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**The Thesis Submitted for the Degree of Master of Science
(In the field of Bioinformatics)**

Study of Simultaneous Effect of Dibutyl Phthalate and Glucose upon Human Serume Albomin

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ABSTRACT:

Diabetes is a group of chronic metabolic diseases characterized by high blood sugar. Hyperglycemia causes the non-enzymatic covalent binding of sugars to proteins (glycation), which causes structural and functional changes in the body's macromolecules. Phthalates are a group of toxic chemical compounds found in cosmetics and perfumes. Considering that in addition to genetic and autoimmune factors, environmental factors also play a role in causing diabetes, and also considering the high consumption of these substances in daily life, it is necessary to study the effect of such chemical compounds on the body's cells it seams. In this study, we will investigate the effect of dibutylphthalate on human serum albumin protein in diabetic conditions. Therefore, human serum albumin protein was treated with glucose and dibutylphthalate for 35 days in quasi-physiological conditions. Then changes in human serum albumin were studied using various methods such as dual spectroscopy, fluorescence, ultraviolet-visible spectroscopy and FT-IR. The binding of phthalates to the active site of human serum albumin protein and the amino acids involved in their interaction were also investigated using molecular docking. The results of fluorescence emission showed that human serum albumin treated with glucose was further reduced in the presence of phthalate and also the results of molecular docking showed that amino acids ASP108, SER193 and GLN459 have more interaction in this binding.

Keywords: Diabetes, phthalates, glycation process, human serum albumin