Abstract:

Glycation is a spontaneous process (non-enzymatic) between carbonyl group of sugars and free amino group of proteins which leads to changes of structure and function in protein. In this research, the effect of 3- β- hydroxybutyrate on glycation process of the human hemoglobin was studied at physiological conditions (37 ^{o}C, pH 7.4) using various spectroscopic methods such as, UV-Vis, fluorescence and circular dichroism (CD). For this purpose, the hemoglobin with glucose in the presence or absence of 3-β-hydroxybutyrate was incubated for 42 days. The results of fluorescence and UV-Vis spectroscopy demonstrated that the amount of glycated hemoglobin was decreased in the presence of 3- β -hydroxybutyrate. The CD results showed decreasing the structural changes of glycated hemoglobin in the presence of 3-β-hydroxybutyrate. Thus, it could be concluded that 3-β-hydroxybutyrate acts as an inhibitor in the hemoglobin glycation process leading to reduce the complications of binding sugar to protein.

Keywords: Human hemoglobin; 3- β- hydroxybutyrate; inhibitor; Glycation

University of zabol

Graduate School

Faculty of Science

Department of Chemistry

The Thesis Submitted for the Degree of Master of Science

(In the field of organic chemistry)

The effect of 3-β- hydroxybutyrate on the glycation of hemoglobin

Supervisors:

Dr. M. Ghaffarimoghaddam

Dr. M. Bohlooli

Advisors:

Dr. A. A. Moosavi-Movahedi

Dr. M. Khajeh

By:

M. Eskandarzadeh Ahmadbigloo

June 2016