

Stability of glycated albumin in human serum analyzed by developed aptasensor

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Abstract

Glycated human serum albumin (GHSA) is a product from non-enzymatic reaction called “Glycation” in blood stream. The glycation involves the addition of reducing blood sugar to human serum albumin (HSA); the most abundant transport protein in blood, to form a freely reversible Schiff base or Amadori products. GHSA has been reported as a biomarker for glycemic control in diabetes patients, Alzheimer and inflammation, therefore, accurate concentration of GHSA in serum/plasma has been considered. Previously, we successfully developed aptasensor for glycated albumin detection in diabetes mellitus (DM) serum/plasma. This work we studied the stability of GHSA and HSA in serum/plasma samples using our developed aptasensor. We found that GHSA and HSA concentrations are stable at least 8 hours at room temperature, at least 7 days at 4°C and at least 30 days at -80°C after blood drawing. However, we observed significant changes of the GHSA and HSA concentrations in serum/plasma stored at -80°C for longer than 30 days due to serum osmolality. Interestingly, GHSA concentrations from DM serum/plasma were highly fluctuated comparing with those from normal serum/plasma. It is possible that reversible glycation rate in the DM serum/plasma was higher than that in normal samples. Therefore, in order to get accurate GHSA and HSA concentrations for diabetes monitoring, human serum/plasma samples are not allowed to be kept at room temperature for no longer than 8 hours or at 4°C for no longer than 7 days and at -80°C for no longer than 30 days. In order to prolong the sample storage time, glycation inhibition should be considered.

Keywords: Glycated albumin; human serum albumin; serum; plasma; stability; aptasensor

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