Modifying effect of UV-irradiation on the development of abnormal body patterns in the weakly centrifuged eggs of *Chironomus samoensis* (Insecta: Diptera); investigation on the photoreversion of UV-effect

Hideo YAJIMA

Department of Biology, Faculty of Sciences
Ibaraki University
Mito, 310 Japan

UV-irradiation to the anterior or posterior end of the chironomid eggs before and after the centrifugation modified the development of abnormal body patterns which will be expected by centrifugation only (Kalthoff *et al.*, 1982; Yajima, 1982). Among the various modified results, double abdomen (DA) can be obtained after anterior irradiation of the centrifuged eggs. Since DA is almost always induced by UV-irradiation to the anterior end of the uncentrifuged eggs and the effect is photoreversible, it is necessary to examine whether UV-irradiation effect to the centrifuged egg is photoreversible or not. For this purpose, photoreversion treatment was applied to the UV-irradiated eggs all of which have been centrifuged at the 2-pole cell stage or 30 to 45 minutes after than this stage.

In the eggs treated only with UV-irradiation, the effect of UV-irradiation was photoreversible irrespective of the stages of the eggs treated. However, when combined centrifugation and UV-irradiation experiments were carried out, photoreversion was seen to occur only under specific conditions. That is, photoreversion failed to occur when the anterior end of the eggs was UV-irradiated irrespective of the stages of the eggs, whereas photoreversion did occur when the posterior end of the eggs at the later stage was UV-irradiated. I could produce following interpretations on the results obtained in this series of experiment.

In cases of anterior egg end UV-irradiation, although photoreversible target which may induce DA was dislocated by centrifugation, it is likely that some photoirreversible targets were maintained at the anterior end of the egg despite centrifugation and reacted to UV-irradiation.

In cases of posterior egg end UV-irradiation, on the other hand, following two interpretations may be possible: (1) It may be due to enough amount of photoreversible target that was maintained at the surface of posterior end of the egg despite centrifugation. (2) It may be possible to assume that, although photoreversible target was dislocated by centrifugation, it remained at the specific position in the egg, which is within the effective range of UV light.

Present experiments of combining the centrifugation and UV-irradiation have revealed that photoirreversible UV-target which may likely induce DA in the anterior half of chironomid eggs has remained in the anterior end of the eggs even after centrifugation. Kalthoff (1979) has already characterized DA-inducible, photoreversible target lying in the anterior end of the centrifuged *Smittia* eggs as RNP. Therefore, I consider it very necessary to promote the studies on; 1. Interaction or coaction which may likely occur between previously known photoreversible target and presently known photoirreversible target, and 2. Chemical nature of the photoirreversible target, as the means to understand pattern formation in chironomid eggs.

References

Kalthoff, K. (1979) Analysis of a morphogenetic determinants in an insect embryo (*Smittia spec.*, Chironomidae, Diptera), *In*: *"Determinants of Spatial Organization"*, (S. Subtelny and I. R. Konigsberg, eds.), pp. 97–126, Academic Press, New York.

Kalthoff, K. *et al.* (1982) *Develop. Biol.*, **91**, 413–422.

Yajima, H. (1982) *Proceedings of 18th Annual Meeting, Study Group of the Students of Arthropodan Embryology in Japan* (Sugadaira), p. 33 (Not available on request).