MAYO CLINIC LABORATORIES

Test Definition: CRTHT

Double-Stranded DNA (dsDNA) IgG Antibodies, Crithidia luciliae Immunofluorescence Titer, Serum (Non-Orderable)

Overview

Useful For

Only orderable as a reflex. For more information see CRTHS / Double-Stranded DNA (dsDNA) IgG Antibodies, *Crithidia luciliae* Immunofluorescence Screen, Serum.

Antibody titer testing for antibodies to double-stranded DNA using the *Crithidia luciliae* indirect immunofluorescence test is part of the evaluation of patients with clinical features of systemic lupus erythematosus (SLE) or at-risk for disease

This test **should not** be used independently for the diagnosis and management of patients with SLE.

Method Name

Only orderable as a reflex. For more information see CRTHS / Double-Stranded DNA (dsDNA) IgG Antibodies, *Crithidia luciliae* Immunofluorescence Screen, Serum.

Indirect Immunofluorescence Assay (IFA)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Only orderable as a reflex. For more information see CRTHS / Double-Stranded DNA (dsDNA) IgG Antibodies, *Crithidia luciliae* Immunofluorescence Screen, Serum.

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.8 mL Serum
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Specimen Minimum Volume

See Specimen Required

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	OK
Heat-treated	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Frozen	21 days	

Clinical & Interpretive

Clinical Information

Anti-double-stranded DNA (anti-dsDNA) antibodies are a hallmark serological marker for systemic lupus erythematosus (SLE), with high specificity that makes them crucial for diagnosing and classifying the disease, particularly under the 2012 Systemic Lupus International Collaborating Clinics and 2019 European Alliance of Associations for Rheumatology/American College of Rheumatology criteria.(1-3) Clinically, these antibodies are not just diagnostic but are strongly associated with disease activity and the pathogenesis of severe complications, most notably lupus nephritis (LN), as their titers often rise just before or during clinical flares.(4-7)

The frequently used methods for detection and quantification of anti-dsDNA antibody in the clinical laboratory include the solid-phase immunoassays (SPAs) such as the enzyme linked immunosorbent assay (ELISA), fluoro-enzyme immunoassay, chemiluminescence immunoassay, multiplexed bead-based assays and indirect immunofluorescence test using *Crithidia luciliae* (CLIFT) as substrate.(8) The Farr radioimmunoassay (RIA) is traditionally considered a "gold standard" for detecting anti-dsDNA antibody testing as it selectively detects high avidity antibodies, uses native antigen, and has high specificity. However, the Farr-RIA has largely been replaced by manual or automated solid-phase immunoassays and CLIFT.

The CLIFT is a highly specific diagnostic tool used primarily for the confirmation of medium-to-high avidity and medium-to-high affinity anti-dsDNA IgG antibodies.(3) By utilizing the kinetoplast of the non-pathogenic hemoflagellate *Crithidia luciliae*, which contains a dense, pure concentration of circular double-stranded DNA (dsDNA), the assay provides a unique substrate free from contaminating nuclear antigens like histones or single-stranded DNA.(8) While its sensitivity is moderate (approximately 42%-76%), its specificity for SLE is nearly 98% to 100%, making it an essential "rule-in" test after an initial positive result from more sensitive but less specific SPAs like ELISA.

Beyond its role in SLE diagnosis, the CLIFT carries significant clinical weight in assessing disease activity and organ

involvement.(4,6,7) Positive results are strongly linked to active SLE and LN, and associated with complement consumption.(9,10) Because the CLIFT preferentially detects medium-to-high avidity and medium-to-high affinity IgG antibodies, a positive titer is frequently associated with periods of disease flare, whereas a negative result may occur during remission even if other assays remain positive. Consequently, clinicians use the CLIFT to assess risk for disease remission and specific clinical manifestations, as high titers often drop in response to successful immunosuppressive therapy. However, due to its high specificity but low sensitivity, the CLIFT is widely used as a confirmatory test following a positive anti-dsDNA IgG result obtained in a SPA.(4-8)

Discordant results between SPAs as well as SPAs and CLIFT for anti-dsDNA antibodies is relatively common (3-5,7-8), occurring in a fifth of patients overall and a third of visits.(7)

Reference Values

Only orderable as a reflex. For more information see CRTHS / Double-Stranded DNA (dsDNA) IgG Antibodies, *Crithidia luciliae* Immunofluorescence Screen, Serum.

