MAYO CLINIC LABORATORIES

Test Definition: 13ACT

Coagulation Factor XIII (13) Activity Assay, Plasma

Overview

Useful For
Measuring factor XIII activity

Special Instructions
- Coagulation Guidelines for Specimen Handling and Processing

Method Name
Fluorescence-Based Enzyme Activity

NY State Available
Yes

Specimen

Specimen Type
Plasma Na Cit

Ordering Guidance
Coagulation testing is highly complex, often requiring the performance and correlation of factor XIII activity with multiple assays and correlation with clinical information. For that reason, if indicated, consider ordering ALBLD / Bleeding Diathesis Profile, Limited, Plasma.

Specimen Required
Patient Preparation:
1. Fasting: 8 hours, preferred but not required
2. It is best to perform this study pre-plasma transfusion if possible. If patient has been recently transfused, wait at least 48 hours after transfusion before collecting the specimen.
3. Specimen should be collected prior to factor replacement therapy.

Collection Container/Tube: Light-blue top (3.2% sodium citrate)
Submission Container/Tube: 13-mm x 75-mm, 5-mL, plastic vial (polypropylene preferred)
Specimen Volume: 1 mL Platelet-poor plasma
Collection Instructions:
1. For complete instructions, see Coagulation Guidelines for Specimen Handling and Processing.
2. Centrifuge, transfer all plasma into a plastic vial, and centrifuge plasma again.
3. Aliquot plasma into a plastic vial, leaving 0.25 mL in the bottom of centrifuged vial.
4. Freeze plasma immediately (no longer than 4 hours after collection) at -20 degrees C or, ideally, -40 degrees C or below.

Additional Information:

1. Double-centrifuged specimen is critical for accurate results.
2. Each coagulation assay requested should have its own vial.

Forms

If not ordering electronically, complete, print, and send an Coagulation Test Request (T753) with the specimen.

Specimen Minimum Volume

Platelet-poor plasma: 0.5 mL

Reject Due To

Gross Hemolysis	Reject
Gross Lipemia	Reject
Gross Icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Na Cit	Frozen	180 days	

Clinical & Interpretive

Clinical Information

Factor XIII (FXIII) is found in plasma and platelets. Plasma FXIII consists of 2 A subunits and 2 B subunits; platelet FXIII consists of only 2 A subunits. After FXIII is activated by thrombin, it catalyzes the formation of peptide bonds between adjacent molecules of fibrin monomers, thus conferring mechanical and chemical stability to the fibrin clot. Fibrin that is not covalently crosslinked exhibits an increased susceptibility to fibrinolysis.

Congenital FXIII deficiency is an autosomal recessive bleeding disorder. Individuals with severe FXIII deficiency (FXIII:C <1%) may experience intracranial hemorrhage, soft tissue hemorrhage, hemarthrosis, and hematomas. Typically, affected patients suffer from delayed bleeding occurring 24 to 48 hours after the initial hemostatic response to an injury. In newborns, bleeding from the umbilical stump may occur after separation of the umbilical cord, as well as intracranial bleeding. Poor wound healing and abnormal scar formation are also observed. Asymptomatic individuals with milder deficiencies may experience post-surgical or trauma-related bleeding; additionally female patients may experience recurrent spontaneous abortions and heavy menstrual bleeding.

Although felt to be rare, acquired FXIII deficiency is likely more commonly encountered than congenital deficiency state. In one series of patients, the large majority of patients had an acquired deficiency state as opposed to a congenital deficiency. The various etiologies included consumptive coagulopathy, infection related, or due to development of autoantibodies. These patients develop adult-onset bleeding.

Reference Values

> or =55%

Interpretation

Decreased factor XIII (FXIII) activity could reflect acquired conditions (eg, autoimmune conditions [systemic lupus erythematosus, rheumatoid arthritis, malignancy, monoclonal gammopathy of undetermined significance, medication-isoniazid], increased consumption [surgery, disseminated intravascular coagulation/intravascular coagulation and fibrinolysis, inflammatory bowel disease, Henoch-Schonlein purpura, sepsis, thrombosis], decreased synthesis [liver disease, leukemia, medication-valproic acid and tocilizumab]), autoantibodies to FXIII, or a congenital deficiency state.

Normal FXIII activity makes a congenital or acquired FXIII deficiency less likely. Individuals with heterozygous FXIII-A deficiency have FXIII activity between 30% and 70% and are generally considered to be asymptomatic. However, several studies have reported severe bleeding in affected individuals.

Recent transfusion of plasma, cryoprecipitate, or FXIII concentrate will raise FXIII levels and may mask a diagnosis of FXIII deficiency.

Cautions

Factor XIII (FXIII) activity results may be underestimated by:
-Bilirubin greater than 7 mg/dL
-Hemoglobin greater than 125 mg/dL
-Lipemia greater than 3500 mg/dL

Residual platelets in frozen-thawed plasma can increase FXIII activity such that the FXIII activity may be falsely normal. Specimens that are to be frozen before testing must be centrifuged twice to remove as many of the platelets as possible before freezing.

Factor XIII results on Ceveron s100 are not affected by rheumatoid factor up to 600 mg/dL, fibrinogen up to 6 g/L, ammonia up to 2 mM and heparin up to 10 U/mL.

Clinical Reference

1. Anwar R, Miloszewski KJ. Factor XIII deficiency. Br J Haematol. 1999;107(3):468-484
2. Kottke-Marchant K. Performance and interpretation of routine coagulation assays. In: Laboratory Hematology Practice. Wiley Blackwell Publishing; 2012:420-434
3. Hoffman R, Benz EJ Jr, Siberstein LE, et al. Hematology: Basic Principles and Practice. 7th ed. Elsevier; 2018
4. Kohler HP, Ichinose A, Seitz R, Ariens RA, Muszbek L; Factor XIII and Fibrinogen SSC Subcommittee of the ISTH. Diagnosis and classification of factor XIII deficiencies. J Thromb Haemost. 2011;9(7):1404-1406
5. Al Sharif MA, Mathews N, Tasneem S, et al. Measurement of factor XIII for the diagnosis and management of deficiencies: insights from a retrospective review of 10 years of data on consecutive samples and patients. Res Pract Thromb Haemost. 2025;9(1):102689
6. Dorgalaleh A, Jozdani S, Zadeh MK. Factor XIII deficiency: Laboratory, molecular, and clinical aspects. Semin Thromb Hemost. 2025;51(2):155-169. doi:10.1055/s-0044-1796673

Performance

Method Description
Factor XIII (FXIII) is activated by thrombin in the presence of calcium. Activated FXIII then cleaves the sidechain carboxamide bond of the assay's substrate and thereby releases the dark quencher (2,4-dinitrophenyl) linked to the cadaverine spacer. Subsequently, the increase of fluorescence results from the N-terminally attached fluorophore N-methyl-2-aminobenzoic acid. The fluorescent signal is proportional to the FXIII activity in the plasma sample.(Package insert: Technofluor FXIII Activity. Technoclone; 07/15/2020)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
1 to 8 days

Specimen Retention Time
7 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
85290

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
13ACT	Factor XIII(13) Activity, P	In Process

Test Definition: 13ACT

Coagulation Factor XIII (13) Activity Assay, Plasma

Result ID	Test Result Name	Result LOINC® Value
623415	Factor XIII (13) Activity, P	In Process