MAYO CLINIC LABORATORIES

Test Definition: SSAB

SS-A and SS-B Antibodies, IgG, Serum

Overview

Useful For

Evaluating patients with signs and symptoms of a connective tissue disease in whom the test for antinuclear antibodies is positive, especially those with signs and symptoms consistent with Sjogren syndrome or lupus erythematosus

This test is **not useful** in patients without demonstrable antinuclear antibodies.

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
SSA	SS-A/Ro Ab, IgG, S	Yes	Yes
SSB	SS-B/La Ab, IgG, S	Yes	Yes

Testing Algorithm

For more information see Connective Tissue Disease Cascade.

Special Instructions

- Connective Tissue Disease Cascade

Method Name

Multiplex Flow Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 0.5 mL

Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Specimen Minimum Volume

0.35 mL

Reject Due To

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

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Sjogren syndrome (SjS) is a heterogeneous systemic autoimmune rheumatic disorder characterized by diverse immunologic responses to SS-A/Ro and SS-B/La antigens.(1) These immune reactivities have been implicated in the destruction of exocrine gland epithelium with demonstration of typical peri-epithelial lymphocytic infiltration, which can vary from sicca syndrome to systemic disease and lymphoma.(2) The SS-A/Ro and SS-B/La system is considered to be a heterogeneous antigenic complex made up of three different proteins (Ro52, Ro60 and La) and four small RNA particles.(1,2) The SS-B/La antigen is a 48 kDa phosphorylated protein that can be found in the nucleus and the cytoplasm and binds to several RNA molecules.(3) SS-B/La appears to be susceptible to proteolysis and degrades into smaller, but immunoreactive, polypeptides.(4)

Unlike antibodies to SS-A/Ro, which are present in SjS and other connective tissue diseases (CTD; systemic lupus erythematosus, systemic sclerosis, inflammatory myopathies, overlap CTD) and primary biliary cholangitis, anti-SS-B/La antibodies are found primarily in patients with SjS.(2,5,6) In addition, SS-A/Ro antibodies may be found alone in many patients with SjS; however, anti-SS-B/La autoantibodies without SS-A/Ro have limited significant association for SjS diagnosis or phenotypic categorization.(2,6,7) Lastly, testing for anti-SS-A/Ro antibodies is included in the 2016 American College of Rheumatology/European League Against Rheumatism classification criteria for primary SjS; whereas, evaluation of anti-SS-B/La antibodies is not required.(8) In a recent multicenter study of more than 10,500 patients with primary SjS, anti-SS-B/La antibodies were detected in 58% of anti-SS-A/Ro antibody-positive cases.(9)

SS-A/Ro is an extractable nuclear antigen composed of two distinct antigens of 52 kDa (Ro52) and 60 kDa (Ro60) combined with cytoplasmic RNA species.(10-12) SS-A/Ro (Ro52 and/or Ro60) antibodies occur in patients with several different connective tissue diseases including SjS, an autoimmune disease that involves primarily the salivary and lachrymal glands, systemic lupus erythematosus (SLE), rheumatoid arthritis, systemic sclerosis (SSc), and idiopathic inflammatory myopathies (IIM).(10-14) SS-A/Ro antibodies are associated with childhood SLE, neonatal SLE, and with congenital heart block in infants born to mothers with SLE.(12,14)

Traditionally, anti-Ro antibodies were detected by indirect immunofluorescence assay on HEp-2 substrates and confirmed by immunodiffusion, immunoblot, or enzyme-linked immunosorbent assay (ELISA), mostly using a mixture of both Ro52 and Ro60 as the antigens.(10) With technological advances in the expression and purification of recombinant proteins, solid-phase immunoassays that allow the separate detection of anti-Ro52 and anti-Ro60 antibodies, such as ELISA, fluorometric enzyme-linked immunoassays (FEIA), chemiluminescence immunoassays (CIA), addressable laser bead immunoassay (ALBIA), particle-based multianalyte technology (PMAT), or autoantigen arrays, became available.(11,12) Based on separate determination of Ro52 and Ro60 antibodies, there is substantial evidence that differential associations of these autoantibodies in patients may corelate with specific phenotypes in SLE (neonatal lupus, and fetal atrioventricular blockade), SjS, SSc, IIM, or primary biliary cholangitis.(10-13,15) Patients who have SjS with antibodies to both Ro52 and Ro60 are characterized by higher prevalence of markers of B-cell hyperactivity and glandular inflammation compared to those with single positivity.(13,15) Although these antibodies are often found together, both autoantibodies have important and distinct diagnostic and predictive attributes and should be distinguished when SS-A/Ro antibody is positive or tested singly.(11,13,15)

