MAYO CLINIC LABORATORIES

Test Definition: ADNA

DNA Double-Stranded Ab, IgG, S

Overview

Useful For

Evaluating patients with clinical features or at-risk for systemic lupus erythematosus (SLE)

An adjunct test for monitoring disease activity in SLE patients previously positive for double-stranded DNA IgG antibodies

Method Name

Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Specimen Volume: 0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Minimum Volume

0.35 mL

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Of the systemic lupus erythematosus (SLE)-specific antibodies outlined in the immunology domain of the 2019 European League Against Rheumatism (EULAR)/American College of Rheumatology (ACR) classification criteria for SLE,(1) antibodies to double-stranded DNA (dsDNA) is the most common. It is also included in the Systemic Lupus International Collaborating Clinics classification criteria (SLICC) for SLE.(2) Detection of IgG antibodies to dsDNA is the most used isotype clinically.(3-5) The diagnostic performance of dsDNA IgG antibodies in SLE is variable and dependent on several factors; notably the immunological method used for their detection, the structure of the DNA, the patient's disease state (early or active vs inactive) including specific clinical manifestations and demographics.(3-7) Weak-positive dsDNA IgG antibodies have low affinity and low avidity with variable clinical correlations for SLE.(3)

Testing for IgG antibodies to dsDNA is indicated in patients positive for anti-cellular antibody (ie, antinuclear antibody: ANA) homogeneous pattern using HEp-2 substrate by indirect immunofluorescence assay (IFA) along with clinical features compatible with SLE.(1,2,8). A minority of SLE patients may test negative using HEp-2 by IFA for nuclear antibodies.(8,9) Testing antibodies associated with HEp-2 IFA cytoplasmic pattern such as ribosomal P IgG autoantibodies may be useful if features of neuropsychiatric disease are present. Alternatively, patients may be tested for Smith, ribonucleoprotein, SSA-52, and SSA-60 antibodies.(8,9)

The levels of antibodies to dsDNA may fluctuate with SLE disease activity. Increasing antibody levels may be associated with flares while decline or negative results may indicate response to treatment or disease remission.

Reference Values

<30.0 IU/mL (negative)

30.0-75.0 IU/mL (borderline)

>75.0 IU/mL (positive)

Negative is considered normal.

Reference values apply to all ages.

Interpretation

A positive result for double-stranded DNA (dsDNA) IgG antibodies in the appropriate clinical context is suggestive of

systemic lupus erythematosus (SLE). The performance characteristics of dsDNA IgG antibodies in SLE is dependent on the immunological method used for their detection, the patient's disease state including clinical manifestations, and demographics.

Weak-positive dsDNA IgG antibody results have a low-positive predictive value for SLE.

Negative results do not rule out a diagnosis of SLE.

Cautions

Measurements of IgG antibodies to double-stranded DNA (dsDNA) are semiquantitative. Slight changes in the levels of these antibodies should not be relied upon to predict changes in the clinical course of patients with systemic lupus erythematosus (SLE). Clinical flares of disease in patients with SLE may not be accompanied by changes in the levels of dsDNA antibodies. Thus, antibody levels alone are not sufficient to guide disease management.

Weak-positive results may not correlate with a diagnosis of SLE. Confirmation with *Crithidia luciliae* indirect immunofluorescence test (CLIFT), which is more specific for SLE, may be useful to make diagnosis in certain circumstances.

A weak-positive dsDNA IgG result by enzyme-linked immunosorbent assay and a CLIFT-negative result may suggest early disease, remission, or false-positive results.

False-positive results are usually of low titers.

A negative result does not exclude a diagnosis of SLE.

Clinical Reference

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3. Infantino M, Manfredi M, Merone M, et al: Analytical variability in the determination of anti-double-stranded DNA antibodies: the strong need of a better definition of the old and new tests. Immunol Res. 2018 Jun;66(3):340-347. doi: 10.1007/s12026-018-8992-9

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5. Ambrose N, Morgan TA, Galloway J, et al: Differences in disease phenotype and severity in SLE across age groups. Lupus. 2016 Dec;25(14):1542-1550. doi: 10.1177/0961203316644333

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9. Choi MY, Clarke AE, St Pierre Y, et al: Antinuclear antibody-negative systemic lupus erythematosus in an international inception cohort. Arthritis Care Res (Hoboken). 2019 Jul;71(7):893-902. doi: 10.1002/acr.23712

Performance

Method Description

Microwells are pre-coated with calf thymus double-stranded DNA (dsDNA) antigen. The calibrators, controls, and diluted patient samples are added to the wells, and autoantibodies recognizing the dsDNA antigen bind during the first incubation. After washing the wells to remove all unbound proteins, purified peroxidase labeled goat anti-human IgG conjugate is added. The conjugate binds to the captured human autoantibody and the excess unbound conjugate is removed by a further wash step. The bound conjugate is visualized with 3,3',5,5' tetramethylbenzidine (TMB) substrate which gives a blue reaction product, the intensity of which is proportional to a concentration of autoantibody in the sample. Sulfuric acid is added to each well to stop the reaction. This produces a yellow end point color, which is read at 450 nm.(Package insert: QUANTA Lite dsDNA SC ELISA, INOVA Diagnostics Inc; 08/2018)

PDF Report

No

Specimen Retention Time

14 days

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

86225

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
ADNA	DNA Double-Stranded Ab, IgG, S	33799-8

Result ID	Reporting Name	LOINC®
ADNA	DNA Double-Stranded Ab, IgG, S	33799-8