

Abstract

Analysis of glycation effects on structure and function of antioxidant enzyme:

Glutathione Peroxidase

The Maillard reaction or glycation is an intricate set of non-enzymatic reactions that occur between amino groups of proteins and the carboxyl group of reducing sugars or their metabolites forming advanced glycation endproducts (AGEs). The in vivo accumulation of AGEs has been shown to adversely impact the health and function of many tissues and organs including the heart, kidneys, eyes, and brain. The increased levels of reactive oxygen species (ROS) can lead to conditions of oxidative stress that with time can cause tissue damage including alterations to DNA, RNA and proteins. In patients with diabetes, higher than normal levels of ROS have been reported encouraging the speculation that this phenomenon may be due to alterations in the function and activity of anti-oxidant enzymes. Glutathione peroxidase (GPx) belongs to a family of enzymes that catalyze the breakdown of lipid hydroperoxides to their respective alcohols and free hydroperoxides to water. Many studies have shown that this enzyme can serve as the first line of defense in protecting erythrocytes from oxidative damage. In this study we investigated the glycation of glutathione peroxidase under physiological temperature and pH, and determined by a combination of analytical procedures the effect of glycation on the physical and kinetic characteristics of the enzyme.

References:

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