Like anti-Ro52 and anti-Ro60 antibodies, anti-SS-B/La autoantibodies are detected using a variety of solid-phase (such as plate, bead or membrane) immunoassays, such ELISAs, FEIA, CIA, ALBIA, PMAT, and dot or line immunoassays.(16)

For more information see Connective Tissue Disease Cascade.

Reference Values

SS-A/Ro ANTIBODIES, IgG
<1.0 U (negative)
> or =1.0 U (positive)
Reference values apply to all ages.

SS-B/La ANTIBODIES, IgG
<1.0 U (negative)
> or =1.0 (positive)
Reference values apply to all ages.

Interpretation

A positive result for SSA (Ro) or SSB (La) antibodies is highly suggestive of a diagnosis of Sjogren syndrome.

The presence of isolated anti-SS-B/La antibody has low positive predictive value of Sjogren syndrome.

A positive result for SS-A/Ro antibodies may be suggestive of connective tissue disease (CTD) such as Sjogren syndrome, systemic lupus erythematosus (SLE), systemic sclerosis, inflammatory myopathies (especially in patients with anti-synthetase syndrome), CTD-associated with interstitial lung diseases, or rheumatoid arthritis.

A positive result for SS-A/Ro antibodies in a woman with SLE prior to delivery indicates an increased risk of congenital heart block in the neonate.

Differential testing for Ro52 and Ro60 antibodies in patients positive for SS-A/Ro may be useful in the diagnosis of specific CTD clinical subset, disease stratification, and prognosis. Consider testing for Ro52 and Ro60 antibodies (ROPAN / Ro52 and Ro60 Antibodies, IgG, Serum) if the patient is positive for SS-A/Ro.

