that eclose early show a weak pdf phenotype. pdf/+ females are all normal.

In stocks homozygous for B^{M1}: the prescutal lobe appears normal in females and B^{M1}/Y males. Upon outcrossing to produce B^{M1}/O males, the prescutal lobe, as viewed from above, often appears more angular because the portion at the base of the humeral bristles seems to project outward giving a shoulder-like appearance to the entire lobe. The same phenotype is shown by $B^{M1}/Dp(1:f)18$, B^{M1}/y^+Y^L and $B^{M1}/sc.Y^L$ males.