



Glycated Serum Protein LiquiColor® Assay

A **2-3 week glycemic marker** for diabetic patients with conditions that affect RBC half-life

- **Accurate reliable results**

No interference from endogenous reducing substances that affect traditional Fructosamine (NBT)

- **Specific to all glycosylated proteins**

Includes glycosylated albumin, glycosylated hemoglobin, and other glycosylated proteins

- **Useful for conditions and treatments that affect RBC half-life such as:**

Hemoglobinopathy, Iron Deficiency, End Stage Renal Disease
Age and Race, Anemia, Uremia, Blood loss, Drug treatments
and Pregnancy



Daily blood glucose and **HbA1c** are regularly used for monitoring glycemic control which provide short term and long term measurements. **GSP** is used to fill the gap between those tests by providing an accurate, reliable 2-3 week marker for glycemic control.^{1,2}

A glycemic marker like the GSP test benefits patients with these conditions:

- End Stage Renal Disease and hemodialysis^{3,4,5}
- Hemoglobinopathy⁶
- Erythropoietin treatment
- Hemolytic anemia⁷
- Age, race/ethnicity⁸
- Acute blood loss
- Pregnancy⁹
- Any condition/treatment that shortens RBC half-life¹⁰

Glycated Serum Protein Reference Chart

0-151 µmol/L	<ul style="list-style-type: none"> • Hypoglycemia • HbA1c < 5%
151-300 µmol/L	<ul style="list-style-type: none"> • Euglycemia • HbA1c = 5-7%
300+ µmol/L	<ul style="list-style-type: none"> • Hyperglycemia • HbA1c > 7%

Figure 1. It is recommended that each laboratory establish its own reference range to reflect the age, sex, diet and geographical location of the population.

1. T. Shafi et al, Serum Fructosamine and Glycated Albumin and Risk of Mortality and Clinical Outcomes in Hemodialysis Patients Diabetes Care 36:1522-1533, 2013.
 2. Robert M. Cohen et al. Discordance Between HbA1c and Fructosamine, Evidence for a glycosylation gap and its relation to diabetic nephropathy. Diabetes Care, 26; 163-167, 2003
 3. Kazutoni Y. et al, Glycated Albumin is a Better Indicator for Glucose Excursion than Glycated Hemoglobin in Type 1 and Type 2 Diabetes. Endocrine Journal Vol. 55 (2008) No. 3 P 503-507
 4. Barry I Freeman et al. Glycated Albumin and Risk of Death and Hospitalizations in Diabetic Dialysis Patients. Clinical Journal of American Society of Nephrology, 6; 1-9, 2011
 5. TP Peacock et al. Comparison of glycated albumin and hemoglobin A1c levels in diabetic subjects on hemodialysis. Kidney International, 73: 1062-1068, 2008
 6. Bry L, Chen PC, Sacks DB. Effects of hemoglobin variants and chemically modified derivatives on assays for glycohemoglobin. Clinical Chemistry. 2001;47(2):153-163. 7. Goldstein DE, Little RR, Lorenz RA, Malone JI, Nathan D, Peterson CM: American Diabetes Association Technical Review on Tests of Glycemia. Diabetes Care 1995;18:896-909.
 7. Santiago Rodriguez-Segade et al. Progression of Nephropathy in Type 2 Diabetes: The Glycation Gap Is a Significant Predictor after Adjustment for Glycohemoglobin (HbA1c). Clinical Chemistry, 57-2, 264-271, 2011
 8. Davidson MBI, Schriger DL. Effect of age and race/ethnicity on HbA1c levels in people without known diabetes mellitus: implications for the diagnosis of diabetes. Diabetes Res Clin Pract. 2010 Mar;87(3):415-21. doi: 10.1016/j.diabres.2009.12.013. Epub 2010 Jan 12.
 9. R. Schleicher and O.H Wieland Protein Glycation: Measurement and Clinical Relevance. J. Clin. Chem. Clin. Biochem. 27: 577-587, 1989
 10. Armbuster DA, Fructosamine: Structure, Analysis and Clinical Usefulness. Clin. Chem. 1987; 33 (12): 2153-2163..

Note: If a patient has serum protein binding abnormality this test may not be appropriate. Patient should have a normal albumin level as well.