Cautions

No significant cautionary statements

Clinical Reference

1. Brito-Zeron P, Baldini C, Bootsma H, et al. Sjogren syndrome. Nat Rev Dis Primers. 2016;2:16047
2. Vílchez-Oya F, Balastegui Martin H, Garcia-Martinez E, Corominas H. Not all autoantibodies are clinically relevant. Classic and novel autoantibodies in Sjogren's syndrome: A critical review. Front Immunol. 2022;13:1003054
3. Bachman M, Mayet WJ, Shroder HC, et al. Association of La and Ro antigens with intracellular structures in HEp-2 carcinoma Cells. Proc Natl Acad Sci USA. 1986;83(20):7770-7774
4. Habets WJ, den Brok JH, Boerbooms AM, van de Putte LB, van Venrooij WJ. Characterization of SS-B (La) antigen in adenovirus-infected and uninfected HeLa cells. EMBO J. 1983;2(10):1625-1631
5. Deroo L, Achten H, De Boeck K, et al. The value of separate detection of anti-Ro52, anti-Ro60 and anti-SSB/La reactivities in relation to diagnosis and phenotypes in primary Sjogren's syndrome. Clin Exp Rheumatol. 2022;40(12):2310-1317
6. Baer AN, McAdams DeMarco M, Shiboski SC, et al. The SSB-positive/SSA-negative antibody profile is not associated with key phenotypic features of Sjögren's syndrome. Ann Rheum Dis. 2015;74(8):1557-1561
7. Acar-Denizli N, Horvath IF, Mandl T, et al. Systemic phenotype related to primary Sjogren's syndrome in 279 patients carrying isolated anti-La/SSB antibodies. Clin Exp Rheumatol. 2020;38 Suppl 126(4):85-94
8. Shiboski CH, Shiboski SC, Seror R, et al. 2016 American College of Rheumatology/European League Against Rheumatism classification criteria for primary Sjogren's syndrome: A consensus and data-driven methodology involving three international patient cohorts. Ann Rheum Dis. 2017;76(1):9-16
9. Brito- Zeron P, Acar-Denizlin N, Ng WF, et al. How immunological profile drives clinical phenotype of primary Sjogren’s syndrome at diagnosis: analysis of 10,500 patients (Sjogren Big Data Project). Clin Exp Rheumatol. 2018; 36 (Suppl. 112): S102-12
10. Schulte-Pelkum J, Fritzler M, Mahler M. Latest update on the Ro/SS-A autoantibody system. Autoimmun Rev. 2009;8(7):632-637
11. Lee AYS, Reed JH, Gordon TP. Anti-Ro60 and anti-Ro52/TRIM21: Two distinct autoantibodies in systemic autoimmune diseases. J Autoimmun. 2021;124:102724
12. Menendez A, Gomez J, Escanlar E, Caminal-Montero L, Mozo L. Clinical associations of anti-SSA/Ro60 and anti-Ro52/TRIM21 antibodies: Diagnostic utility of their separate detection. Autoimmunity. 2013;46(1):32-39
13. Armagan B, Robinson SA, Bazoberry A, et al. Antibodies to both Ro52 and Ro60 for identifying Sjogren's syndrome patients best suited for clinical trials of disease-modifying therapies. Arthritis Care Res (Hoboken). 2022;74(9):1559-1565
14. Buyon JP, Ben-Chetrit E, Karp S, et al. Acquired congenital heart block. Pattern of maternal antibody response to biochemically defined antigens of the SSA/Ro-SSB/La system in neonatal lupus. J Clin Invest. 1989;84(2):627-634. doi:10.1172/JCI114208
15. Robbins A, Hentzien M, Toquet S, et al. Diagnostic utility of separate anti-Ro60 and anti-Ro52/TRIM21 antibody detection in autoimmune diseases. Front Immunol. 2019;10:444
16. Bossuyt X, De Langhe E, Borghi MO, Meroni PL. Understanding and interpreting antinuclear antibody tests in systemic rheumatic diseases. Nat Rev Rheumatol. 2020;16(12):715-726

Performance

Method Description

Recombinant SS-A/Ro 52 kDa, affinity-purified SS-A/Ro 60 kDa, and affinity-purified SS-B antigen are coupled covalently to polystyrene microspheres that are impregnated with fluorescent dyes to create a unique fluorescent signature. SS-A/Ro antibodies, if present in diluted serum, bind to the SS-A/Ro antigens on the microspheres, and SS-B/La antibodies, if present, bind to the SS-B antigen on the microspheres. The microspheres are washed to remove extraneous serum proteins. Phycoerythrin (PE)-conjugated antihuman IgG antibody is then added to detect IgG anti-SS-A/Ro or anti-SS-B/La bound to the microspheres. The microspheres are washed to remove unbound conjugate, and bound conjugate is detected by laser photometry. A primary laser reveals the fluorescent signature of each microsphere to distinguish it from microspheres that are labeled with other antigens, and a secondary laser reveals the level of PE fluorescence associated with each microsphere. Results are calculated by comparing the median fluorescence response for SS-A/Ro and SS-B/La microspheres to a 4-point calibration curve.(Package insert: Bioplex 2200 ANA Screen. Bio-Rad Laboratories; 02/2019)

PDF Report
No

Day(s) Performed
Monday through Saturday

Report Available
Same day/1 to 3 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

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 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
86235 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value

SSAB	SSA/SSB	87555-9

Result ID	Test Result Name	Result LOINC® Value
SSA	SS-A/Ro Ab, IgG, S	33610-7
SSB	SS-B/La Ab, IgG, S	33613-1