Negative (<1:10)

Interpretation

The presence of IgG antibodies to double-stranded DNA detected using the *Crithidia luciliae* indirect immunofluorescence test is highly specific for systemic lupus erythematosus (SLE) with moderate sensitivity.

A negative result does not exclude a diagnosis of SLE.

Cautions

IgG antibodies to double-stranded DNA detected using the *Crithidia luciliae* by indirect immunofluorescence test (CLIFT) should not be relied upon exclusively to diagnose and manage patients with systemic lupus erythematosus (SLE).

Compared to some solid-phase immunoassays, CLIFT is specific but lacks diagnostic sensitivity for SLE. A more sensitive semiquantitative enzyme linked immunosorbent assay for assessing IgG antibodies to dsDNA is also available, see test for ADNA1 / Double-Stranded DNA (dsDNA) Antibodies, IgG, Serum).

A negative result does not exclude a diagnosis of SLE.

Clinical Reference

1. Petri M, Orbai AM, Alarcon GS, et al. Derivation and validation of the Systemic Lupus International Collaborating Clinics classification criteria for systemic lupus erythematosus. Arthritis Rheum. 2012;64(8): 2677-2686
2. Aringer M, Costenbader K, Daikh D, et al. 2019 European League Against Rheumatism/American College of Rheumatology Classification Criteria for systemic lupus erythematosus. Arthritis Rheumatol. 2019;71(9):1400-1412
3.Orme ME, Voreck A, Aksouh R, Schreurs MWJ. Anti-dsDNA testing specificity for systemic lupus erythematosus: A systematic review. J Appl Lab Med. 2022;7(1):221-239. doi:10.1093/jalm/jfab146
4. Enocsson H, Sjowall C, Wirestam L, et al. Four anti-dsDNA antibody assays in relation to systemic lupus erythematosus disease specificity and activity. J Rheumatol. 2015;42(5):817-825
5. Sarbu MI, Salman-Monte TC, Rubio Munoz P, Lisbona MP, Almirall Bernabe M, Carbonell J. Differences between clinical and laboratory findings in patients with recent diagnosis of SLE according to the positivity of anti-dsDNA by the

Crithidia luciliae method. Lupus. 2015;24(11):1198-1203
6. Bragazzi NL, Watad A, Damiani G, Adawi M, Amital H, Shoenfeld Y. Role of anti-DNA auto-antibodies as biomarkers of response to treatment in systemic lupus erythematosus patients: hypes and hopes. Insights and implications from a comprehensive review of the literature. Expert Rev Mol Diagn. 2019;19(11):969-978
7. Zaminski D, Saxena A, Izmirly P, Buyon JP, Belmont HM. Clinical implications of discordance between anti-dsDNA antibodies by multiplex flow immunoassay and *Crithidia luciliae* assay in a multiethnic racial cohort of patients with SLE. Lupus Sci Med. 2023;10(2):e001012
8. Cockx M, Van Hoovels L, De Langhe E, et al. Laboratory evaluation of anti-dsDNA antibodies. Clin Chim Acta. 2022;528:34-43

Performance

Method Description

Patient serum with a positive screen at the 1:10 dilution is titered up to 1:640 and allowed to bind to the kinetoplast of the non-pathogenic hemoflagellate *Crithidia luciliae* adhered to the slide. The *Crithidia luciliae* contains a dense, pure concentration of circular double-stranded DNA that provides a unique substrate free from contaminating nuclear antigens like histones or single-stranded DNA. Following binding, unbound diluted patient serum is washed off the slide and fluorescent-conjugated antiserum added to the substrate on the slide and incubated. A second washing step is performed to remove excess conjugate. The substrate is cover slipped and reviewed for fluorescent patterns with a fluorescent microscope. Observation of specific fluorescent patterns on the substrate indicate the presence of autoantibodies in the test sample. Positive results are reported with an end point titer up to 1:640. Results higher than 1:640 are reported as greater than 1:640.(Package Insert: Immuno Concepts IgG ANTI-nDNA Fluorescent Test System, Immuno Concepts, Rev 4.0 2023)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

2 to 4 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

MAYO CLINIC LABORATORIES

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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 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

86256

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CRTHT	dsDNA Ab IFA Titer, IgG, S	58466-4

Result ID	Test Result Name	Result LOINC® Value
623427	dsDNA Ab IFA Titer, IgG, S	58466-4