



ABSTRACT

Aging is the result of gradual changes in the structure and function of multi-cellular organisms, which eventually cause damage and ultimately results in death. Recent studies have shown that epigenetic processes may play an important role in aging. In fact, the epigenetic role in determining a longer life span is due to changes in gene expression. The best current model organisms based on their simplicity are basically yeast, nematodes and insects. *Drosophila melanogaster* with short life span is an excellent model for such studies, in order to investigate changes in the expression of genes during aging. In the present study, in order to obtain a more accurate insight into the aging of the nervous system, we tried to show possible changes in the expression of some genes that are involved in epigenetic modifications of the chromatin structure. For this purpose, a comparison was made between the young and old *Drosophila melanogaster* flies. The expression level of selected genes were studied in head region of 4-day-old flies and compared to that of 40-day-old insects. Total RNA of head samples were extracted and in the next step, the cDNA was made and finally RT-PCR was performed using appropriate forward and reverse primers. At the end, the obtained data were analyzed by (Applied Biosystems) 7500 Software 2.0.6. The results showed that a group of genes including *Nvd*, *CG15115*, *Ir41a*, *CG15661* and *Uif* expression decreases by increase in age. Another group, including the *CG40006*, *Dscam1*, *Ints3*, and *Gprk1* genes are found to be express more as the age increases. . The *Snap25* gene expression did not change during aging. These results showed that as the age rises, the expression of the genes in the organisms of this living creature undergoes changes that are due to changes in the epigenetic patterns. The result of this change of expression is the reduction of metabolic and signaling activity and increased accumulation of damage in the cells, which ultimately leads to aging.

Keywords: Aging, Epigenetics, Gene expression, RT-PCR, *Drosophila melanogaster*.



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The Thesis Submitted for the Award of M.Sc. Degree in Genetics

Title:

Investigation of expression of few target genes for epigenetic modification during central nervous system aging in *Drosophila melanogaster*

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Summer 2018