MAYO CLINIC LABORATORIES

Test Definition: C8FX

C8 Complement, Functional, S

Overview

Useful For

Diagnosis of C8 deficiency
Investigation of a patient with an undetectable total hemolytic complement level

Method Name

Automated Liposome Lysis Assay

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Ordering Guidance

The total complement assay (COM / Complement, Total, Serum) should be used as a screen for suspected complement deficiencies before ordering individual complement component assays. A deficiency of an individual component of the complement cascade will result in an undetectable total complement level.

Specimen Required

Patient Preparation: Fasting preferred
Supplies: Aliquot Tube, 5 mL (T465)
Collection Container/Tube: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions:
1. Immediately after specimen collection, place the tube on wet ice.
2. Centrifuge and aliquot serum into plastic vial.
3. Immediately freeze specimen.

Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	OK

Specimen Minimum Volume

0.5 mL

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum Red	Frozen (preferred)	14 days	

Clinical & Interpretive

Clinical Information

Complement proteins are components of the innate immune system. There are 3 pathways to complement activation: 1) the classical pathway, 2) the alternative (or properdin) pathway, and 3) the lectin (mannan-binding lectin) pathway. The classical pathway of the complement system is composed of a series of proteins that are activated in response to the presence of immune complexes. A single IgM molecule or 2 IgG molecules are sufficient to trigger activation of the recognition complex initiated by C1q. The activation process triggers a cascade that includes an amplification loop. The amplification loop is mediated by C3, with cleavage of a series of proteins, and results in 3 main end products: 1) anaphylatoxins that promote inflammation (C3a, C5a), 2) opsonization peptides that are chemotactic for neutrophils (C3b) and facilitate phagocytosis, and 3) the membrane attack complex (MAC), which promotes cell lysis.

Patients with deficiencies of the late complement proteins (C5, C6, C7, C8, and C9) are unable to form the MAC, and may have increased susceptibility to neisserial infections.

C8 deficiency is relatively rare, over 50 cases have been described. The C8 protein is comprised of 3 subunits: alpha, beta, and gamma. However, variants leading to deficiency have not been reported in C8 gamma, and the majority are in the C8 beta subunit. C8 deficiency is characterized by recurrent neisserial infections, particularly meningitis. Autoimmune disease (systemic lupus erythematosus-like) has also been reported. Given the 3 subunits, it is possible to have a low-normal C8 concentration but a nonfunctional protein, therefore the recommendation for testing is the functional assay.

For most of the complement proteins, a small number of cases have been described in which the protein is present but is nonfunctional. These rare cases require a functional assay to detect the deficiency.

Reference Values

33-58 U/mL

Interpretation

Low levels of complement may be due to inherited deficiencies, acquired deficiencies, or due to complement consumption (eg, as a consequence of infectious or autoimmune processes).

Absent C8 levels in the presence of normal C3 and C4 values are consistent with a C8 deficiency. Absent C8 levels in the presence of low C3 and C4 values suggests complement consumption.

Normal results indicate both normal C8 protein levels and normal functional activity.

Cautions

Absent (or low) C8 functional levels in the presence of normal C8 antigen levels should be replicated with a new serum specimen to confirm that C8 inactivation did not occur during shipping.

Clinical Reference

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3. Davis ML, Austin C, Messmer BL, et al: IFCC-standardization pediatric reference intervals for 10 serum proteins using the Beckman Array 360 system. Clin Biochem. 1996 Oct;29(5):489-492
4. Gaither TA, Frank MM: Complement. In: Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods. 17th ed. WB Saunders Company; 1984:879-892
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7. Willrich MAV, Braun KMP, Moyer AM, Jeffrey DH, Frazer-Abel A. Complement testing in the clinical laboratory. Crit Rev Clin Lab Sci. 2021 Nov;58(7):447-478. doi: 10.1080/10408363.2021.1907297

Performance

Method Description
C8 complement activity is measured by mixing patient serum with a C8-deficient serum. The lytic activity of the serum mixture is tested against sensitized, labeled liposomes. If lysis occurs, the patient serum must be the source of the C8. The target liposomes are a commercial reagent (WAKO total complement CH50), and the assay is performed on an Advia XPT.(Unpublished Mayo method)

PDF Report
No

Specimen Retention Time
14 days

Performing Laboratory Location
Rochester

Fees & Codes

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

CPT Code Information
86161

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
C8FX	C8 Complement, Functional, S	50997-6

Result ID	Test Result Name	Result LOINC Value
C8FX	C8 Complement, Functional, S	50997-6