
Overview**Useful For**

Monitoring intermediate (1-3 weeks) glycemic control

Monitoring glycemic control in patients with shortened red blood cell survival

Method Name

Colorimetric Rate Reaction

NY State Available

Yes

Specimen**Specimen Type**

Serum

Specimen Required

Supplies: Aliquot Tube, 5 mL (T465)

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Collection Instructions:

1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and the serum aliquoted into a plastic vial within 2 hours of collection.

Reject Due To

Gross hemolysis Reject
Gross icterus Reject

Specimen Minimum Volume

0.5 mL

Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---------------|--------------------------|---------|-------------------|
| Serum | Refrigerated (preferred) | 7 days | |
| | Frozen | 60 days | |
| | Ambient | | |

Clinical & Interpretive**Clinical Information**

Fructosamine is a general term, which applies to any glycosylated protein. It is formed by the nonenzymatic reaction of glucose with the alpha- and epsilon-amino groups of proteins to form intermediate compounds called aldimines. These aldimines may dissociate or undergo an Amadori rearrangement to form stable ketoamines called fructosamines. This nonenzymatic glycosylation of specific proteins in vivo is proportional to the prevailing glucose concentration during the lifetime of the protein. Therefore, glycosylated protein measurement in a patient with diabetes is felt to be a better monitor of long-term glycemic control than individual or sporadic glucose determinations. The best known of these proteins is glycosylated hemoglobin, which is often measured as hemoglobin A1c, and reflects glycemic control over the past 6 to 8 weeks. In recognition of the need for a measurement that reflects intermediate-term glycemic control and was easily automated, a nonspecific test, termed fructosamine, was developed. Since albumin is the most abundant serum protein, it accounts for 80% of the glycosylated serum proteins, and thus, a high proportion of the fructosamine. Although a large portion of the color generated in the reaction is contributed by glycosylated albumin, the method will measure all proteins, each with a different half-life and different levels of glycosylation.

Reference Values

200-285 µmol/L

Interpretation

In general, fructosamine reflects glycemic control in diabetic patients over the previous 1 to 3 weeks. High values indicate poor control.

All glycosylated proteins are measured by this method, with glycosylated albumin contributing a large portion.

Cautions

Since the assay is nonspecific, color may be generated by compounds other than glycosylated proteins. Interferences are seen from ascorbic acid (vitamin C) and elevated bilirubin values.

However, the second-generation assays have been shown to be highly specific for glycosylated proteins.

Fasting blood glucose and hemoglobin A1c are the usual and preferred means of monitoring glycemic control.

Clinical Reference

1. Sacks DB: Diabetes mellitus. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:1194-1197
2. Masharani U, German MS: Pancreatic hormones and diabetes mellitus. In: Gardner DG, Shoback D, eds. Greenspan's Basic and Clinical Endocrinology. 9th ed. McGraw; 2018:46-47
3. Austin GE, Mullins RH, Morin LG: Non-enzymatic glycation of individual plasma proteins in normoglycemic and hyperglycemic patients. Clin Chem. 1987;33:2220-2224
4. Schleicher ED, Mayer R, Wagner EM, Gerbitz KD: Is serum fructosamine assay specific for determination of glycosylated serum protein? Clin Chem. 1988;34:320-323

Performance

Method Description

The fructosamine assay is a colorimetric test based on the ability of ketoamines to reduce nitroblue tetrazolium to formazan in an alkaline medium. The rate of formation of formazan is directly proportional to the concentration of fructosamine, and is measured photometrically at 546 nm. (Package insert: Fructosamine reagent. Roche Diagnostics; v. 8.0, 12/2018)

PDF Report

No

Specimen Retention Time

1 week

Performing Laboratory Location

Rochester

Fees & Codes**Test Classification**

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

82985

LOINC® Information

| Test ID | Test Order Name | Order LOINC Value |
|---------|-----------------|-------------------|
| FRUCT | Fructosamine, S | 15069-8 |

| Result ID | Reporting Name | LOINC® |
|-----------|-----------------|---------|
| FRUCT | Fructosamine, S | 15069-8 |