

Overview

Useful For
Investigation of a patient with a low (absent) hemolytic complement

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.

To evaluate for complement C2, C3, and C4 in one orderable, consider ordering C2 / C2 Complement, Functional, with Reflex, Serum.

Specimen Required
Patient Preparation: Fasting preferred but not required
Supplies: Sarstedt 5 mL Aliquot Tube (T914)
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.

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	OK
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Gross lipemia	Reject
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum Red	Frozen	21 days	

Clinical & Interpretive

Clinical Information

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. This 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.

The absence of early components (C1, C2, C3, C4) of the complement cascade results in the inability of immune complexes to activate the cascade. Patients with deficiencies of the early complement proteins are unable to generate lytic activity or to clear immune complexes. They may also have symptoms that suggest autoimmune disease in which complement deficiency may be an etiologic factor.

Although rare, C2 deficiency is the most common inherited complement deficiency. Homozygous C2 deficiency has an estimated prevalence ranging from 1 in 10,000 to 1 in 40,000 (the prevalence of heterozygotes is 1 in 100 to 1 in 50). Half of the homozygous patients are clinically normal.

However, discoid lupus erythematosus or systemic lupus erythematosus (SLE) occurs in approximately one-third of patients with homozygous C2 deficiency. Patients with SLE and a C2 deficiency frequently have a normal anti-double-stranded DNA titer. Clinically, many have lupus-like skin lesions and photosensitivity, but immunofluorescence studies may fail to demonstrate immunoglobulin or complement along the epidermal-dermal junction.

Other diseases reported to be associated with C2 deficiency include dermatomyositis, glomerulonephritis, vasculitis, atrophodema, cold urticaria, inflammatory bowel disease, and recurrent infections.

The laboratory findings that suggest C2 deficiency include a hemolytic complement of nearly zero, with normal values for C3 and C4.

Reference Values

25-47 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 (or low) C2 levels in the presence of normal C3 and C4 values are consistent with a C2 deficiency.

Low C2 levels in the presence of low C3 and C4 values are consistent with a complement-consumptive process.

Low C2 and C4 values, in the presence of normal values for C3 is suggestive of C1 esterase inhibitor deficiency.

Cautions

As with all complement assays, proper sample handling is of utmost importance to ensure that the complement system is not activated before clinical testing.

Clinical Reference

1. Gaither TA, Frank MM: Complement. In: Henry JB, ed. Clinical Diagnosis and Management by Laboratory Methods. 17th ed. WB Saunders Company; 1984:879-892
2. Agnello V: Complement deficiency states. Medicine. 1978;57:1-23
3. Buckley D, Barnes L: Childhood subacute cutaneous lupus erythematosus associated with homozygous complement 2 deficiency. Pediatr Dermatol. 1995;12:327-330
4. 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**

C2 complement activity is measured by mixing patient serum with a C2-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 C2. The target liposomes are a commercial reagent (WAKO total complement CH50), and the assay is performed on a Siemens Advia XPT.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 3 days

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

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

86161

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
C2FXN	C2 Complement, Functional, S, NR	93977-7

Result ID	Test Result Name	Result LOINC® Value
C2FX	C2 Complement,Functional,S	93977-7
INT53	Interpretation	69048-7