



## Acetaminophen effects on human serum albumin (HSA)

Fatemeh Astaraki\*( Tehran University of Research Sciences)

Email:Golnoushastaraki@gmail.com

### Abstract

Thermal conformational changes in human serum albumin (HSA) are currently investigated with a 10 mm phosphate buffer, at pH = 7 via circular dichroism (CD) and UV spectroscopy. The results showed that temperatures in the range of 25oC to 55oC induce a reversible structural change in the HSA structure. HSA phase transition related to physiological and pathological conditions of the body, especially fever. The conformational change observed in the HSA is accompanied by a slight conversion of its secondary structure. Acetaminophen is a popular pain killer, and HSA is used as a carrier of the drug. Hence, acetaminophen can interact with HSA. In this study of HSA - acetaminophen interaction shows that the effects of acetaminophen on the structure of HSA, prevent its phase transition. HSA-acetaminophen interaction has led to stabilization. This interaction is associated with 8 times the kJ / mol free energy change. Structural changes in HSA due to its interaction with acetaminophen can be considered as a side effect of drugs and it may affect protein function.

**Keywords:** Human serum albumin; Conformation; Temperature; Circular dichroism (CD); Acetaminophen.

### Introduction

Human serum albumin (HSA) is a major protein component of blood plasma (present at 50 mg/ml (600  $\mu$ m)), which is also found in the interstitial fluid of body tissues and has a half-life of 19 days in humans (1, 2). HSA has different roles in the body. The most important ones are: maintenance of normal oncotic pressure, binding to the different substances and transporting drugs and endogenous compounds, metabolic function such as inactivation of some compounds, and acid-base function due to having numerous charged residues and being abundant in plasma.

It also has an effective role in the regulation of plasma buffer, anti-oxidant function and an anticoagulant effect (1, 3, 4). HSA is best known for its ligand binding capacity, because it binds