



University of zabol

Graduate school

Faculty of science

Department of Biology

**The Thesis submitted for the Degree of M.Sc
(in the field of Genetic)**

Title:

**Evaluation of relationship between age and Nrf2 gene expression in
Alzheimer's disease model of *Drosophila melanogaster***

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Abstract

Alzheimer's disease is a disease associated with age-related neurodegenerative death, which increases the risk of developing a disease with increasing age. Having the disease before the age of 65 is a form of early onset and the disease after the age of 65 is called late form. Two important factors in the early form of this disease are amyloid beta protein (Form 42 amino acid) and Tau mutated protein (Tau). The Tau protein, by attaching it to the microtubules, stabilizes them, so when lost, cellular skeletons lose their strength and the neuron collapses and collapses. On the other hand, the accumulation of Tau mutated proteins causes cellular stress. One of these stresses is oxidative stress. During oxidative stress, there is a lot of damage to the cells and cells of the nucleus. One of the cellular responses to this stress is the expression of the *Nrf2* gene. The *Nrf2* protein is a transcription factor that expresses the natural antioxidants of the cell. Normally, the *Nrf2* protein is inhibited by the Kelch protein. When oxidative stress occurs in the cell, the Kelch protein is inhibited and the *Nrf2* protein is activated. Vinegar flies are a very good way to check for Alzheimer's disease, which control the expression of a foreign gene through the *Gl4 / UAS* system. In this study, with the expression of Tau r406w in vinegar floral neurons, increasing oxidative stress increased, and the expression of *Nrf2* gene expression also increased. Also, expression of the Tau r406w protein in vinegar fly neurons has reduced the activity of vinegar flies. In the present study, the expression of *Nrf2* gene expression under conditions of increased oxidative expression resulting from expression of Tau r406w protein in vinegar fly neurons was investigated. The results indicate that with increasing age and also increasing oxidative stress, the expression of *Nrf2* gene increased significantly.

Keyword: Alzheimer's disease, *Nrf2*, *Drosophila melanogaster*, aging