

McCrary, E. University of North Carolina at Greensboro, North Carolina. Wing disc tracheotomy prior to pupation in *D. virilis*.

In order to establish the relative roles of the tracheal supply and the hypodermal stalk in the development of the wing disc during metamorphosis, we have compared the results of three distinct types of operations with mock operated controls. Mature third instar larvae of *D.*

virilis were etherized and dissected with a sterile Aloe #115 ultra-micro dissecting hook. The tip of the hook was inserted through the dorso-lateral body wall in the meta-thoracic segment so that four distinct results were obtained:

- a) unilateral cutting of the ventral branch of the dorsal segmental trachea, the only tracheal supply to the disc,
- b) severance of the hypodermal stalk, including its internal tracheal branch,
- c) operations in which both "a" and "b" were accomplished on the same side in one animal,
- d) mock operations consisting of insertion of the dissecting needle without the cutting of either the tracheal trunk or the hypodermal stalk.

The preliminary results of these operations are summarized below:

<u>Operation Category</u>	<u>Number</u>	<u>Survivors (%)</u>	<u>Normal Wings (%)</u>	<u>Abnormal Wings (%)</u>
a	117	77(66)	66(86)	11(14)
b	108	37(34)	35(94)	2(06)
c	46	19(41)	12(63)	7(37)
mock	44	41(93)	40(98)	1(02)

A majority of the wing abnormalities found following category "a" and "b" operations consisted of wings which were not properly expanded following emergence. Five operated animals in category "b" which had normal wings lacked one or more macrochaetae, most often the anterior notopleural. The relatively large number of wing abnormalities observed after category "c" operations, in which the mortality was also the highest, consisted of wings in which a major failure of cell differentiation had occurred, similar to earlier results obtained in the transplantation of whole discs into mature larvae^{1,2}. Since the majority of operated discs were able to develop normally, it appears likely that the previously observed failure in wing development in transplanted discs could be associated with the metamorphosis of such discs in the absence of the normal association of their thoracic areas with the other discs ordinarily contiguous with them. The nature of this association and its influence are being investigated further. (Supported by grant 153 from the North Carolina Board of Science and Industry).

References: 1) Glancy, E.A. and R.B. Howland; 1938, *Bio. Bull.* 75: 99-105; 2) McCrary, E., 1970, *Amer. Zoologist* 10: 320 (Abst.)

Tarantul, V.Z., V.T. Kakpakov and V.A. Gvozdev. Kurchatov Institute of Atomic Energy, Moscow, U.S.S.R. Protein, RNA and DNA synthesis in the established line of diploid cells of *Drosophila melanogaster* in vitro.

The synthesis and intracellular content of macromolecules were determined in the established diploid line of embryonic cells of *Drosophila melanogaster* (*Genetika*, Russ., 1969, 5, 12, 67; DIS 1970 45: 110). The quantity of DNA per diploid cell measured chemically by diphenylamine reaction according to Burton was 1.9×10^{-12} g.

The quantity of RNA and protein per cell was $7-14 \times 10^{-12}$ g and $5-10 \times 10^{-11}$ g correspondingly. Actinomycin D (3 μ g/ml) inhibited incorporation of C^{14} -uracil or C^{14} -uridine to 5-10% of the control. The protein synthesis measured by the C^{14} -lysine incorporation stops in 8-9 hours after the actinomycin addition. The half life of messenger RNA evaluated by the actinomycin induced inhibition of C^{14} -lysine incorporation is about 3-3.5 hours. The RNA synthesis is resistant to α -amanitin (20 μ g/ml), although the same sample of the drug effectively inhibits the RNA synthesis in the isolated rat liver nuclei. The RNA synthesis in presence of rifampicin (100 μ g/ml) decreases by 30%. Puromycin (100 μ g/ml) inhibits C^{14} -lysine incorporation by 85%. After 6-12 hours of puromycin treatment the increase of the number of cells accompanied by the decrease of cell size was observed although the normal mitotic figures were absent. The presence of puromycin leads probably to the abnormal cell division or cell fragmentation. Hydroxyurea in concentrations of 100 μ g/ml and 1 mg/ml inhibits the H^3 -thymidine incorporation to 15% and 3% of the control respectively.