

After one generation in vivo the monolayer of epithelial cells becomes rearranged. It appears sponge-like due to intercellular spaces; it also lacks cellular continuity in areas. The basal lamina is often the only structure maintaining the sac-like appearance. In these tumors the outer portion of termed the "cortex" and is comprised of a remnant population of epithelial cells. These cells surround a "medulla" region which is composed of cells arranged in spherical configurations. The cell number in these spheroids vary but are reminiscent of the ommitidial precursor cluster found in the developing eye disc of the wild-type (Waddington and Perry 1960). Thus, it is possible that tumorigenesis did not affect the determined state of this cell population, but did interfere with the differentiation process. A considerable amount of cell debris and amorphous material is found in the medulla.

Autoradiographic studies of tumors incubated with ³H-thymidine for 48 hours showed differential incorporation in areas of the tumor where masses of cells bulge in the epithelium. This indicates that proliferation continues in the epithelium (cortex region) as opposed to the medulla. These features are important in determining basic kinds of cellular interactions which occur in other tumors arising from secretory epithelia and are indicative of a certain pattern of neoplastic change.

References: Bodenstern, D. 1950, *Biology of Drosophila*, Hafner, New York; Gateff, E. 1977, DIS 52:129; _____ 1978, *Science* 200:1449-1459; Hadorn, E. 1963, *Develop. Biol.* 7:617-629; Poodry, C.A. et al. 1973, *Develop. Biol.* 32:376-386; Poodry, C.A. and Schneiderman, H.A. 1970, *Wilhelm Roux Archives* 166:1-44; Urpsprung, H. 1972, *Biology of Imaginal Discs*, Springer-Verlag, New York; Waddington, C.H. and M.M. Perry 1960, *Proc. Roy. Soc. B* 153:155-178.

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Wu, C.K. and P. Smith. Adrian College, Adrian, Michigan. Calcium cyclamate induced lethal effect and genetic damage in spermatocytes of *Drosophila*.

In determining the lethal effect of calcium cyclamate on development, v w f females of the same age were mated individually with three males into five different series according to the concentrations of calcium cyclamate solution in the food media. It is assumed

that, on the average, one female would lay the same number of eggs during the same period of time. It was found that in the treated series, the survival rates were decreasing with increasing concentrations of calcium cyclamate solution in the media, or in other words, the higher the concentration of calcium cyclamate in the medium causes the higher rate of lethality (Table 1). It clearly suggests that calcium cyclamate causes lethal effect on the early development of *D. melanogaster*.

Table 1. Average number of progeny, survival rate and lethality rate from a single female *Drosophila* in media with different concentrations of calcium cyclamate.

	Control	Cyclamate media			
		0.625%	1.25%	2.5%	5%
Male	46.3 ± 9.8	27.2 ± 4.3	27 ± 2.5	10.2 ± 11	0
Female	56.7 ± 4.3	37.2 ± 2.7	35.6 ± 13.2	15.8 ± 9.8	0
Total	103 ± 14.1	64.4 ± 3.8	62.6 ± 13.0	28.6 ± 18.4	0
Survival rate	1.00	0.63	0.61	0.28	0
Lethality	0	0.37	0.39	0.72	1

To estimate the chromosomal damage induced by calcium cyclamate, a doubly marked Y chromosome was used in the experiment. Males of the composition ywf/B^S.Y.y⁺ (y= yellow body; w=

white eyes; f= forked bristles; B^S= Bar eyes of Stone, which is a marker on the long arm of the Y chromosome; y⁺= normal allele of yellow, which is attached to the tip of the short arm of the Y chromosome) were used in this study. Day-old males were collected and transferred to a treatment chamber in which medium mixed with 1.25% calcium cyclamate for about 2 days. Then, the treated males were mated individually with three virgin females of the composition ywf/ywf for a period of 9 days; males treated with 1.25 sucrose mated in the same manner served as the control.

The regular offspring from these crosses are phenotypically yellow, white, forked females and Bar, white forked males. An exchange between the X chromosome and Y^L (the long arm of the Y chromosome) proximal to the B^S marker generates an X chromosome with Y^S and the appended y⁺ marker attached proximally and is recoverable as a phenotypically white, forked female (ywf).

y+/ywf). The reciprocal product is a centric fragment carrying the B^S marker, recovered as Bar, yellow, white, forked male (ywf/FR Y·B^S). An exchange between X and Y^S (the short arm of the Y chromosome) proximal to the y+ marker generates an X chromosome with Y^L and the appended B^S marker attached proximally and is recoverable as a phenotypically Bar, white, forked female (ywf·B^S/ywf) and the reciprocal product is also a centric fragment, carrying the marker y+ (FR Y·y+) recovered as a white, forked male (ywf/FR Y·y+). These exceptional males may also arise from the deletion of one of the two markers. From the recovery of both X and Y chromosomes following nondisjunction phenotypically Bar, white, forked females (ywf/ywf/B^S·Y·y+) are obtained. The reciprocal product is recovered as yellow, white forked males (ywf/0). Such a male may also arise from loss of both markers.

Table 2. Progeny from crosses of ywf females, mated with ywf/B^S·Y·y+ males. Treated (T) or not treated (C) with 1.25% calcium cyclamate medium (frequency x 10⁻⁴).

Series	Regular		X-Y Exchange		Nondisjunction	
	Female	Male	Female	Male	Female	Male
C	10907	9022	0	1	4	6
			-	(1±1)	(3.5±1.8)	(6.6±2.7)
T	39449	32172	1	6*	9	1
			(.25±.25)	(10±5.5)	(2.3±.76)	(1.6±.7)

*In one vial there were 7 exceptional males; the event probably occurred in the spermatogonia stage. It was scored as a single event.

calcium cyclamate to the disjunction of X and Y chromosomes.

In line with the findings in the first experiment, these data suggest that the calcium cyclamate not only inhibits the early developmental stages to cause lethality, but also causes chromosomal breakage during spermatogenesis of *D. melanogaster*.

The results are given in Table 2. The information from the exception flies of X-Y exchange class indicates that the frequencies in the treated series exceed those in the control series. Turning to the class of nondisjunctional, it may be seen that there is no harmful effect of

Xamena, N., R. Marcos and A. Creus.
Autonomous University of Barcelona
Bellaterra, Spain. Effect of mating
system on disruptive selection.

Among the different effects that disruptive selection can produce on a population, the increase in the phenotypic variability and consequently, the divergence between the extreme phenotypes is generally accepted.

See Thoday (1972) for a review. However,

there is not agreement about other effects that disruptive selection can produce, as well as the effectivity of different mating systems used.

In order to check the effect that the different mating systems can produce on the divergence of extreme phenotypes we have carried out a disruptive selection experiment using two mating systems: quasi-random and mating-choice.

With the quasi-random mating the gene flow in any generation depends only on the probability that the "hybrid" individuals will be included in the selected sample. With mating-choice is also depends on the probability that "hybrid" matings will occur, and on their success relative to the "non-hybrid", that is, assortive matings that occur.

The experiment has been carried out during 15 generations and the trait selected has been the interocellar bristles in *D. melanogaster*. All the experiments were done at 25±1°C with a selection intensity of 20%.

For each kind of mating two lines were set up. Figs. 1 and 2 show the divergence between extreme phenotypes in the two mating systems. From these figures we can conclude that while mating-choice mating does not produce divergence (neither MCh1 nor MCh2), in one line of quasi-random (QR1) there is a clear divergence (2.04% of overlap at 15 generations) although in the other the divergence is practically null.

These results seem to show that quasi-random mating is more effective; but something striking in these results is the resistance to divergence of this population, which con-