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Antimutagens act as modulators of gene expression

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Conception of antimutagenesis considers it an evolutionally emerged individual genetic process the function of which consists in maintaining integrity and stability of hereditary structures. Antimutagenesis proceeds by means of antimutagenic system including both endogenous antimutagens and diverse protective systems of cell and organism. Exogenous antimutagens act as modulators of gene expression in diverse endogenous protective system.

We have studied the effect of antimutagens, derivatives of 1,4-dihydroisonicotinic acid, on maternal repair of primary DNA damages responsible for emergence of chromosome breaks. Drosophila melanogaster females of a different genotypes were treated with antimutagens and ethyl methanesulfonate acted on males. This made it possible to eliminate completely interactions of these compounds in organism and to study the influence of antimutagens on the systems of maternal repair involved in the making of EMS-induced chromosome breaks and gene mutations.

Feeding of repair-active females of different genotypes with antimutagens reduced the frequencies of chromosome breaks induced with EMS in spermatozoids. Protective antimutagen action was noted immediately after fertilization and on 5-6th and 12-14th day of storing EMS-treated spermatozoids in

female spermatheca. It should be noted that there are no the studied compounds already on the 5-14th day after antimutagen treatment.

Antimutagen efficiency at female treatment depends on repair capacity of their oocytes because treatment of repair-defective females (mei-9, mei-41) with antimutagens did not decrease the level of EMS-clustogenesis in most cases.

So, antimutagens-antioxidants studied increased maternal repair efficiency of primary DNA damages induced with EMS in male spermatozoids.

The antimutagen capacity to modulate functioning of maternal repair systems for 5-14 days folliwing antimutagen treatment of females seems to indicate long-term and stable gene expression of maternal repair under their influence.

Further study on this intriguing capacity of antimutagens to induce `long-term stable expression of repair genes are need.