University of Zabol
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The Thesis Submitted for the Degree of M.Sc
(In the field of molecular genetics)

Title:

Influence of Titanium dioxide nanoparticles on DNA Glycation by Glucose

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Abstract

The nanoparticles is widely used in medicine, food and cosmetics Recently, titanium dioxide nanoparticles have been widely used in food and cosmetics. As titanium dioxide nanoparticles enter the body, they may affect the structure and interactions of vital macromolecules.. One of the most important macromolecules in the body is DNA, whose structural changes due to its interaction with other small molecules have been studied by researchers. Non-enzymatic interaction of DNA molecules with glucose, called glycation, leads to structural changes and mutations in DNA.

As a result of the glycation process of macromolecules, products are created whose accumulation causes diseases and disorders such as cardiovascular diseases, type 2 diabetes, Alzheimer's and cancer.. Therefore, in this study, the effect of titanium dioxide nanoparticles on DNA glycation process was investigated using fluorescence, gel electrophoresis and visible ultraviolet spectroscopy.The results of fluorescence, ultraviolet-visible and FT-IR spectroscopy showed that the rate of glycation formation increased in the presence of nanoparticles

The electrophoresis results also confirm that the DNA treated with glucose and TiO2 nanoparticles failed more.Therefore, it can be said that TiO2 nanoparticles increase the harmful effects of glycation in diabetics.

Keywords: Titanium dioxide nanoparticles, glycation, DNA.